

Activity Tracker: A Personal Health and Fitness Tracker

Tyler Loewen
Bradley Rey
Nahiyan Naim

Milestone 1

Part (a): Identify Your Project Idea

The project idea is to design a health tracker website that can be used to help users keep track of their health-related activities as well as to help them become motivated or keep them motivated. The website will include functionality that allows the user to enter a health goal that they can then strive to meet in designated time intervals that they themselves set. The users of the website will mostly range from eighteen to sixty-year-old males and females who are looking for ways to improve or maintain healthy physical activity and/or dietary habits. We expect the website to be used in mainly two situations, the user entering data soon after they have completed activities that they want to record, or at the end of the day when they enter all their data. The users may also want to be able to use the website in a quick and simple way in both outdoor and indoor environments.

Part (b): Identify Stakeholders

Primary

- **Motivated Daily Primary User:** This user is someone that needs the motivation to improve their health and uses the health tracker's data entry and streak features daily to accomplish this.
- **Unmotivated Daily Primary User:** This user enters activity data into the website daily to meet their personal goals. They do not need to use the website as a means of staying motivated but instead uses it only for the data recording functionality.

These primary users will have at least some experience using websites because they use the health tracker website daily. They may also be of any age within our target range of eighteen-to-sixty-year-olds, as well as from either gender.

Secondary

- **Motivated Occasional User:** This user is someone that uses the health tracker for goals and streaks that only require weekly data entry. They are using the website to fulfill their needs, but their activities or goals do not warrant daily data entry.
- **Unmotivated Occasional User:** This user is the one that is using the health tracker to motivate themselves to become healthier but fails to stay motivated. This causes them to only use the health tracker website in short periods of irregular use.

Some of the secondary users may not have lots of experience with websites or technology in general, while others may be comfortable with them. The age range of these users is also likely in our targeted range of 18-60 years, and from both genders.

Tertiary

- **An acquaintance of Primary or Secondary Users:** This user is the friend, family member, or anyone that interacts with the primary and secondary user. This is because the use of the health tracker can have positive effects on the primary/secondary user, such as improved physical appearance, mental health or other characteristics. These changes then become apparent to the tertiary users, affecting how they perceive and interact with the primary and secondary user, as well as possibly motivating them to become healthier as well.

Tertiary users have a very large range of experience and background knowledge of technology. Regarding the requirements, they do not need to have any experience or background knowledge on how to use the health tracker or any websites in general. They can also vary greatly regarding age because they are defined as anyone that interacts with the primary and secondary user.

Part (c): User Research

Research Methods: Justification

Character Profiles

Using character profiles works well in this situation because it allows for the creation of potential users based on real people with varying cultures and backgrounds. The creation of these profiles allows the website to be tested by a made-up user with specific characteristics and traits that want to be tested for. This means we can explore and understand the broad range of potential users of the website without having to spend time and resources finding a person in the real world with similar traits and characteristics.

Card Sort

Using the card sort method of researching is useful because it allows us to understand the mental model of the user. This is done by writing potential functions of the website on cards and getting the user to organize them in a way that makes sense to them. Knowing the mental model of the user helps us to learn how the user sees themselves using the website. Knowing this information is important in helping us understand what functionality is most important to the user, and to help prevent the addition of unwanted features and functions.

Scenarios

Using scenarios involves creating potential uses of the website to learn more about the context that it may be used in. The scenarios method of research synergizes very well with the character profiles method. The character profiles allow for the detailed development of potential users and their characteristics while scenarios of the website's use can then be created

and expanded on using the users from the character profiles. This allows for the specific and detailed creation of a user's potential experience with the website. These created scenarios help test the application of the website in different contexts of use, such as the environment, time constraints of the user, etc. Having detailed descriptions of how to website might be used in specific contexts allows us to modify and refine it to accommodate these situations.

Research Methods: Summary and Findings

Character Profiles

Mary's character profile shows that some users may not have a very good short-term memory. This means that components of the website such as icons and layout should be memorable for the benefit of these types of users. Another way of assisting these users would be to add daily notifications reminding the user to enter their data from the day.

Tim's character profile illustrates how some users are extremely busy and will use the website infrequently. They may not even have the time to update their health data completely on the website. They would only occasionally to update and track their fitness/health data. The website could still be able to offer basic suggestions or goals for such a user based on their small irregular inputs. Additionally, the site should have an easy and fast data input system for a busy user like Tim who does not have time to use the website often but still wants to update his data occasionally.

Amanda's character profile shows how some users may already be healthy, but just want to improve themselves a little more. She is looking for a bit of extra motivation to keep up with a healthier lifestyle, mainly regarding activities other than physical. Since she was previously very active and is currently healthy, she ultimately wants to maintain where she is now, she can do this by using the website to help motivate her. Time is also a factor since she will often only be able to enter data on the go or at work very briefly. This means that the website will need to be very quick and simple so adding and viewing info can be done quickly and on the go.

Card Sort

First, I gave the card sort volunteer a stack of cards with different health-related activities on them. I then gave them general instructions on how to arrange the cards. After the volunteer was finished, I had a visual representation of how they think about these activities. It showed me that activities such as "No Smoking" and "No Caffeine" were important to them, yet they were not activities that they would be interested in tracking data on. It also showed me that some activities are important to them as well as being activities that they would record data for, such as "Water Intake", "Walking" and "Supplement Intake." This information is invaluable in helping us make sure activities are added to the website that users want to use.

The participant was a 23-year-old male who could be a future potential user of the website. I wrote down fifteen different health activities on separate cards. Then I instructed him to carefully arrange six to seven activity cards that he personally thinks are important to him. I took down some notes while he was going through and arranging the pile of cards. After he was done, I took a picture of his arrangement and instructed him to arrange the cards again, this time, based on activities he would like to keep track of. After that, I noticed that the number of cards decreased by one from the first to the second instruction and the type of cards also varied between the two arrangements. For example, "Working out" was missing from his first arrangement but was present in the second one, and "No Alcohol" was also missing from the second one while being present in the first arrangement. This revealed that even though certain health-related activities are important to a user, they may not be interested in tracking all of them. This helped us differentiate which activities are more important to the user and which are not, and which activities the user would be interested in keeping track of.

The volunteer was a 30-year-old female that is trying to become more active and overall healthier in what they eat and do. They are currently healthy; they just want to have more energy and be overall a little more fit. After the first instruction, it showed that they were very interested in non-physically active activities and more on things that can be done to overall better yourself. After the second instruction, they were very interested in tracking all of the same activities but "Water Intake", since they felt that one was not hard to mentally keep track of. This information is very helpful in figuring out what users may want for activities added to the website, which are trackable, and after hearing their justifications how they would track each.

Scenarios

Mary's scenario describes how the website may be used in the context of the outdoors, exposed to natural elements such as the sun. The creation of this scenario exposed the potential difficulty of seeing items on the website in the outdoors. To make sure the website works well in this context of use it could include large icons that are easily visible and have symbols that are easily recognizable. When there is text it could be large enough for the user to read even with the glare on the screen from the sun, as well as having high contrast with the background to also help with the readability. The scenario also shows how for some users it is important for them to enter their information at the time of the activity or they may forget about it later.

Tim's scenario shows mostly a sedentary lifestyle with no time for extra physical activity. Since he has a full course load at the university, along with a part-time job, he is an extremely busy individual. Because he is so busy, updating the website with inputs daily is not a priority to him. However, he still wants basic fitness goals presented to him on the website that is suited for his specific lifestyle. Since recording data right after an activity is not feasible for him due to time constrictions, he can only make-do with recalling and entering the data one night a week. Additionally, this scenario also points out that error recovery is an important aspect of the

website's data input since he made a few typing mistakes while in a rush. The website should provide a means of recovering from erroneous data entry that could potentially mess up a user's goals.

This scenario shows that Amanda has access to her phone throughout the day and has many brief moments to quickly update stats within the website. While she is in the car on the way to work, she can converse and quickly add something done that morning. During work, she can add water intake briefly, without spending five or more minutes updating statistics. The bus ride home and maybe late at night before bed are two times where she has a little bit more time to enter stats or look through streaks. Fast use of the website is very important. Quick access and given information are ideal for a user to be able to add input and view results, all within the time it takes to click a circle/streak. At night is when Amanda felt like she would enter in data. She mentally does this now, as to what she did and did not do that day. Including dark colours could be a good idea since some users will be trying to fall asleep shortly after entering data. All information should be on one page without navigating being an issue, this helps the overall speed and flow.

Part (d): Requirements

Functional

- Activity tracking
 - This requirement is of utmost importance and is the fundamental requirement of the website. If a user cannot track their activities or healthy habits, they will not be able to see progress.
- Motivate the user
 - Something the website should be able to do is motivate the user. The idea is that having streaks/goals will help the user want to complete these on a daily/weekly basis, thus creating a healthier lifestyle.
- Displays of progress/graphs/diagrams
 - Something that could be added in later versions is a timeline of the user's progress or graphs depicting overall progress, longest streaks, and history of an activity. This could be used by a user to see where they came from or where they may want to get back to.

Data

- Specific requirements for their goal
 - The website will need data from the user about their specific goals. Knowing this data will help decide if a streak is daily/weekly etc., as well as what criteria needs to be met for the goal to be reached.

- User streaks
 - User streaks are one of the foundations of the website because it is something that will help the user stay motivated. What constitutes a streak will be determined by the user, so they can maintain that streak at their own pace.
- User Weight
 - If weight loss/gain is something the user wants to track they will need to enter their body weight. This is the only data about the user that will need to be collected unless later versions want to monitor BMI.

Environmental

- Fast paced/Slow paced
 - From the character profiles and scenarios, it is evident that users will both use the website while in a rush, say immediately after completing an activity and before moving on to something else, or when they have more time, such as at the end of the day before going to bed.
- Indoor/Outdoor
 - Many activities the user may be doing are both indoor and outdoor, therefore the website should be usable in both environments
- Public/Private
 - The website does not contain a lot of sensitive user information, so it could be used both publicly and privately.
- Extracurriculars
 - The website does not require any sound or listening from the user, therefore it can be used in loud environments. Also, quick and simple interactions add to streaks/goals so only one hand is needed, if a user has one hand free, they can use it for their phone or other devices.

User

- Little technical knowledge required
 - The website will be designed very simply. With circles that depict each activity and simple buttons to add to a streak/goal. This allows for very little technical knowledge from the user and allows for a wide range of ages to use the website.
- Healthy/Unhealthy
 - Both healthy and unhealthy users may use this website. Some may be looking to record more information while others simply want to record when certain activities are completed. Some may also be looking for daily motivation while others just want to keep track. These can all be for both healthy and unhealthy users.

Usability

- Quick and simple to enter user data
 - The website needs to be very efficient, seamless, simple and quick. Not many people have lots of time to enter in data. It should not get in the way of a user's productivity, hinder, or deter them from being healthier.
- Easy for new user to learn, understand and remember
 - It is important that new users can learn and understand the website quickly. A user will not keep using the website if they cannot learn, understand, or remember how to use it.
- Easy to recognize/read icons and text
 - Icons need to be like icons used today by other apps, websites, books, etc. The icons and text also need to very easy to see and read so a user can find what they are looking for fast. This will allow for great learnability and memorability from the user.
- Edit previously entered input
 - Safety is an issue for the user if they accidentally enter incorrect data. They will want to be able to alter previously entered data, or at the very least delete previous entries and add a new one.

Part (e): Scenarios

Mark is a 58-year-old man that is a secondary user. Since he recently retired, he has noticed that he is not doing as much to stay active and healthy. He does own an iPhone but only uses its basic functions such as the phone, messaging, and safari to search the web periodically. His grandkids often try to show him other features, but he does not grasp most of them. Today he went for coffee in the morning with friends, then went to run a couple of errands. After lunch, he was doing some housework at home when one of his grandkids stopped by. While talking, his grandchild mentioned the health website he is using daily, Mark thought it sounded interesting. He would not mind tracking activities occasionally, such as walking once or twice a week. After his grandkid leaves, he goes to the website on his phone. At first glance, the website has a simple look, but when he tries to use it, he is confused by the navigation. He recognizes that different icons represent different health-related activities but does not understand the meaning of each icon. Furthermore, he struggles to enter his activity information since it is a different interface than most of the websites he usually visits. Not knowing how to enter his health data into the website he leaves it for a later time and continues with his day.

Anne is a 35-year-old female that is a tertiary user. She has three kids and a husband that all live very busy lifestyles. In the morning, she spends time packing her kid's lunches before she sends them off to school. After her kids are gone, she heads to work where she often sees her co-worker Rick. Rick is a primary user of the health tracker website and has been using it for a few months. Anne has started to notice that Rick has lost some weight in a short period of time, as well as having an improved attitude. After work, she heads home to take the kids to sports and spend time with her family. Seeing the changes that Rick has made has motivated her

to try and start a healthier lifestyle, despite her already busy life. She decides to ask Rick about the website at work the next day.

Milestone 1: Appendix

User Research

Character Profiles

Mary

Mary is a 45-year-old mother living with her husband and four kids in a small house in Seattle. She works full-time at a local grocery store as a cashier. For some reason, she has always been bad at remembering things, whether it is remembering an upcoming evening out or remembering to pick something up from the store. Over the last few years, she has become overweight due to bad eating habits and general laziness. She has been wanting to change her lifestyle for a few weeks already but has not found the motivation to do so. She would like to start some form of daily exercising like going for daily walks but has always found excuses not to.

Mary's goals and priorities

- Start walking to lose weight
- Spend time with her family
- Start eating healthier to lose weight

Tim

Tim is a 19-year old university student with a full course load this semester. In addition to this, he also has a part-time job at a retail store in the city mall. He leaves home every day at eight in the morning for classes and goes to work directly from there in the afternoon, and finally returns home at night. Upon returning home, he takes a quick shower, has dinner and then gets up to speed with homework and class lectures before heading to bed. Due to such a hectic weekly schedule, he has no time for physical activity. However, he still wants to occasionally stay in touch with his health and proper well-being with minimal extra activity.

Tim's primary goals:

- Stay fit like he is now
- Maintain current body weight (no gain or loss from current number)
- Be consistent with calorie intake with the same type of diet every day
- Get accurate hours of sleep at night so that the next day is not hampered by drowsiness and he can stay productive

Amanda

Amanda is a 29-year-old woman that lives with her fiancé. She was a very active kid growing up, she played many sports while in grade school, but now does not do as much physical activity. She works 8-5 every Monday-Friday at the CRA and cannot find much time amongst other events going on in life to stay active and healthy. She would like to find a sport to play even just once a week or find an active hobby that she and her fiancé could motivate each other to do.

She tries to, and for the most part, eats healthy. Having recently picked up a vegetarian lifestyle she has started to really watch what she is eating, and often makes everything she eats. Her and her fiancé to go out with friends though, and she finds it tough to eat good full meals when a restaurant may not serve the healthiest vegetarian options. Because she is not as physically active anymore, she does monitor things like fruit and veggie intake, calories, vitamins, and water intake. This is all done as an estimate in her head though and not tracked down anywhere. She has tried a few apps but finds they are too bloated and excessive for what she wants to record.

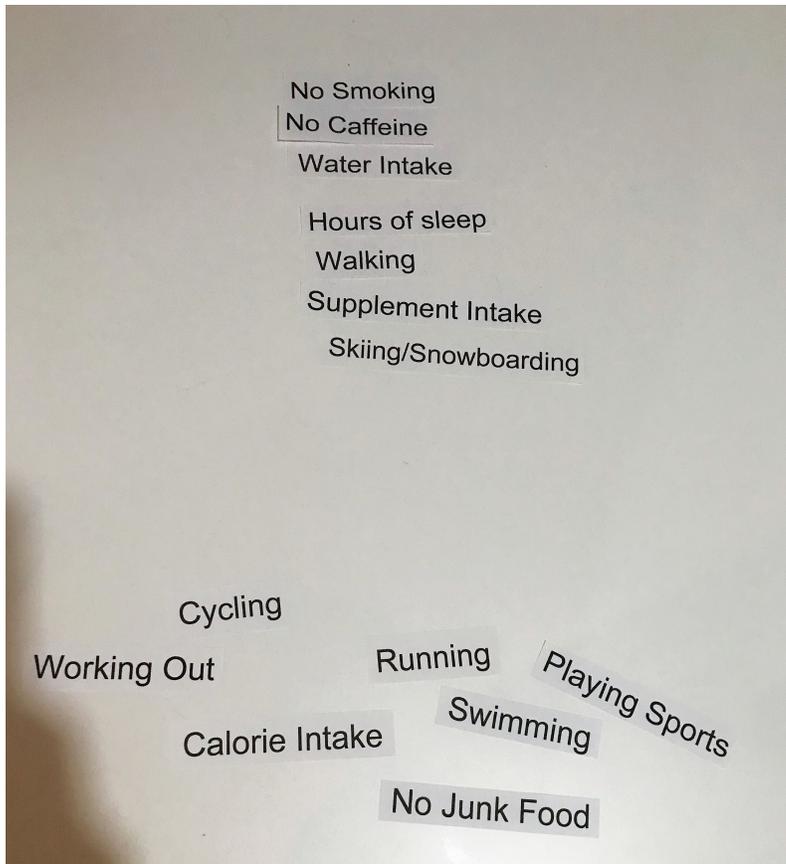
Amanda's Goals and Priorities

- Maintain a healthy weight, and healthy body image
- Stay vegetarian since she has noticed an increase in energy
- Become a little bit more physically active, to supplement the healthy eating
- She does not want to devote her life to healthy living, so convenient and simple tasks that come together to help her stay healthy is what she wants

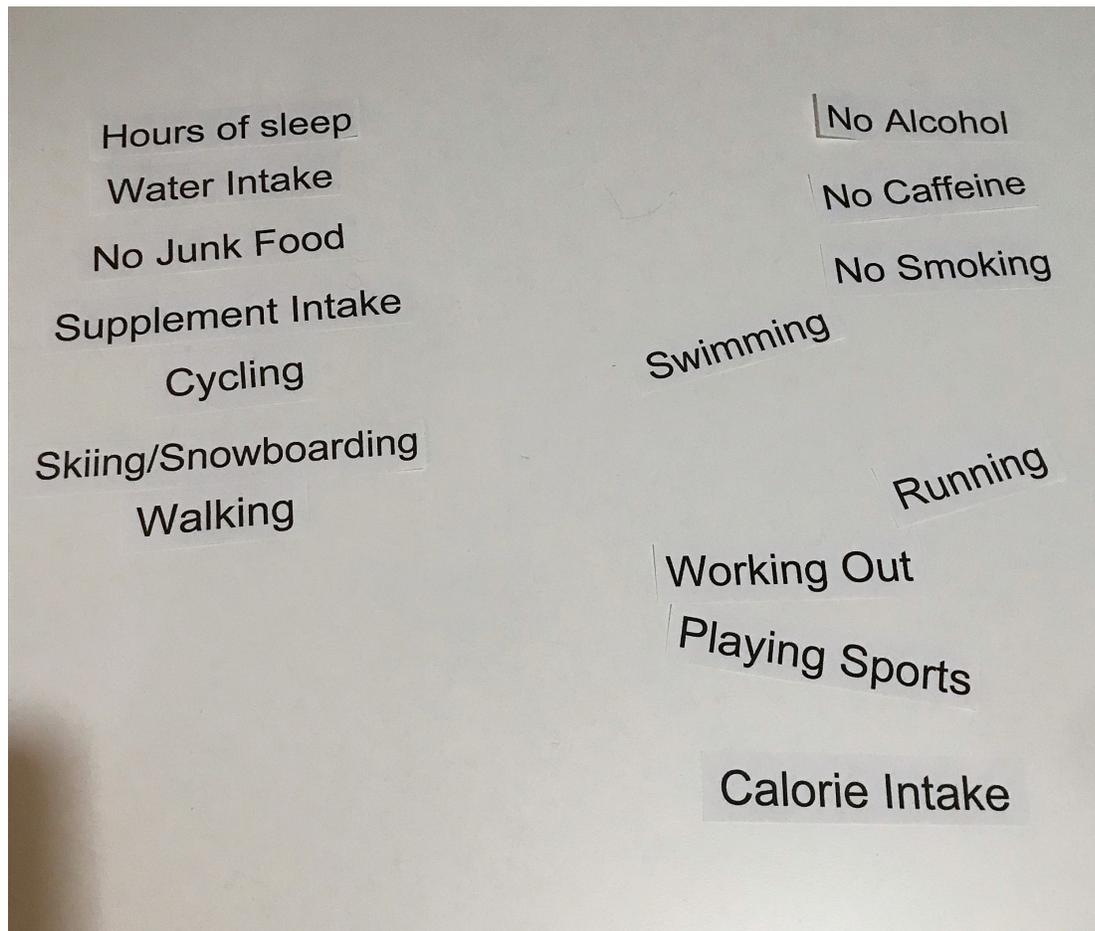
Card Sort

47-year-old female card sort

Instruction 1: "Arrange six to seven of the cards based on activities that are most important to you."



Instruction 2: “Now arrange six to seven of the cards based on activities you are interested in tracking (keeping a record of).”

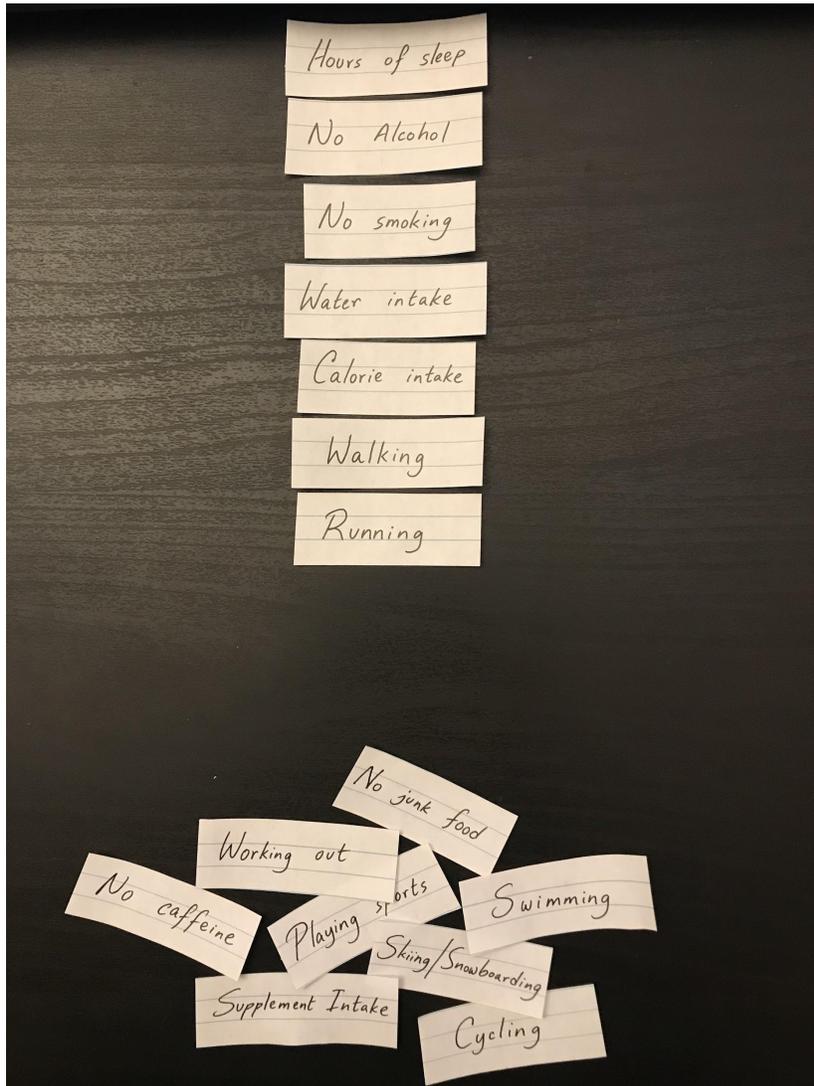


Instruction 3: “Justify your arrangement of cards.”

- Sleep is very important for the mind and body to stay healthy
- Water intake is important for good health and digestion
- No junk food is better for health
- Supplement intake is important for building your immune system
- Cycling is a very good cardio workout and leg muscle workout
- Skiing is a good exercise in fresh air, a combination for good health
- Walking is also very important for your health

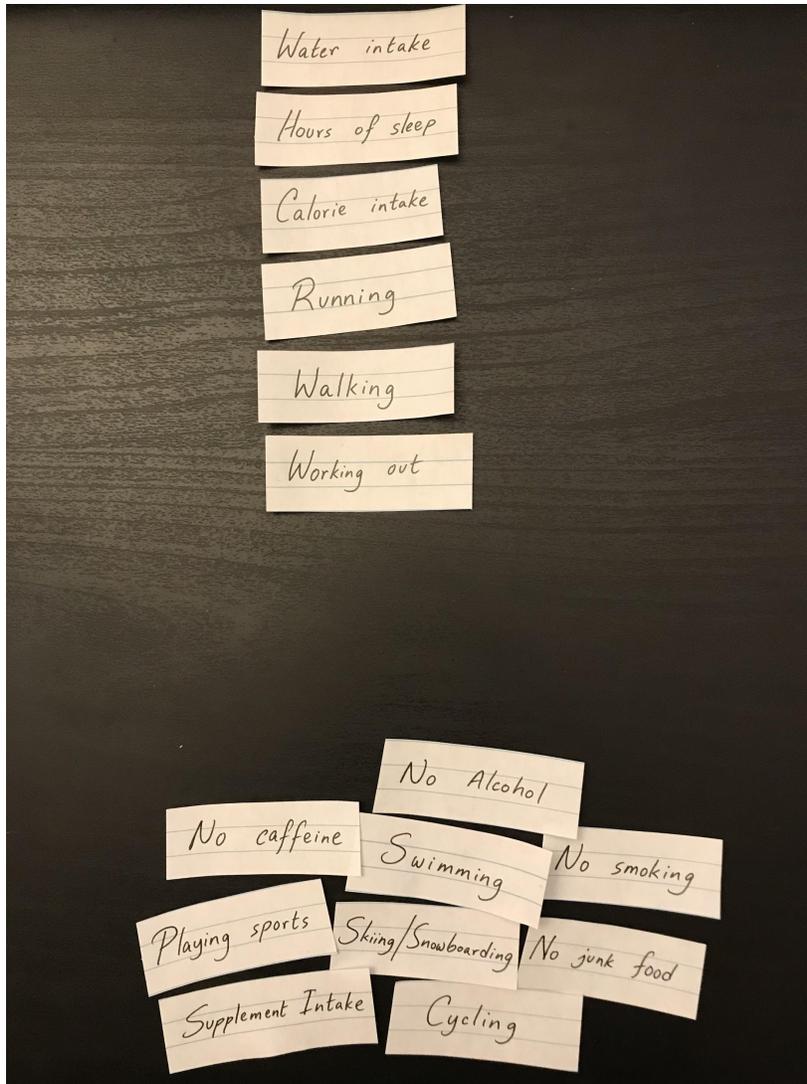
23-year-old male card sort

Instruction 1: "Arrange six to seven of the cards based on activities that are most important to you."
arranged seven cards in decreasing priority according to his opinion.



Instruction 2: “Now arrange six to seven of the cards based on activities you are interested in tracking (keeping a record of).”

Participant arranged 6 cards in decreasing priority according to his opinion.



Instruction 3: “Justify your arrangement of cards.”

Even though the participant was given a general instruction of arranging a pile of activity cards that are important to him, he seemed to have arranged them in a prioritized list. Notes:

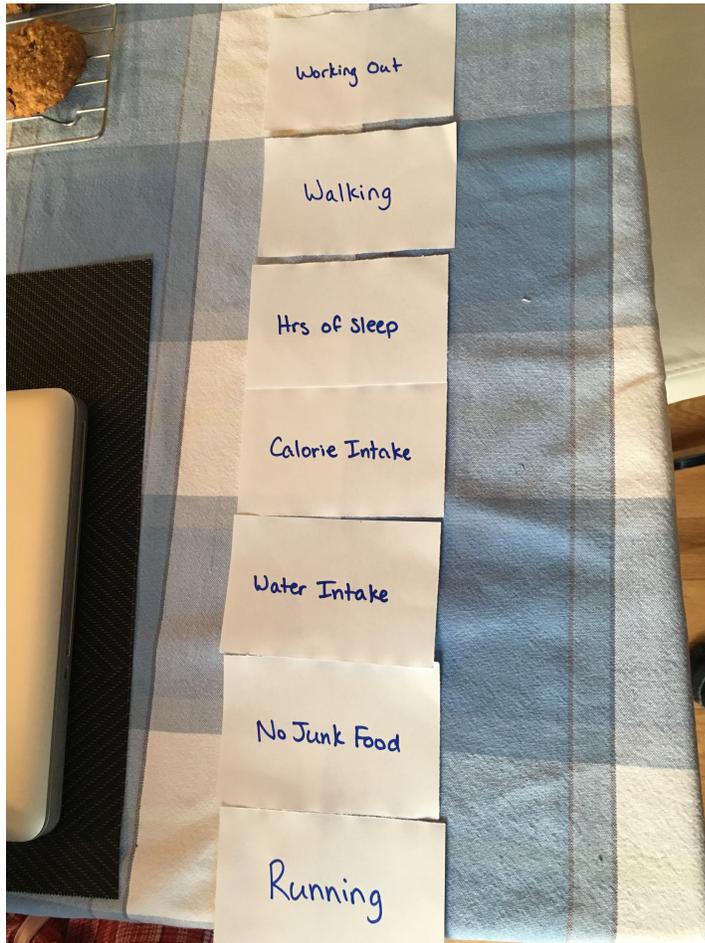
- Number of hours of sleep is most important for a long and happy life and maximum productivity
- No alcohol or smoking is important but not interested in tracking them
- Water and Calorie intakes are vital to staying healthy
- Walking and running greatly helps to stay active and maintain fitness
- Working out is not as important in general but would like to keep track of it if it is ever done

30-year-old female card sort

Instruction 1: "Arrange six to seven of the cards based on activities that are most important to you."

Instruction 2: "Now arrange six to seven of the cards based on activities you are interested in tracking (keeping a record of)."

Instruction 3: "Justify your arrangement of cards."



Card sort was the same for instruction one and two. The only difference was that water intake was not necessarily a necessary one to track. They are not placed in any specific order

- For running both distance and amount of times a week were things they wanted to track
- Calorie and Junk Food were seen as one and the same. Where if tracking calories then not as much junk food was going to be eaten
- Water and food were seen as just doing well not serious tracking
- Hours of sleep was not targeted but just something that was accomplished
- Working out was seen as tracked as active minutes
- The card sort really suggests just maintaining a healthy body, and not serious/in-depth tracking

Scenarios

Mary's Scenario

Mary wakes up in the morning at seven o'clock to get ready for her eight o'clock shift at the grocery store. She quickly grabs a pre-made frozen meal from the freezer and heads off to work. During her half-hour lunch break at work, she decides that she wants to go for a quick walk for some exercise. She finishes eating her lunch and leaves for a walk. Surprisingly today is a sunny day in Seattle and a perfect day for walking. She begins her walk, walking around a few blocks of the city until she decides it is time to stop and get back to work. As soon as she finishes her walk pulls out her phone to quickly record her walk before beginning work again, as she thinks she would most likely forget later in the day. As she is on the website, she is having a hard time making out what text on the screen is saying due to the bright overhead sun. She turns her phone brightness all the way up, but it is still difficult to read. Becoming frustrated she puts her phone away without entering her walk data into the website. She goes back to work and finishes her shift at the grocery store. By the time the evening comes around she has already forgotten that she was going to record her walk and it is never entered the website.

Tim's Scenario

Tim usually starts his day, waking up at seven in the morning. He usually has a tendency of snoozing the alarm until the last minute and then rushes to class, arriving barely in time. He then grabs some breakfast on campus in between back to back classes. In the afternoon, while trying to catch the last bus before his shift started, he was replying to his friend's message. Since he was running and texting at the same time, he made a few typos. At work, Tim is not allowed to use his phone because of company policy. At lunch break, he goes to the cafeteria and orders a cheese pizza because it is the cheapest option available without thinking about the high calories involved. At night, he returns home and makes a quick dinner to utilize most of the remaining time of that day, on course assignments, term tests or catching up with current weeks readings. Tim aims to be in bed by 11 pm so that he can get a full eight-hour sleep for the next day but usually finds himself not able to finish all work by that time and stays up an extra hour or two, reducing his hours of sleep. Next day, he follows the same hectic routine unless it is the weekend. Just before going to bed if he had a few minutes, Tim would record a few of his health-related data based on memory into the website once or twice a week. Otherwise, it is difficult to do so during the day with such a busy schedule.

Amanda's Scenario

Amanda wakes up with just enough time to get ready for work. She does not include time to eat breakfast, but maybe grabs a granola bar and some water before getting picked up and dropped off at work. She knows she should get up earlier to grab a good breakfast but cannot seem to find the motivation. She converses in the car with her friend the entire way to work.

At work Amanda sits most of the day, this is where she notices most of her water intake. She goes out for quick lunches with co-workers or uses the break room if she prepared a lunch that day. She does have her phone with her at work and can periodically check it and respond to messages etc. while working.

She then must take the bus home. It is about a 20-minute bus ride and she mostly listens to music, or messages friends, checks Facebook, etc. After getting home her and her fiancé either decide to make something for supper or go out with friends. If it is a relaxing night at home, they may get some stuff done around the house, watch tv, or play a game. If they go out Amanda will not get home till it is almost time to go to bed. Staying at home Amanda can prepare for the next day's meals etc. But when she goes out, she is often not very prepared for the next day. Before going to bed she often takes vitamins, but sometimes forgets to take these. She feels like this is the time she would enter in most of the data for the day.

Milestone 2

Part (a): Group Brainstorming

Keeping many of our requirements for the website in mind, we made sure the interface is as simple as possible for user data entry. This was seen in many prototypes where a single plus button could be used to add activity data. The Input was not bloated or overwhelming in the prototypes, and often only had a couple of text boxes or sliders. Having this simplicity would, in turn, help the user enter data easily without a lot of effort.

We considered the requirement that some users may have very little technical knowledge while creating some of the prototypes. We implemented this requirement into the designs by adding aspects to the layout that make it easy to recognize for anyone such as progress bars, a calendar, and simple icons like a plus button. This allows a user with little technical knowledge to understand what the website is trying to convey to them even if they have little to no technical experience.

In some of the prototypes, we made sure that the interface contained clear and visible icons for the different range of technical users. We recognized that the website should contain both icons and text for the different activities present. This will help with both learnability and memorability for the user. Experienced users will understand the icons and new users will learn from the text and remember easily. Another idea that was explored was large cards or circles for each activity. With larger cards or circles users can quickly and easily access their desired activity while they are in a rush or on the go. This idea seemed to be more coherent with our requirements compared to some of our more linear or data focused sketches.

We also saw some of our functional requirements come through in our brainstorming and prototyping. Activity tracking, by allowing users to enter data, is what the website should ultimately be accomplishing for the user. This was made a priority in many of the designs as a single plus button or tap, taking a user to a data entry screen. We also want the website to motivate users to continue their progress and reach their goals. This was thought about in many of the prototype designs by including a streak count that tells the user how many days they have continually accomplished a certain goal. By brainstorming we were able to talk about certain ways streaks could be implemented and how the user would view that information.

Part (b): Idea Polishing

Prototype 1

This prototype shows the use of a tabular design in separating a user's goals, streaks and progress. The basic idea is to organize the user interface by arranging different sections of the site in each tab. For example, the streaks tab would show the list of completed, ongoing, or failed streaks of an

activity. The goals tab would let the user enter their desired goals for completing activities within a specific timeframe. The progress tab would show how far a user has come and how much they have yet to accomplish by showing graphs and/or averages of their input.

Keeping the user's needs and constraints in mind, this prototype design implements easy navigation between each section across the entire website. Satisfying the requirement of functionality, this polished design is extremely feature-rich. In the progress section, the user would be able to keep track of their daily, weekly or monthly accomplishments so far by viewing progress bars, graphs, and/or diagrams. Using this, the user can see where they came from or where they might want to get back to in terms of personal goals. Having this dedicated progress tab helps the user stay motivated by having a large amount of data that can be viewed.

Prototype 2

This prototype divides the user's activities into vertical bars. Each bar contains a symbol representing the activity along with the name of the activity. Underneath that there is a vertical progress bar showing the user's current progress towards their goal, along with numbers and the units. Below the progress bar is the number of times in a row that the user has met their goal (a streak). When one of the activities is clicked a box expands outwards to the side of the selected activity box. In this box, a user can enter their data from their completed activity. They can also modify streak or goal settings such as the days of the week they complete the activity and the requirements to meet a goal.

This prototype has the simplest interface out of the three polished designs. It has distinct vertical bars that separate all activities and displays activity information. The only action that can be taken is by clicking the bar for any activity. This brings up a box that allows a user to enter in data and/or change settings. The other requirement that this prototype employs well is user streaks for motivation, these are made very clear to the user with the given text "Streak". Streaks, along with other elements, use large text and icons to make it easier for the user to see and understand quickly, whether outside or on the go. Overall, this prototype encompasses many of our user requirements discussed in the previous milestone.

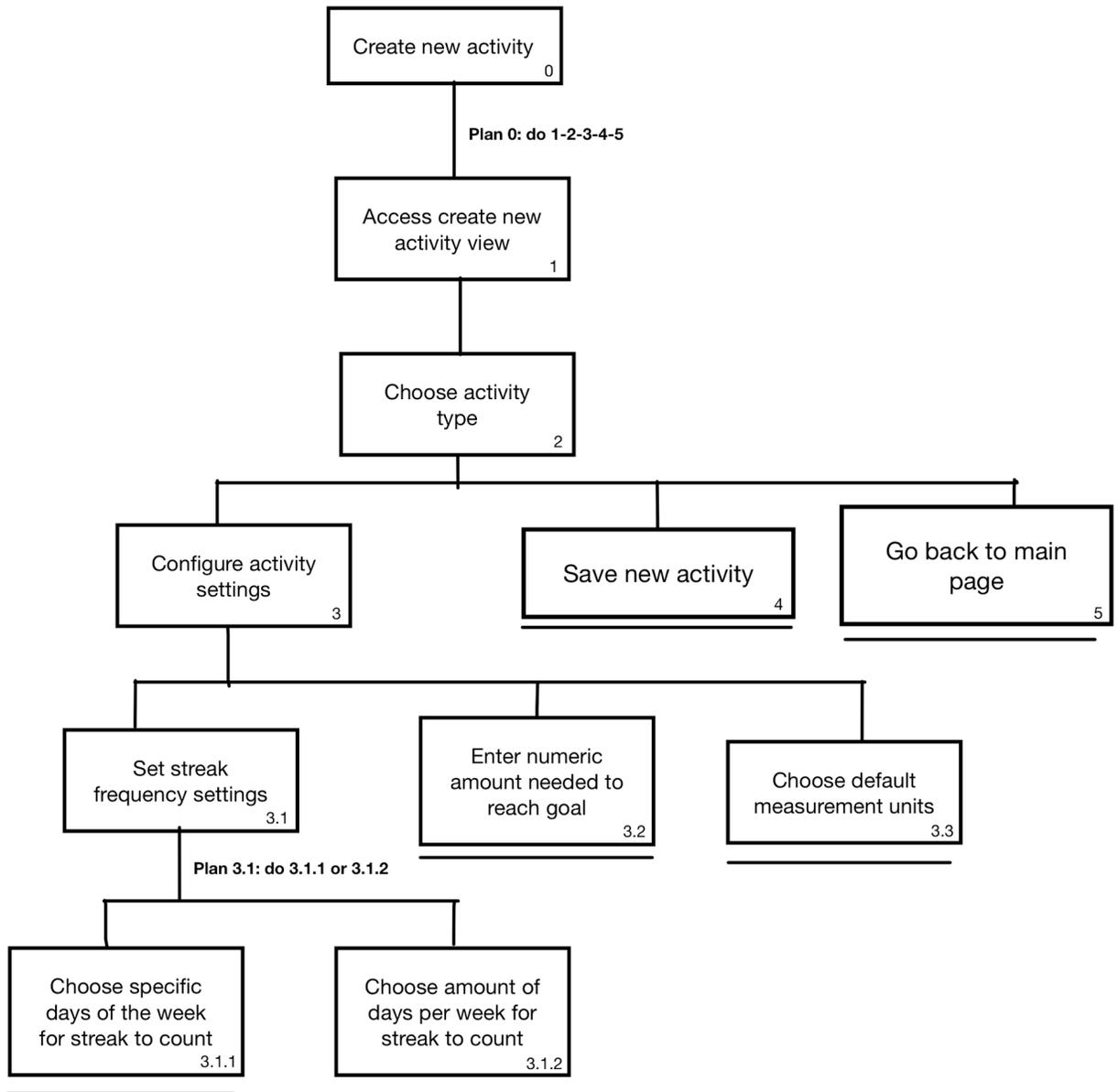
Prototype 3

This prototype has user activities organized into separate cards in a grid layout. Each card contains a symbol and text representing the activity, the goal's progress bar, and streak information. At the bottom of the card, there are two buttons, one for adding new activity data, and the other for modifying the activities' settings. When the button is clicked to add a new activity, the information displayed on the card changes to a data input view for the user. When the user clicks on the edit button the contents of the card change to information about that current activity that they can edit. This information includes the requirements to meet their goal and the days of the week they will track the activity. Users are also one tap away from different progress views by tapping the upper part of the card itself.

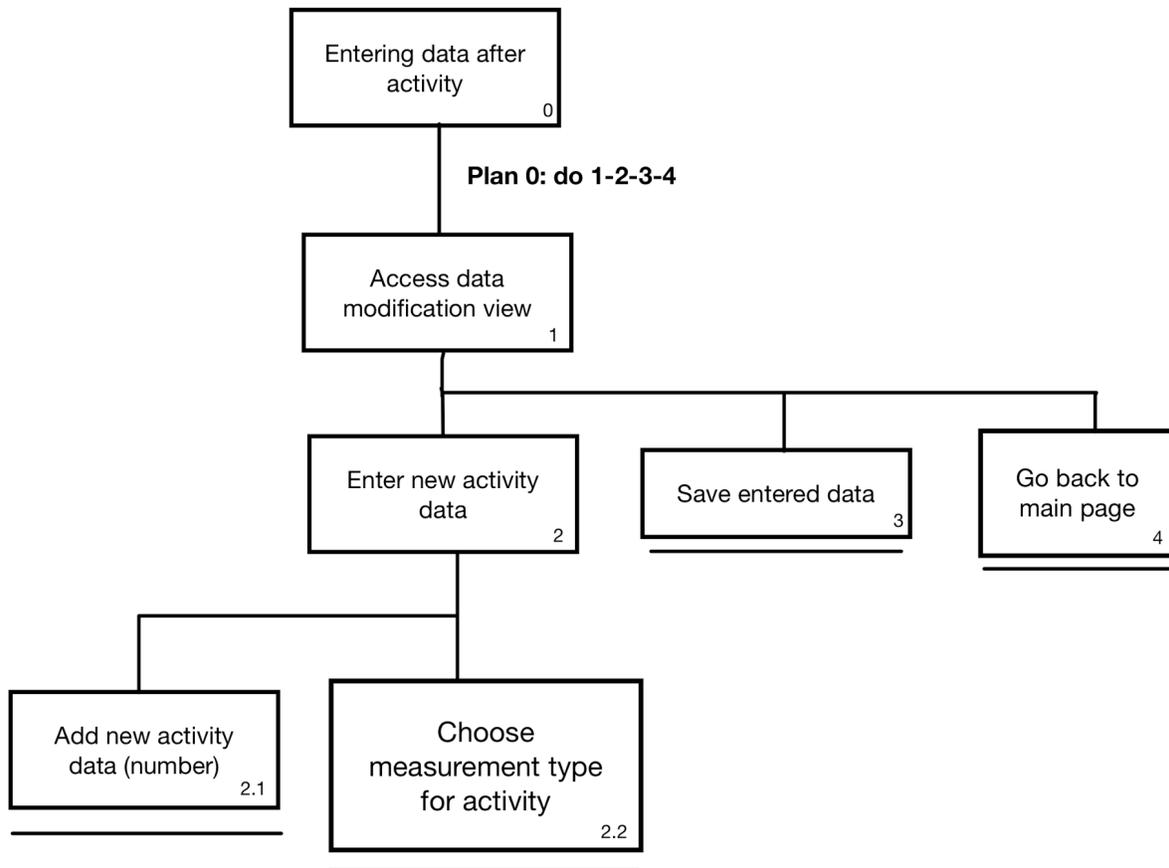
This sketch kept in mind that the interface should provide a quick and simple way of entering user data, editing activities, and viewing progress. It does this by having big and easy to see buttons for showing the user were to do the most important tasks. Learnability and memorability were kept in mind by creating icons and text that are easy to recognize and remember. This is shown by how the “plus” and “edit” button show their function in either the form of an icon or text, making it easier for a new user to learn the buttons use. Moreover, we focused on motivating the user by including a progress bar and streaks, all within the card for each activity. Progress can be viewed by using a single tap, allowing a user to quickly see their activity history. We felt this prototype was the most well rounded and provided the most functions that are relevant for a wide range of users.

Part (c): Hierarchical Task Graphs

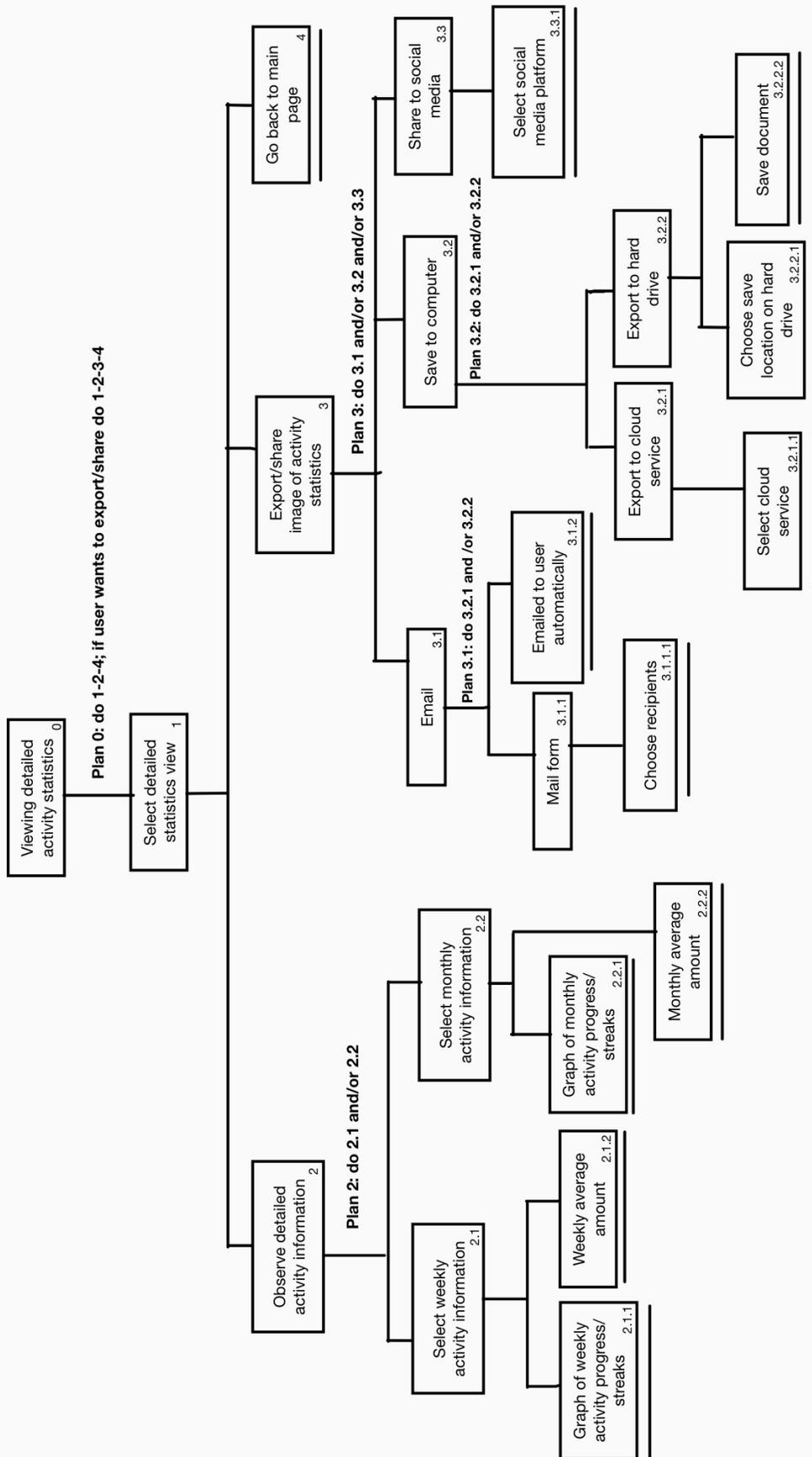
Task 1: Creating a new activity



Task 2: Entering data after activity



Task 3: Viewing detailed activity statistics



Part (d): Low-Fidelity Prototypes

Our paper prototype allowed the user to complete some of the important tasks on the website. These included creating a new activity, adding user activity data, and viewing detailed information about the activity. Some other features such as the general settings or user profile were not implemented. This prototype was used to get an understanding of how a new user would use and interact with our current website design. This prototype is intended to convey the appearance of the interface as well as the logical flow of using the features.

To use our prototype, you would start with the empty web browser page and place the green plus button labelled (Plus) in the top left corner. When the plus button is clicked the new activity (NA) cards would be used and placed where the plus button was. Starting with the first NA card through to the third the user would select and enter in data until saving the new activity. Once this is done the appropriate activity card (AC) would be placed where the plus button was, and the plus button would move over to the right of the AC card. A 0 streak (S) number would be added to the top right corner of the AC. If a user adds a new activity, repeat the previous steps. If a user clicks the smaller plus button on the AC, then place the add activity card (AA) on top of the AC. If saving data, then update the S number by one and update the progress bar (PB) which is located under the text naming the activity. If a user clicks the edit button, then put the edit activity card (EA) on top of the AC. If a user clicks on the upper half of the card, then place the progress card (P) on top of the AC. From here if the user clicks “export summary” then put the export card (E) on top of P.

Part (e): Informal Prototype Evaluation

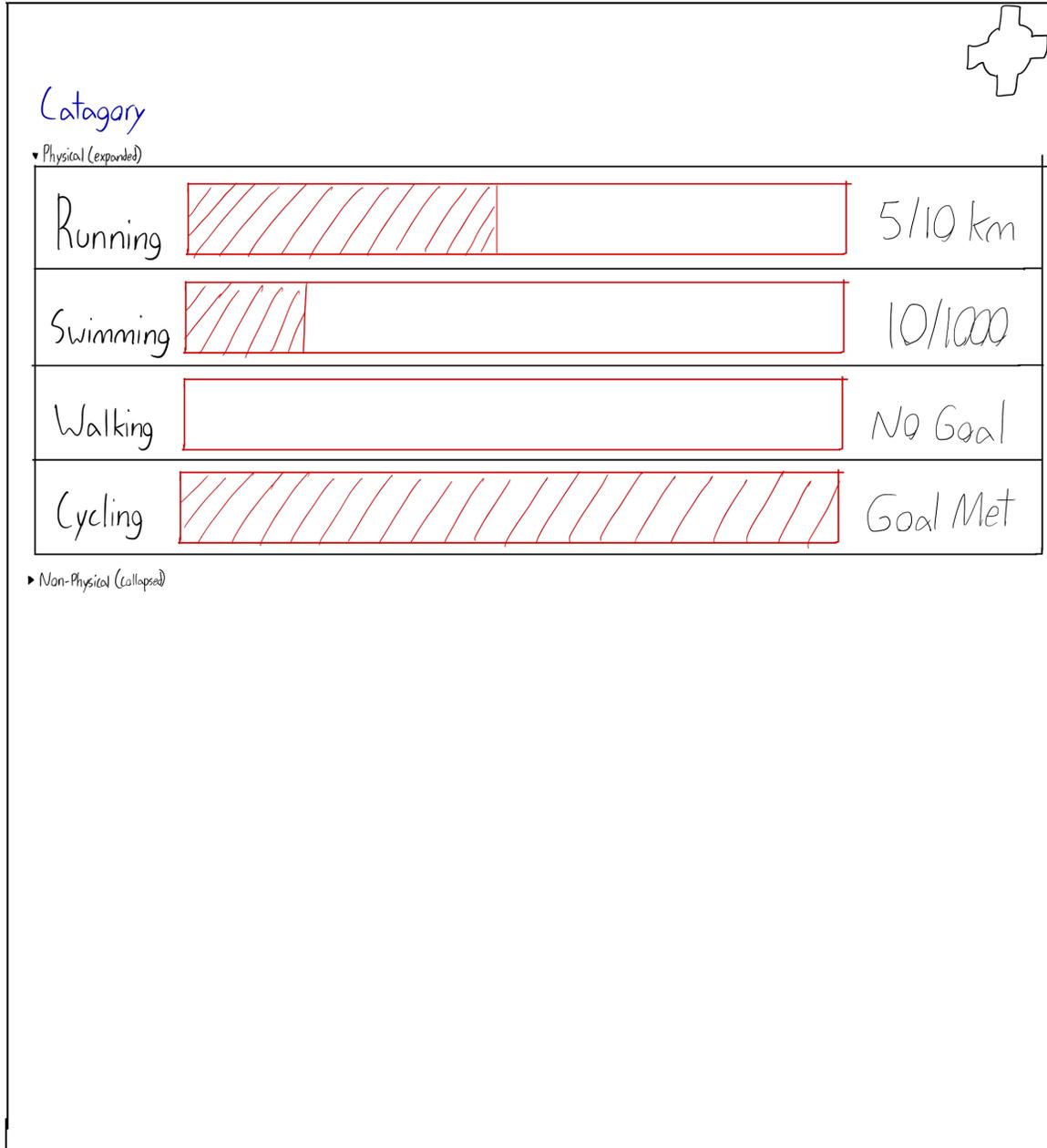
Most of the test users ran into similar problems, mainly confusion about what certain symbols meant, what data to enter, and what some elements were for. The most common user misconception was the function of the two green plus buttons. The fact that they looked identical but provided different functions confused the user into thinking they had the same functionality. When some of the users came to the data entry screen, they were unsure of what data they were being asked to enter, due to vague instructional text. The users did not have a fundamental understanding of what a streak meant in relation to our website, causing a misinterpretation of the purpose of the streak number and progress bar.

Generally, the users liked the idea of a layout with activities as individual square cards in a grid. Some users thought the website would provide a mobile-friendly experience because of how the cards flipped in-place, not taking up extra screen space. One user liked that navigating through the website was made simple by having a back button that was always in the same location on a card. Users also found that being able to choose different measurement units provided greater flexibility instead of restricting them to just one unit.

Milestone 2: Appendix

Brainstorming Sketches

The following six sketches were created on a tablet using a drawing stylus



Category

▼ Physical (expanded)

Running		5/10 km
Swimming		10/1000
Walking		No Goal
Cycling		Goal Met

► Non-Physical (collapsed)

User Profile

Edit

First Name: Bob

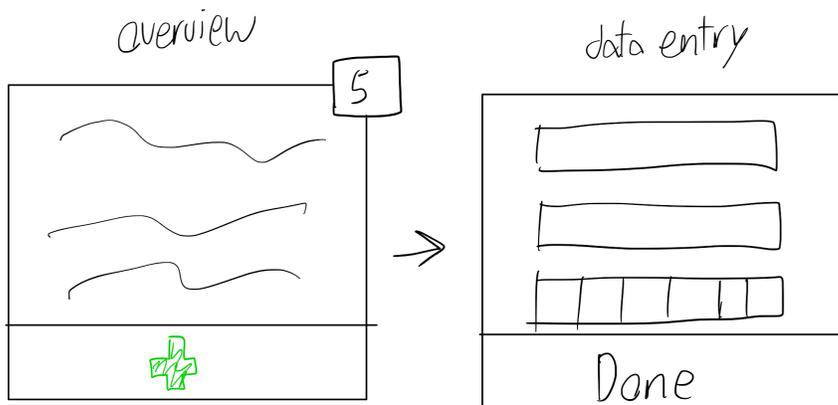
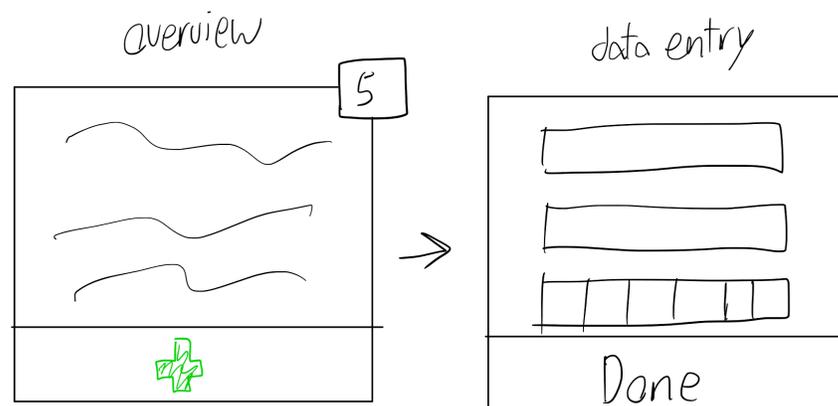
Last Name: Bobby

Age: 42

Gender: Male

Weight: 75 kg

Height: 190 cm

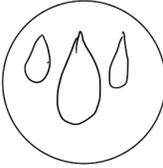
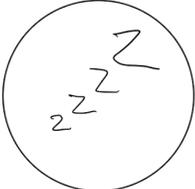
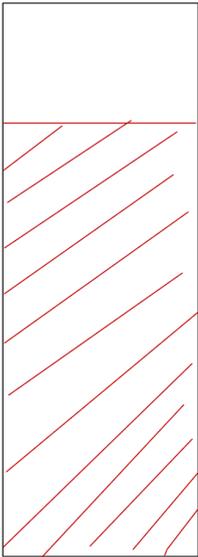
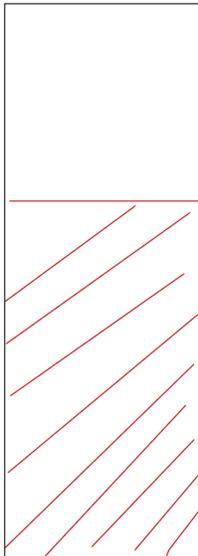
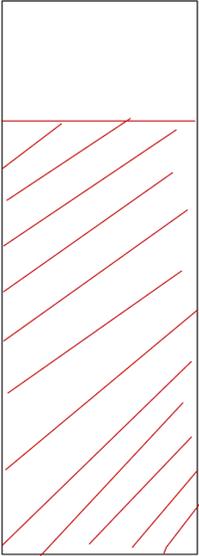


New Activity

(spawns new bar)

tap and hold
to re-arrange

- point to new
activity
button when
no tiles present

			
<p>Goal 3.9 / 5km</p>	<p>Goal 1 / 10km</p>	<p>Goal 675 / 1500ml</p>	<p>Goal 7 / 8hrs</p>
			
<p>streak 5 days</p>	<p>streak 0 days</p>	<p>streak 1 days</p>	<p>streak 4 days</p>

Running

Progress: 5/10km

Streaks: 10

Days: S ~~M~~ ~~T~~ W T ~~F~~ S

Pills: 4

Sleep: 5

Cycling: 10

Running			
Water Intake			(+)
Streak	current	Goal	Intervals
yes/no	1000mL / 2000mL		S M T W T F S
Cycling			

Informal User Testing Notes

User 1 (19-year-old male):

Creates water activity

- “Can I click on each circle?” (Streak goal in new activity)
- “What does streak goal mean?”
- Tried to enter both streak goal and days per week at first when you can only enter one or the other
- Not sure which was a textbox or dropdown menu in goal amount/ default units section
- Surprised when he clicked on the water icon and the progress game up (had no way of knowing it would do something)
- Clicked green plus button on a card but not sure if it added a new activity or added to the progress of the current activity
- “Not sure what the red number means, does it mean I have one day left, or that I should be drinking more water?”
- Thought adding an amount after clicking the green plus on the card would add another water activity and not just add to the current activity (“the two green plus buttons look similar so I thought they did the same thing, and the one on the card was just a shortcut”)
- Thought it would go back once the save button was clicked instead of having to click back as well after saving
- Thinks the streak numbers are days
- Set his running goal units to minutes instead of a distance which was unanticipated
- Tries dragging to select all boxes
- Does not know what the progress bars do
- After a long time finally understood what the red square meant and what the progress bar meant

Overall Thought

- Very mobile friendly layout
- streak goal/days per week page is confusing as to what it means
- Every input page could have a small info icon in the corner that explains the meaning of the data fields that need to be inputted
- A label for the progress bar or other that defines what it is
- “Daily progress” under or on the progress bar to describe its function better

User 2 (48-year-old Female from milestone 1):

- Clicks the green plus to make a new activity while in the create new active dialogue already
- Clicked on next without any data entered in the select activity dialogue

- set a water goal to eight cups a day and then clicked the green plus on the card eight times thinking it was adding a cup each time
- thinks “add activity” is another activity (“add activity’ throws me off because it looks like I am adding a new activity and the ‘new amount’ and ‘units’ look the same as the data entry boxes when I created the activity, so I think I am changing those settings”
- thinks changing values in “add activity” screen updates the activity settings
- thought the streak number was number of days passed
- not sure if the progress bar resets every day or when the number of days selected when creating the event is over
- green plus signs look too similar

Overall thoughts

- “like the idea of the water drop to show the progress of water intake”
- “add activity” should be changed to “track activity”
- liked that there was the option to choose streak goal days of the week specifically or generally
- likes how the export options are setup (likes the export options that it gives you and it is has a simple layout that is easy to follow)
- “I like the back arrows because they are a simple way to get out of the page”
- Did not understand what “default units” meant (understood what “goal amount” meant but thought “default Units” meant to enter data that you did not meet your goals for that day)
- “default Units’ should be worded differently so it is more understandable”

User 3 (19-year-old female):

- Liked how each activity are distinctly separated using boxes
- two plus buttons confusing at first. Maybe replace one of them with something more meaningful?
- Good that, able to choose various measurement units based on your specific lifestyle
- Is the streak shown in the home page for daily/weekly, no way of telling for sure?
- No way of changing the priority of activity cards later by drag and drop? If a user later wants hours of sleep on top of running. View preference?
- Wanted a motivational emoji beside streak count, :) for good :(for failed streaks instead of just numbers

User 4 (23-year-old male from Milestone 1):

- Said there was too much info to look at and process right at the home page, maybe hide all progress bars inside and just show activity symbol and name in the front
- At first glance, did not understand the purpose of “Edit”. Maybe need more explanations in the UI

- Liked how cards just flip in the same spot and does not open a big new page
- Suggested that it would have been better if there was an option of receiving notifications or reminders about certain goals through email or something (when time runs out for a certain streak and user forgot)
- Overall liked the simplicity in the UI and the streak idea to push users

User 5 (21-year-old female):

- Thought that the streak goal card when adding an activity was asking to enter in data already.
- Streak goal not well defined, she was not sure what that part of the activity setup was asking for or what a streak did.
- Was not sure what to enter for the goal amount in hours of sleep. Was she supposed to enter in the hours of sleep that she wanted a night or for the entire week?
- Progress bar needs to be described or have some indication as to what it is when it is empty. She thought it was another drop-down box.
- For the weight activity, she was not sure if the goal was supposed to be amount lost/gained or a new total weight goal.
- She thought that edit was supposed to allow her to edit previously entered entries, not just change the goal amount and default units of measurement.
- There was no clear way to get to the progress page, to see data or export. She was unaware you could click on the upper part of the card to see the progress.

User 6 (18-year-old male):

- He did not know what the streak goal setting was when creating a new activity. The word streak confused him.
- For running the user thought to put in a goal of daily/single run, not a larger goal of say, 20 km in a week.
- The same plus button in the activity card made him not push it thinking it would create an entirely new activity. Did not know how to add a new data entry to an activity.
- The wording of “new amount” in add activity made him think he was changing the daily 4kms not adding just one run. Also, was not sure if he was supposed to do the math himself for total or just add one run.

Milestone 3

Part (a): Project Description

We made the activities in the prototype by creating cards for all possible actions and placing them inside containers for each different activity. When a button on an activity is clicked, the card to navigate to is placed in front of the currently displayed card using jQuery methods. When a back button is clicked the same process occurs but in reverse. Whether an activity is visible or not depends on if it has a display property of “none” or “inline-block”. When the button to create a new activity is clicked the relevant activity container is unhidden, when an activity is deleted the relevant activity container is hidden. JavaScript is also used to save some of the activity settings and data entered by the user. This data is then used to update the progress bar for the relevant activity.

One of the major features of our interface is the ability to create and delete activities, as well as having the activities dynamically rearrange on the screen as they are added and removed. Another useful feature is the ability to modify an activity’s settings after it has already been created. This allows the user to make changes to the activity without having to delete and recreate the same activity, therefore losing their progress in the process. Another major feature is entering data for an activity and the progress bar on each activity card (**Refer to Image 1**). The progress bar allows the user to quickly and easily see how close they are to meeting their goal for the day.

We really like how all the possible actions for an activity are contained within that activity card. This means the user does not have to scan the screen to search for their next action, possibly losing focus of their task in the process. Having each activity in self-contained cards also gives the interface a clean and simple look without cluttering the screen with options (**2**). A feature of our interface that we think is useful is the consistency of button placement and appearance. For example, the back button is in the same location on every card that can be returned from, allowing the user to learn and remember how to return to a previous card easily. We also think that having a dynamic dropdown menu when choosing what new activity to create is a useful feature that helps prevent potential user confusion and reduces the clutter of the drop-down options (**3**). This dynamic dropdown removes any activity from the “Create New Activity” drop-down menu when that same activity is already created as a card.

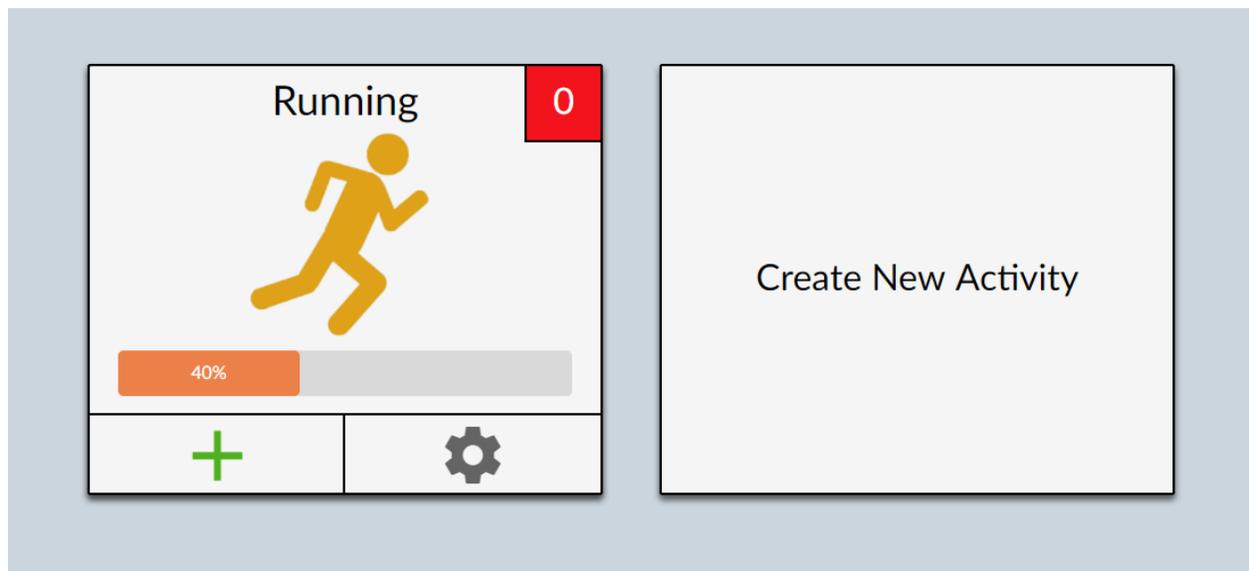
The biggest strength of our system is the navigation of the interface and simplicity of the layout. The navigation works well because the layout and looks for different activity cards are consistent. This consistency allows a user to only interact with a single activity card once before they will know how to use a card for any activity. The interface also has good learnability due to the easy to learn and recognize icons for each different activity (**2**). The input validation that we do is important for preventing the user from continuing if they have either no input or invalid input (**4**). This input checking improves user interaction by making the interface less error prone.

Part (b): Problems and Issues

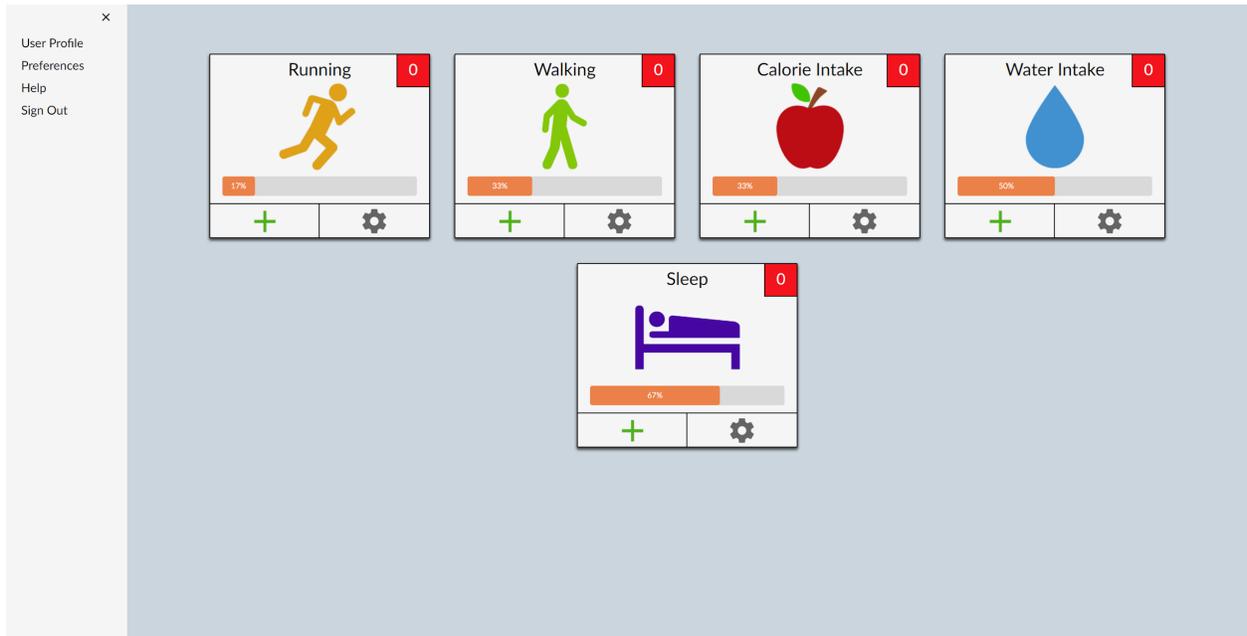
There are a few issues with the current prototype that we are aware of. One of the issues is when reloading the main page, all the activities that have been created along with any data that has been entered are reset. Another problem is when more than one or two activities are added, some activities will swap positions in the grid, making the order of the activities different from that which the user chose. The third problem we found is related to the progress bar on the activity cards. When a value of “.5” is added to the activity, the progress bar reads it as a string causing it to display “NaN” on the progress bar. Although when “0.5” is added to the activity the progress bar shows a percentage as it should instead of “NaN”. There is a problem when the data entered is a decimal value, causing the value to be truncated due to storing the value as an integer in the underlying code.

Reference Images

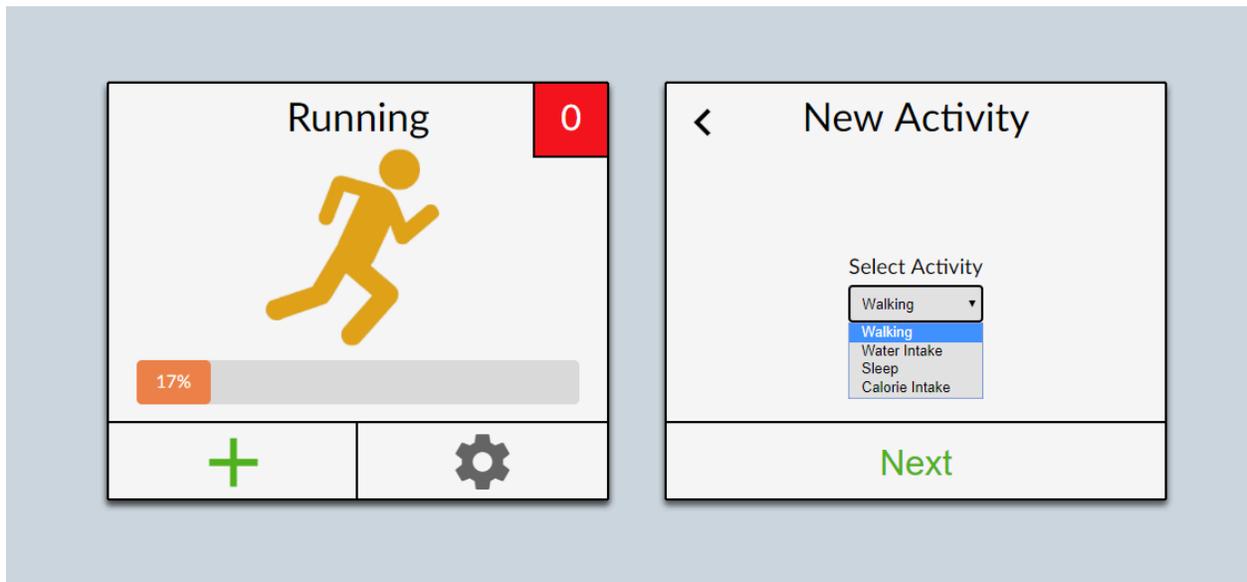
1)



2)



3)



4)

Before clicking the "Next" button

The screenshot shows a mobile application interface titled "Goal Settings". At the top left is a back arrow icon. Below the title, the text "Daily Amount Required For Goal" is displayed above a text input field containing the value "dfj". Below this, the text "Default Units" is displayed above a dropdown menu showing "Metres". At the bottom of the screen is a large grey button labeled "Next".

After clicking the "Next" button

The screenshot shows the same "Goal Settings" screen. The text input field for "Daily Amount Required For Goal" now displays "Invalid Number" in red text, indicating a validation error. The "Default Units" dropdown menu remains set to "Metres". The "Next" button is still visible at the bottom.

Milestone 4

Part (a): Method Overview

We completed the heuristic evaluation of our interface using our three group members as evaluators. Each evaluator spent an hour and a half independently evaluating the interface using Nielsen's Usability Heuristics, looking for potential violations. Every time conflict with a heuristic principle was found descriptive notes were taken so the problem could be easily described later to the other group members. We then met as a group and presented each discovered issue by providing a demonstration of the problem within the interface. After each group member shared their findings, we worked together to group common issues and summarize the overall problems we found with the interface.

Part (b): Heuristic Evaluation

The following issues found in the interface are categorized in terms of the heuristic that they violate. Within each heuristic category, the issues are arranged from lowest to highest priority.

Visibility of System Status

We recognized that our website violated the visibility of system status heuristic in only one way. Initially, the progress bar of an activity is a blank element, and the interface provides no way of informing the user of the purpose or function of the element (**Refer to image 1**). The user is not fully informed about why the progress bar element is on the card. This is an issue that has medium severity, as the user will understand what the progress bar is as soon as they enter in data for the first time but may initially be confused and unsure of its purpose. We would fix the issue in the next version of the website by including a '0%' or '0/goal amount' text in the empty progress bar and possibly include diagonal slashes that would help represent a progress bar.

Match Between System and Real World

Matching between the system and the real world is another heuristic that we found our website violated in a few ways. A lower severity issue we found was when a user wants to enter data for an activity, the card they are presented with is titled "Enter Data". The word data may be a little too system oriented and less user-friendly than it could be. A solution would be to either have the title "Enter an Activity" or make it more activity specific, for example using the title "Enter A Run" for the running activity.

Another violation we found was that our activity cards order themselves according to how the HTML is written, not in the order that the user creates the activities. This contradicts how the user wanted to have the cards appear, or how they may feel the cards should be ordered. The user's mental

model is very important, and we needed to better match the system and the real world. We were limited by our programming knowledge when creating the website. A fix to this problem would need to be in the code of the website, making sure that a new activity is placed at the end of all the current activities.

User Control and Freedom

We noticed that there is no way to cancel an action or escape the current card within an activity. This is a low priority issue as we implemented a back button that takes one click to get back to the home state in most cases. We noticed that if multiple cards are not on the activities main view it would be convenient to be able to reset all of them to their respective home state. This is an issue that could be fixed by allowing the user to click the background (anywhere outside the cards and not the menu icon) bringing all the cards back to their home state.

We also realized that when creating a new activity, the back button does not save data entered in the previous card of the process. If the user chooses the activity they want to add, has entered in the goal, chosen their default units, and then clicked 'Next', if on any step they want to go back to a previous card to see what previous data they entered, it is reset to either a blank textbox or the first item in the drop-down. This forces the user to recall and re-enter data they have selected and entered before. This is another low priority issue that could be fixed by using code to store the data entered during the process of making a new activity.

Help Users Recognize, Diagnose and Recover from Errors

One issue we found regarding this heuristic principle is that our error message when a user enters an invalid number is small, and not overly descriptive, as it simply says, "Invalid Number". A longer more descriptive message could be given to the user using a pop-up or an alert, allowing us to fit a sentence that is easier to understand for more people. This issue leads into the next as we do not suggest solutions for the user to help them understand why the data they entered is invalid, or how they can correct their input. Currently, the user does not know what constitutes an invalid number. Providing examples of valid entries when the user makes a mistake such as using "0.5" instead of ".05" could greatly help the user and reduce the frequency of this medium priority issue. Again, this could be done within the pop-up or alert.

Lastly a high priority issue we noticed on our website was the inability for the user to edit or delete previously entered data. This function could be needed if a user accidentally enters the wrong data or simply wants to delete or edit an old data entry. A solution we came up with would be to store all data entries and allow the user to access those entries in a list form. Once they are viewing all the data entries, they would be able to modify or delete specific entries that they no longer want or made in error.

Error Prevention

Another heuristic we found our website violated was error prevention. Design that helps prevent as many errors as possible from occurring in the first place is key. We noticed that realistic units of measurement were not selected by default in the drop-down elements. For example, within the running activity meters is the selected option by default, where kilometres would be more reasonable for most people. This could be fixed by changing the unit selected by default to be one which most users would choose for that activity, thus saving many users an extra step in the process of creating a new activity.

There were also a few issues that were much higher in priority, one of which is how the user can enter negative values in any textbox input. Negative values entered on the enter data card subtract from the user's current goal progress. This is a problem that could be fixed by checking for negative values in textboxes and considering them invalid input along with strings.

Lastly, we recognized a bug that allows the user to incorrectly enter a decimal value which causes the website to treat it as a string. If for example '.05' is entered the website sees the decimal and then displays 'NaN' in the progress bar. This is an unrecoverable error as the only way to fix it is to delete the activity and start over, therefore making it a very high priority issue to resolve. This problem could be fixed by also checking for entries that start with a decimal, allowing the user to recognize the mistake and type, for example, '0.5' to continue.

Recognition rather than Recall

This heuristic was violated in a few ways on our website. For instance, in our application, the user profile, preferences, help and sign out menu options are hidden behind an expandable menu. Hence, some users must recall how to access the menu as well as whether the specific option they want to access is in the menu or not. This issue is a low priority one and could be resolved by displaying the menu options horizontally at the top of the page.

Additionally, we discovered that all the intermediate cards except for the main front card do not show which activity it is for **(1)**. If there are multiple activities created and the user is on the "Enter data" or "Modify Settings" card on more than one activity they may lose focus and forget which activity corresponds to which "Enter data" or "Modify Settings" card. This is because there is no visual cue indicating which activity the intermediate cards belong to. We think this issue has a medium severity level that could be fixed by adding appropriate sub-headings with the activity titles to each unlabeled card.

Furthermore, the default unit chosen does not change in the enter data card based on what was selected as the default unit when creating the activity initially. The first option in the dropdown list in the enter data card could show the wrong unit by default. This is a high priority problem as it breaks the

user's expected functioning of the website. Once a default unit is chosen it should be the unit first given when entering in new data or modifying an activity's settings.

Lastly, the amount required for a goal, default units, and the number of days required is never shown anywhere in the interface after they are first entered when creating a new activity. This would contribute to increased memory load for the user when they try to recall what those options were previously set to. Because of this reliance on memory recall, we consider this to be a high priority violation. A likely solution to this issue would involve displaying all three of these pieces of information in relevant places amongst the cards where they may be needed by the user. This would make them easily viewable for the user and reduce the amount of recall needed at the same time.

Flexibility and Efficiency of Use

We found that our website violates the flexibility and efficiency of use heuristic. We noticed that a user has no way of navigating to a specific card directly, avoiding any intermediate card, they are instead forced to navigate through cards one by one. This is a low priority issue which could be solved by adding new buttons which navigate directly to a specified card. For example, the "Share" card could be accessed using a specific share button from the very front main card.

Another issue we found under the same heuristic is that there is no support for keyboard-only navigation. For example, tabbing through input fields, buttons or doing common actions using keyboard shortcuts do not provide the expected results. This has a low priority and could be solved by programming standard keyboard shortcuts for common website actions, such as creating a new activity or adding data to an activity, as well as ensuring all navigation can be completed using a keyboard.

Lastly, another issue is that a user is not able to rearrange the order of the activity cards according to their liking. Once there are multiple activities the user may want to put a certain activity at the beginning of all the cards or at the end. This has a medium level priority and could be solved by programming a rearranging interaction using drag and drop.

Help and Documentation

Our website has a few interface issues regarding help and documentation. One of them being how the topics explained on the help page do not provide any context as to where the user might need to know the information. For example, the user may read about what a streak is and how it works but without any context they may not know that the red square with a number in the corner of every card represents the streak. This issue is a medium priority for us because we think most users can understand the descriptions on the help page without specific context. One potential solution to this issue would be to provide tooltips for all relevant parts of the interface, allowing the user to get help immediately while they are at the location in the interface where they need it.

Another issue we discovered was with the depth that the help section provides. The topics it covers are important but are only general descriptions of system functions. If the user wants help finding out how to complete specific actions, such as creating a new activity or changing an activity's settings, there is no help for them. This is a high priority for us because our website has a broad range of users, meaning that there will be a lot of people that will need assistance. This problem can be fixed by creating more detailed step-by-step walkthroughs of specific actions, possibly with relevant pictures as well to visually help the user learn.

Milestone 4: Appendix

Evaluation Notes

Nahiyan's Evaluation:

User control and freedom

- No major "cancel" button in between the process of adding an activity to escape from the middle. The user either must repeatedly press back button or finish creating an activity to escape. So, less freedom in the interface it seems.

Help users recognize, diagnose, recover from errors

- No undo feature so cannot get back to the previous state of the activity once the user accidentally enters a wrong entry in "Enter data" card and messes up the activity entirely

Flexibility and efficiency of use

- No relevant navigation jumps such as jumping to the specific card directly and avoiding any intermediate card. Forced to navigate one by one.

Help and documentation

- Help section seems too generalized. Only gives an overview of the app not how to use it
- Help located inside the navigation bar. Cannot be found at first glance of the site.

Tyler's Evaluation:

Visibility of System Status

- If there are multiple activities created and the user is on the enter data or modify settings card on more than one activity at once, the user may lose focus and not know which activity corresponds to which enter data or modify settings screen. This is because there is no visual cue indicating which activity the menus belong to

Help Users Recognize, Diagnose and Recover from errors

- Currently, there is no way to undo the data entered at the enter data card, so if a user enters a wrong number by accident the only way to fix it would be to

delete the activity and recreate it. They would then have to re-enter all the activities previous data which would not be feasible

Error Prevention

- The user can currently enter negative values in any text box.
 - a negative value can be entered when adding data to an activity which subtracts from the previous total data entered (technically this could be used to undo the user's error, but it is not intended or optimal)
- The user can enter a decimal value with no digit before the decimal place in any textbox which will cause the progress bar on that activity to display "NaN" (ex: 0.5)

Recognition rather than Recall

- The user profile, preferences, help and sign-out menu options are hidden behind an expandable menu, this means the user must remember how to access this menu as well as whether the content they want to access is in the menu or not

Flexibility and efficiency of use

- It is not possible for the user to re-arrange the order of the activities how they see fit
- There is little or no support for keyboard-only navigation, such as tabbing through input forms or action buttons
- no support for any types of keyboard shortcuts

Help and Documentation

- Help is available, but it is hidden behind one level of navigation
- The help page gives some idea as to what the help information relates to, but the help information is not available directly in the context of the help topic (ex. help for the goals is not available at the stage of navigation where the user is making a goal)

Bradley's Evaluation:

Visibility of System Use

- The amount required for the goal not shown anywhere after it is first inputted.
- Initially, the progress bar is an unknown element.

Match between system and real world

- Cards shuffle position based on the HTML and not in the order of how a user adds them
- “Enter Data” is maybe system language versus how a person would say it.

User control and freedom

- Does not support undo of adding data to an activity.
- When creating a new activity, the back button does not save previously entered data, making the user re-enter data.
- Maybe clicking the background (outside any card) should bring back all the cards to the initial state (activity card home).

Help users recognize, diagnose, recover from errors

- The error message is quite small.
- No solution suggested the user may not know what constitutes an invalid number (other than initially the placeholder text, but that disappears after wrong input).

Error prevention

- Real world defaults were not chosen the best for some activities.

Recognition rather than recall

- Default units chosen does not change in the enter data card based on what was selected when creating the activity. The first option when adding could be the wrong units.
- The amount required for goal, default units, and the number of days required never shown after first entered by the user when creating an activity.
 - When updating may not remember what it was previously set to.
- All cards for an activity, excluding the home card don't display what activity it is for

Help and documentation

- The help section is not implemented deeply

Image References

Image 1

