Deliverable B – Needs, Problem Statement, Metrics, Benchmarking and Target Specifications

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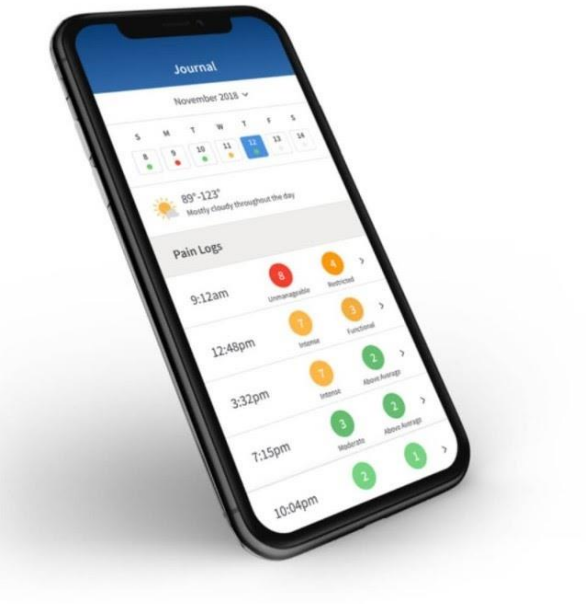

Figure 2: Pain scale journal screen demonstrating the pain log.

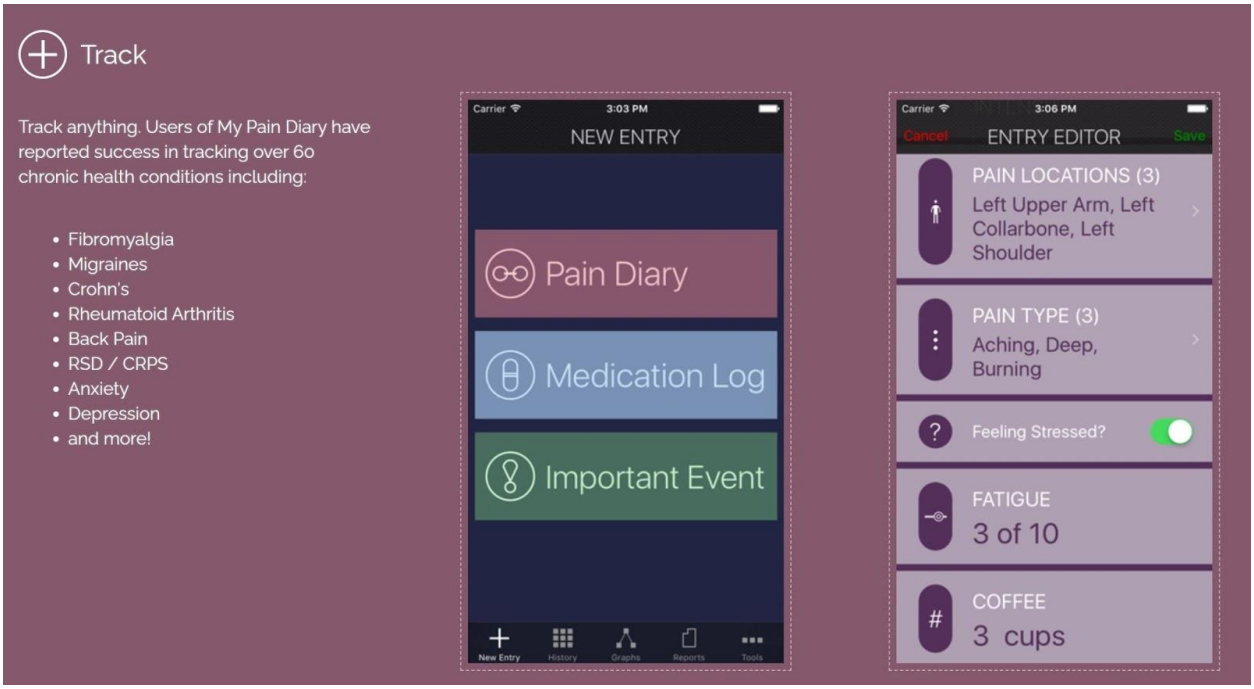

Figure 3: My pain diary entry screen as well as entry editor.

Introduction

Understanding the client is essential when proceeding with a design process. The information collected during the client interview enabled the team to translate client statements into client needs and create a list of metrics for the product. Design specifications were also made and other products on the market were compared.

Client Statements

- The client would like for the application to allow the client input on suggested exercise. Meaning that if the application suggests an exercise the client wants to input if that exercise was useful or not. This way the client can have the ability to customise the application to her needs.
- The client stated that she owns an Android and an iphone. She also said that she owned an older Macbook air laptop, but her main laptop is a dell. She doesn't have a smart watch because it hurt her wrist.
- The client described how during different days different joints will hurt. The parts that hurt the worst are the shoulders, wrists, and arms. The client suffers from joint instability and hypermobility. She experiences chronic pain and can get migraines depending on the joint pain. The right-side experiences more continuous paint. Joint pain can vary and move throughout the day.
- During the interview it became very clear that the client is very interested in collecting data as she expressed that if she has a way to track the data, she would be motivated to continue doing the exercises. The client expressed that if the process of using the app is easy, she will be further motivated to use the app and do the exercises. She expressed that medicine doesn't work so she is very motivated to try and fix the problem.
- Some ideas that were talked about during the interview was that there should be a way to track the pain over time. For the survey she should be able to select the joints that hurt and be able to select from a scale of 1 to 10. She should also be able to add and remove to the list of exercises. The client doesn't like notifications (she ignores them). Perhaps there should be a way to graph the data.
- Throughout the interview the client talked about how the exercises should not be very long (Under 5 minutes); they could be maybe a couple minutes of walking. The exercises could be spread out throughout the day (maybe 3-4 times a day plus a way to give feedback and adjust the amount).

Translated Customer Needs

1. The application needs to allow the user to input on suggested exercise. Meaning that if the application suggests an exercise the client can input if that exercise was useful or not.
2. The application needs to be able to run on either android or ios. The application also needs to have a function that allows the user to input their data to a computer.

3. The application needs to have the ability to allow the users to input which joints hurt and scale of the pain. The application also needs to have functions that can be used to indicate if the pain moved throughout the body.
4. The application needs to be user friendly to motivate the users to do the exercises.
5. For the pain survey the application needs to allow the users to select the joints that hurt and be able to select from a scale of 1 to 10 (pain).
6. The application needs to allow the users to add and remove to the list of exercises.
7. The application needs to allow the users to turn off notifications.
8. The application needs to be able graph the data collected.
9. The application needs to have the ability for the clients to customise the duration and spread of the exercise throughout the day.

Problem Statement

A mobile application is needed to remind the client, Maddie, to exercise at various intervals throughout the day to help mitigate joint and chronic pain. The app needs to include customizable options and the ability to track data while being a user-friendly and functional tool.

Metrics

#	Needs	Metrics	Importance	Units
1	8,2	Database	5	MB
2	1	Suggestions after the survey	4	numbers
3	3	Questionnaire about the pains	5	list
4	1,3	Survey form	3	list
5	7	Notifications	1	list
6	9,6	Time needed	3	minutes
7	9	Speed	3	second

Benchmarking

Benchmarking was performed by first analyzing other products on the market and then comparing the models.

Track + React is an application specifically designed for those with arthritis. It helps the user understand how various factors affect their pain. The app tracks nutrition, fitness, sleep, medication, and symptoms on top of stress-levels felt during the day and other factors such as social interaction. The information is then compiled into a series of graphs with the option of choosing the dates and which feature(s) the user would like to have developed into a graph to see the trends. While the app does not provide reminders to exercise throughout the day or have the option to create and customize workouts, the app works on a very similar system to that of the pain questionnaire that is part of team Z8's requirements. For each factor, the user is able to use a slider to answer the question for example, "How I felt when I woke up?", using the designated scale. This information is then store and can be extrapolated. Additionally, the app meets our client's need for data. Track+React tracks all the data as previously mentioned and the graph system allows the user to easily find trends between their pain and the designated factors. The app provides helpful information regarding each factor; however, the design of the interface is cluttered and not extremely user friendly.

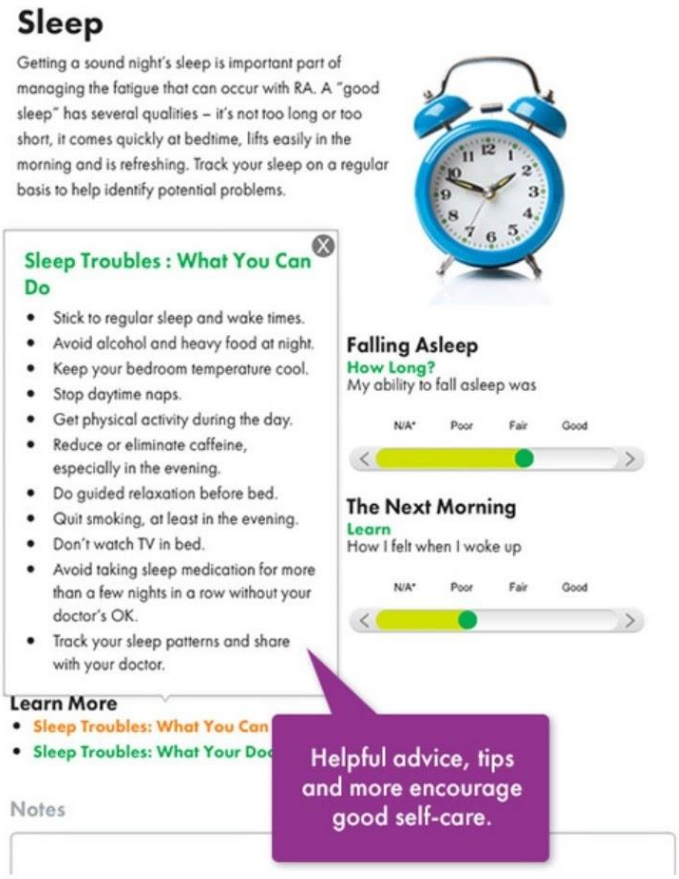

Figure 1: Track+React screen tracking the user's sleep.

Painscale is an application that offers treatments for user conditions and symptoms with added features to make the tool functional. The app allows the user to track various health factors including pain level, sleep, medication and activity levels. The app is intended to be used in combination with medical advice, the app helps the user track all this information to help the user present the data to

their doctor. However, Painscale can also be used independently from any medical professional. There is a library of medical articles, tips and videos to help users. There are also reminders set to motivate users to track their daily symtpoms and log them into the app. The information is then tracked by the app, from tracking pain types to how much pain the user has depending on the time of day. Additionally, there is a community the user can connect to through the app.

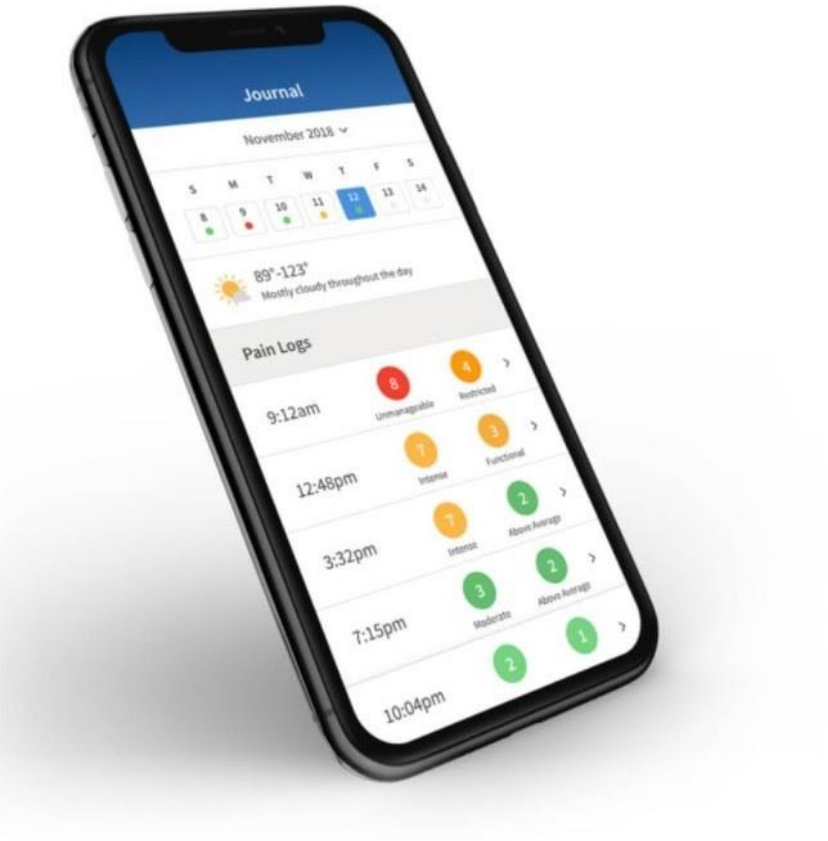

Figure 2: Pain scale journal screen demonstrating the pain log.

My Pain Diary is another app that aims to track user pain, symptoms and other factors in an effort to be used as a report for the user's doctor. The app can be used to track over 60 health conditions by creating a diary for the pain as well as a medication log and event log. My Pain Diary tracks the location of the pain, stress levels and pain levels among other things. To give the user a complete picture of possible factors there is even the possibility to graph their pain levels based on the weather/temperature. The app is able to generate a PDF report that can then be handed to a medical professional. The searchable track function also easily allows the user to revisit all the day for one day in particular. The app's ability to generate a report is an innovative data function that certainly fulfills our client's needs.

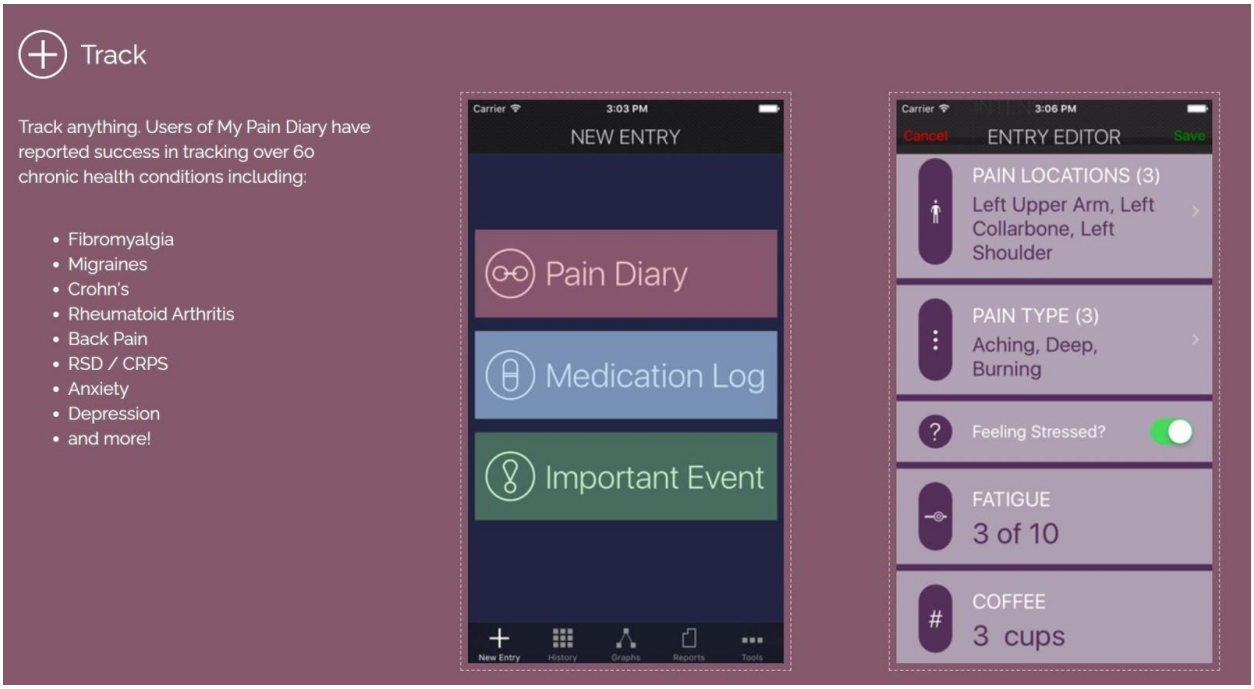

Figure 3: My pain diary entry screen as well as entry editor.

Metrics	My Pain Diary	Painscale	Track+React
Database (5)	2	3	1
Suggestions (4)	3	3	3
Questionnaire (5)	2	3	3
Speed (3)	3	3	2
Total	41	51	38

For the applicable metrics, the three products were compared on how well they fit the given criteria. Each metric has a value of importance associated with it. This value was then multiplied by the value on a scale of 1-3 of how well each product completed the metric. 3 represents the best and 1 the worst. The higher the total the better.

Target Specifications

	Target Specifications	Unit	Value
1	Application (App) Response Time	ms	>4
2	App Size	MB	>50
3	Exercise Time for Users	min	>10
4	Database Size	MB	>25
5	Surveys Amounts	-	>25
6	ISO 9241 Testing	-	Pass
7	Install ion Package Type	-	.apk

8	User Interfaces Amount	-	<2
9	Power Consumption	%/h	>1
10	User Friendly Range	-	8
11	Running Operating Systems	-	Android
12	Cost for Creating App	CAD	>0
13	Recover Range Percentage After Using the App	%	<80
14	Running Space Requirement	MB	>20
15	Customer Satisfaction Range	-	<7
16	Types of Data Diagrams	-	<2
17	Debug Service	month	>1
18	Time for Testing	week	>2
19	Development Period	month	>1
20	Production Life Span	Years	<1
21	Tutorial Document	-	1

Reflection

The client meeting impacted the team's results, ideas and the design process. Initially, there were many unanswered questions regarding the client's condition as well as her requirements for the application. The interview allowed the team to gain greater insight into her daily routine and how her work impacts her condition. She discussed how sitting down and typing causes pain in her joints and that she needs to continuously get up and exercise to relieve some pain. Before talking to the client, the team was under the impression that the app would be used perhaps once a day however this assumption was found to be incorrect. Thus, the app must be tailored more towards small bursts of exercise/workouts. This means that an efficient and rapid experience is to be expected. In regard to her joint pain, the team discovered that her pain varies a great deal from day to day. The area where her pain is concentrated will also change from day to day for example from her wrist to her arms, the type of pain can also change from nerve pain to tendon pain or both. There is also a chronic component that must be considered. In essence, there are many factors that must be considered for the app to be effective. This changed how the team was going to approach the app. The app must have the ability to be modified and tailored on the user side. The client needs to have the ability to choose which area to target, which exercises to do (whether based on the area or type of pain or both) and choose based on her pain levels. Consequently, a database will need to be created with the possibility for expansion. Customization is a large component and this needs to be implemented in the design process. Additionally, the app would ideally customize and adjust the amount of time spent on the workouts. The application itself is not restricted to one platform since the client has devices across numerous platforms

(Android, IOS, etc) and is open to using the application on any platform. This allows the team to choose the platform that will best suit the creation of the application without sacrificing any functionality for one platform. The meeting also allowed the team to understand how the client uses her phone and how the app would work into her routine. Her routine is fluid and there is no fixed time for these workouts ergo an app that reminds her throughout the day is necessary. The team also learned that the client wants a simple and straightforward app that is functional above all. Data is another large component of the application that was a factor the team had not thought of. The client wishes to track data to see trends over time. The team will consequently tweak the app ideas to prioritize simplicity and functionality while allowing a great deal of customization and the ability to track all the data to extrapolate trends. The client meeting was very beneficial in understanding the problem and how to best tackle it.

Conclusion

In conclusion the team was able to gain valuable insight into the client`s vision for the project from the client interview. The client needs, metrics and specifications will help the team when creating the concept design for the application. Understanding what other products are on the market and how they fulfill certain criteria is a key component in the design process. All the information gathered will help advance the team to create a viable solution for the client.

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