Deliverable F – Prototype 2

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Introduction

The task for Deliverable F was to create the second prototype building on the first prototype as well as the information received in the previous client meeting. The group met with the client for the last time before the final prototype/product will be presented. With the feedback and knowledge gained in the most recent client meeting, the team analyzed what was said to apply the suggestions to the final product. The creation of the second prototype also occurred and each UI screen was documented and explained. Every function was analyzed. Furthermore, testing was conducted on the second prototype to obtain raw data that is necessary in comparison portion of the testing phase. The second prototype was then compared against the metrics to determine what needs to be improved and what needs to be completed. The second prototype created a working application that will be modified and transformed into a final product that will satisfy the needs of the client.

Client Feedback

Our third and final client meeting was successful. The team discussed the changes that had been incorporated into the prototype since the last meeting. Later the team presented the second prototype to receive feedback and help understand what improvements can be made.

Client Statements

We presented our client with the second prototype for the third client meeting and received new valuable feedback. To start, the client suggested that we have global activities. This means having certain activities like icing the hurt joint appear under every joint, not exclusive to one joint. The client liked that our group managed to implement a lot of the previous feedback from the other client meetings. The client again expressed the importance of data collection and stated that she does not care about the app's look; she is more focused on overall functionality. One comment the client made about the app is that we do not have to implement a scroll feature; multiple pages are acceptable. Lastly, we talked about the possibility of designating a few members of the group to focus on the app and the others on the deliverables.

-Data collection is the most important feature. Everything else is secondary. The client would not see a purpose in using the app if there is data collection.
-The aesthetics and other features can be left to the end of the final product development.
-The client was happy with the features that were implemented. She was happy with the skeleton version of the customization features.
-Functionality is the most important part of the app. The semantics of the app including scrolling features or different pages were not essential to the ideal product.

Client Feedback Analysis

The meeting allowed the group to refine the goals and priorities for the next deliverable. As mentioned, the client focused on the data collection. This is the most important feature of the app; without it the user is likely not to use the app because they are able to workout on their own. The purpose of the app is to collect the data while providing a tool to improve the user's workouts

simultaneously. Ergo the group will focus on the data collecting aspect of the app for the final prototype and then focus on the other features. It should be mentioned that the client acknowledged that the way we were going about creating the app was logical. The team decided to create all the customizable features in skeleton form before creating the data collection. This way it simplifies the task. The customization aspect was satisfactory to the user ergo the structure for this aspect will remain relatively the same. Other improvements to help with functionality will be included such as the duration changer implemented onto the timer page itself. The user was happy with the adjustments made to the first prototype including the inclusion of a stop button for the timer itself. The client answered an important question as well detailing how she performs exercises individually instead of in a pre-planned workout. This affects the layout and flow of the app thus it will be taken into consideration. The other features and aesthetics are all secondary. In conclusion, the team learned that the data collection will now be their main focus and that the other features are satisfactory and can be developed if time remains.

Second Prototype

In the second prototype a functional application was created with numerous features. UI screens and app features were added to the first prototype skeleton app.

The prototype objectives were:
-Create a functional app
-Improve the timer function of the app
-Include motivational/anti-cheating measures
-Link the UI screens together
-Create all the screens
-Skeleton form of the rating system
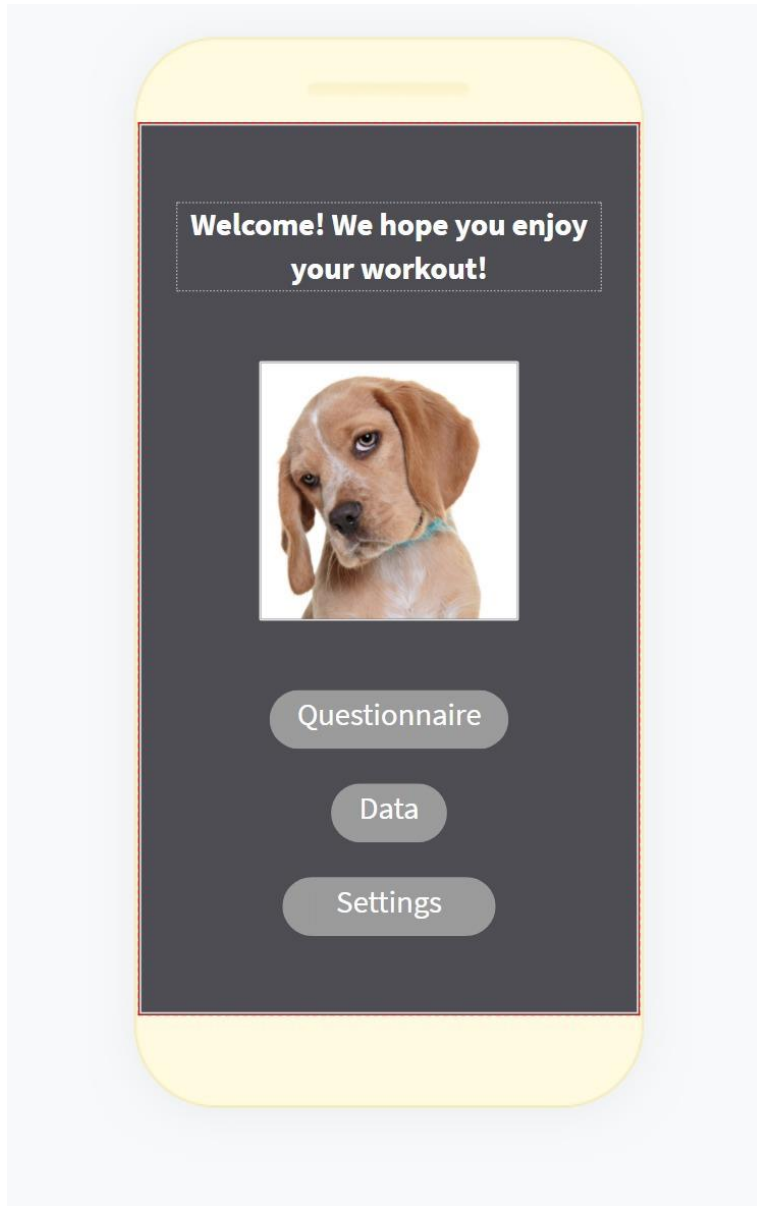-Incorporate the client's feedback into the app

Figure 1: Application welcome page.

The first page of the application is the welcome page. Initially the welcome page was used as a functional test in the first prototype to determine how the features would co-exist and interact with each other to accomplish the given tasks. Upon review it was decided that a home page would be a beneficial part of the application. The user is greeted with a message welcoming them to the application and wishing them a good workout. Below is an image of a dog that was used for aesthetic purposes as well as a test for the final prototype where more videos and photos will be implemented into the app. Below the image and text field are three buttons; each button leads to a different page and down a different path of actions. The questionnaire button leads to the questionnaire and all the way to the workout, the data button leads to the data page and the settings button leads to the settings page.
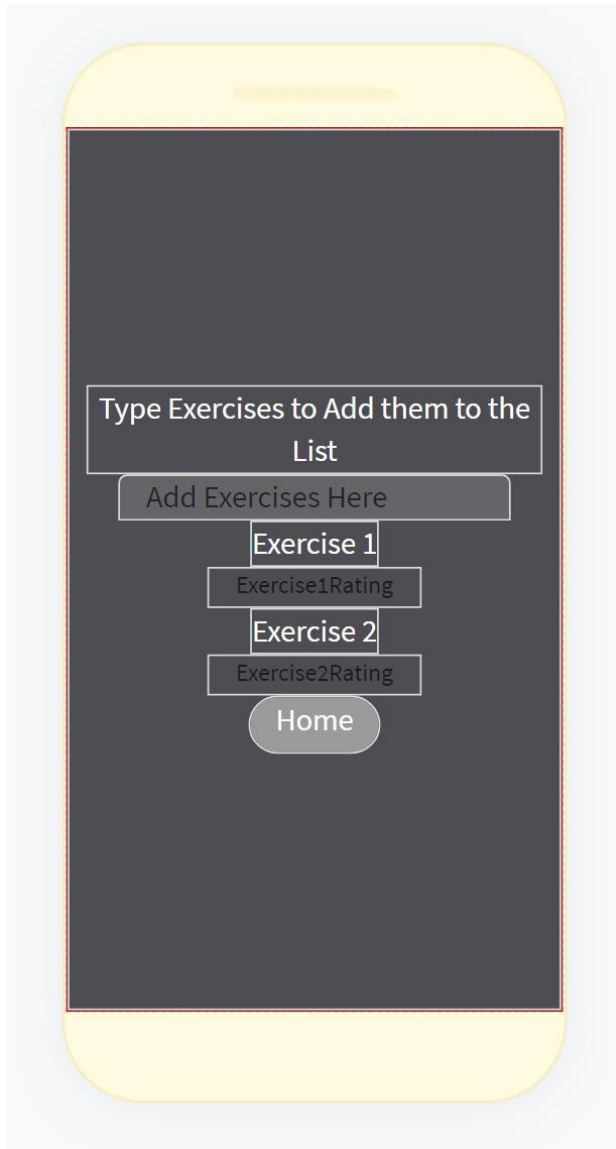
Figure 2: The settings page along with its customization and rating feature for the exercises.

The settings page allows the user to customize the exercise list. By writing into the text box a new exercise will appear on the workout list and on the settings page. The exercise on the settings page will then be able to be rated by the user so they can analyze which exercises suit or help them best. Currently, if the user were to write into the text field no exercise would be created. This is a feature that will be developed in the future for the final prototype. From the settings page the user can go back and forth with the home page, ergo it is not necessary for the user to start and complete a workout to customize the list of exercises.
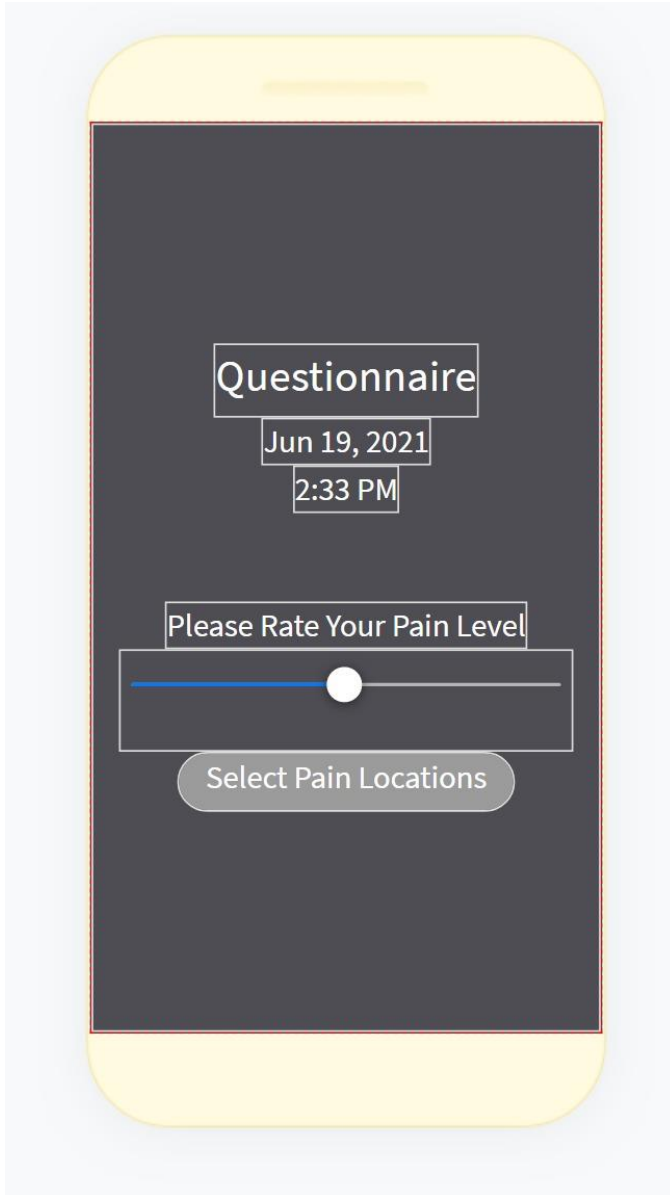
Figure 3: The pain questionnaire of the application.

        The pain questionnaire page appears once the user has clicked on the questionnaire button on the home page. Part of the motivational aspect of the app is that it is assumed that once the user goes to the questionnaire page, they want to complete a workout. Therefore, from this page the user must complete a workout to return to the home page. The questionnaire includes a time and date stamp that will be used in the data collection portion of the app to determine when the user works out the most and what time is most beneficial for them. Furthermore, the user can rate their pain on a scale of 1-10 using a slide rule tool which will be modified in the final prototype to show the numbers underneath. From this page the user can go on to select the joints/muscles that hurt that they would like to stretch.
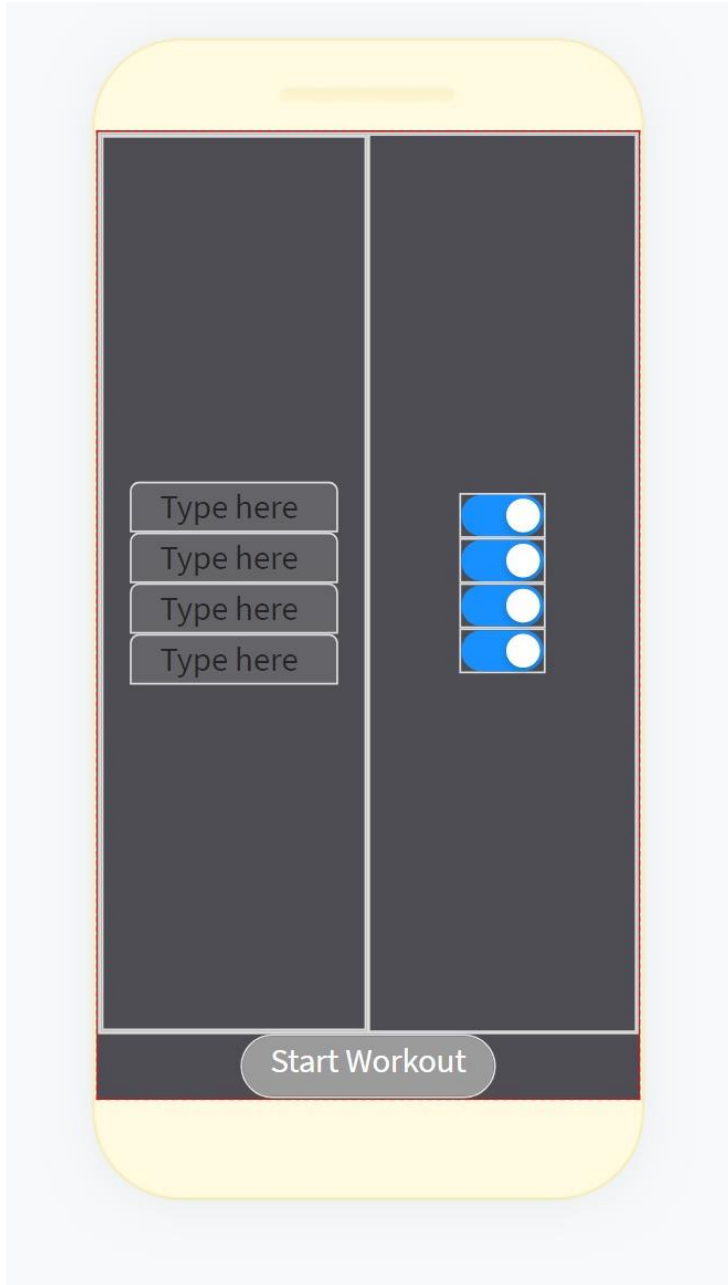
Figure 4: Pain locations page with selection feature.

The pain locations page allows the user to choose which joints or muscles she would like to exercise or stretch. It works using a slider button, when the button is switched on the user will eventually be led to a page with the appropriate exercises based on the pain level and pain location questionnaire. Currently, this questionnaire component has text fields where the user can input the exercises; the text fields will be removed in the next prototype. This feature was completely absent from the first prototype. Now the foundation for the true customization and data collection of the app has started. On this page the user is presented with a "Start Workout" button at the bottom of the screen. The button will lead the user to the exercise list based on the questionnaire answers which will lead to the timer and beyond.
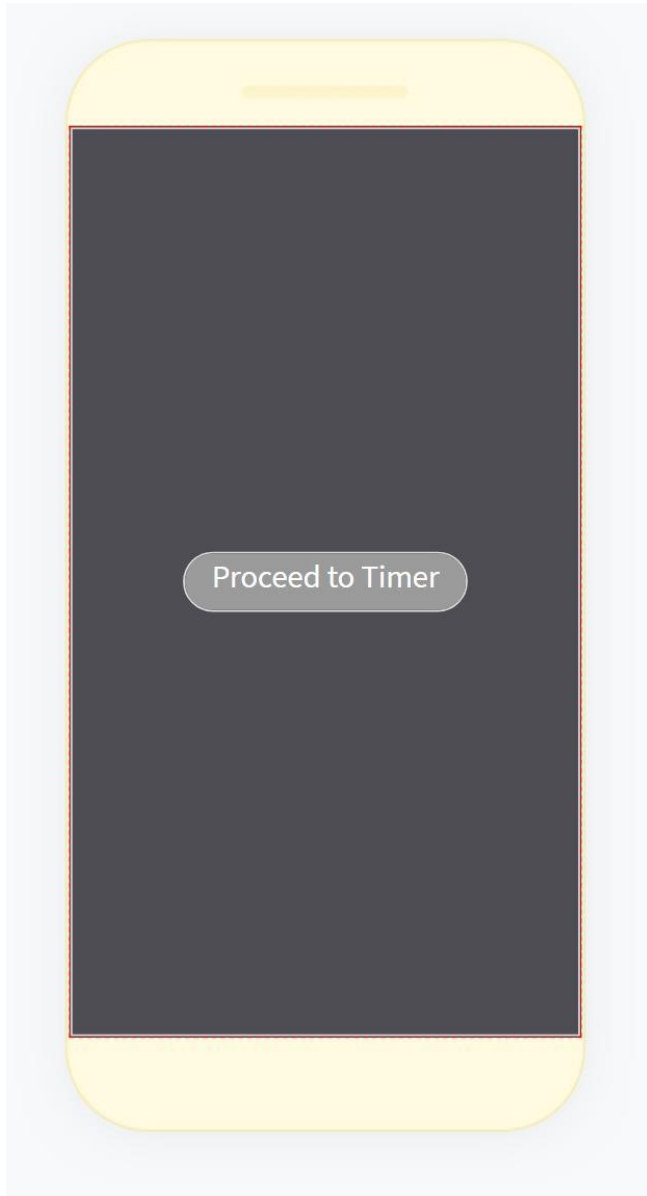
Figure 5: The exercise/workout page.

Currently the exercise/workout page is a proof-of-concept UI screen. The button from the pain questionnaire leads to this page and the button stating "Proceed to Timer" is another functional button that leads to the appropriate page. The first prototype included a version of an exercise list however since that list was not connected to the other features such as the questionnaire, the exercise list had to be redesigned. This page will host the appropriate exercises for the pain level and location that the user has chosen. The classification of the exercises as being an exercise for pain levels 1-10 for example will also be inputted by the user this way the app is making no medical suggestions.
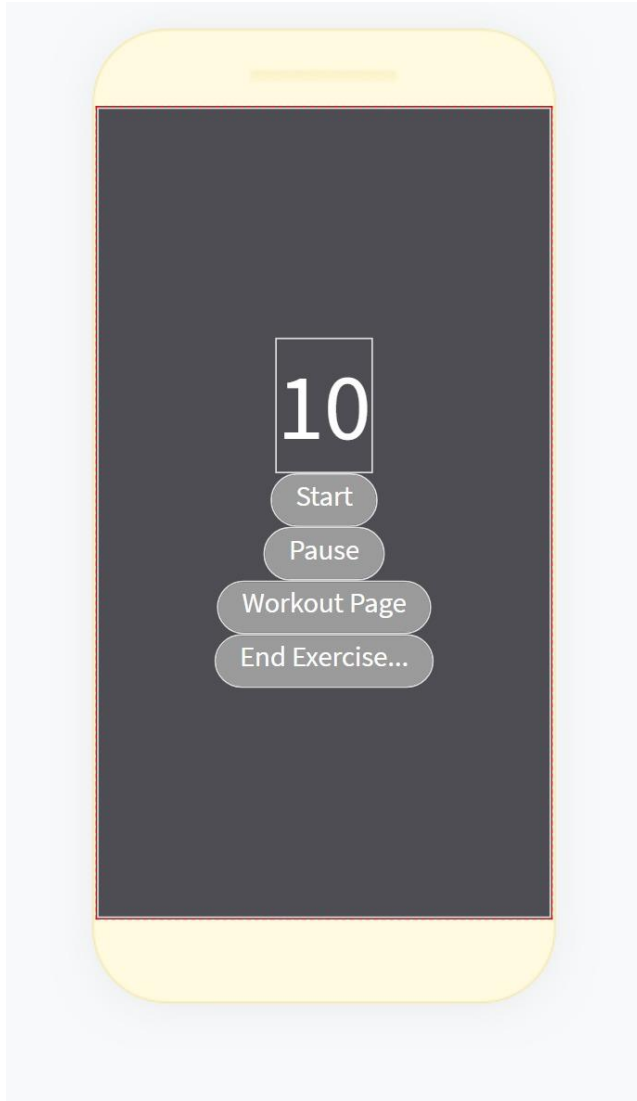
Figure 6: The timer feature with start and pause buttons.

The timer feature proceeds the app exercise list and motivates the user to commence their workout. The screen includes a start and a pause button that allows the user to use either feature at any point before the countdown reaches 0 seconds. This is an improvement upon the first prototype which featured a start button but no pause button or anti-cheating/motivational aspect. The motivational feature comes into play with the other two buttons: the workout page and end exercise buttons. The workout page takes the user back to the list of exercises in the case that they wish to do another exercise. Whereas the "end exercise" button leads the user to the congratulations page finishing the workout. Both buttons are only available once the countdown has finished. Thus, the user is not able to end the workout without having completed the timer which helps the user stay motivated. In the future, the timer page will include the timer duration customization feature.
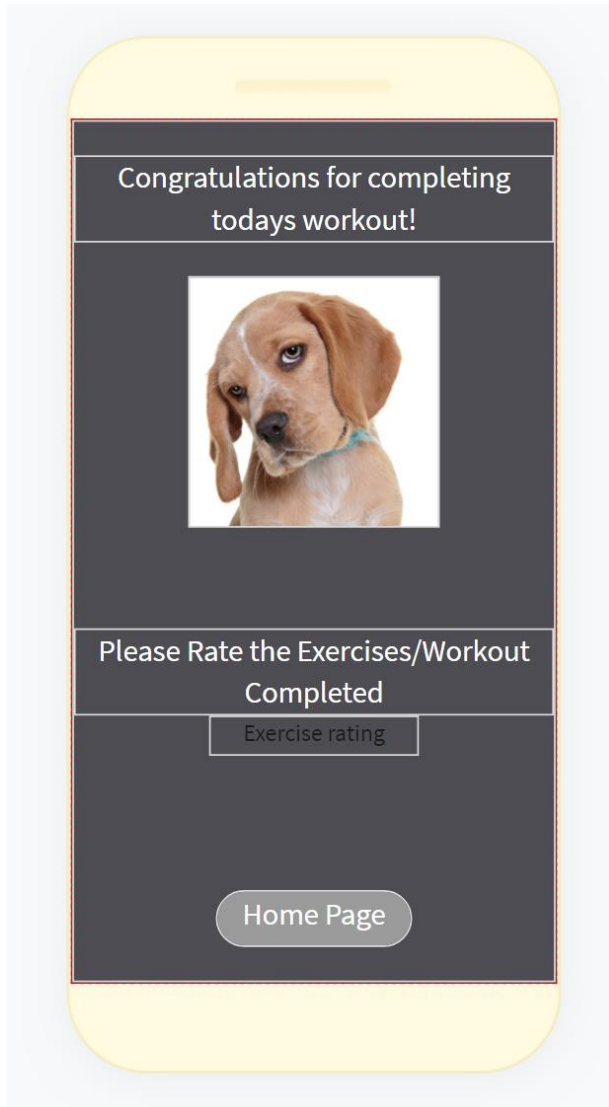
Figure 7: The congratulations and workout rating page.

The congratulations page is the final page in the workout sequence. It appears once the user has completed the workout by pressing the "end exercise" button on the timer page. A message appears as well as an image congratulating the user for completing the workout. At the bottom of the page there is a star rating feature for the exercise that was just completed by the user. The stars do not appear unless the app is in preview mode (how the user would be interacting with it).

Prototype Testing

How the tests were conducted:

The app was tested based on the chosen metrics and compared to the expected results. For the application response time the app response time was timed by the team to determine how long the app took to respond to the command given by the user. In other words, the app was timed to see how long it took for the app to perform the said function after the user had pressed the button to initiate the app to perform said function. Five trials were conducted, and the average was taken giving a result of 1.326 seconds. The application size was tested by looking at the stored data and writing down the result. The number of data tracking features was tested by looking at the features that the app was exporting to the specified data sheet. The data collection has still not been added to the second prototype ergo this prototype was measured as having zero data tracking factors. To clarify the data tracking features makes reference to the number of factors that the data tracking component of the app is writing down. This includes the date, time of workout, the pain level, the location of the pain and other features such as the duration of the workout. This will be implemented in the final product. The complexity of actions relates to the number of actions the user needs to perform to complete the workout. This was measured simply by going through the application and counting the number of actions or for this prototype the number of buttons pushed. It should be noted when conducting the test none of the customization features utilised ergo for this test it was simulated as though the user wanted a list of general exercises thus, they did not choose one specific area. To include every combination of location and possible exercise would generate a much different result. The customizability was tested by counting the number of features that the user could change. This was done by counting the features. Lastly, the performance time which is the time it takes the user to reach the workout was measured in the same way as the response time. Five trials were conducted, and the average was taken giving a result of 27.322 seconds.

Explanation for the results:

The results discussed are feature in the table below. The application response time did not attain the expected results; however, an improvement was made compared to the first prototype. The first prototype had a response time between 3-4 seconds whereas the average response time for the second prototype was 1.326 seconds. This is a discrepancy that the team believes is caused by the image and data files that were added to the prototype. We also believe this partly due to the Thunkable platform being used. The expected or ideal result does not seem realistic for the platform upon conducting multiple tests over two prototypes. The application size surpassed the expected result of 25MB. This is another expected result that was created before starting the application. The expectation now seems unrealistic as well. Because of the data files added the app will never be 25MB. The user was however happy with the features included in the app and the customizable features therefore it does not make sense to remove these features. The data tracking metric was not applicable for the second prototype since the data tracking has not yet been created. Ergo a value of zero was given. This is the major focus for the team in the coming weeks. The complexity of the second prototype surpassed the expected results. As noted in how the tests were conducted, in the test the user did not customize their workout meaning they did not choose a location(s) for their pain meaning that multiple actions were not

considered. If the user were to choose every customizable feature, they would reach 11 actions for the final prototype. Once again, this expected result seems unrealistic in hindsight since the ability to tailor the workouts or exercises based on the location is an extremely beneficial feature. The app surpassed the expected result for customizability, giving the user 3 features to customize being the duration of the workout, the pain level, and exercises. The rating system is not considered part of the customizability of the app but rather solely part of the data collection. Finally, the performance time surpassed the expected results. This is in part thanks to the faster response time however it was not faster than the actual result due to the additional features that would occupy the user's time such as the slider for the pain scale and pain locations page.

Metric	Expected results	Actual results
Application response time	4ms	1.326s
Application size	25MB	100MB
Data tracking (#factors)	2+ factors	0 (N/A) factors
Complexity (# of actions needed to finish workout)	10 actions	7 actions [11 actions]
Customizability (# of customizable features)	2+ features	3 features
Performance time (Time to reach workout)	30s	27.322s

Table 1: Prototype testing: comparison with metrics.

Trial	Time (s)
1	1.31
2	1.75
3	1.09
4	1.08
5	1.4
Average	1.326

Table 2: Testing data for the application response time.

Trial	Time (s)
1	27.2
2	28.4
3	26.05
4	27.33
5	27.63
Average	27.322

Table 3: Testing data for the performance time.

Conclusion

In conclusion, the team created the second prototype in this deliverable. A functioning app was created which built on the skeleton version of the app created in the first prototype. The framework, questionnaire function, timer function, and exercise rating function were added into the application. Numerous UI screens were also added to incorporate all these features. Regarding the feedback of our client, we will focus on completing the data collection function part of our application in the upcoming weeks. The data collection is the most important aspect of the application for the client. Benchmarking was also performed with this prototype to determine any points of improvement before proceeding with the final prototype. Features such as the data collection, a list of favourite exercises and the customization features will be added in the future. The group was able to create a successful second prototype and refine the vision for the final product with the client.

Appendix

WRIKE - Snapshot

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=65uGfxtzv1W1PdKiyHNN9KDIwKAwL2mL%7CIE2DGMZZGQZTILSTGE3A