Gym Tracker Mobile Application

Oskar Grzenda

B.Sc.(Hons) in Software Development

April 10, 2022

Final Year Project

Advised by: Joseph Corr

Department of Computer Science and Applied Physics
Galway-Mayo Institute of Technology (GMIT)
GitHub: https://github.com/OskarGrzenda/FinalYear_Project

Contents

List of Figures

About this project

Abstract I am developing a mobile application using react native the application will work on both ios and android devices but my main development focus is for an android device. The target audience of the app is going to be aimed at gym goers as it is a gym tracking application that allows users to track their gym workouts. With the mobile app market growing at a massive rate my goal is to learn more about mobile app development and to have a project I can present at interviews.

Authors The author of this project is Oskar Grzenda. I am doing a solo project. I am currently a 4th year student at G.M.I.T. I am studying Bachelor of Science (Honours) in Computing in Software Development.

Chapter 1

Introduction

1.1 Context

I designed a mobile application using react native, the purpose of this application is to help gym users track their workouts. When you are in the gym you are performing many different exercises and it can be difficult to remember everything you done in the gym that day or what weight you were lifting and how many reps and sets you done. This app will allow a user to track all those metrics easily and view it whenever they are back in the gym. This will allow the user to keep everything relating to their gym workout in one place. In the app there is also a progress page where you can add pictures of yourself and enter your weight, if you want to it's up to the user and overtime they can see their progress in the gym and how their body is looking. There is also a step tracking feature where users can track their steps and distance.

Tracking you gym workouts is something that is very common to do while at the gym there are many different ways people do it the most common way many people used to do it was by writing it down on a piece of paper while working out but bringing a bottle of water, notepad, pen/ pencil, phone, headphones and towel in some cases can be a lot of things to carry around the gym with you. So by minimising the amount of things you have to carry around can just make your gym experience a small bit better and since most people now a days have a smartphone which they can download apps on I thought creating a gym tracking mobile applications would be a good way of getting myself involved in the field of mobile app development while providing some value with an application that could maybe help a person in the gym to track their workouts. Most people also already have a mobile phone with them at the gym anyway to listen to music on so it wouldn't be any extra

thing that the person would need to carry around with them.

1.2 Context of Technology

I made the mobile application using React Native as my framework, Node JS as my back end run time environment which runs my java script code and Express JS as my framework for Node.js. As my back-end database I went with Firebase as it acts as a real-time database which was a very important part of my mobile application as I needed information to be returned to the user instantly once they have created their workout. The whole react native application is made using the expo cli which is built on top of the React Native cli. Expo is a framework and a platform for universal applications meaning expo react native applications can run on ios and android devices using the same JavaScript / typescript code. I go into more detail on the technology of this project in the Technology Review chapter.

1.3 Objectives

1.3.1 Become a better mobile app developer

My objectives with developing a mobile app are to become a better mobile app developer as the mobile app market is growing at a very rapid rate and mobile app developers are at very high demand currently.

1.3.2 Project to present at interviews

I also wanted to develop a mobile application to have a project that I could present at interviews.

1.3.3 Learn more about mobile apps

I also want to learn more about what makes a good mobile app and to have all the key mobile app features that any new mobile application has and that the mobile application is user friendly and does not require a massive learning curve. The goal is to make it super simple for a user to use.

1.3.4 Enhance React Native skills

Another objective for this project was also to enhance my react native skills. React native is a very popular technology that is used to develop mobile

applications, some of the biggest apps in the world are developed using react native such as Instagram, Facebook and Uber eats there are many more examples but these are some of the most popular apps that most people will recognise [9] .

1.3.5 Gym Tracker app

Another objective I had with my mobile application was to focus on a specific category and not make the app to broad. So my focus was on fitness but specifically the gym. This would allow me the keep the app simple and user friendly without overloading each screen with a lot of information or different features that someone might not need. For example I could have done a general fitness tracking application that focused on many different sports but that would have left many features off the app unused by many people as most people don't usually play loads of different sports they normally just have a few favorites they consistently practice. So I did not want to over complicate the UI with different features that would not be used. A minimalist approach can help the user get more comfortable and familiar with the mobile app much faster.

1.4 Chapter Summary's

In this dissertation there are 6 different chapters Introduction, Methodology, Technology Review, System Design, System architecture and Conclusion,

1.4.1 Introduction

In the introduction you can find a brief summary of the whole project. You can find what the project is about and my objectives with the project.

1.4.2 Methodology

In the methodology chapter you can see how I went about the development of my project for example what type of development approach I took on such as agile/scrum, what tools/technology I used for the development and how I went about my planning. You will also see my testing approach for my mobile app.

1.4.3 Technology Review

In the technology review chapter I talk about all the research I had done on my project and all the technology I used for developing my mobile app.

1.4.4 System Design

The system design chapter is all about how I went about structuring/designing my mobile app and I talk in detail about all the features of my app and how you navigate around it.

1.4.5 System Evaluation

In the system evaluation chapter I talk about my objectives I set out in my introduction and I say if things went how I planned or things I would do differently next time I go about developing a mobile application again.

1.4.6 Conclusion

In the conclusion chapter I wrap up the whole project dissertation and give my final thoughts on how everything went and I give the reader a final reminder of my overall rationale and goals of the project. I also mention any new things I learned during the development of this project.

Chapter 2

Methodology

2.1 Research

It was very important for me to do good research before I began development on my project so I could understand what technology to use and to get an idea of how I was going to approach the development of my mobile app. For my research I used different sources such as papers, articles, blogs, documentation and videos. It was also important to do thorough research on the technology I was going to use to make sure I am choosing the right technology to help me reach my objectives.

2.2 Why a mobile app?

At the beginning of my project I was planning on developing a web application for my project but after trying to plan out my project as a web application I realised it makes no sense for it to be a web application as it would not be user friendly. A web application would have made it much more difficult for the user to use in the gym to track their workout. As most people use mobile applications on their phone and typically only search on google for answers to questions rather than using a whole web application. So I decided to develop a mobile application as it is something I have never tried doing before so I thought it would be a good thing to do to increase my skills in that area. The demand in mobile app developers is increasing at a rapid rate. Nearly every business now a day is looking for their own app or a business that has a website is trying to convert to mobile applications. The number of mobile app developers is expected to increase from 17% to 26% by 2026 [10] . With that massive increase of mobile app developers I thought it would be a good opportunity to increase my skills in that field

and hopefully open a opportunity for myself as a mobile app developer in the future if that is something that I would like to pursue in the future. My mobile application is an expo react native application which will work on both platforms ios and android but my main focus of development was for android. The total users of smartphones has crossed over 3 billion users and with that 87% being android users and 13% being ios users [10]. But not only has the demand for smartphones been in great demand over the last couple of years and still growing at a rapid rate but so has the market for tablets which as of 2017 their were over 1.35 billion tablet users in the world which also has a massive impact on the amount of people using mobile applications [11].

2.3 Approach to Development

I approached my project development with a AGILE approach I planned 2 week sprints. So every two weeks I was hoping to have a certain section of the mobile application complete.

I had project meetings every week with my supervisor. We discussed how the development of the project is going and what isn't working well and what we can fix. The meetings were focused on making sure everything is being done on time and to make sure the project would get complete on time. Having weekly meetings also kept me doing some work towards the project each week so we could look over the work done and continue planning ahead with the next part of the development process. The feedback from the meetings greatly helped in the decisions that I made during the development process and how I approached the design of the application. The meetings allowed my supervisor to have a look at the design of the application and the functionality of it. By presenting my project during our meetings I got great feedback on things I can improve on.

I planned out my UI of the application using wire-frames. I made a few different ones as initially I had planned on developing a web application but creating wire-frames to help visualise the project it made me realise a web application is not suitable for the project I had in mind. By making wire-frames I realised I should design a mobile application. The wire-frames helped me consider different features and the structure of the UI. Planning storyboards/ wire-frames greatly helped me with the development process as I knew how I wanted to structure the mobile app before even having any code started.

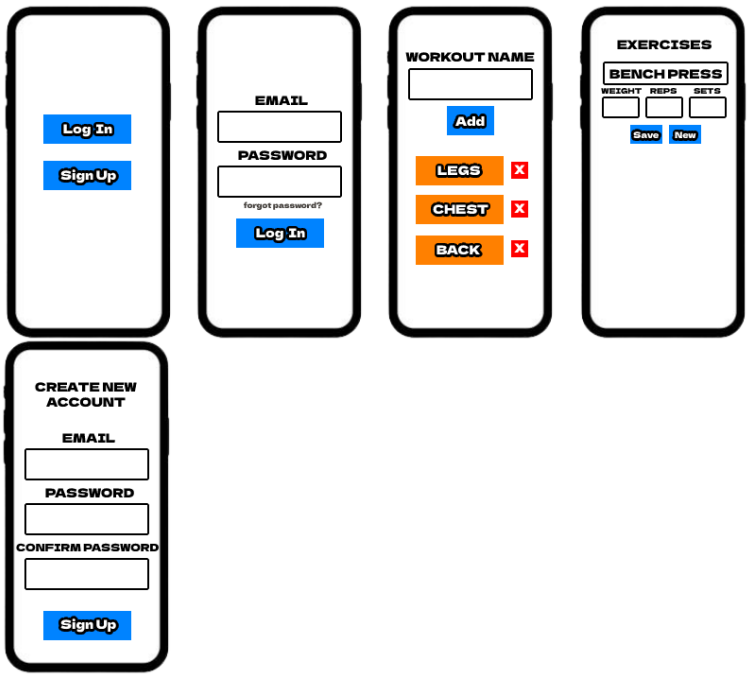

Figure 2.1: Project Wireframe

Through my storyboards/wire-frames it helped me determine the requirements for my project. I was able to visualise how the user will be able to navigate between all the different pages and what each page will require. During this time I also had a look at mobile applications and what features they all have and used that research to implement some of those features into my own application as each mobile app has some standard features that are necessary to create a safe and secure app. It was very important to research about the user log in and sign up page to prevent people from creating false accounts and having access to other users data.

2.4 Testing

For the testing of my mobile application I done different user testing by giving my application to a friend or just testing it myself. The benefit of this was that the application got tested from the point of view of a real person using it. This allowed me to see where I need to improve on my UI or what features have bugs in them that need fixing. During this process I really got to improve my sign up and log in page as I had different issues such as users being able to create random accounts with emails they don't even have access to. I was able to solve this issue by making users verify their email

if they can't do that they would not be able to log into the app. I also had to give feedback to the user of what was going wrong as they were creating their account. Sometimes the user would not put enough letter/ numbers into their password or they would forget to enter an email address into the text-box or forget to confirm password or the email they entered was in use or invalid and I had to provide feed back to the user because initially they were getting no response and that made it difficult for the user to sign up because when something went wrong they did not even realise what was happening. I didn't face these issues when I would test the application as I knew what I had to enter to allow an account to be created but once someone else was testing the application I quickly realised someone who did not develop the mobile application will not be aware of how everything works. Throughout testing a massive factor I was missing was user password reset this was a major problem in the application as if a user forgot their password they were basically locked out of their account forever and would have lost access to all their gym tracking progress so when I encountered that issue where I forgot a password to one of the demo test accounts I was using I quickly realised that is a very important feature and a feature that is present on every website and mobile application.

During my testing process I had also realised and found bugs in my database as my database had a major privacy issue where when a user logged in they basically had access to every ones information. I found this bug when I was testing the application and when I had created a new account and logged into the app then I noticed information was already present in the new account from another user. Privacy is very important when developing a web application or mobile application that is holding sensitive user information. If users would find a privacy issue with an application that is already on the market the chances of that person leaving that app and not using it again are very high as there is many other apps that are out there on the market and users would rather use that as they don't want to risk getting their information leaked again. According to an article I had read privacy and security are some of the top features people require on an app [12] because no body wants their private data leaked out to everyone. That is why the testing process is very important and an app needs to be thoroughly tested many times before deployment of the application on the market.

2.5 Validation

During the design and development of my application it was very important to keep the target audience in mind as the design of the application would

be different depending on the target audience of the application. To validate my mobile app and find out how I was going to approach things one of the things I done was looked at apps that were in a similar category for example fitness in my case and I also looked at more specific fitness apps such as ones that were focused specifically on tracking gym workouts. By looking at these apps it give me a good understating of what works well on apps in this category and since these apps were already published they had already gotten feedback on different things they could improve on which I took on board for my own application. Also looking at apps on the app store I was able to filter them by ratings which let me primarily focus on looking at apps that have already done well in this category. But it was also worth looking at the apps that have not performed well and to see why by using them myself and reading reviews and feedback that people had left on these apps. As the app is focused for multiple users, reading reviews and feedback people had left on other apps is a very good way of validating your app and finding out what works as at the end of the day you are not making the app for your self but hopefully for thousands if not millions of other people so it was important to focus on not just creating something that I think is good but something that other people have mentioned they would like to see on a mobile application and specifically a gym tracking application as that is what I have developed. An articles that really helped me on finding different validations strategies is [13].

Validation was very important during the development of my mobile app as there are already very similar gym tracking apps out there and I had to ask myself what can I do that would make my app stand out and get a user to download it and following the different validation strategies really helped me to understand the process of app validation and things I can do to create a good mobile application and get users eyes on it. 4 steps that I found very important in app validating were finding an app idea and most people find an app idea when they come across something in the world where they think I wish there was an app that could do that for me to hopefully make there life a bit easier but coming up with an idea is the first step and can be quite difficult to do so as there already are so many mobile apps out there, it is very important to make sure you are creating an app that will provide some sort of value to other people. My second point is to analyze the market have a look if your idea exists and how your app could still provide value and can you solve the problems other apps are experiencing, third thing, to begin creating it, through that process you will learn a lot more than simply just thinking of the idea once you start taking steps towards making it happen you will realise if this is something that is worth your time if it will really provide value to people. The fourth things is to begin finalizing your

app and giving a prototype version out to people to test and see the apps performance. These 4 steps really helped me during my development process of my application. Making sure I was properly testing the app throughout the whole development also validated that things were going to work and function as I intended them to.

2.6 Development

For the development of of my mobile application I used GitHub I was doing a solo project but pushing my work to GitHub allowed my supervisor to see my must up to date work and see how I'm doing on my development and if everything is on time as scheduled according to our 2 week sprints. It also allowed me to have access to previous versions of my project so if anything went wrong during development and I was unsure what went wrong I was always able to go back to the most recent push I had made to GitHub. My development process was planned using a sprint approach where every two weeks I would have a new task to complete on my project and in our weekly stand up meetings every Thursday we would make sure the development of the project is going according to plan. On GitHub I was also able to store all my other parts of the project such as presentations, wire-frames and project plans so GitHub allowed me to keep all parts of my project organised and in one place.

Chapter 3

Technology Review

3.1 Technology Used

Before I began my development I also had to do some research on the technology I was going to use and why I would choose certain technology over other technology. I initially started looking at web development frameworks and technology stacks that I could use for my website which I had planned at first, I had planned to make a MERN stack web application but after doing further research and planning out my project as a web application I came to the conclusion that my idea is not suitable for a web application so I decided to switch to a mobile application. I first began looking at technology and frameworks I could use to develop my mobile app. I had heard of React Native so I decided to do some research into React Native and went with that as my front-end JS library, Node js as my back-end JavaScript run time environment, Express JS as my framework for Node.js and after looking into different databases I went with Firebase as my back-end database. I also used Expo which is a frame-work built on top of React Native which allowed me to easily build and deploy applications on different emulators and interpret code that worked on Android devices and Ios devices. But my main focus was on building on Application for an android device. I ran my mobile app on an emulator using Android Studio which really helped speed up the development process as I did not need to be connecting to an external device I was able to do all my testing and development on my laptop.

3.1.1 React Native

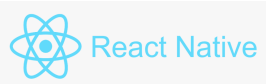

Figure 3.1: React Native Logo [1]

As I mentioned React Native is a front-end JavaScript library for UI components. After doing research on React Native I had found that some of the most popular apps in the world such as Facebook, Instagram, Uber Eats and Air BnB were developed using React Native so that had caught my attention and made me interested in the technology [9] . Also React Native allows users to build applications that work native on both platforms Ios & Android. This is a major benefit of React Native as it can greatly decrease the production time of development and can keep costs at a cheaper rate as the business that needs an app doesn't have to hire separate developers to build an app for Ios and Android platforms it can all be done using React Native. A big benefit of using React Native for cross-platform development is that it creates a product that a user is expecting to see when using a specific operating system. For example Android and Ios may have very similar features but the way they are displayed on each platform various. Here is an example using a date picker the left image is an Ios device and the right image is an android device both UI components are rendered using the same JavaScript code but display differently according to their OS. This allows the user of an ios and android device feel familiar with the app right from the beginning without having to get used to new components and learning their functionality from the beginning again. [2]

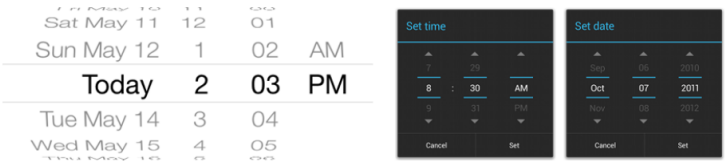

Figure 3.2: Date Picker ios vs android [2]

Even though React Native allows you to develop mobile applications using JavaScript code and renders the code on both ios and Android you can't expect for every single thing to just work as smooth as that. The more complex a feature gets the chances of it working native on each platform with no issues begin to decrease. To make specific features work on a certain

platform you need to use platform specific js files during the development process of your application but if you still can't get a specific feature working using the React Native frame work you can use Objective-C, Swift, or Java and tie them back into the JavaScript base code that you build. But even though not everything might work flawlessly when developing an application using React Native framework it is not unreasonable to assume that 85% of the code gets shared across both platforms [2] .

I decided to use React Native as my framework for my project as React Native is a very popular framework for mobile app development with that comes a lot of demand for React Native developers. By developing a mobile app using React Native it will allow me to have a project to present at interviews and give me a head start on mobile app development as it is a topic that is interesting to me and I would definitely like to learn more about it.

3.1.2 Node JS & Express JS

Figure 3.3: Express js & Node js logo [3]

Node JS and Express JS both work together as the service of my mobile app they act as a link between my React Native front end framework and my fire-base back-end database. Node JS is an open-source, cross-platform, back-end JavaScript run time environment which executes JavaScript code outside a web browser [14]. Express JS is a back end application framework made for Node JS [15]. To use Node JS it is necessary to install Express JS alongside of Node JS. To run a React Native application Node JS is necessary to run your JavaScript code.

3.1.3 Firebase

Figure 3.4: Firebase logo [4]

Firebase is my back-end database for my React Native project. Firebase is a Google product that provides developers with many tools to help develop applications mobile and web. Some of firebase key feature are authentication, real-time database, hosting, test lab and notifications [16]. As I developed a mobile app it was very important for me to pick the right database. Firebase is a very popular database when it comes to the development of React Native applications. Firebase works in real-time and this was a very important feature that I needed a database to have as I needed to store information in the database and return it to the user in real-time. Firebase is a no-SQL database which worked fine for me as I did not need to make any complex query's from my database. No-SQL databases are also good for large amounts of data and high user loads and this is something that is very important for your database to be able to handle large amounts of users and user data [17] being able to handle large amounts of data can really help in the future when you are scaling your app as mobile applications tend to have very large amounts of users and data. Firebase authentication also allows users to sign up using password, emails, phone numbers, twitter and many other ways [16].

3.1.4 Expo

Figure 3.5: Expo logo [5]

Expo is a framework that is built on top of React Native [18]. Using Expo allows you to by pass writing any Native code for Android or Ios. Expo allows you to write native applications for Ios Android using JavaScript but the main difference between using regular React Native and React Native with Expo is that with Expo you get a command line CLI which allows you to run your project on emulators, in the web and on your physical device. With expo you can download Expo go which is an App for mobile phones. Once your JavaScript code is compiled Expo gives you a QR code which can be scanned using your physical device and gives you access to use your app in real time on any Android or Ios device. A massive advantage that Expo CLI provides over React Native CLI is that it allows you to run and use both Ios and Android versions of your application where as if you are just using the React Native CLI without Expo you will only be able to develop Ios applications

using Xcode on a Mac and Android applications using Android Studio on a Windows device. Another advantage of Expo CLI over React Native CLI is that if you want a different user to test out your app you need to send them the whole .apk / .ipa file and run all the code on their own machine with their own emulator it takes a lot more time and makes the process more complex where as with Expo CLI you can send the other person a QR code or a link to your app and they can begin testing it immediately without having to setup multiple things to access the app on their own device. Expo CLI is also a lot more beginner friendly when it comes to setting up your first project compared to the React Native CLI, to set up with React Native CLI you would need to know the basic file structure of Android and Ios files and it would require a lot more configuration [19] . Overall both Expo and React Native CLI both have pros and cons and what I found is that as someone new to mobile app development and React Native starting with an Expo project can create an easier learning curve and can be better when working with others. Below are some of the main pros and cons I have found during my research these are not all of them but some that in my opinion are worth noting.

React Native CLI pros [19]

- Good for Designing and building apps designed for one specific OS but can still do cross-platform
- Basic Cross-platform apps
- Good for developing Apps with complex UI

React Native CLI cons [19]

- Requires Android Studio or Xcode to run your project
- Can't build/test ios apps without a Mac or iPhone
- Requires you to push whole .apk / .ipa files for someone else to test your app
- Setting up a project can be difficult, complex configuration
- If you are testing or running your app on a physical device it needs to be plugged in at all times

Expo CLI pros [19] [20]

- You can easily send your app to someone else using a QR code or Link

- Apps can be run over WiFi and do not require to be plugged in at all times
- You can eject your project and go back to using React Native CLI, Expo will unpack all your files and sort them into Android or Ios folders and split your App.js files into App.js and Index.js to suit the React Native CLI

Expo CLI cons [19] [20]

- Can't use native modules this can be a big turn off for some developers (Expo CLI apps tend to be more basic)
- Also some API's are not available with an Expo application such as Bluetooth
- An app built using the Expo CLI can be larger than a native Android app for example as with Expo you get many different API's installed whether you are using them or not. A Expo built app can be approximately 20MB where as a native Android app using the React Native CLI can be about 15MB.

I decided to go with React Native Expo CLI as I mentioned earlier as this was my first time getting involved with mobile app development and the Expo CLI helps you with that as you don't need specific native Android or Ios files. Also being able to share my project using a link is very beneficial when it comes to my user testing as I was easily able to share my project with other people to test out the app functionality.

3.1.5 Android Studio

Figure 3.6: Android Studio logo [6]

As I was using a windows machine I needed to use Android Studio to be able to use an Android emulator. I needed an Android emulator in order to be able to see my app working and running this was not only important for the development process but also for testing. Android studio offers many

different Android devices to use for the development of your project such as different Nexus or Google pixel phones [21]. During the development of my mobile app I used a Google Pixel emulator. Using Android Studio helped a lot as I was able to do all my development on my laptop and didn't need an external device to develop my mobile app.

3.1.6 VS Code

Figure 3.7: VS Code logo [7]

For my IDE I used Visual Studio code. VS code provides different features such as intelli-sense which is a smart code completion feature and it has built in debugging features [22]. Visual Studio code is also a small install so it does not take a lot of space on your device and is very light when it is running on your machine and it does not use much processing power. VS code is also a very popular IDE and one that I have personally used throughout my course.

3.1.7 GitHub

Figure 3.8: GitHub logo [8]

For managing my project I used GitHub. GitHub is a cloud based service that allows developers to store and manage their code [23]. GitHub is one of the most popular cloud based services for developers, GitHub is really good when you are working in a team as everyone can use one repository to track and manage their code [24]. With GitHub I was able to track my code but also any other files relating to my project such as wire-frames, presentations and screen-casts. GitHub also allowed me to see previous versions of my project so if I had any major mistakes in my project I was always able to go back and clone a version where the error did not exist. Also being able to store code in the web is very beneficial if you need access to your code

when you are away from home. As all you need to do is log into your GitHub account on any device and you immediately have access to all your code.

Chapter 4

System Design

4.1 App Architecture

Once I had done all my research on what technology I was going to use I was able to begin the development of my project. The system design of my mobile app was a very important part of my project as mobile apps are meant to be easy to understand and easy to navigate around. You want a new user to be familiar with the app without even having used your app and you want the navigation to be as clear as possible so the user knows what page they will be brought to by the buttons they press.

While designing the mobile application I kept in mind the user at all times to ensure what I'm developing is something that will actually help the user and not make things more difficult for them. During the development of my UI I had looked at other mobile applications with a similar concept to mine to see how I can structure my UI and what things I found to work well in other applications that I could implement in my own way in my mobile app and I also looked at things that didn't work so well in other applications and I worked on preventing those things in my application. The objective with the UI was to keep the learning curve to a minimum and allow the user to be familiar with the app without having even used it. The UI is very important as having a good UI can create a better user experience which can keep a user returning to the app. As of 2018 the number of mobile app downloads has been 205.4 billion and by 2022 it is expected to hit 258.2 billion [25]. With so many mobile apps constantly being downloaded it is very important to make your app stand out from the millions of apps that are out there. Because if a user is not happy with your app all they have to do is delete it and download another one and as you saw from those massive number of downloads you can clearly see people go through apps very quick and don't

mind moving onto to something else when the app is not what they wanted or expected. New mobile devices each year are constantly getting improved and working faster and the speed of your application is a major factor of people sticking around and using your app so I had to make sure that I'm not cluttering the user UI with to much data from the database on one page as over time when the user creates more data it could begin to slow down the device or take things longer to load on that page of the app. So it was very important to keep the UI and data on the pages as clutter free as possible and doing so also made the app look much more aesthetic and your eyes were not overloaded with information when you opened any page of the mobile app. As the application was focused on gym users it was also very important to make things work easy and quick so a person at the gym doesn't have to spend a very long time using the different features of the app.

4.1.1 What a user first sees

My mobile app consists of many different pages when a user first opens the app they are first brought to a page that displays the app name with two buttons below 'Log In' and 'Sign Up' at that point the user can choose to Log in if they already have an account or Sign up if they don't have an account yet. These are two standard features that pretty much every app or website now a days has. 4.1

Figure 4.1: The first screen a user sees

4.1.2 Sign Up

On the 'Sign Up' page a user has the option to create an account by entering their email and password twice to confirm they spelled it correctly. If a user is trying to sign up and they enter their information incorrectly or forget to fill in a field they will be prompted with alerts to let them know what went wrong in the creation of their account. It is very important to give a user feedback of what is going on so they can resolve the problem and not leave them stuck or confused as that could turn away a person from using your app if they are experiencing problems, this is also why thorough testing is very important to avoid as many of these problems as possible and ideally to get rid of all of them.

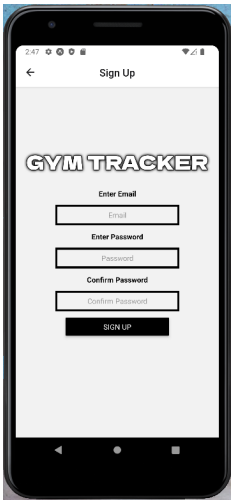

Figure 4.2: Sign Up Screen

4.1.3 Log In

Once you have created an account successfully on the 'Sign Up' page you will automatically be brought over to the 'Log In' page where you will be required to enter your log in information which consists of the email and password you entered on the 'Sign Up' page but firstly before you attempt to log in you will need to check your email for a verification link to verify your email to gain access to the app if your email is not verified you will not be able to access the app this feature is there to prevent users from logging into the app with emails they do not have access to. Also on the 'Log In' page you will find an option called 'forgot password?' when you press 'forgot password?' you will need to enter your email so it is important you signed up with your own email as you will receive an email with a link that will allow

you to reset your password once the password is reset you will now be able to log into the app once you are using a verified email address and a correct password.

Figure 4.3: The Log In Screen and forgot password

4.1.4 Workout Screen

When you successfully log in you are immediately brought to the 'Workouts' page/screen on this page at the bottom you will be able to see a navigation bar which you can use to bring you to different pages but the main feature of the main workout page is the workout creation. On this page you will be able to enter your workout name and after pressing the 'add' button your workout name will appear in the form of a button. You are able to create as many different workout names as you'd like. Once you create many different workout days the page will become scroll-able so you will always be able to see your different workout days.

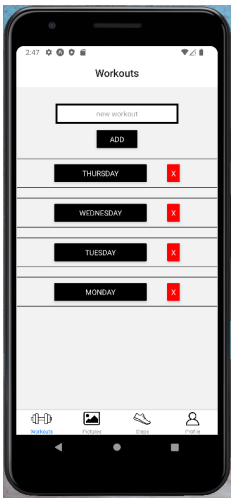

Figure 4.4: The workout screen

4.1.5 Exercises

When a workout is added you can press on the workout and it will navigate you to a page called 'Exercise Page' where you can enter more details regarding your workout. On this page a user can enter their exercise they are performing and what weight they are lifting, number of reps and sets. Each exercise page will only display information from the workout name they clicked on so for example if you had a workout called 'Monday Leg Workout' and you clicked on it you could enter your different leg exercises and if you then opened a different workout such as 'Tuesday Chest Workout' you would not see 'Monday Leg Workout' data as each workout day has a unique id which gets linked to the exercises you wrote when you opened a certain workout. The exercise page will be the main function of the app and will allow users to see there exercise information and next time they workout they can open up their workout from last week and aim to hopefully improve this week.

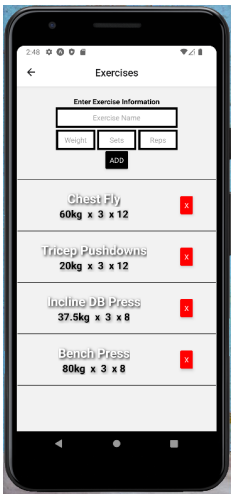

Figure 4.5: The exercise screen

4.1.6 Progress Pictures

When you are on the 'Exercise Page' you can go back and you are brought back to the 'Workout Screen' from there you can use the navigation bar to bring you to different pages such as the 'Profile' page, 'Progress Picture' page and 'Steps' page. On the 'Progress Picture' page you can track your body progress by uploading images you also have the option to add your current weight and it will be displayed above the picture with the current date so a user can view their pictures and know when it was uploaded and how much they weighed at the time when that picture was uploaded. The purpose of this page is to allow a user to keep track of everything in one place and on the same app with their exercises to prevent having your progress pictures all over the place in your photo album on your phone.

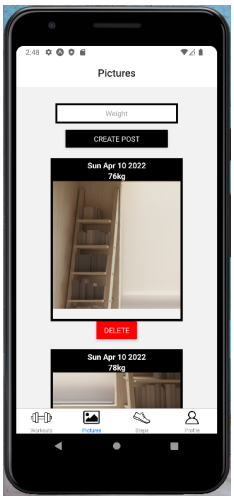

Figure 4.6: The progress pictures screen

4.1.7 Profile Page

The next page you can access from the the navigation bar is the 'Profile' page. On this page a user has a few different options such as setting their profile picture, changing email, sign out and delete account. Initially there is no profile picture attached to your account so you have the option to set one up yourself if you would like to have one. The change email functionality is there as sometimes people change their email for whatever reason and allowing a user to change their email on the app is a very important feature this will prevent a user from losing all there data in case for some reason the user did lose access to their old email the user now has the option to set up their account with a new email so they can still have access to their account on the app. But once a new email is set up you will once again you need to verify the new email to gain access to the app once you log out. So on the user profile you also have a log out feature which is a pretty standard feature that many apps and websites provide. The purpose of this is too allow a user to log out of their account and allow someone else to log in if they are for example sharing a device. It is also important to allow users to log out of their account as it could be a serious security problem if users logged into a public device and had no option of logging out. The final feature on the 'Profile' page is the delete account option which allows a user to completely delete their profile and every single bit of information that is stored in the database in relation to their account.

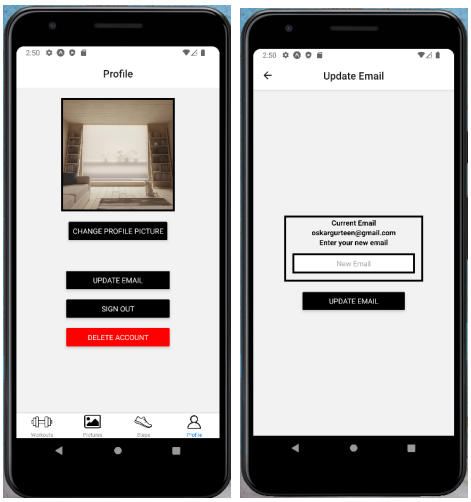

Figure 4.7: The profile page screen and update email screen

4.1.8 Steps

The final page that you can access using the navigation bar is the 'Steps' page this page allows a user to track their steps and distance. If you are deciding to go for a walk or run you can open this page and start tracking your walk/run. The step data is being saved to the database every time the step count increases and there is a calculation that converts the step count into total distance. If you have complete your walk/run and would like to reset your steps/distance you have the option to press the reset button to set all data back to 0 which will allow you to start from 0 when beginning a new walk/run.

Figure 4.8: The steps screen

4.1.9 Deleting Data

Any piece of data that you enter into the app you also have the option to delete which deletes it from the database. It is important to allow the user to delete their data as sometimes some information can be input wrong and you don't want the GUI becoming cluttered with loads of misspelled information or the only way of deleting data to be by deleting the entire account as sometimes the user may have just made an error in one area and you don't want the user deleting everything else that is fine as a user can have built up a lot of information regarding their workouts and progress pictures over-time.

4.1.10 Database

All user data is stored within firebase in 3 different sections such as authentication, firestore and storage. User log in details are stored in Authentication that is also where the user unique id is created when a user signs up to the app and where you check if the user email is verified or not. Firestore is used as the main database for my project in firestore you can find all exercises, workout days, progress pictures and step counts for each user stored in a specific collection. Within each document of a collection you can find much more details on a specific exercise such as who created it what workout day the exercise is linked too and when everything was created and firebase storage is used for storing files and images. Once an image is stored in firebase storage a custom URL for each image gets created and I store the URL inside a collection in firestore linking it to a user id and that way I can return

specific images for each user.

Chapter 5

System Evaluation

5.1 Testing

During the development of my project I consistently tested the app. I made sure any function I wrote worked the way I intended it to work by manually testing the application pressing different buttons and hoping to get the result I expected to get by writing the different functions. It is very important to test the app properly to prevent putting out an application to people with bugs. I also done user testing by giving the app to other people to use as a regular app this way I was able to get real users on the app and test out the different functionality and this helped me realise what needs improvement and where the bugs are that need fixing.

5.2 Evaluation

I achieved many things I had initially set out to do in my objectives during my development and research of mobile apps. Some of my objectives before starting my mobile app were to become a better mobile app developer and get some experience developing mobile apps, have a project I can present at interviews and having a mobile app is great if I was to apply for a position as a mobile app developer, learn more about mobile apps and what makes a good mobile app and how it attracts users, get better at React Native as it is a very popular mobile app development framework and my final objective was to design an app that can provide value to a person specifically someone who goes to the gym and tracks their workouts.

5.2.1 Become a better mobile app developer

One of my objectives was to become a better mobile app developer and to gain experience as I had an interest in mobile app development but had never went out of my way to research or make a mobile app. By taking on this project I realised I actually do enjoy mobile app development and it is something that I would like to give a go in the future.

5.2.2 Project to present at interviews

Another objective I had was to have a project that I can present at interviews to show case some of my mobile app development skills I have acquired during the time I was making this app.

5.2.3 Learn more about mobile apps

So when it comes to mobile apps it is really important to understand what makes a mobile app stand out from thousands of other mobile apps and what attracts a user to your app specifically. Throughout my research on this topic I have definitely learned a few things on attracting users to your app and how to make them stay around. One massive factor of getting people to use your app is the UI. I learned that an app needs to be very user friendly and easy to understand because if it is difficult a person will not want to spend their time trying to learn how to use your app when they have many other apps to choose from.

5.2.4 Enhance React Native skills

So when I was choosing what framework to use for the development of my app I realised there was many to choose from but I decided to go with React Native as there was many successful apps made using React Native and from the research I had done React Native was also a good framework for someone new to mobile app development. After making my own mobile app using React Native I can say I enjoyed using it and it is a framework that I would like to stay familiar with in the future but I do think there are still many other frameworks out there that I would also like to try out and gain some experience with such as 'Flutter'.

5.2.5 Gym Tracker app

Another objective I had set out for myself at the beginning was to make a gym tracker application. My goal was to help other gym users by creating a mobile application that can help a user simply track their workouts and their progress all in one place. From testing and using the app myself I think I achieved the goal of helping users track their workouts.

Chapter 6

Conclusion

Overall the project went well. I developed the mobile application I had in mind which was a gym tracker application that was focused on tracking a persons gym workout I also got other features included into the mobile app that I did not have initially planned but the idea for them came up during development.

I achieved all the objectives I had set out for myself at the beginning such as becoming a better mobile app developer I would say I definitely improved in that area as at the beginning of the project I had no experience with mobile app development so by building my first ever mobile app and doing research into mobile applications I definitely learned new things and I realised I do enjoy the process of developing a mobile app at the beginning I knew I had some interest in it but I did not know if I would enjoy it but it turned out to be better than expected. Since mobile app development and the demand for mobile app developers is increasing it is a very good skill to have.

By taking on this project I now have a project that I can present at interviews if I'm applying for a job in the mobile app development area which before doing this project I did not have and was one of my objectives before starting.

Another things I achieved by doing this project was expanding my knowledge on mobile apps and how important different parts of a mobile app are such as the UI, it is very important an app is easy to use and easy to navigate to keep a person on your app. There are hundreds of apps out on the market so it is very important to make yours stand out. The goal of each app should be to provide a person with some sort of value.

Since this was my first time using React Native I didn't know what to really expect from it at the beginning I did find it quite challenging and my development progress was much slower because of that but the more research I done on React Native and the more I played around with it I found I began

to understand it and once I got familiar with how certain things work the development process began feeling a lot smoother and I enjoyed using React Native.

If I was to do the project again some things I would potentially do differently is do the project with a team. I think working with a team could help a lot especially at the beginning when trying to come up with the initial idea and as a team everyone can help each other out in different areas which could also speed up the development process.

But overall I enjoyed taking on this project and I'm happy I decided to do a mobile app instead of a web application as mobile app development is something completely new to me so now I have learned a new skill and a mobile app suited my gym tracker much better than a web application would have.

Appendix A

Installation & GitHub

GitHub: https://github.com/OskarGrzenda/FinalYear_Project

How to run the Project

- Install Android Emulator (https://developer.android.com/studio) or Install Expo Go app on your mobile device
- Set up an emulator and start it
- Clone the repository
- Open the 'GymTrackerApp' folder in the terminal
- Run 'npm install'
- You can then open http://localhost:19002/ from there you can run the project on a emulator or scan the QR code with a physical device and open the mobile app on Expo Go

Bibliography

[1] P. Item, “React native logo.”

[2] J. Bender, “Cross-platform mobile applications with react native.”

[3] R. Cruz, “Express js and node js logo.”

[4] FireBase, “Firebase logo.”

[5] A. Melynk, “Expo logo.”

[6] Pantech, “Android studio logo.”

[7] wikimedia, “Vscode logo.”

[8] Github, “Github logo.”

[9] FireupPro, “9 amazing mobile apps built with react native.”

[10] Aparna, “The rising demand to hire mobile app developers in 2021.”

[11] H. Oza, “The demand to hire app developers in 2022 - an in depth insight into app development of the future.”

[12] Guest, “10 features that make a really great mobile app.”

[13] P. Saxena, “How to validate an app idea successfully.”

[14] Wikipedia, “Node.js.”

[15] Wikipedia, “Express.js.”

[16] E. Team, “What is firebase?.”

[17] L. Schaefer, “What is nosql?.”

[18] E. Docs, “Introduction to expo.”

[19] O. Bespalko, "React native init vs expo 2021: What are the differences?."

[20] E. Docs, "Limitations."

[21] Prithviraj, "Introduction to android studio."

[22] V. Code, "Why did we build visual studio code?."

[23] K. Blog, "What is github? a beginner's introduction to github."

[24] J. Juviler, "What is github? (and what is it used for?)."

[25] S. Mishra, "Significance of ui/ux design in mobile applications."