## University of Ottawa

## Faculty of Engineering

## Department of Mechanical Engineering

# INTRODUCTION TO PRODUCT DEVELOPMENT AND MANAGEMENT

**GNG 2101 Team: Z11** 

## **Deliverable I: Video and User Manual**

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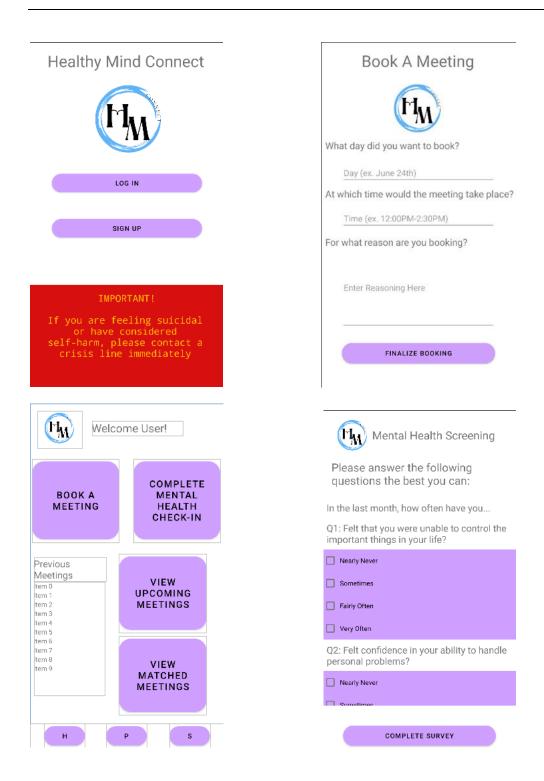


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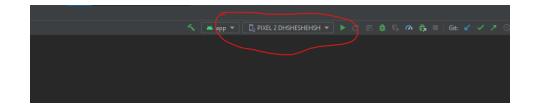


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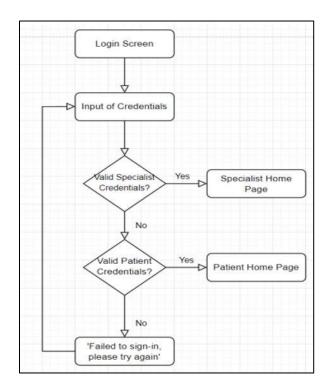


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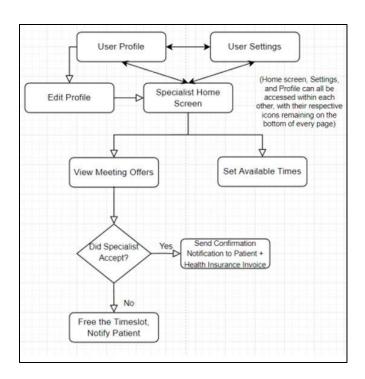


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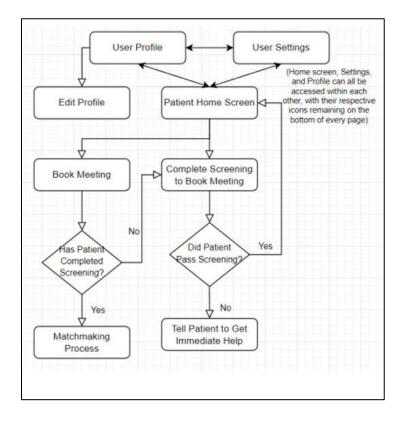


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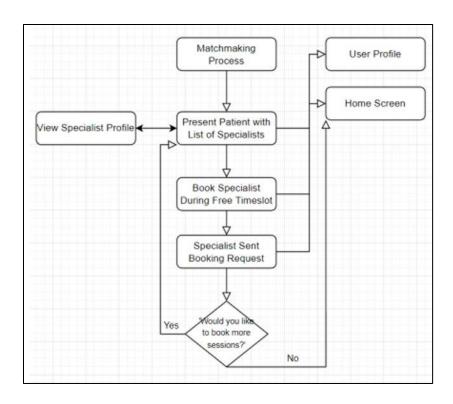


Figure 9: Matchmaking Process Flow Chart

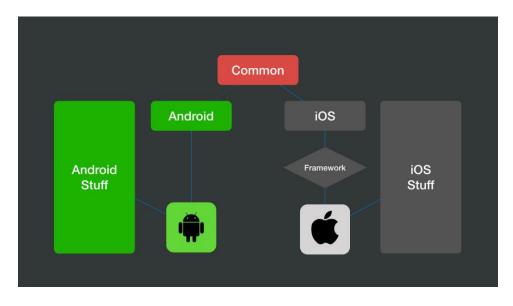


Figure 10. How Kotlin is compatible with both IOS and Android.

```
patientSignup.setOnClickListener{    imb View!
    val userNamedb : String = userName.fexf.toString();
    val passworddb : String = password.fexf.toString()
    val tastNamedb : String = lastName.fexf.toString()
    val firstnamedb : String = firstName.fexf.toString()
    val meddb : String = meds.fexf.toString()
    val genderdb : String = gender.selectedItem.toString();
    saveFireStore(userNamedb, passworddb, firstnamedb, lastNamedb, genderdb, meddb);

    van intent = Intent( packageContext this, LoginPage::class.fava)
    startActivity(intent)
}

fun saveFireStore(username:String, password:String, firstname:String, lastname:String, gender:String, meds:String){
    van db = FirebaseFirestore.getInstance()
    val user: MutableMap<String, Any> = HashMap()
    user["username"] = username
    user["username"] = password
    user["lastName"] = firstname
    user["firstName"] = firstname
    user["gender"] = gender
    user["medication"] = meds
    user["medication"] = meds
    user["medication"] = meds
    user["medication"] = false

db.collection( collectionPath: "users")
    .add(user)
}
```

Figure 11. Code for a Realtime update to Firebase.

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## List of Acronyms and Glossary

Table 1. Acronyms

| Acronym    | Definition                         |
|------------|------------------------------------|
| IDE        | Integrated Development Environment |
| WHO        | World Health Organization          |
| HM Connect | Healthy Mind Connect               |
| UPM        | User and Product Manual            |
| BOM        | Bill of Material                   |

## 1 Introduction

Based on the project description we're given, we have gathered that our client is looking to minimize mental stresses caused by factors such as the pandemic, job loss, and social isolation by facilitating the connections between patients and councilors. From the information provided, we were able to create the following problem statement:

"A need exists for the development of a user-friendly app which connects patients and mental health professionals, province wide and enables them to share their availability and book appointments with ease regardless of location within the province. This project will find a solution to this problem while considering the client's needs."

From this statement, our job was to create an app, which will allow people in need of mental health assistance province wide in Ontario, to get in contact with a counsellor or psychologist via video conferencing. This app is called Healthy Mind Connect. The goal is to provide this resource to people located even in more isolated areas such as those in the northern Ontario communities. The app allows a patient in one city in Ontario to be able to provide their availability and relate to a professional that does not necessarily have to be in the same area.

The production of this app was made based on the key assumption that there is a need for this kind of service. This assumption was done based on the following statement from the WHO:

Introduction 1

"Fear, worry, and stress are normal responses to perceived or real threats, and at times when we are faced with uncertainty or the unknown. So, it is normal and understandable that people are experiencing fear in the context of the COVID-19 pandemic."

This shows that there is an increased need for mental health support such as our app during the pandemic we are currently living in. We hoped this was enough information to make our key assumption.

This document will outline everything a user would need to know from how it was made to the functionality and how to use it. This report is broken into 6 main sections. The first section labelled "overview" introduces the reader to the basic aspects of the product. In this section the final prototype is shown and briefly explained. This explanation includes any warnings and cautions that we issue to the app users. The next section is called "getting started" and will provide users with a comprehensive set of instructions on how to use the product. This section will take both the user and the professionals using the app through a step-by-step instruction scheme for creating an account, navigating, and exiting the system. Then, the document moves on to a description of how to use all the different features within the app. This report then provides a description of the troubleshoot services we offer. Finally, there is a breakdown of the products documentation and our group's recommendations for future work to be done. This User and Product Manual (UPM) provides the information necessary for patients and professionals to effectively use the Healthy Mind Connect app and for prototype documentation.

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## 2 Overview

It is well-known that the COVID-19 pandemic has forced people into living a more isolated lifestyle. According to the WHO, this increased isolation has kick started a new mental health pandemic caused by limited access to help (World Health Organization. (n.d.). *Mental health and covid-19*). The goal of this app is to address this problem in Ontario. The province is known for having vast amounts or remote communities with limited resources to begin with. Some people living in northern Ontario communities must drive almost a whole day to get to the nearest healthcare center. Although COVID-19 did have a lot of consequences, it also brought out some of the best design work to date. This pandemic gave us many new tools to help connect people virtually such as zoom. This app will use these resources to help facilitate therapist-patient meetings. It will also help people get connected according to their personalized needs.

Most products that provide virtual healthcare charge the patients to use their services. What makes this app unique is that patients can use a basic version for free while the professional mental health workers pay to use the service. This way, the professionals can charge patients at their own rates and patients can find different doctors that specialize in different areas for free. This means the app is more of a facilitation service that allows doctors and therapists to provide their services as they wish. The app is also designed to educate people on a variety of mental health issues and will provide printable prescriptions.

Overview 3

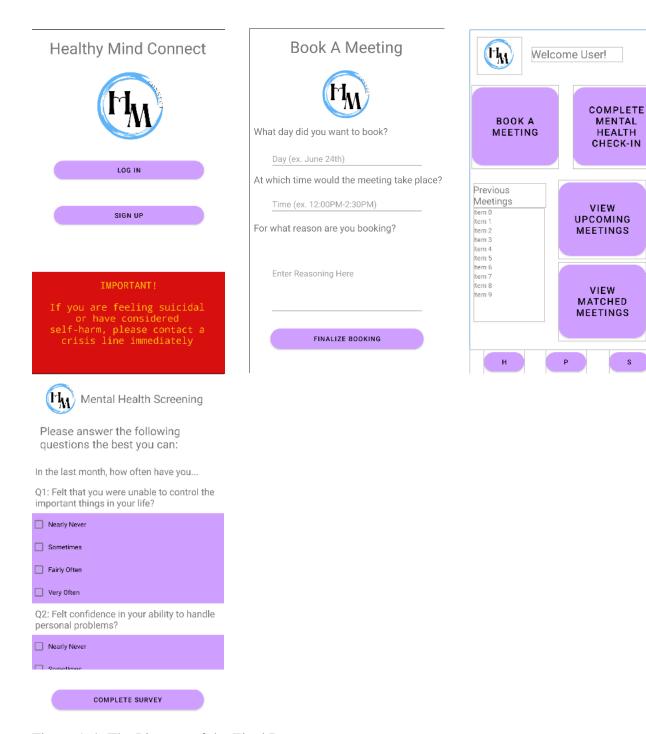


Figure 1-4: The Pictures of the Final Prototype.

This app is made using Android. Studio and is divided into two types: Patients version and Specialist version. After logging in with Botton, users can see the main screen and select

Overview 4

appointment times and check the previous and subsequent meetings. Patients' version should fill in a questionnaire to check whether they are suitable to use this online app for treatment before booking the meeting.

#### 2.1 Conventions

By app convention, this app is designed to be used on a smartphone with a touch screen.

The user can select by clicking their desired button on the screen with their finger.

## 2.2 Cautions & Warnings

This app is not intended to be used as a helpline. The app requires a quiz prior to its use to check the current mental state of the user. If a user gets alarming results from the quiz or has any thoughts of suicide or self-harm, they should call a helpline immediately.

• Call 911 or Telehealth Ontario at 1-866-797-0000.

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## 3 Getting started

To set up the app, one must run an emulator on Android Studio. To create an emulator, they must click on the emulators tab on the top (see below), and then follow the Android Studio tutorial to guide you through creating an emulator.



Figure 9: emulators tab

Also circled right beside the emulation tab is the 'run' tab which will run the app on the emulator that was created.

## **3.1 Configuration Considerations**

To run the app, one simply needs to download our application folder and open it using Android Studio. From there, you can hit the run button after configuring an emulator and a phone emulation tab will spawn on your screen. From there, just let the application load and it will be ready to use.

#### 3.2 User Access Considerations

We considered many personas when initially designing our app. The general persona that one thinks of would be an average person seeking therapy. They might be mentally distressed, so we made sure to keep our colour palette of low intensity and made the app very simplistic to not confuse

the user. We implemented a lighter colour scheme without overloading the user comprised of a simple lavender/white. The buttons and text were also kept quite large so the user could quickly scan and understand the purpose of each button, and then decide where to go from there.

Another more niche group we considered was those who are in mental crisis intending to use the app. As a group, we believed it would be morally wrong to just accept that these people would have to wait for their appointments to get help, as they could seriously harm or kill themselves during this wait period. As a precaution, we implemented a mental health survey to ensure they are in the right state of mind to use the app. If they fail the test, they are steered toward a crisis help line.

#### 3.3 Accessing/setting-up the System

To access the system, one must sign up for an account. Upon running the app, it provides two options: one to login and one to sign up. To sign up, press the signup button and choose between specialist/patient, depending on which user you are. Then, fill in your information and choose a valid username and password that you will remember. After signing up, you will be brought to the login page. Input your username and password to access the application.

## 3.4 System Organization & Navigation

The app layout is different for the patient and the specialist. For both types of users, there is a bottom bar feature to help orient the user. The bottom bar contains three buttons, a home button, profile button, and a settings button. The home button would bring the user to their home screen, and the profile button brings them to their editable profile. Both types of users have access to a

button which allows them to edit the specifics on their profile. This can help them get matched with more compatible specialists/patients.

#### 3.4.1 - Patient Page

On the patient side, there is the option to book a meeting, take the mental health questionnaire, or rebook an appointment with a specialist previously consulted. They can also view their currently matched meetings, and their upcoming meetings. To book an appointment, the user must first complete the 10-question mental health survey to detect whether they are in the correct current mental state to safely use the application. Then, they can book a meeting. To book a meeting the user must input a date to book for, a time of said day to book, and finally add a reason for their booking. On the specialist side, we will be able to view all this information before accepting the offer. The last core piece of functionality on the patient page is the ability to view meetings that specialists have accepted and be able to view upcoming meetings that both parties have accepted.

#### 3.4.2 - Specialist Page

After logging in as a specialist, the home page contains only two needed functionalities: view offers and view upcoming meetings. Viewing the offers presents all the offers the specialist has received from patients. The information presented to the specialist is the date and time of the meeting, and the reasoning for it. They are then presented with an accept/decline button beside it and can view this accepted meeting in the view upcoming meetings tab, along with other meetings they have accepted.

## 3.5 Exiting the System

#### 3.5.1 - Android

To close the app on Android, click the bottom left menu button or swipe up if the menu button does not exist. Once open you will see an array of open applications, simply swipe up oh Healthy Mind Connect and the application will close.

#### 3.5.1 - IOS

For the most recent models of IOS models that have no home button, simply swipe if your still in the app to reach the home screen. Once on the home screen, swipe up and then swipe up once more on the application. For older IOS models that have the home button, just double tap the home button quickly. When you see the array of applications swipe up on Healthy Mind Connect and the app will close.

## 4 Using the System

HM Connect is composed of two systems which belong to two separate types of users; the specialists and the patients. This is due to the fact that these two users have different functionality within the app and distinct roles on the app, so they have separate systems which allow them to perform their unique functions. There is the login/sign-up system, the specialist system, the patient system, and the matchmaking process which has its own system. The following subsections provide detailed, step-by-step instructions on how to use the various functions or features of the app, HM Connect.

## 4.1 Login System

To begin, before accessing any of the functions of any of the systems within the app, the user must first sign up and then log into the app. During this sign-up/login stage, the type of users is differentiated and depending on whether the user is the specialist or the patient, they are taken to the appropriate portal of the app. The following flow chart depicts this process.

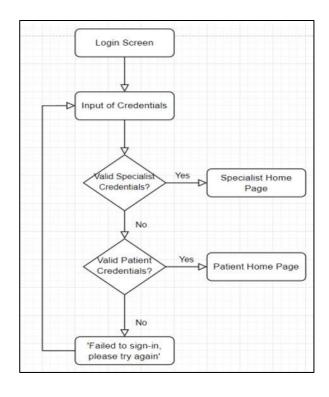


Figure 6: Login System Flow chart

After first opening the app, the user is asked to log in using their credentials. They are also asked if they are logged in as a specialist or as a patient. If they are logging in as a patient, their credentials are checked and if they are valid patient credentials, they are taken into the patient system. If they are not, they are asked to try again. When the user indicates that they are a specialist, they are asked to input their credentials and if they are valid, they are taken into their portal, if not they are asked to try again. It is important to note, that in the sign-up process when a user is signing in as a specialist, their credentials are first verified through a number which is found in a directory for specialists within the government, and if everything matches up, they are then allowed to access the app as a specialist.

## 4.2 Specialist System

When a user who is a specialist successfully logs in as a specialist, they are immediately taken to the home page of the specialist portal. Here, they will have access to all the functions within the specialist portal. They will be able to edit their profile, access their app settings, view meeting offers from patients and have the ability to accept or decline them, set their availability, and view their upcoming appointments in the Calander.

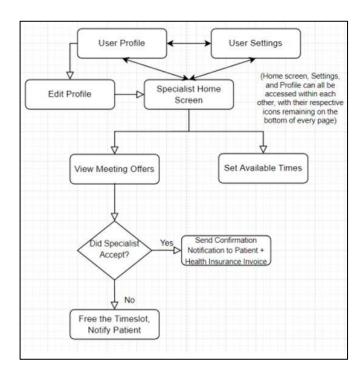


Figure 7: Specialist System Flow Chart

## 4.3 Patient System

When a user successfully logs in as a patient, they are immediately taken to the patient's home screen. Once here, they will have some of the same functions as the specialist which include

the ability to edit their profile and access their user settings. They will also have additional functions such as being able to book a meeting with a specialist, complete the screening and the mental health assessment questionnaire and view the previous specialists they have met with.

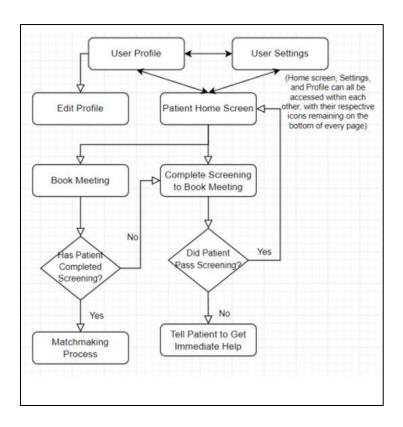


Figure 8: Patient System Flow Chart

#### **4.3.1 Matchmaking Process**

One of the functions of the patient system is being able to match with a specialist that they feel comfortable to meet with. Patients will be presented with a list of specialists and given the option to view their profile. Once a patient has chosen the specialist they would like to meet with, they

book the appointment. A request is sent to the specialist and once they have accepted, the meeting will be booked and finalized.

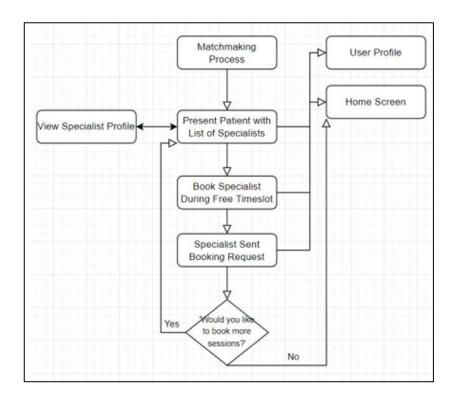


Figure 9: Matchmaking Process Flow Chart

#### 4.3.2 Mental Health Assessment

It is crucial to ensure that the patients using HM Connect are not at any immediate risk to themselves or others, since this is not a help line, and they may not be provided with immediate care. To ensure this, they are urged to take their mental health questionnaire every 24 hours and before booking all appointments. If their answers show that they are in a crisis, they are asked to contact a help line.

## 5 Troubleshooting & Support

This section of the document covers the recovery and error correction procedures to ensure that the HM Connect app is operational. This includes different error messages / behaviors, special considerations, maintenance, and support.

#### **5.1** Error Messages or Behaviors

#### **5.1.1 Forgot password**

In the process of using the APP, users may forget their login password, so they cannot log in to their account to check their appointment status. At this time, you need to contact our backstage technical personnel at ahaga081@uottawa.ca. Users are asked to send their identity and username and some recent appointments to confirm their identity. After this, we will send you the original password and you can request to change it.

#### **5.1.2** Appointment cancelled

In some cases, users may accidentally hit the cancel button and cancel a meeting without

their noticing. In this case, please send your username and appointment time to us within

half an hour of the cancellation, and we will help you restore the original appointment time.

5.1.3 Network connection error

The use of this APP needs to be connected to the network, which may fail to be connected

due to reasons of users or us. In this case, please check whether your network is working

properly first, and then check whether you have given the app permission to use the network.

If everything is good, please contact us and we will check our network situation.

**5.2 Special Considerations** 

Since this app is using external parties, such as zoom and uses the patients' emails to connect

them to mental health professionals, users should consider contacting zoom trouble support if they

are having problems with video conferencing. Similarly, if a user is having a hard time with their

email, the best course of action is to contact the support for the email directly.

Zoom Customer Support: https://explore.zoom.us/docs/en-us/contact.html

**5.3** Maintenance

In an ideal scenario, the app will release updates through your smart phone's app store

(example: the apple app store). These updates will be developed to fix reported bugs, implement

new features, and implement any feedback provided by the users. In this case it is important to note

that updated versions of the app may require different software specifications than the previous.

**Troubleshooting** & Support

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#### 5.4 Support

When using the Healthy Mind Connect app, one may encounter different problems that they will need help to fix or have questions for the developers. For example, if the apps code has Troubleshooting & Support 16 problems, you can contact Raymond Moreau at <a href="mailto:rmore082@uottawa.ca">rmore082@uottawa.ca</a> or Ashton Hagar at <a href="mailto:ahaga081@uottawa.ca">ahaga081@uottawa.ca</a>. If you are having problems with the usability or design of the app and have any questions/feedback, you can contact Alaa Elkurtehi <a href="mailto:aelku046@uottawa.ca">aelku046@uottawa.ca</a>, Noe Kapuscinsky at <a href="mailto:nkapu024@uottawa.ca">nkapu024@uottawa.ca</a>, and Yang Chen at <a href="mailto:ychen703@uottawa.ca">ychen703@uottawa.ca</a>. If you have any questions revolving the application in general, please contact anyone of the forementioned designers and they should be able to help.

## **6** Product Documentation

#### 6.0.1 - Coding Language

The coding language we settled on to code our prototype was Kotlin. Kotlin is a cross-platform, statically typed, general programming language. The reason we chose this language was that our app required cross-platform capabilities. Other alternatives we looked at such as java and JavaScript are outdated and do not support both IOS and Android operating systems.

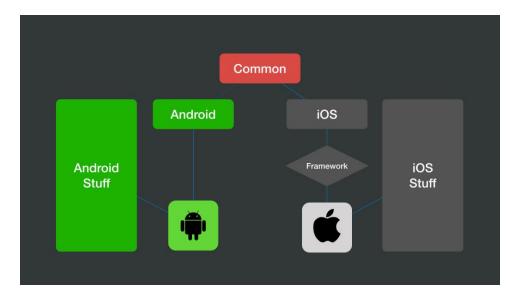


Figure 10. How Kotlin is compatible with both IOS and Android.

#### 6.0.2 - Database

Since our app required the storage and retrieval of data on a large scale, a database was necessary. The database we decided on was Firebase. The other option we compared was a database called SQL, which while great for more complex applications, does not have real-time support. Real time support was necessary for our app to function because we had to update the status of meetings in real time so other users could accept them. Firebase provided and was much simpler to implement compared to SQL.

```
patientSignup.setOnClickListener{    imt View!

val userMamedb : String = userMame.text.toString();
val passworddb : String = password.text.toString()
val lastMamedb : String = lastMame.text.toString()
val firstnamedb : String = firstName.text.toString()
val meddb : String = meds.text.toString()
val genderdb : String = gender.selectedItem.toString();
saveFireStore(userNamedb, passworddb, firstnamedb, lastNamedb, genderdb, meddb);

van intent = Intent( packageContext this, LoginPage::class.java)
startActivity(intent)
}

fun saveFireStore(username:String, password:String, firstname:String, lastname:String, gender:String, meds:String){
van db = FirebaseFirestore.getInstance()
val user: MutableMap<String, Any> = HashMap()
user["username"] = username
user["password"] = password
user["firstName"] = firstname
user["firstName"] = firstname
user["gender"] = gender
user["medication"] = meds
user["nedication"] = meds
user["nentalHoalthCheck"] = false

db.collection( collectionPath: "users")
    .add(user)
}
```

Figure 11. Code for a Realtime update to Firebase.

## **6.1** BOM (Bill of Materials)

The following table includes everything that went to creating the app, HM Connect.

| Product/ | Cost | Description | Link |
|----------|------|-------------|------|
|          |      |             |      |

| Material   |     |                           |   |
|------------|-----|---------------------------|---|
| React/     | 0\$ | Programming language/     | N/A   |
| Javascript |     | tool used to program      |   |
| Library    |     | and put together the app. |   |
| Android    | 0\$ | Integrated Development    | https://developer.android.com/studio?gclid=CjwKCA |
| Studio     |     | Environment (IDE)         | jw_ISWBhBkEiwAdqxb9jskMaY-kuN-                    |
|            |     |                           | JTah9sLTd7SXH8DAz07yhw92dVQsHoJEK7IqCA            |
|            |     |                           | XY3hoC7LMQAvD_BwE&gclsrc=aw.ds                    |
| Firebase   | 0\$ | Online database           | https://firebase.google.com/products/realtime-    |
|            |     |                           | database?gclid=CjwKCAjw_ISWBhBkEiwAdqxb9m         |
|            |     |                           | AIkT5DKJtZAsgFaGgDHDHcnIFBpAQsgMGxyL3             |
|            |     |                           | CUBjqa9kXB6gAWBoCrzsQAvD_BwE&gclsrc=aw            |
|            |     |                           | <u>.ds</u>  |
| Github     | 0\$ | Online collaborator       | https://github.com/                               |

## 6.2 Equipment list

As this is simply a virtual application, we do not need any hardware outside of a normal computer. For software, one would need to install Android Studio to run the Kotlin based application, and access to Firebase databases. All are free software found on the internet.

## **6.3** Testing & Validation

Many tests were performed to ensure our app was in good working condition. These tests included mostly database tests and backend tests. We tried as hard as possible to 'break' the app, by pressing through every screen imaginable on the application, going back and forth many times to see if it would load improperly, even signing up 3 different user accounts and then only logging in to the first one. On every sign-in, we ensured that the correct name and information was displayed on the user's profile, as well as correct information displayed when multiple meetings were booked. Healthy Mind Connect passed all tests.

## 7 Conclusions and Recommendations for Future Work

To conclude, this document outlines every stage of the design of HM Connect, from how to use the app, to how to make it. The final prototype is the completed prototype and has full functionality which is outlined in this user manual. Although the prototype is complete, there are ways for it to be improved and expanded on. Due to lack of time and the complexity of certain functions, which were deemed not functionally critical to the functionality of the app, by both the design group, and the client, certain functions were left out of the final implementation of the app. Functions such as the downloadable invoice and a chat function within the app are all great ways to improve the app and makes way for future work to be done on the app.

As already stated, had there been a few more months to work on the project, many more functions could have been implemented by the group. There were many discussions on the topic of including an in-app communication service for patients and specialists to directly communicate without a third party and to go with that, an in-app voice and video communication service which again would not include a third party. This would not only limit the need for third parties, but also limit the costs of providing zoom services to users. Other functions which could have been implemented had there been more time, are a downloadable health invoice as well as a prescription section in the app where patients can access their health invoice and all their prescriptions all in one place.

## 8 Bibliography

World Health Organization. (n.d.). *Mental health and covid-19*. World Health Organization. Retrieved July 5, 2022, from https://www.who.int/southeastasia/outbreaks-and-emergencies/covid-19/mental-health-and-covid-19

Bibliography 23

## 9 APPENDIX I: Design Files

Throughout the design process of this app, multiple deliverables documented the different steps and different design plans and strategies used to make the prototypes as well as the progression from the first prototype to the final prototype. This user manual has all the information in most of these deliverables. The deliverables included the business model and economics report which contain essential information that goes with this user manual, and they are important to understanding the business that comes from this product. There is also a design day presentation which summaries the major aspects of the project. All these documents can be found in the referenced documents table below.

**Table 22. Referenced Documents** 

| Documen   | Document Location and/or URL  |          |
|-----------|---|----------|
| t Name    |   | e Date   |
| Design    | https://makerepo.com/noekap/1208  | July 14, |
| Day Pitch |   | 2022     |
| Economic  | https://uottawa-makerspace.s3.us-west-2.amazonaws.com/bkolv0lotueudzdkjek0i6sn90bi?response-content-disposition=inline%3B%20filename%3D%22Deliverable%2OG.2%20Economics%20Report.pdf%22%3B%20filename%2A%3DUTF-8%27%27Deliverable%2520G.2%2520Economics%2520Report.pdf&response-content-type=application%2Fpdf&X- | July 3,  |
| s Report  | Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIA34PB766H365QOAG6%2F20220725%2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Date=20220725T014057Z&X-Amz-Expires=300&X-Amz-SignedHeaders=host&X-Amz-Signature=6a1d03b841a9a1568f448726bcf1b1924d6455ff3ea72b753685db016711b1f5   | 2022     |
| Business  | https://uottawa-makerspace.s3.us-west-2.amazonaws.com/9k3s9lurvs6fuo8kvab8uowy96b3?response-content-disposition=inline%3B%20filename%3D%22Deliverable%20G.1%20Business%20Model.pdf%22%3B%20filename%2A%3DUTF-8%27%27Deliverable%2520G.1%2520Business%2520Model.pdf&response-content-type=application%2Fpdf&X-Amz- | July 3,  |
| Model     | Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIA34PB766H365QOA66% 2F20220725% 2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Date=20220725T014437Z&X-Amz-Expires=300&X-Amz-SignedHeaders=host&X-Amz-Signature=8c0612c9b07acee948add1be87a021613bdaee1d5504c3e22b87c92fd3ec0e42   | 2022     |