Project Handover Document

Team: MindLab Translators
Tribe: Deakin Research Tech Translators

Trimester 1, 2021

Table of Contents

1. Project Information

1.1. Client/Product Owner

Name: Rui Wang
Title: Dr
Email:rui.wang@deakin.edu.au

1.2. Academic Mentor/Supervisor

Name: Antonio Robles-Kelly
Title: Prof
Email: antonio.robles-kelly@deakin.edu.au

List multiple if applicable.

1.3. Project Team

Squad Name Mindlab Translators
Tribe: Deakin Research Tech Translators

Student ID	Student Name	Role
219008057	Jude Toohim	Project Lead
220170742	Sheila Huang	UI/UX Senior
218341881	Jameson Ding	Software Senior
216281624	Anjalee Kariyawasam Marathignga G	Hardware Senior
216268516	Mariam Dhanani	Hardware Senior
219199115	Bryan Hew	Hardware Junior
217515904	Victoria Nguyen	Hardware Junior
217264923	Phillip Georgoudakis	UI/UX Junior
218397364	Faiz Ahmed Qureshi	Software Junior
218017615	Huibin Gao	UI/UX Junior
219282454	Mahir Abrar	Software Junior

2. Project Overview

In modern society, the growth rate of elderly was continually growing up, so solving the health and safety issues of aged person were the main object of MinD Lab Translators. The main purpose of this project which MInD Lab Translators were able to improve the safety of elderly and ensure that aged people have a safe environment.

The aim of this project was bringing the IoT devices into smart home that were able to support Carer can monitor the status of the elderly at any time. For instance, how to monitor and identify the critical events from aged people, such as falling.

Deliverables for T1 2021:

As seen in the Roadmap Trello board, our main deliverables for this trimester are:

1. Continue mobile application deliverables from last trimester
    a. Further creations of notification types – currently only support connection requests and fall detection
    b. Tidying & expansion of UI/UX pages – a few pages are still bland and not all pages have a landscape view
    c. Font size change & language change
    d. Dark Mode Colour Palette
    e. Tidy UI of heatmap feature
2. Expansion of smart phone
    a. Emergency help button – instead of waiting for an incident to happen, patient can contact Caretaker immediately
    b. Add notifications for sudden Temperature /humidity increases or drops
    c. Popup alerts for extreme temperature/humidity levels
3. Expansion of smartwatch
    a. Implementing UI on the watch
    b. Creating similar features from Smart Phones to Smart watch.
4. IOT device data – Extraction, sorting & Output
    a. Creating a replay/live stream system to view the patients smart phones to see their location of the incident
    b. Connection to a camera set up around the house that can detect any dangerous objects around the house
5. Miscellaneous Fixes (Quality of life Improvements)
    a. Fixup of action bars
    b. Remove Carer/Patient option
    c. View carer information page (Patients)
    d. Auto sign in feature
    e. Add necessary buttons needed on most pages

Link to Roadmap Trello board: https://trello.com/b/yc0OUx02/mind-lab-roadmap

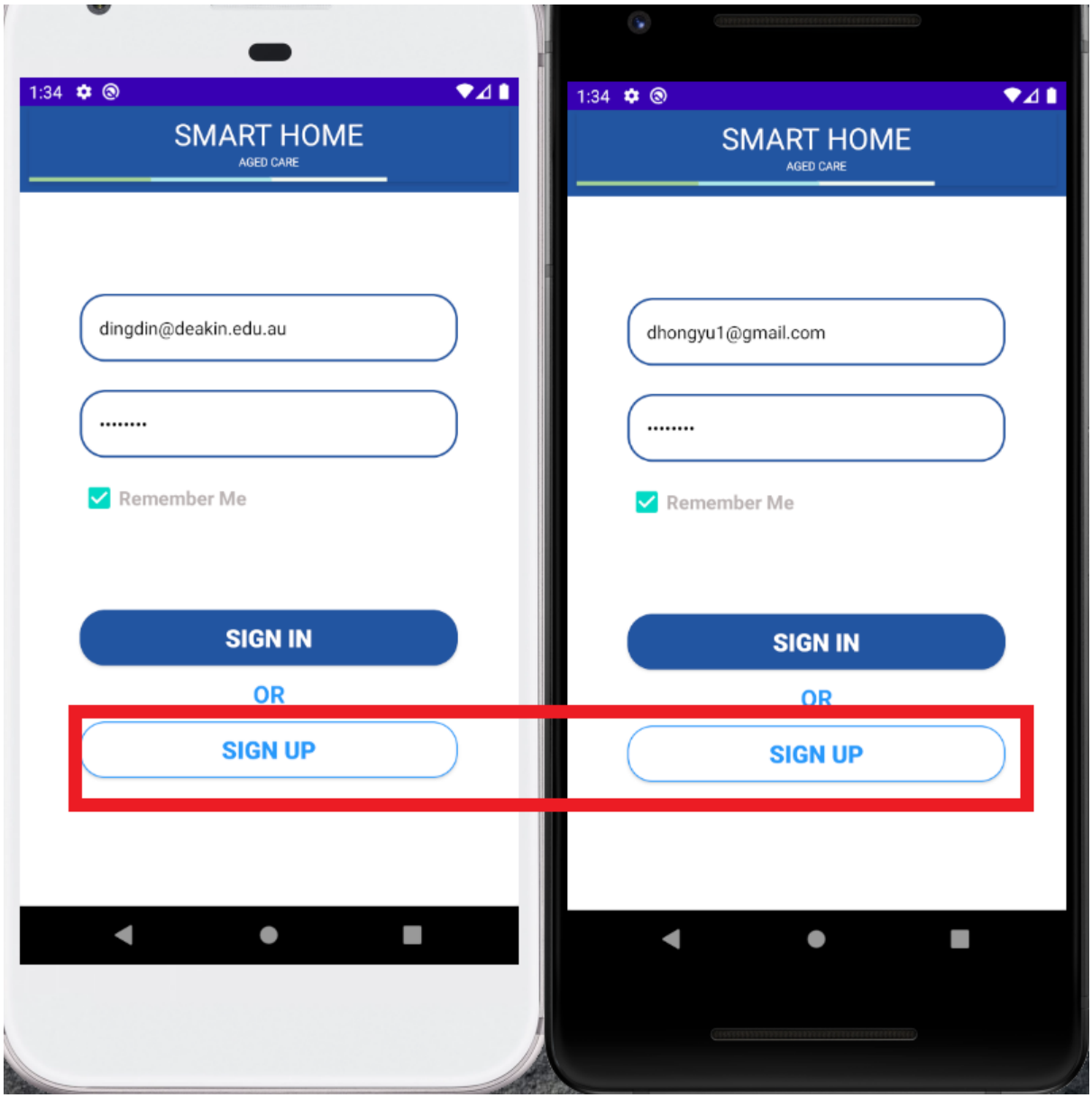
As we continue to be affected by COVID-19 at T1 2021, like previous trimester, we are still unable to access the physical hardware that is used in the project. So, in its place, additional features and improvements were worked on which can be seen from the list below:

- Added “my carer” page.
- Carer notification rework (Patient and date filtering)
- Auto sign in feature
- Adding landscape layouts for both carers and patients
- Adding smart devices page
- Changing incorrect toast message in sign in screen
- Forgot password feature
- Dark mode Colour palette
- Mark all notifications as seen button / feature
- Change “Username” label to “Email”

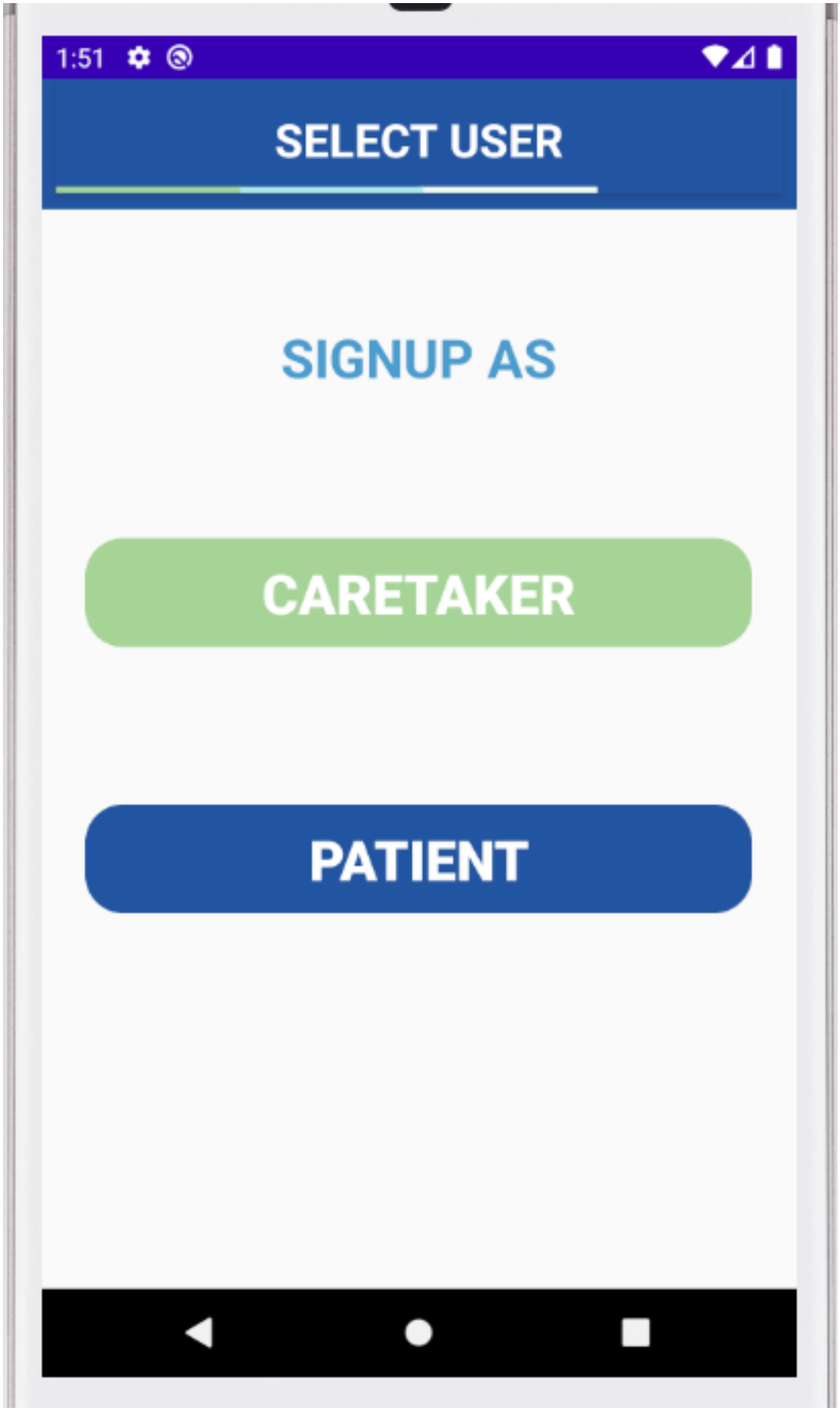
Additional information about these deliverables can be found in the team's presentations within the T1-2021 presentation folder. (MInD Lab Translators > T1-2021 > Presentation)

3. User Manual

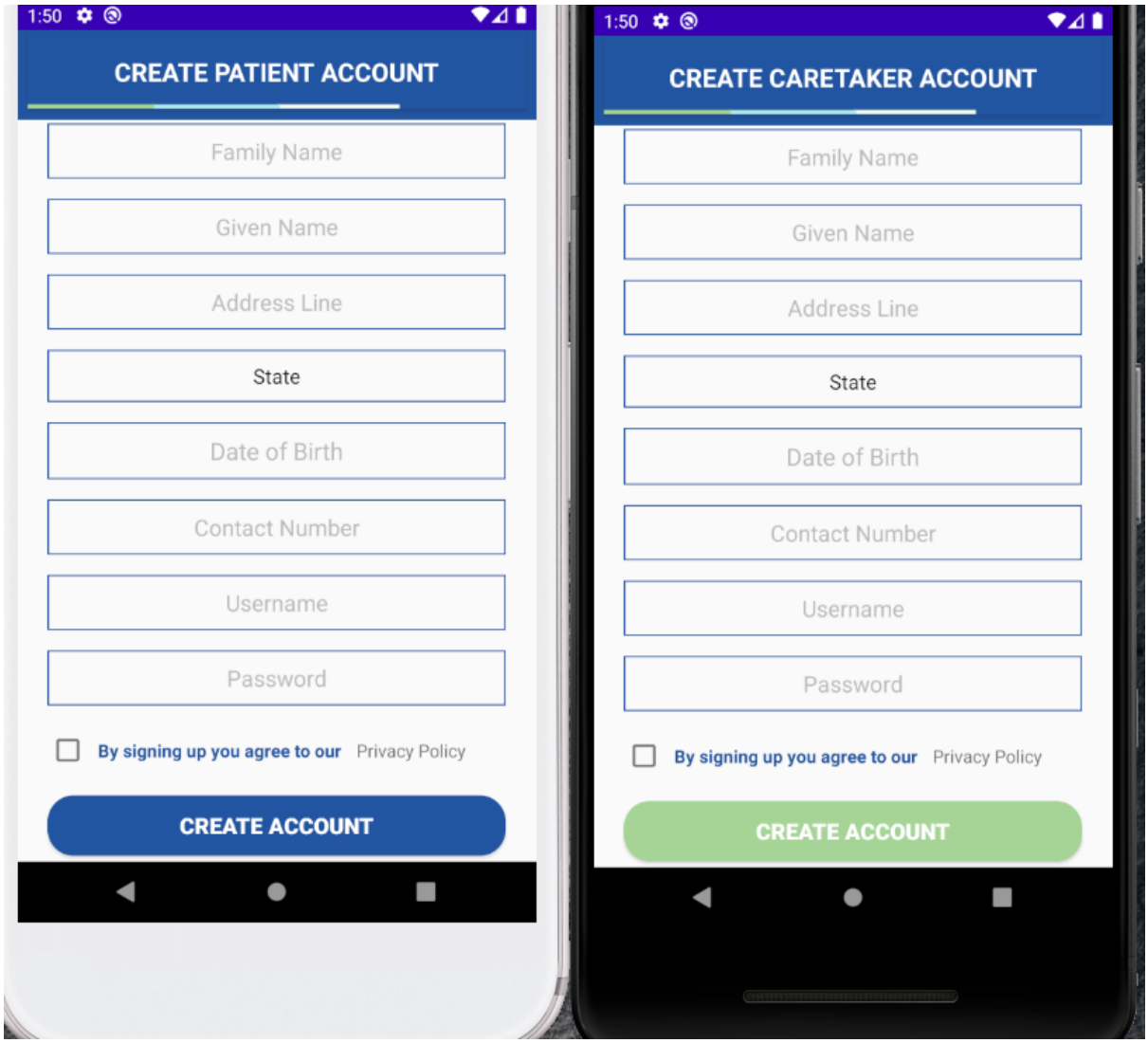
In the application's sign-up screen, it is the same for both patients and carers for consistency. At the bottom of the screen there are two options available, one to sign in once the user has inputted account details and the other to allow the user to 'sign up' and create an account.



After clicking the sign-up button, it will allow the user to sign up as caretaker or patient, if you were patient click the patient button, if you were Carer, click Caretaker.


1:51
SELECT USER
SIGNUP AS
CARETAKER
PATIENT

After you click the sign-up as Caretaker or Patient, you will see another screen, the left-hand side of the phone were Patient's registered account screens, the right-hand side were Carer's ones. Insert the information as required of the form (the Username will be the user's personal email address), after you finish it, click the create Account buttons. (don't forget clicking the Privacy Policy to agree with our policy)

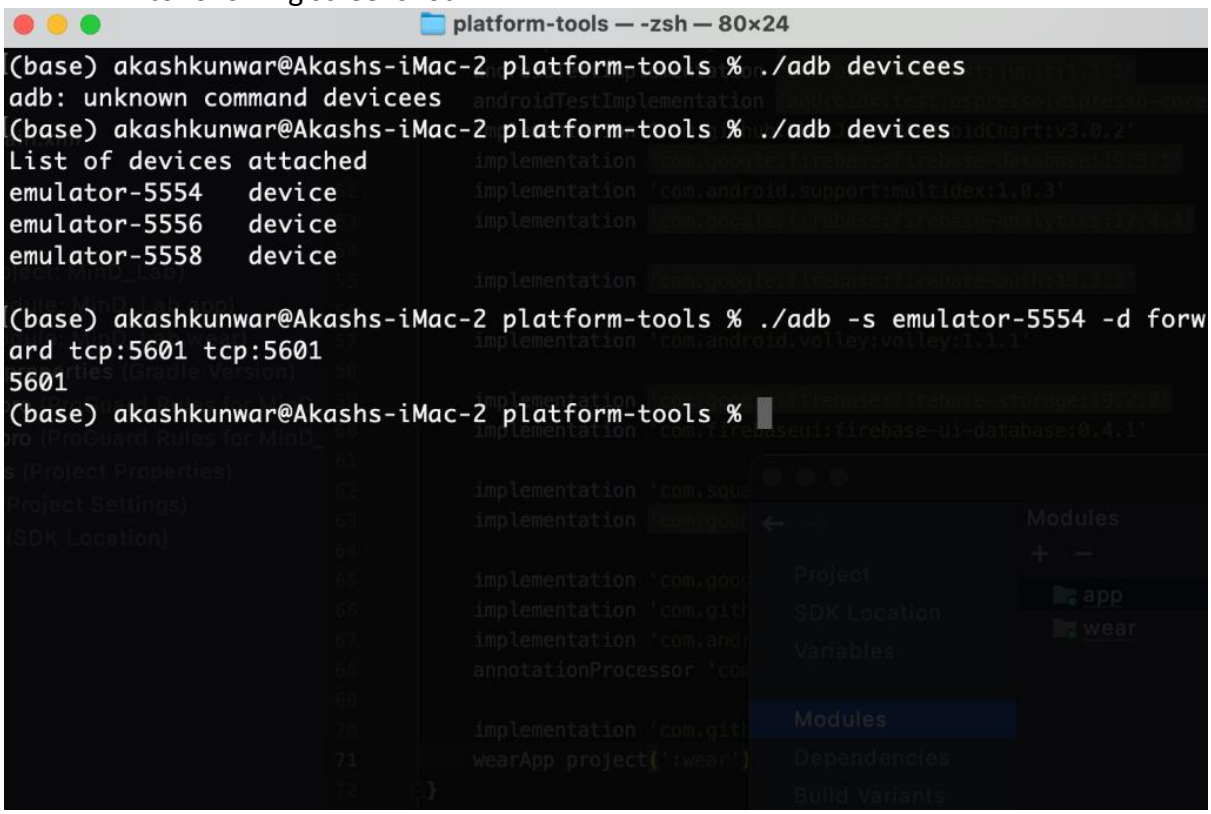


Once you finished inputting details in the sign-up details screen, there will be an email to confirm the creation of the account. To verify the email/account, the user will need to click the link found in the confirmation email. After that is complete, the user can access their account.

Link for pitch video:

For smartwatch connection from patient's phone (While pairing using emulators), follow these steps:

- Install Wear OS from Google play in Phone Emulator (patient emulator)
- Connect new device -> select connect emulator
- Now open terminal at location of platform-tools of android studio in computer
- Type **./adb devices** to see list of attached devices; you will see similar to following screenshot



- Then **./adb -s <device_ID> -d forward tcp:5601 tcp:**5601 to forward tcp/ip and connect as Bluetooth (Device_ID is the emulator id) ;
- now emulator will be connected (via Bluetooth)

if used in Windows, replace ./adb with **adb.exe**

Common troubleshooting:

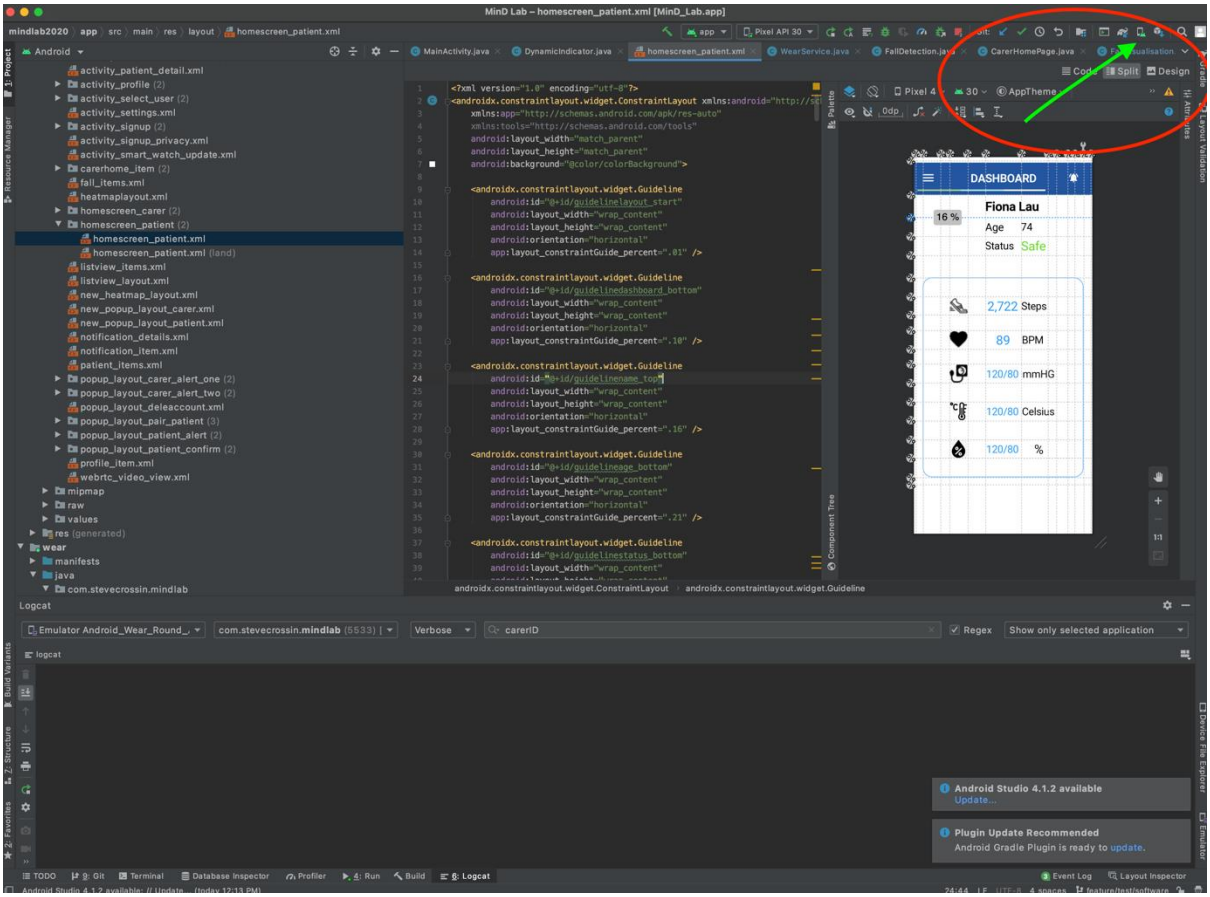
Sometimes there might occur two issues while working with smartwatch which are:

1. Wear OS takes too long to connect
2. Smartwatch doesn't detect fall at all

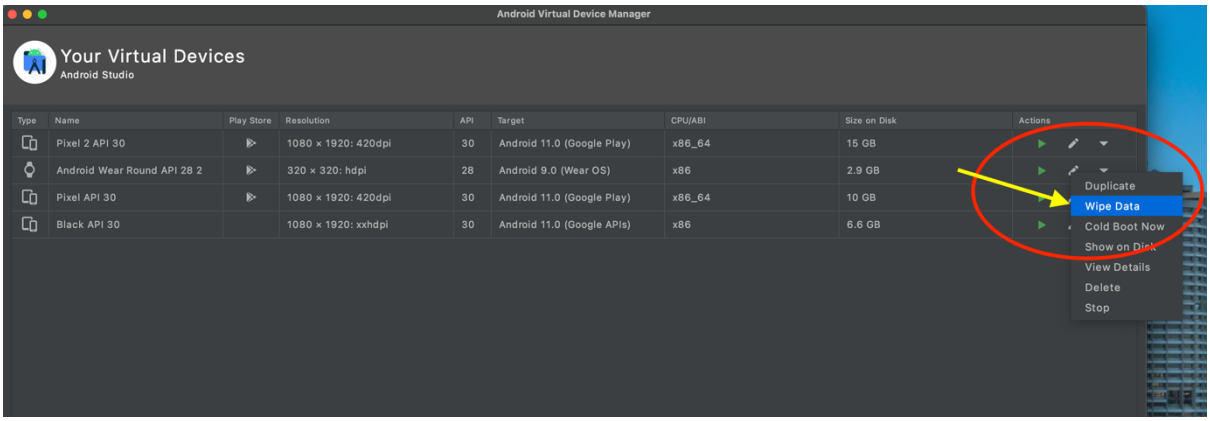
This usually happens when smartwatch is not updated with newest configuration so either reinstall of application or wipe smartwatch fixes this issue temporarily.

To wipe smartwatch emulator;

- Shut down the smartwatch emulator
- From Android Studio, go to AVD Manager as shown in screenshot below



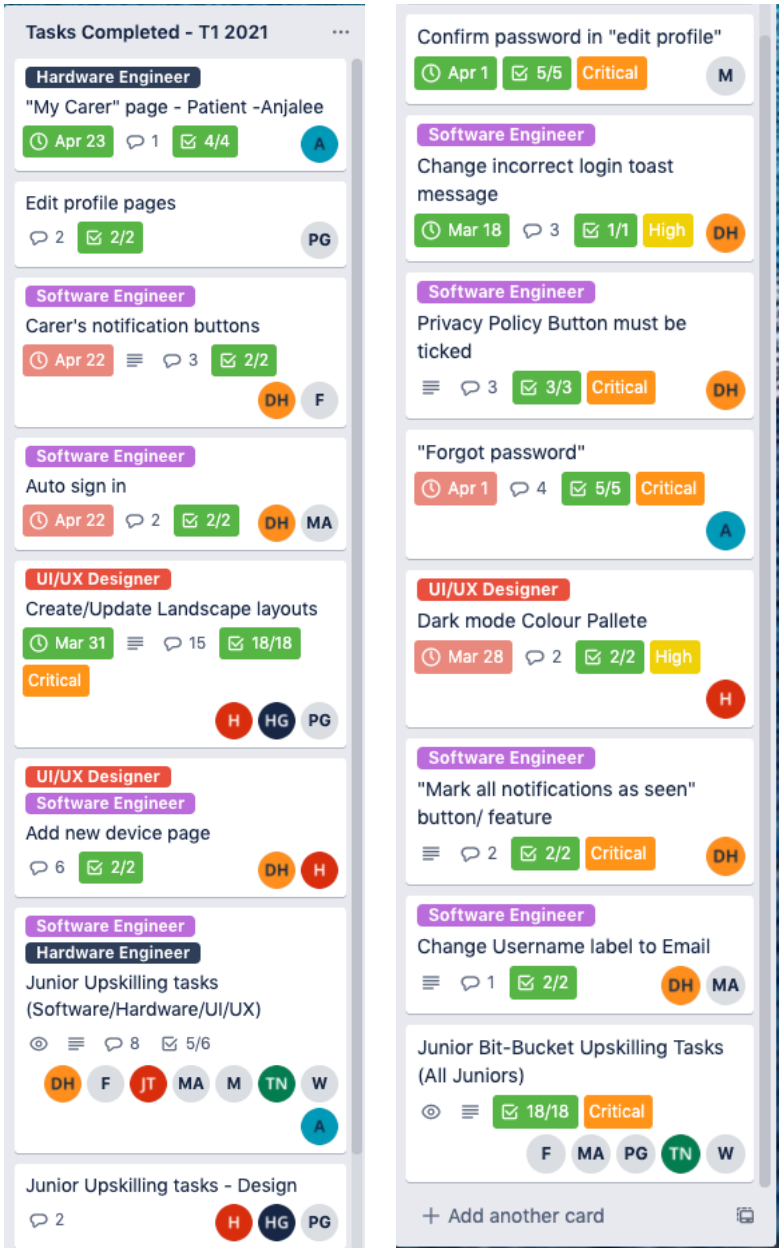
- Click on down-arrow button on smartwatch in AVD manager



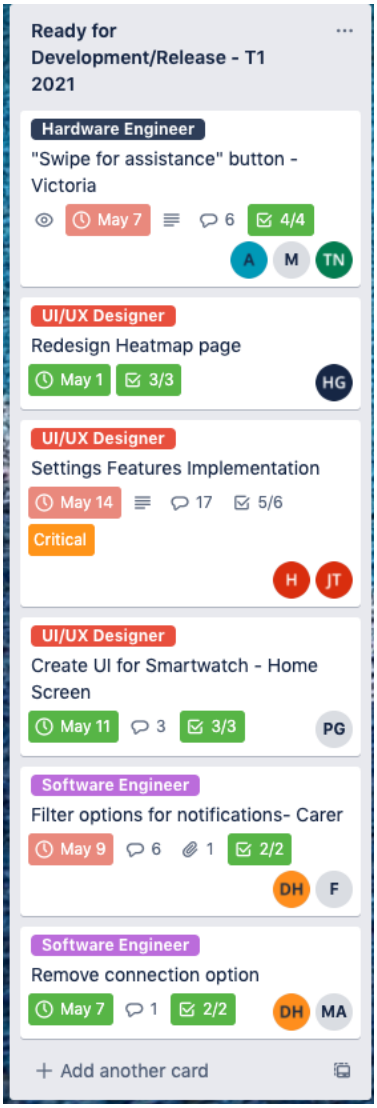
Click on Wipe Data

4. Completed Deliverables

- Task completed – T1 2021



- Task for development/Release – T1 2021



(A quick summary of the completed deliverables over this trimester)

1.1 My Devices page

My Devices page is a list of all connected cameras (for the moment) that the patient has around the house as well as their phone itself for the caretaker to be able to keep an eye out over the home/ patient directly.

Trello card:
https://trello.com/c/E9r8xMEO

4.2 Notifications - Filter Options

This feature allows the Carer to filter specific notifications by date and/or patient, this was added so if a Carer has multiple patients, they can find and view a notification from a specific patient with ease.

Normally when accessing the notification page, you would see all notifications generated for the Patients connected to the Carer. what this feature does is it simply allows the Carer to select the to filter by the following options:

- Date
- Patient

The Carer can filter by either one or both of these option in order to see the generated notifications for a select patient.

Trello card:
https://trello.com/c/a1CMf8Pk
https://trello.com/c/dTsJkmof

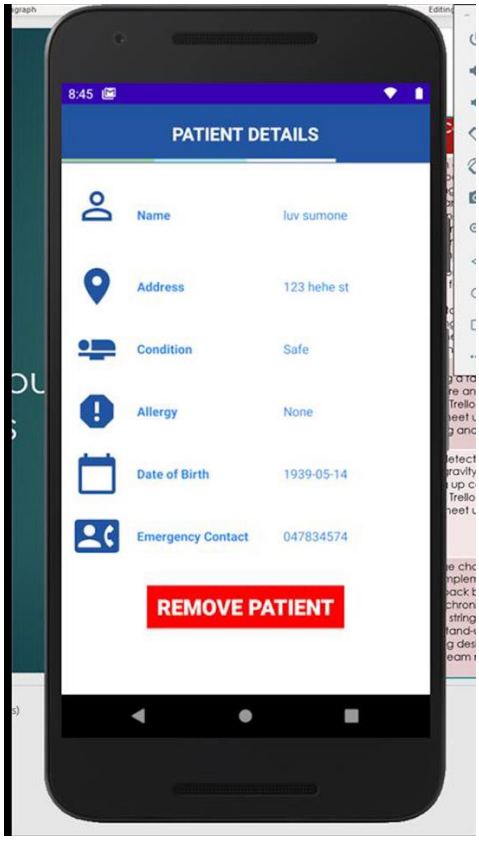
4.3 Remove Connection from Patient feature - Carer

This feature allows a carer to delete or remove a patient from their account. In an aged care facility, a carer might be assigned to a specific resident. But if a resident moves out of the facility or is no longer under the carer's supervision, then there's no point of having that patient's details in the carer's account. It might even cause privacy issues.

When someone logs in as carer the first that appears shows all the patients they are connected with. In the case of removing connection from a patient -

Tap on the patient's avatar or image
From the bottom of the page select 'My Patient'
The page will show you the patient's details. Scroll down to find the 'Remove Patient' button. When you click the button, the patient's details will be removed from the account.
To create this feature, first a button was created with onclick attribute in the activity_patient_detail.xml page. Then on the PatientDetail.java page an onclick listener was added for that onclick attribute so that when the button is clicked, the patient's details and the pairing request are deleted from the carer's side of the database which results into the carer not being connected to the patient anymore.

Trello card:
https://trello.com/c/b65BzxRU



- MVRM2uoTOPVujaZG9qVlhBRgped2
  - Carer Profile
    - Address: "123 lala st"
    - Avatar Holder Current Position: 0
    - DOB: "1995-08-03"
    - Device Token: "eNA3nXR2RAKbhG3c2ZWQ3h:APA91bF93-GmjYNBeia6wrbu..
    - Email: "jtoohim@deakin.edu.au
    - Emergency Contact: "0427829433"
    - Family Name: "Toohim"
    - Given Name: "Jude"
    - Selected_Patient: "7rV9dxyM9BMoyFSEFcbV2bY1dIx2
    - State: "VIC"
    - image: "https://firebasestorage.googleapis.com/v0/b/min..
  - Pairing Requests
    - 20210508_210322
      - hasCarerSeen: "seen"
      - patientID: "AvCmxyNpEShuSkfWSz4kmP361C22
      - patientName: "Matyre Esflat
      - respondedDate: 162047180357
      - responseStatus: "accepted"
    - 20210515_112149
      - hasCarerSeen: "unseen"
      - patientID: "iXdjsNcsNgb0AUS8sBTBmMxFgfj1"
      - patientName: "Samir Revvy"
      - respondedDate: 1621041709858
      - responseStatus: "notResponded"

4.4 "Swipe for Assistance" feature

The pop up for swipe button is one of the key features of the application which serve the purpose of notifying relevant parties of any assistance to require occurred real-time. These relevant parties at this stage are patient and carer but may including more functionalities in the future. The current system works as follows:

In the database we have “Status” files for the patient and stored a String value if “Safe” or “Assistance Require”. When the patient first signs up to the application, the default value is set to “Safe”.

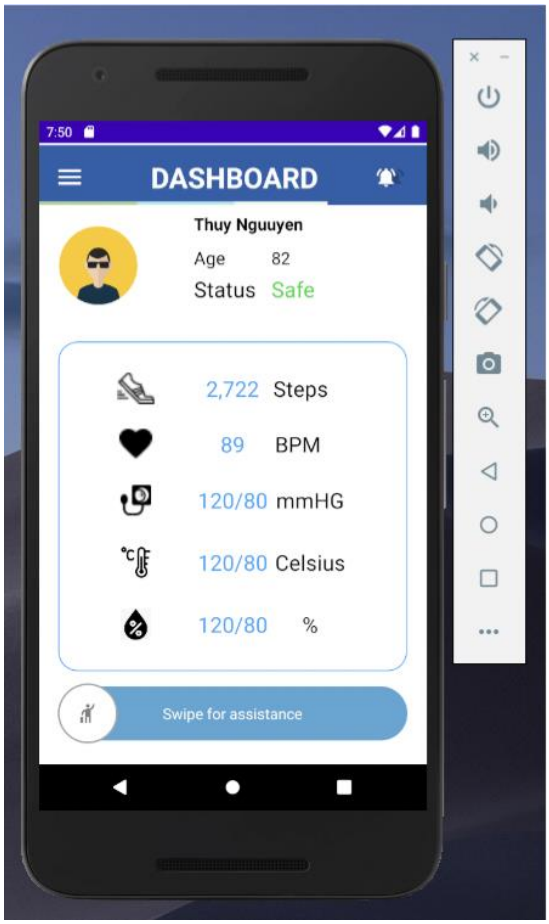
Whenever a “Swipe for Assistance” is swiped the Status value is changed to “Assistance Require”. In the PopupPanicCarer.Java and PopupPanicPatient.Java, there is a listener function that checks for any updates in the Status value, when a requirement for assistance had been click, the status will change to “Assistance Require”, the pop-up screen layouts will appear at the same time to connect between carer and patient.

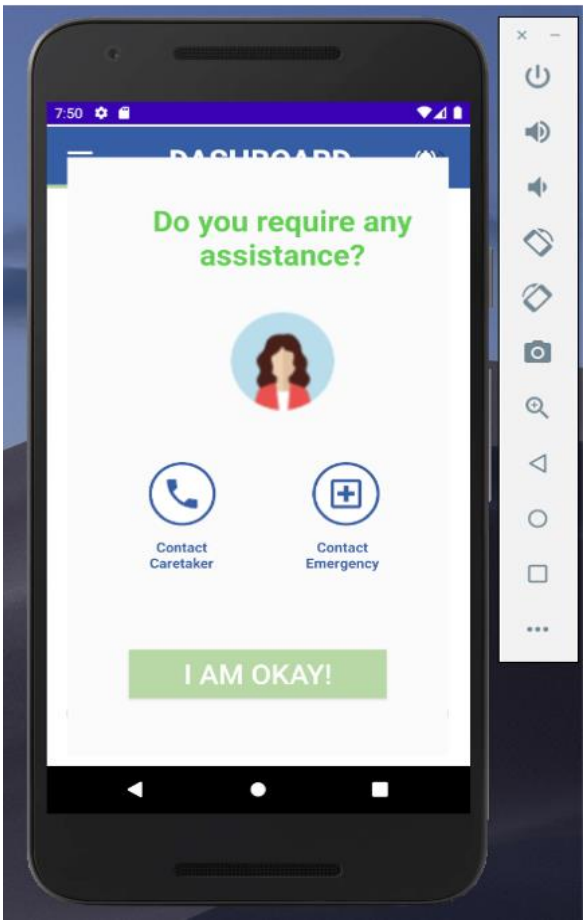
From this pop-up screen, the patient can be able to contact emergency services or their carer. However, they can resolve the situation by clicking the “I am Okay” button. Similarly, on the carer side, they can also be able to call their patient, emergency services or resolve the situation after making sure everything is good.

When either patient or carer resolve the situation, the status value will be updated and set to “Safe”, both pop-up screen close and return to the previous screen.

Link to the Demo:
https://deakin365-my.sharepoint.com/:v:/g/personal/thuthuy_deakin_edu_au/Efak0TWWU7FEvHA64RR1LXEBnoH6kHHcOP-fM2KyEOgeog?e=ipRrEf

Trello card:
https://trello.com/c/ypIhWEzG





4.5 "My Carer" page - Patient End

This feature was implemented for the patient end where the patient has the option on the Patient menu to view details of their assigned Carer. (This page is Static at the moment - needs to be linked to the Firebase in the future.)

Trello card:
https://trello.com/c/AWhygoWb

4.6 "Forgot Password" function

This feature was implemented on to the login screen when a user(patient/carer) forgets their password. One can click on the "Forgot password" hyperlink and will be taken on to a page where one can enter their email address, and then receive an email with a link to reset user's password.

Trello card:
https://trello.com/c/CiJay2yK

4.7 Notifications page - Mark all as seen

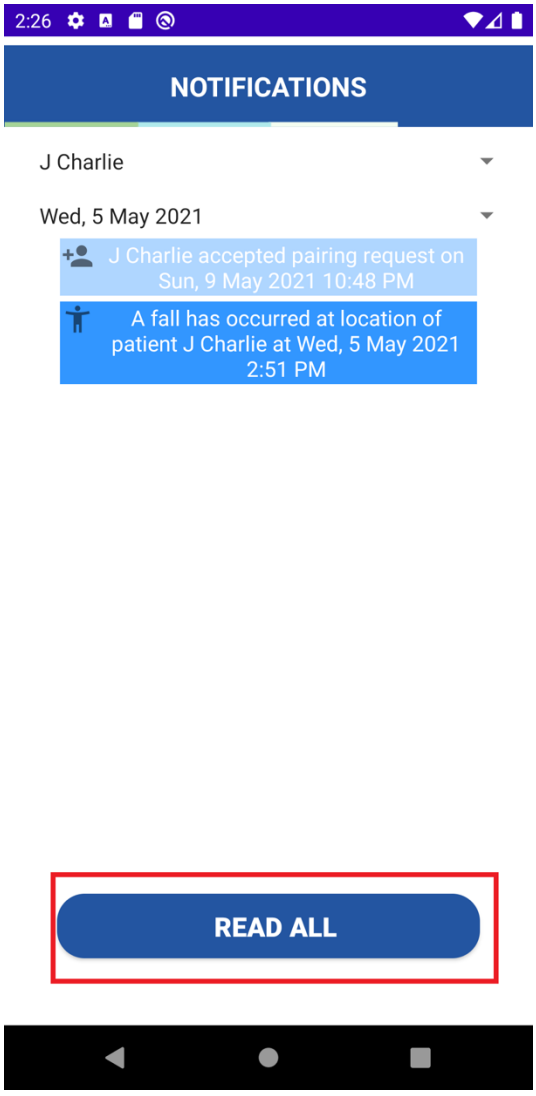
This feature was implemented in order to mark all notifications as seen if both Patients and Carer do not want read notifications. Users just need click a button instead of clicking the notifications one by one to close it and read it.

What it has - We added a button called "Read All" in the bottom of patient and carer notifications screen. user was able to click that button to mark all notifications as seen, once click that button, it will automatically jump to of Patient and Carer home screen.

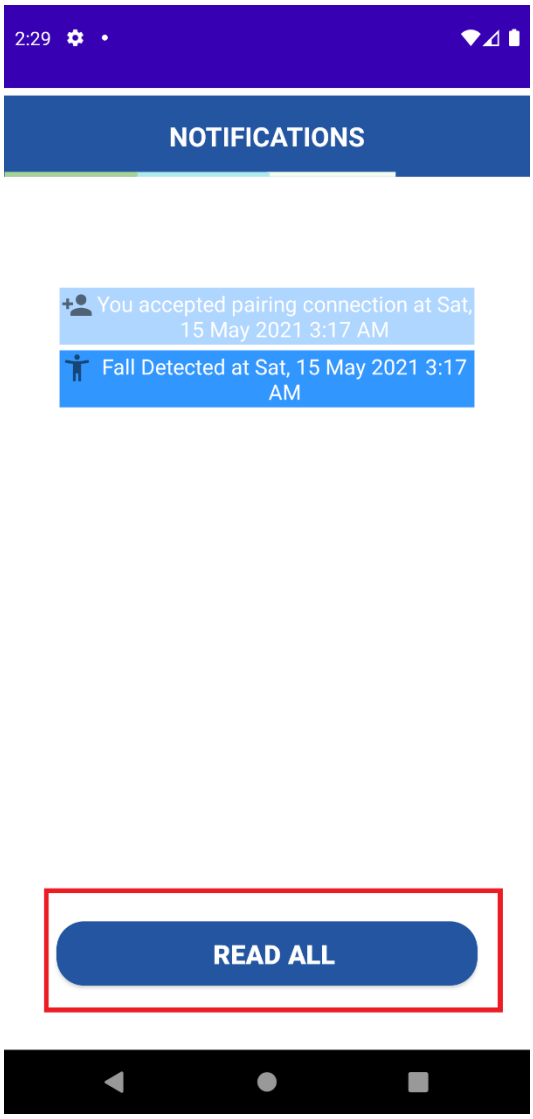
Link to the Demo : https://web.microsoftstream.com/video/484669df-a252-4bde-b8c6-26e59c488d1c

Trello card:
https://trello.com/c/qFl7TaJu

Carer Screen



Patient Screen

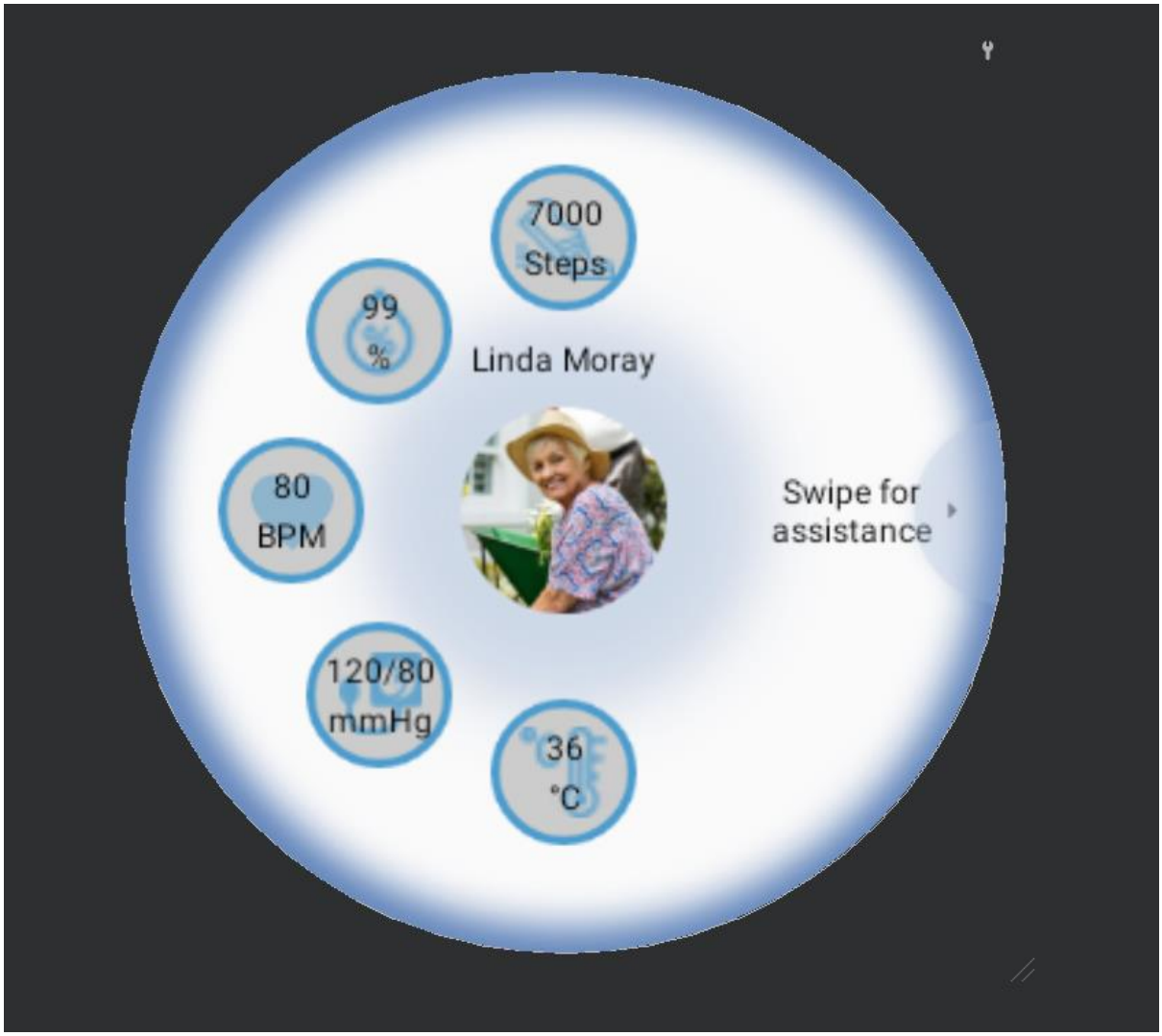


4.8 IOT - Smartwatch UI

Currently this feature has no functionality. The smartwatch is currently a patient only device with limited functionality, as smartwatches are small and are dominated by the flat design style. Through research done, it was determined that smartwatches need to focus on only the core functionality of the mobile app. The information needs to be determined in a glance and needs to have a predictable navigation (though not many smartwatch apps have a very easily predictable navigation).

The design currently uses the app colours to concisely show the patients' details, with the option to swipe for assistance (Not made yet). The swipe for assistance smartwatch page is planned to bring you to a confirmation page before sending the appropriate alert to the connected carer. Other features that can possibly be implemented is a settings menu.

Link to smartwatch research:
https://teams.microsoft.com/_#/school/files/MInD%20Lab%20Translators?threadId=19%3A3a7e166678e44af8aa84f70ca2c6fb68%40thread.tacv2&ctx=channel&context=Design%2520for%2520smartwatches&rootfolder=%252Fsites%252FDeakinResearchTechTranslators%252FShared%2520Documents%252FMInD%2520Lab%2520Translators%252FT1-2021%252FEvidence%2520Documents%252FPhillip%2520Georgoudakis%252FResearch%252FDesign%2520for%2520smartwatches



Trello card:
https://trello.com/c/C1maT2hs

4.9 Add image function

This feature was implemented so that every user can apply a profile picture to their own account. This is quite an important feature as an image linked to an account allows both the patients and the carers to match a face with a name. This aids in the identification of a patient or carer as one patient can have multiple carers.

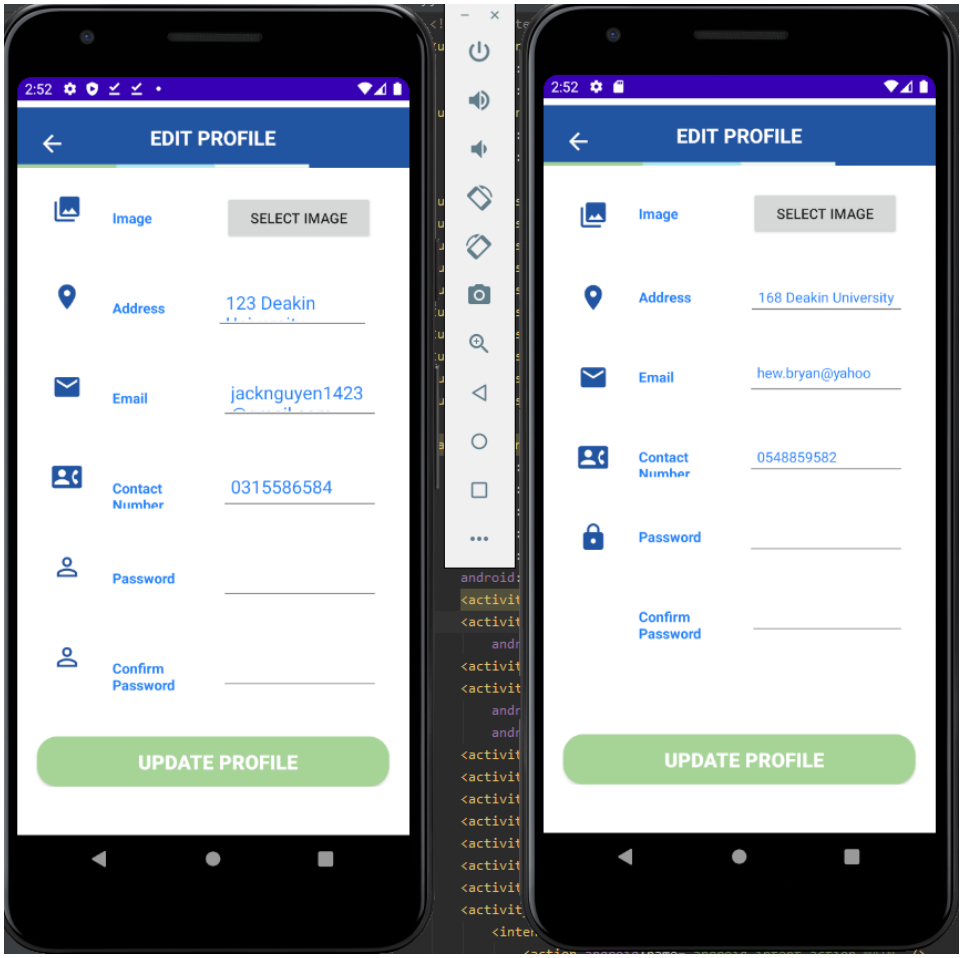
To access this feature the user must go to their profile and select edit profile.

From there the user's first option is to change the image on the right side there is a button called 'select image' the user can tap that to be brought over to the next page.
In this next page, user brought to a screen where their image/avatar is shown at the top of the screen and a button below that displaying "Change Profile Picture". When the button is tapped, the user can choose to set an existing image as the profile picture, use the camera function to take a picture, or select a file within the phones storage which has the user's desired image.
After choosing a desired image, the user can then crop their image to better focus on faces or whatever the user would like the image to focus on.
After Cropping the user needs to then hit the "Save" Button located on the right side of the screen, this will then save an image URL under the patient located in the Firebase
Image is now set and will be displayed the menu and pop up screens for both patients and carers.

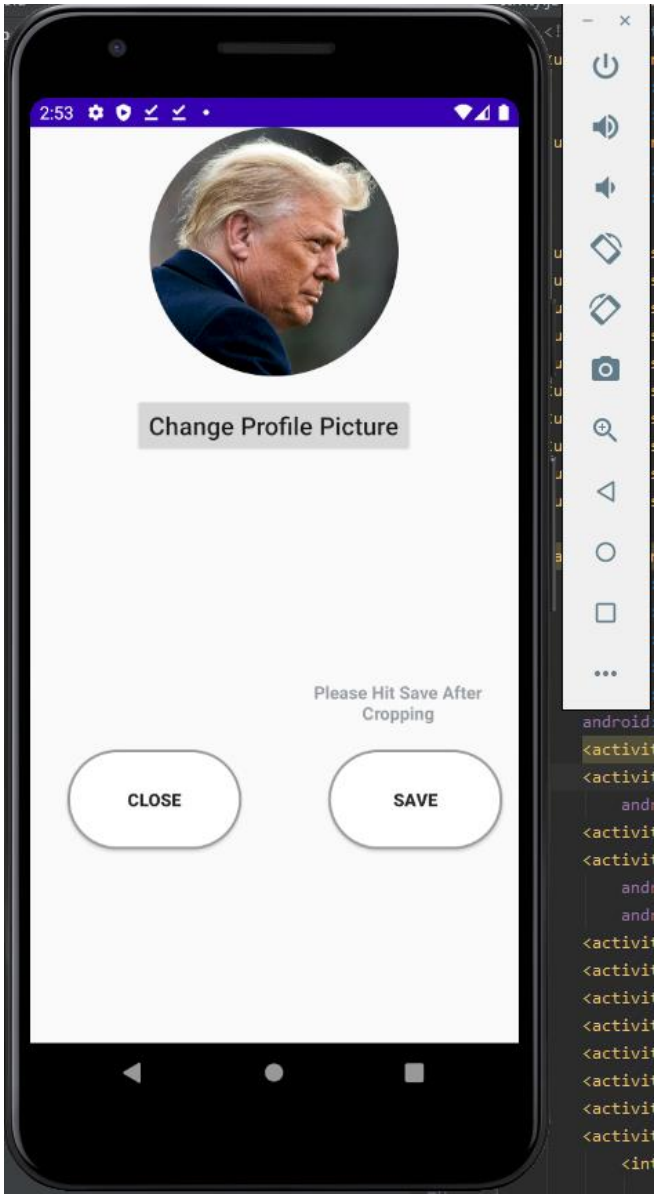
Tutorial/Walk-through Video: https://web.microsoftstream.com/video/1308cbe5-3ea8-49b5-b791-6161d0b7642b

Trello card:
https://trello.com/c/KHO1oP4f

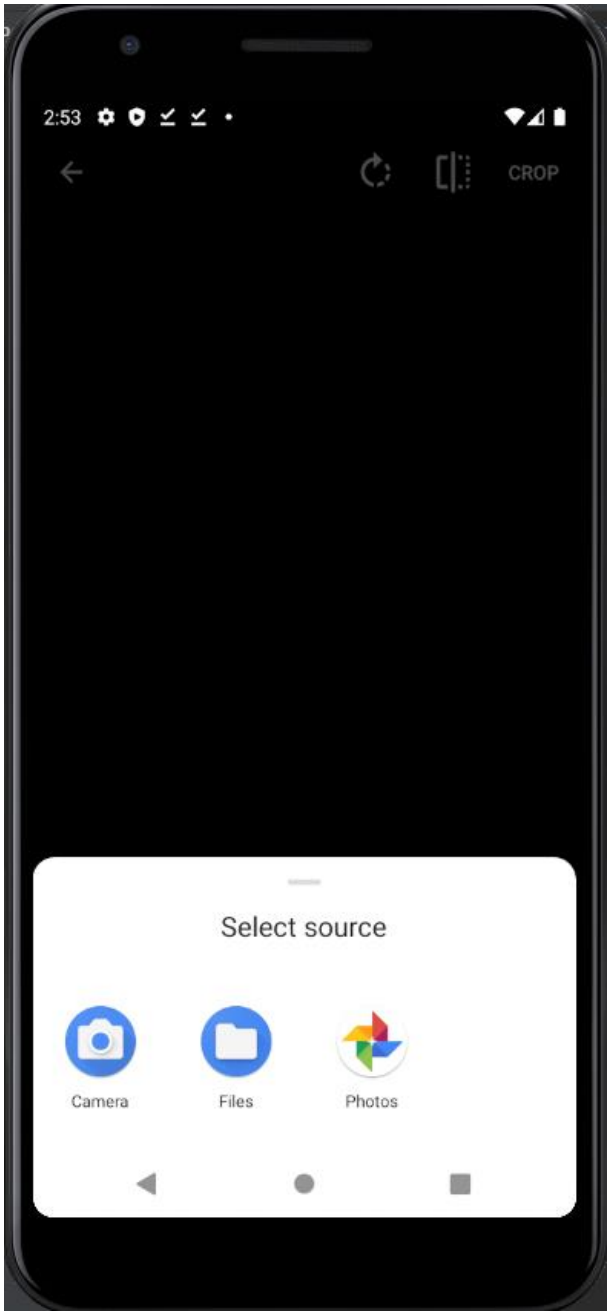
Edit Profile Screen on both Patient and Carer side (Carer left, Patient Right)



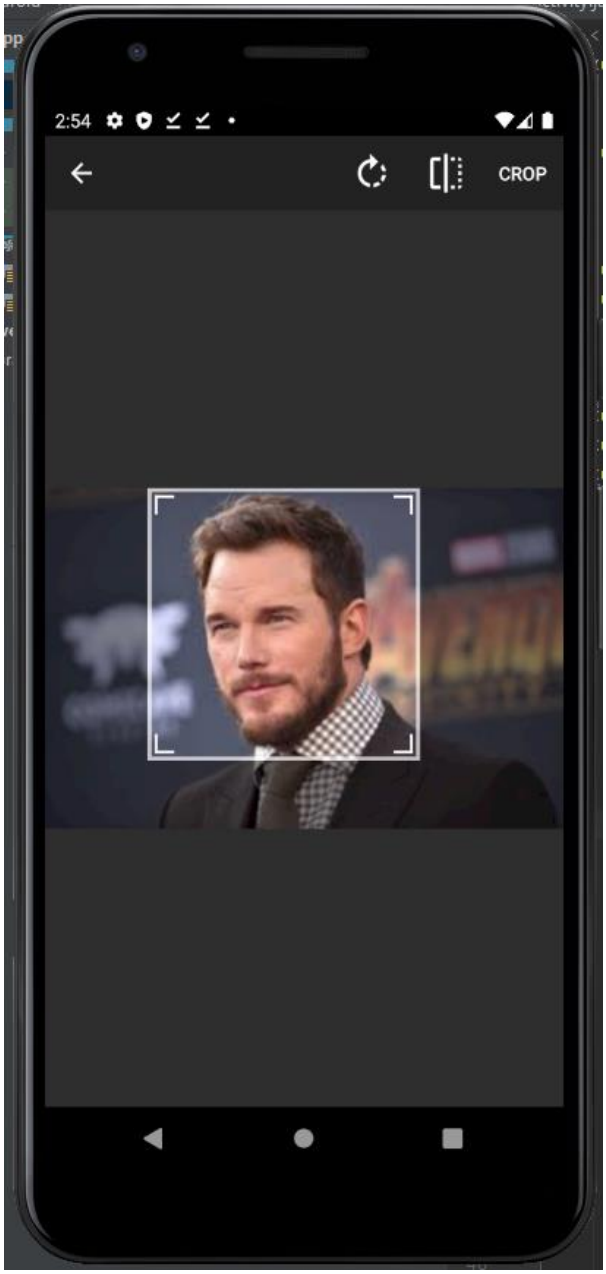
Edit Profile screen (Same for both patients and carers)



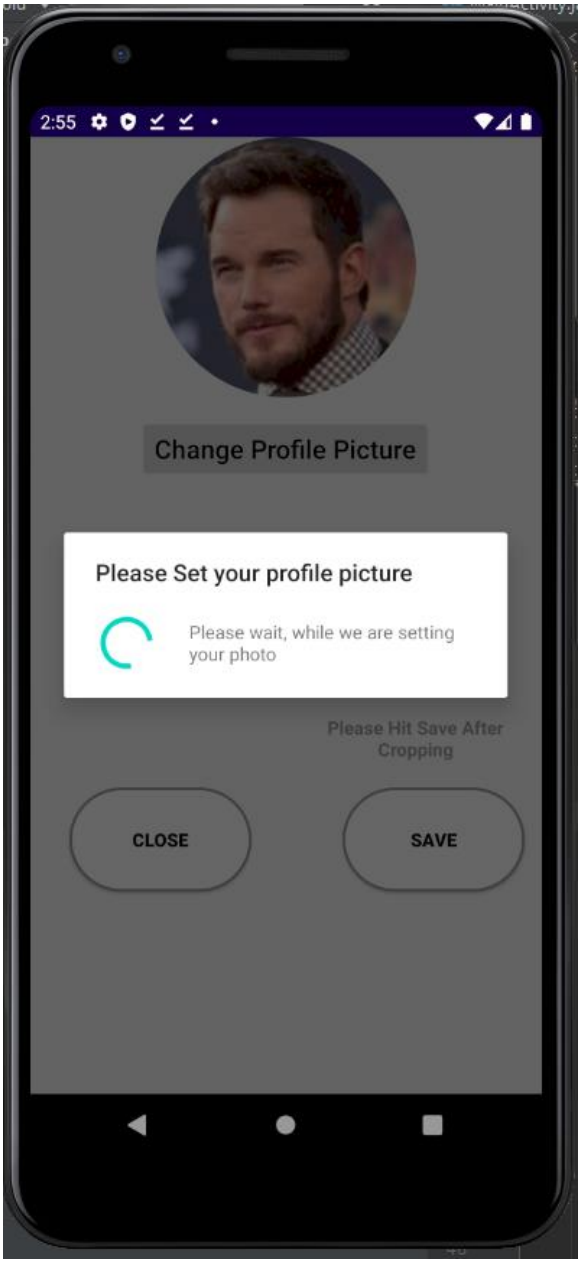
Selecting whether to take a photo or choose existing photo



After taking a photo or selecting existing one, user can crop the image to their liking



After Cropping the image, the user can then tap on the save button to save the image to the database

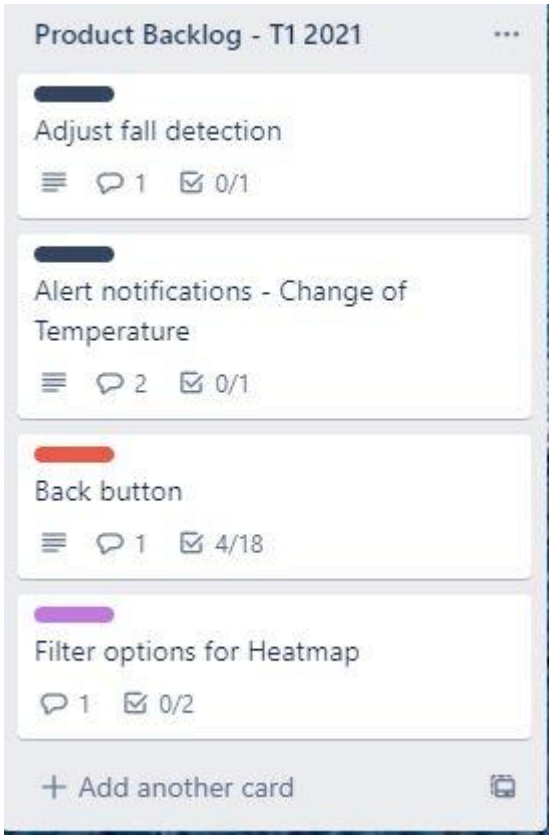


Database with the image being saved under each patient and carer account

5. Roadmap

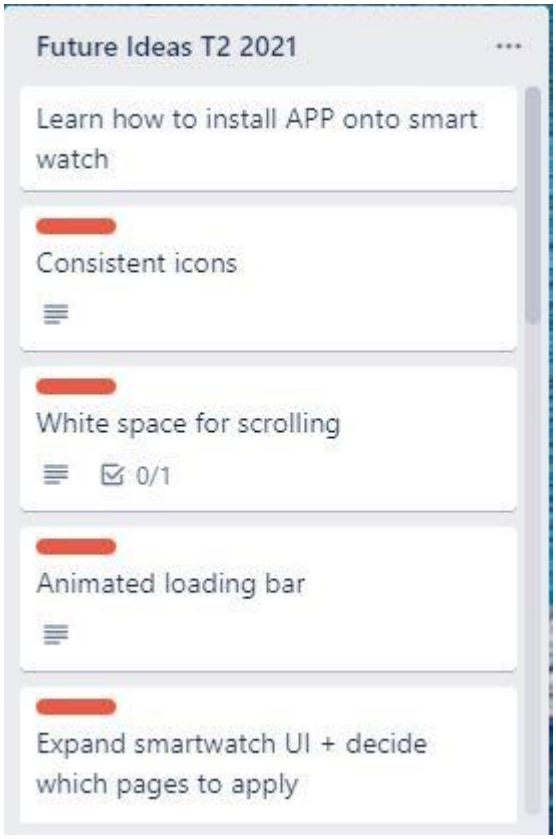
Backlog from T1 2021 –

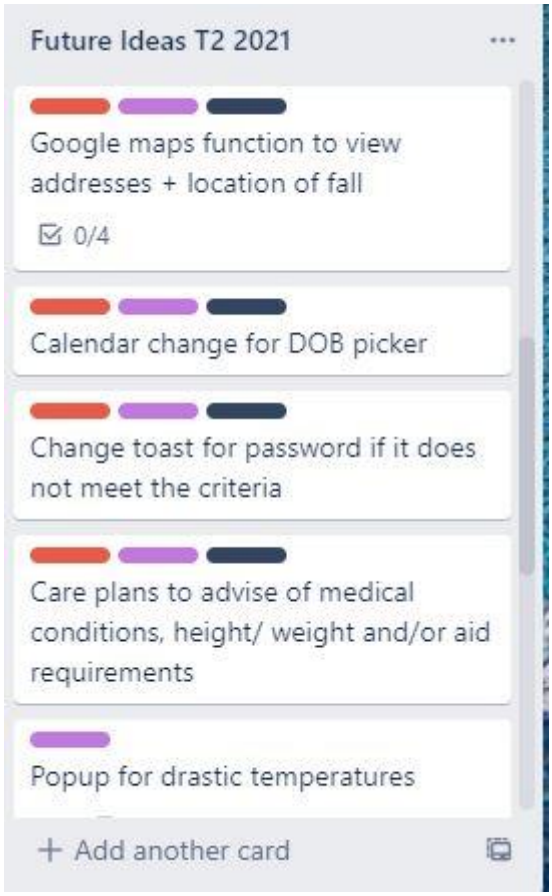
Having faced with couple of major issues we weren't able to complete some tasks. We plan on discussing these tasks extensively and hopefully completing them next trimester



Planned Deliverables for T2 2021 –

At the end of this trimester all of the juniors had a meeting with the team leader to map out future ideas for the app. Next trimester our main focus point will be expanding the project so that the app can be used with smartwatches in the future. We have also identified a lot of enhancements and new features. Here's a list of all the ideas and more will be added in the future.


Future Ideas T2 2021
Learn how to install APP onto smart watch
Consistent icons
White space for scrolling
0/1
Animated loading bar
Expand smartwatch UI + decide which pages to apply


Future Ideas T2 2021
Google maps function to view addresses + location of fall
0/4
Calendar change for DOB picker
Change toast for password if it does not meet the criteria
Care plans to advise of medical conditions, height/ weight and/or aid requirements
Popup for drastic temperatures
Add another card

6. Open Issues

Our team has completed required deliverables of this trimester ensuring all features work as expected. However, there are few minor issues which can be worked on in future.

The project's major open issues include:

- As this project relies heavily on Android Studio, we need team members to have access to devices with the required specs to run the project. Unfortunately, this couldn't be ensured this trimester.
  But hopefully we will fix this issue by notifying interested parties about the required specs before they join our team

- There are no real hardware devices to test features (All features are tested on emulators).
  We will try to figure out if we can expand our project to work with physical devices.

Some other minor issues-

- When team members use different versions of the Gradle in their Android studio project, it leads to incompatibility of the application

7. Lessons Learned

In general, as a team, we have implemented various new functions, faced some challenges, and overcome these difficulties, which is very beneficial to the entire development process.

First, I hope that in the next semester, for individuals, I hope to have a good grasp of the work progress and quality. For the team, I hope everyone can keep up with everyone's pace. For the project, I hope that if there are any problems, I can be the first Time to report to the project leader and provide suggestions and feedback.

8. Product Development Life Cycle

PDLC consists of 6 stages:

1: Analysis

Before the beginning of the life cycle, it is necessary to think about the "needs" of the target users. By complying with customer requirements and feedback, we will be able to provide new or updated processes/functions to increase the affordability of the application.

2: Design

This part is about putting ideas into the plan. Create multiple plans or multiple tasks to meet the needs of users, and finally filter to find the most suitable results. The team will review all plans for approval or rejection.

3: Implementation

This stage is to implement the plan. This section requires developers to meet task design and specifications.

4: Quality assurance

Perform a complete test on the product and evaluate and test whether the product has the ability to meet customer requirements and performance. All tests will ensure that the design/product meets the requirements provided in the design plan (phase 2). This stage will be completed by the project leader.
If the test is successful, the product will enter the next release phase. If the code does not fully work, feedback will be provided. Either way, a message will be posted on the team channel to provide the latest information about the task.

5: Deployment

Once this stage is reached, the newly implemented code will be pushed to all branches for everyone to update their code and display it in the showcase.

6: Support& Maintenance

In the future, the code may be incompatible with any new code, or the code may be outdated. Code management will be carried out to ensure that we provide the best products for end users.

8.1. New Tasks

In the week before the start of each iteration, the elderly will work together to create tasks that are about to be completed. A list of functions that can be implemented/adjusted for the project has been created. Discussion between the project leader and senior leaders from China
Each area (design, software, hardware, etc.) will be carried out to select the appropriate number of tasks to be completed in three months.

First, there are several ways to suggest new tasks/ideas:

Meeting discussion

Chat with seniors

When coding the function, team members may be aware of some gaps in the overall function and may decide to implement additional code to improve certain aspects of the function.

The project leader can create new tasks, and anyone who is willing to take on these tasks can assign it to it.

The project leader will understand the abilities of each class member when assigning tasks and be able to help them complete the task if they encounter any problems.
If the suggestion seems achievable, fits in the time frame, and has little or no task to complete, then the task/idea can be implemented in a Trello card.

8.2. Definition of Done

First, after completion, we will upload the source code files with code comments to bitbucket and submit them to related groups, such as the tasks of the design group, or the software group, or the task of the hardware group, and then the project The leader will see this code and check it for confirmation. The project leader will unit test this code to ensure that there are no data or memory leaks and will require testing. If there is no problem with the code, the project leader will update the code to our project.

8.3. Task Review

After the task is completed, the project leader will check the code and test for crashes or errors. Once this code test is passed/approved, the task is marked as complete on the Trello board.

This will work according to our branch strategy, in which squad members can send pull requests to various branches or designated branches (such as software, hardware, design) on Bitbucket. Only by issuing a pull request can the updated code be verified or checked. Once the pull request to the designated branch is approved, it will be merged into the main branch by authorized personnel who perform the code review.

8.4. Testing

Can refer to the definition of "done".

The requirements after this refer to the content recorded at the beginning of the mission or the content displayed on the Trello card. The card can be updated, which may mean that the requirements may not be met on time. However, the overall function must meet the expected deliverables. Effective but appropriate standards

8.5. Branching Strategy

We have a total of 4 branches, one is the design team branch, one is the software team branch, and the other is the hardware team branch.

Master: It is the main development branch. Developers will use this branch to start all new story/task development, and if approved by members of the authorized team responsible for code reviews and bitbucket, the completed changes (via pull requests) will be merged back into this branch. management.

Before developers can start working on a new story, it is vital that developers must clone or update the latest master branch and process it.

Story branch/function branch:
Story branches/feature branches will be created from the master and used for incremental product development. To complete the development of the story/task, there are some important rules:

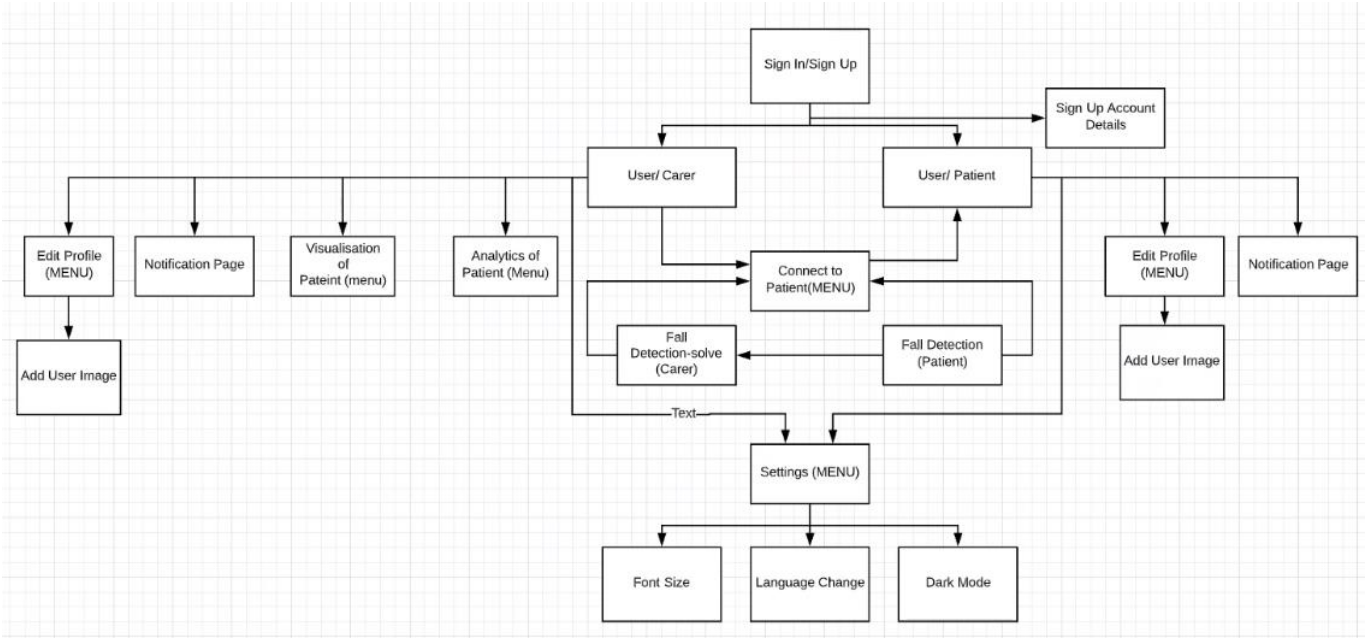
Before making any changes, make sure you are in the correct branch, then update the latest master branch and proceed.

After the quality of the work is appropriate, a pull request is made for review.
Provide a detailed description of the task.

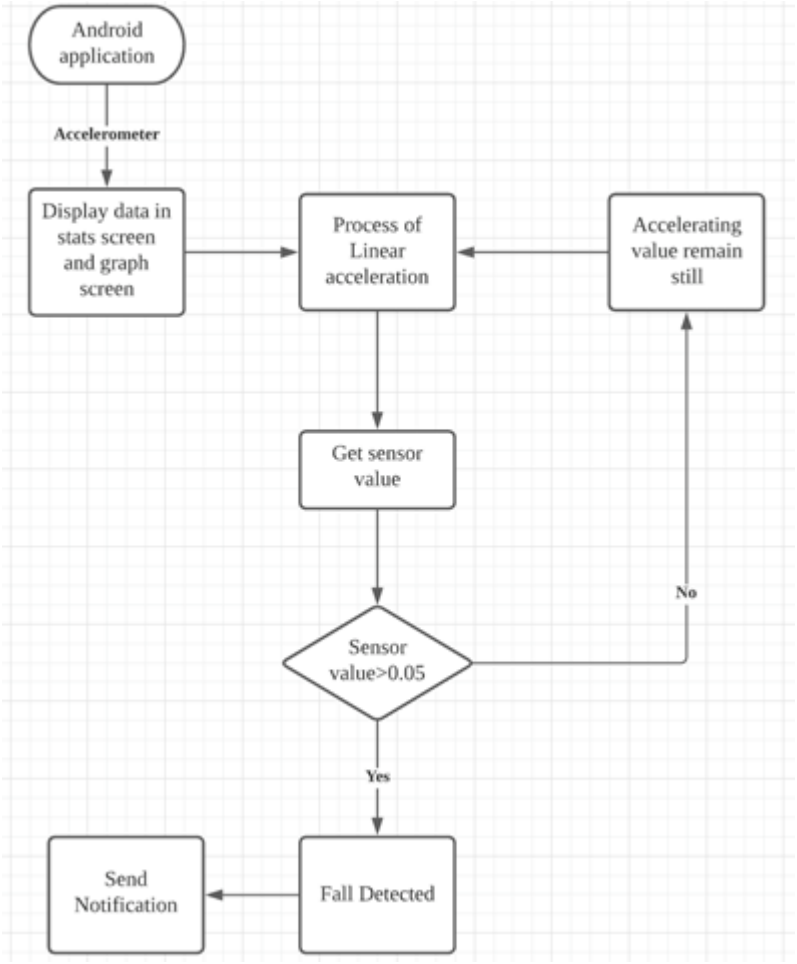
9. Product Architecture

9.1. UML Diagram

The UML diagram below showcases the main features and components of the project app and illustrates what the user will be presented with when initially opening the app. Some features may vary between the different types of users (Caretaker and Patient) and most the features are initiated from the Menu Page as it serves as the home page for the app.



And below is the UML diagram is the current architecture of the fall detection process which is a simple logic process and was updated and tweaked throughout the iterations for this trimester to allow the fall detection process to work while the app isnt running.



9.2. Tech Stack

As for the technology stack of the mobile application development, here are some aspects of technologies included:

- Android-operation system

To start, we choose to build for android platform, factors we take into consideration:
It offers more opportunities and freedom for developers in terms of some features.
In terms of design, more access to create delightful layouts.
One app can be run in different devices.
App can be build for iOS when the first version is established and successful.

- Development tool-Android Studio

Programming Language-Java
Development kit-Android SDK
We develop our application with Android Studio IDE(Java), which provides excellent toolset and huge support of online community, which ensures the ability to handle both front-end and backend related tasks to meet the design and functionality accordingly.

- Database- Firebase Realtime Database

Firebase Realtime database allows us to not only store data in real time onto the cloud but also retrieve it back as well in milliseconds.
Furthermore, its low barrier of entry, low maintenance costs, and fast queries allow developers to test the application while it is in development and we believe this will not only reduce the development time required but also increase error logging and monitoring capabilities for those with minimal IT skills.

10. Source Code

The source code of this project is hosted in team's Deakin Bitbucket which can be accessed in link https://bitbucket-students.deakin.edu.au/users/jtoohim/repos/mindlab-application_t1_2021/browse
To use this source code, one can follow this process:

- fork this repository from given link to their repository
- load new project from version control and use the clone link from their bitbucket repository.
- Work on agreed branch to make any changes

Once project is loaded in Android studio, there will be two different modules:

- app: this module contains all source codes for android phone
- wear: this module contains source code for smartwatch

To gain access to Firebase database, administrator will have to add to new member to firebase database with their Gmail account so new member will be eligible to make changes in database. The database link of the project is https://console.firebase.google.com/project/mindlab-firebase/overview .

To use Android studio, it can be installed by downloading for free from https://developer.android.com/studio

It is assumed that Git and Java Development Kit (JDK) are installed in the system before using the project, however if not, these packages can be downloaded from:

- Git: https://git-scm.com/downloads
- JDK: https://www.oracle.com/au/java/technologies/javase-downloads.html

11. Login Credentials

Firebase
App Login:
Patient:
Email - mindlabtranslators1@gmail.com

Password - Hello123#

(UID - rzrWMLvg4ogtYECR9ABawU9QtIG3)

Caretaker:
Email - mindlabtranslators2@gmail.com

Password - Hello123#

(UID: ZQcc9y4KApaKEpnI091RxziicOm1)

12. Appendices

Handover Document on Teams
(MInD Lab Translators > T1-2021 > Handover and Showcase > T1 2021)
https://teams.microsoft.com/_#/school/files/MInD%20Lab%20Translators?threadId=19%3A3a7e166678e44af8aa84f70ca2c6fb68%40thread.tacv2&ctx=channel&context=T1%25202021&rootfolder=%252Fsites%252FDeakinResearchTechTranslators%252FShared%2520Documents%252FMInD%2520Lab%2520Translators%252FT1-2021%252FHandover%2520and%2520Showcase%252FT1%25202021

Link to the MInD Lab Translators T1 2021 – Project Pitch Video
https://www.youtube.com/watch?v=zUK8EMjDg9k&ab_channel=JayTee