

Project Handover Document

Team: MInD Lab Translators

Tribe: Deakin Research Tech Translators

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1. Project Information - Frank

1.1. Client/Product Owner

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1.3. Project Team

Squad Name Mind Lab Translators

Tribe: Deakin Research Tech Translators

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2. Project Overview

Vision Space is mobile application about virtual reality. Its main purpose is to allow architects or designers to use virtual reality to visualize all behaviours generated by users in a 3D environment.

The aim of this project was to be able to use both Virtual Reality eye tracking data and mobile application which allows Designers or Architects to visualise the way people/users move and interact within a 3D environment.

Deliverables for T2 2021:

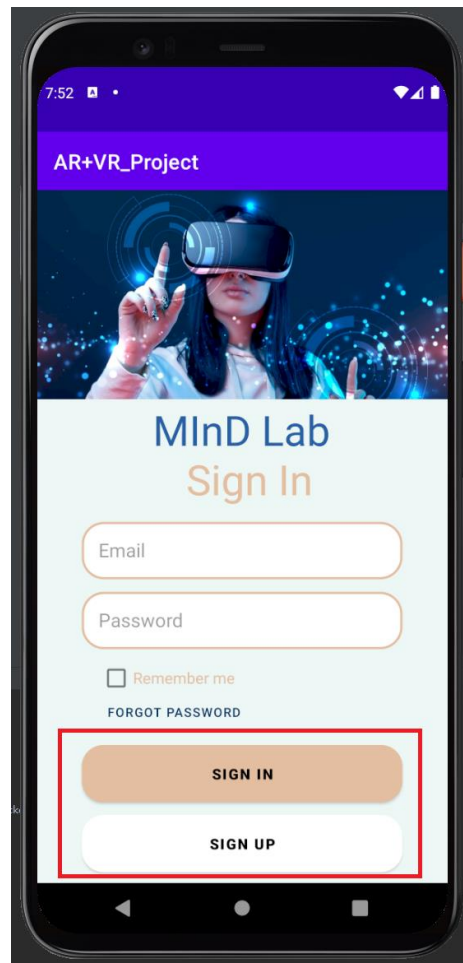
As seen in the VR/AR Trello board, our main deliverables for this trimester are:

- 1 Finish the mobile application design in the Adobe XD.
- 2 Finish the mobile application Backend Database (Google Firebase).
- 3 Completed Mobile application pages:
 - a. Sign in/ Sign Up page
 - b. Home page
 - c. Dashboard page
 - d. Setting page
 - e. User Profile page
 - f. Menu page
 - g. Location heatmap page
 - h. Profile Edit page
 - i. Add New Device page

Link to Roadmap Trello board: <https://trello.com/b/IOA5FTI2/mind-lab-translators-vr-ar-trello>

3. User Manual

On the application's sign-in/sign-up page, there are two buttons available on the screen, top button is for sign-in, if the user has an account, they can use their e-mail and password to sign into the application. And another button is for the user first using our application, user can use this button to create an account.



When the user clicking the sign-up button, the app will take the user to another page, users need to write personal information according to the requirements of the form after the user finish the form, also need to agree with our terms and conditions, after that, the user needs to click the complete registration button.

7:53

AR+VR_Project

Register

Family Name

Given Name

Contact Number

Address

Date of Birth

Email

Password

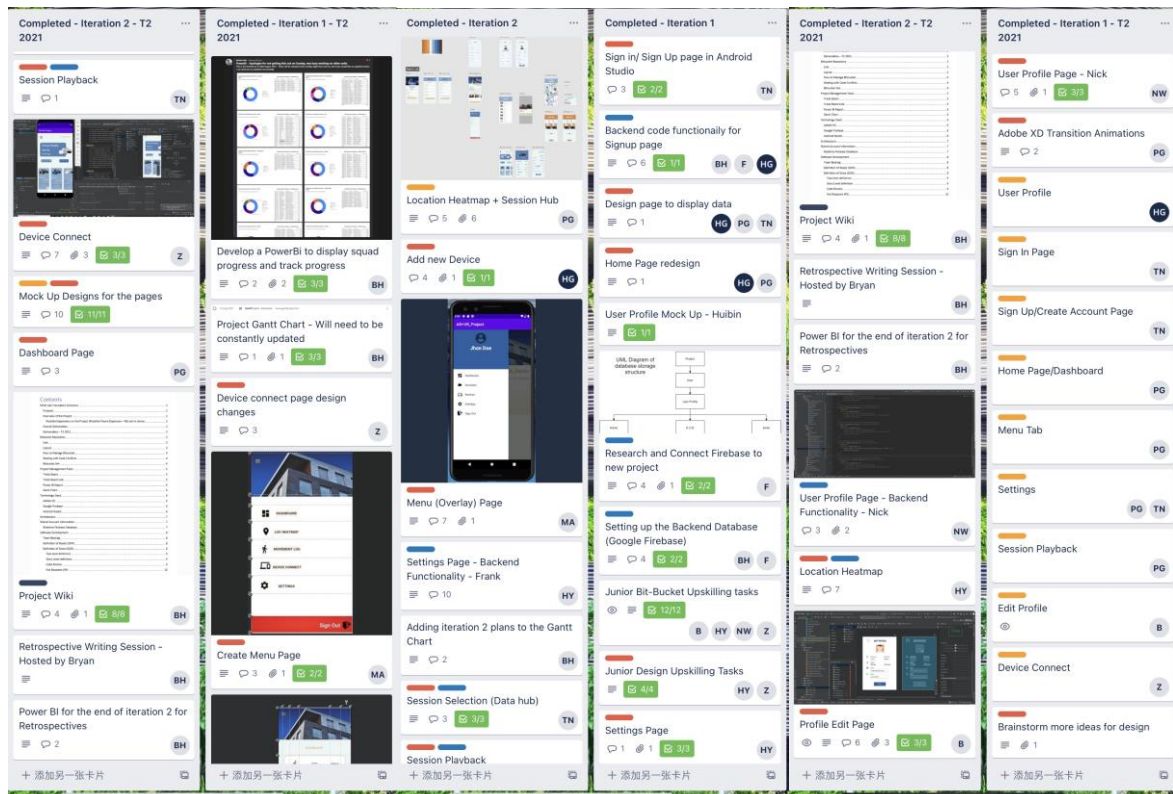
Confirm Password

☐ I agree to the [terms and conditions](#)

COMPLETE REGISTRATION

Once everything is finished, the user successfully created their account and can access their account.

4. Completed Deliverables



4.1 Major Function

The MInD Lab Squad is currently working on a project called Vision Space. Its goal is to be able to leverage both Virtual Reality eye tracking data and a mobile application to help designers and architects visualize how people move and interact in a 3D environment.

We want to develop a mobile application that can display the data recorded on a virtual reality platform such as HTC VIVE and save it to the database. From there, we want to use the saved data, then convert it into human readable information, and then display the information through mobile devices

Create a functional mobile application that allows data to be displayed on it. Mobile applications should allow users to create their own accounts and save data to the database.

From there, the application should be able to load their data and / or allow them to enter their own data by linking their virtual reality device to the phone itself (send the virtual reality data to the database and then use the data to send it to the device)

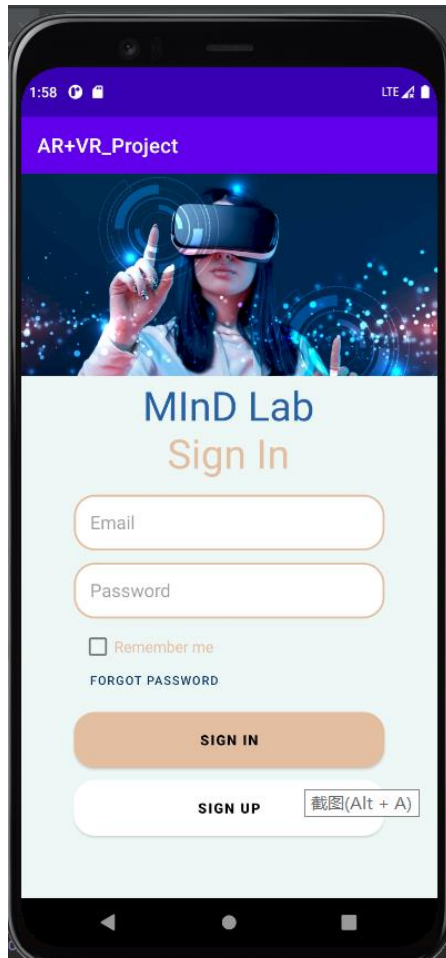
Test and find a method to save the data collected from the virtual reality device to the database, and then convert the data into human readable data.

Trello card:

<https://trello.com/c/IKltGC0q>

4.2 Sign in/ Sign up page

Registration and login interface has always been an essential part of design and application. What we develop and design is an application in the form of virtual reality eye tracking data. The virtual VR / AR static illustration design has good matching effect with the light background, and the simple input box design in the visual center provides users with a better sense of experience. Give users a friendly sense of substitution effect.



Trello card:

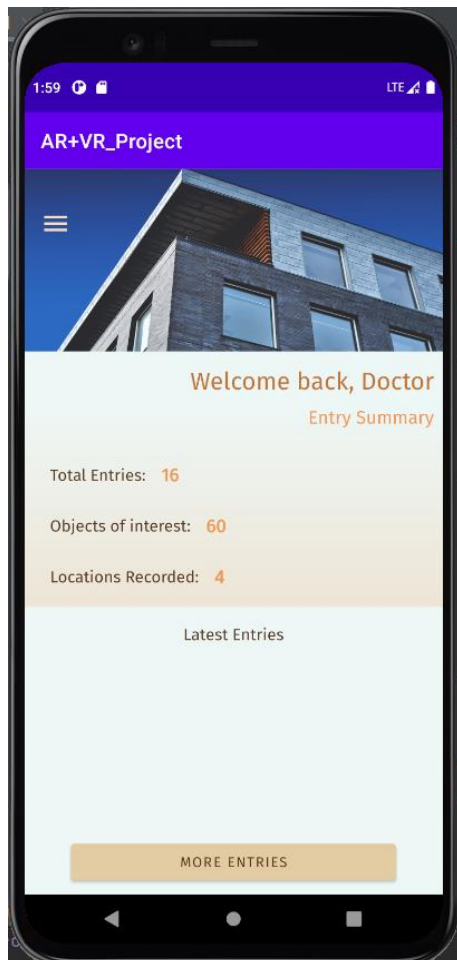
<https://trello.com/c/NOMYx4Gg>

<https://trello.com/c/absiwLr5>

4.3 Home page

The main interface is the main controller of the system. Most of the functions of the system are shown here. Therefore, the main interface must be constructed with a large number of menus and toolbars. Of course, it needs a lot of code to hook events. Just like the design of our main page. His interactive design aims to make it easy for users to use. Functional buttons are placed in the upper left corner to link each associated page of the software. The

house illustration design gives users the feeling of home, reflects the core design of the main page, and the visual center clearly displays several parts of browsing data. The "more" information button is designed at the bottom to let users control the page and provide a variety of possibilities for users at different levels.

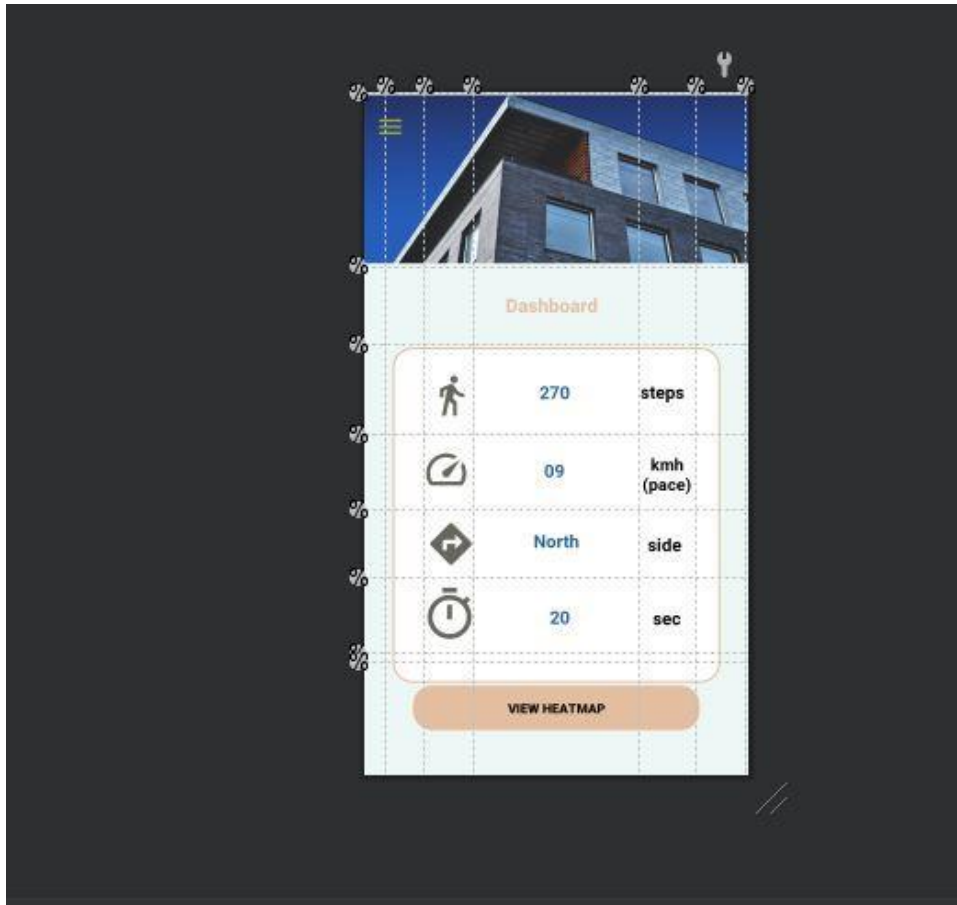


Trello card:

<https://trello.com/c/fYYISv6X>

4.4 Dashboard page

The indicator board page design provides multiple graphic designs, and the mild color design of the text box makes the user experience the effect of visual fatigue. However, at the same time, the design of graphic symbols provides the user with visual stimulation, uses the metaphor of the real world, respects the user's past use experience, makes the picture interesting and shortens the distance with the user.



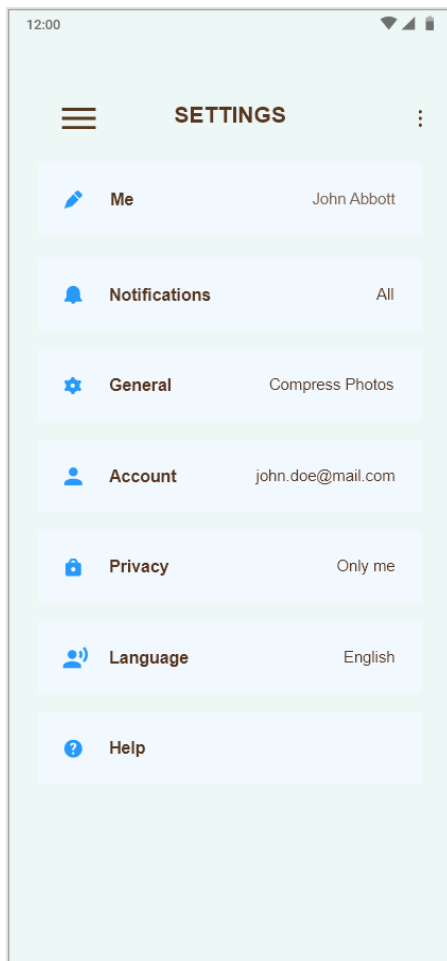
Trello card:

<https://trello.com/c/sCzgexNG>

4.5 Setting page

The difference between this interface and profile edit page is that profile edit page is used to set users' personal information, and the main purpose of this interface is that users can set more software related information through this interface. When the content of the system needs to be set in many apps, the app will jump to the setting function of the system by some way. However, this one we designed is different. We can select it through the setting button in the menu page and jump to the setting interface we need.

It is obvious in this interface that we can clearly see the contents that can be changed. There are mainly 7 parts that can be set: me (Can also use this button to jump to the profile edit page), notifications (Set the specific content to be notified here), general, account, privacy (Set the user's privacy here. Users can select the parts they want to disclose and the parts they don't want to disclose), language (Can choose any language that is helpful to the user) and help (Can ask some parts you don't know how to set through software customer service.).



Trello card:

<https://trello.com/c/sCzgexNG>

4.6 User Profile page

In this interface, you can see the user profile page, which displays the personal data associated with the user and the assigned role (user or administrator). User information synchronized from an external directory may also include principal name, identification name, and external ID data. The profile page for local users displays the user attributes available to users in the local user directory.

In the user profile page, you cannot edit the data of users synchronized from external directories. You can change the user's role. In this interface, users or administrators can see their own information: User photo, Name, Gender, Dob, Email and Phone number.



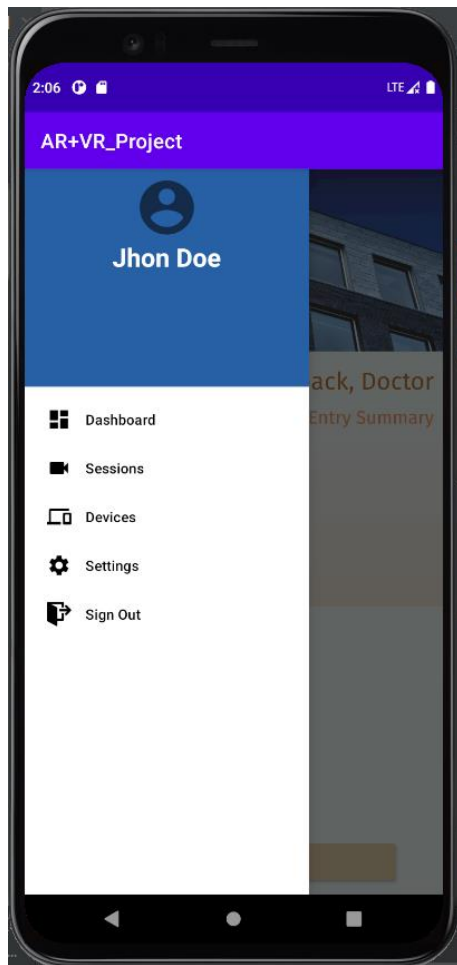
Trello card:

<https://trello.com/c/CHLAv7iO>

4.7 Menu page

The display structure of menu bar in the interface is a tree structure, which provides function entry for most functions of the software. Click to display the menu item. As shown in the screenshot, you can find the required menu items on the leftmost side of the interface. The interface is a dynamically displayed menu bar. When the mouse is placed on the menu icon, the menu bar will pop up automatically on the leftmost side of the interface (its sub menu items will be displayed only when the user places the mouse pointer on the parent node)

The menu bar of this application mainly has the following functions for users to choose from: Dashboard, Sessions, Devices, Settings and Sign Out. You can jump to different interfaces by clicking different buttons.



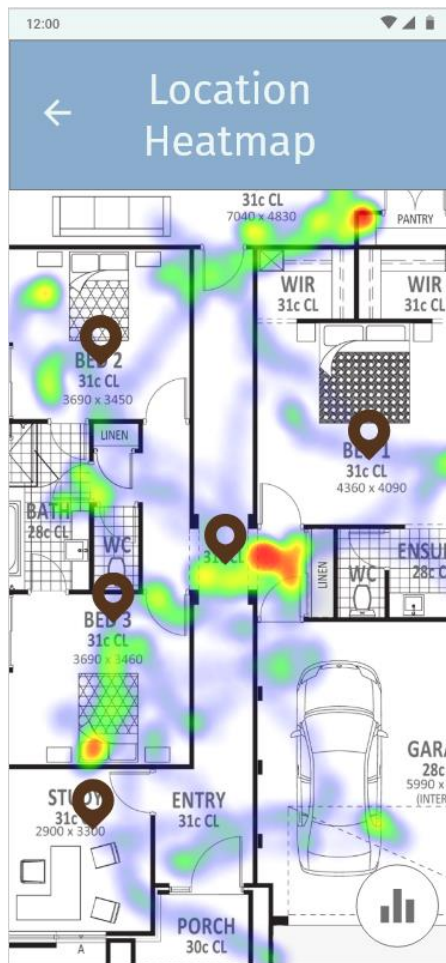
Trello card:

<https://trello.com/c/xqZDAeKX>

4.8 Location heatmap page

In the heat map, the user's favorite page or region and the user's geographical area are displayed in a special highlighted form. Because the main function of our project is that the visual space is the brain laboratory. The goal is to use virtual reality eye tracking data and mobile applications to enable designers or architects to visualize the movement and interaction of people / users in the 3D environment. In order to better meet the theme of this project, we have added the function of location heat map, so that we can track the main location of users in an environment.

Integrate the location where users most often stay, so that designers can design a more comfortable and convenient living mode for users where they live or stay.



Trello card:

<https://trello.com/c/xqZDAeKX>

4.9 Profile Edit Page

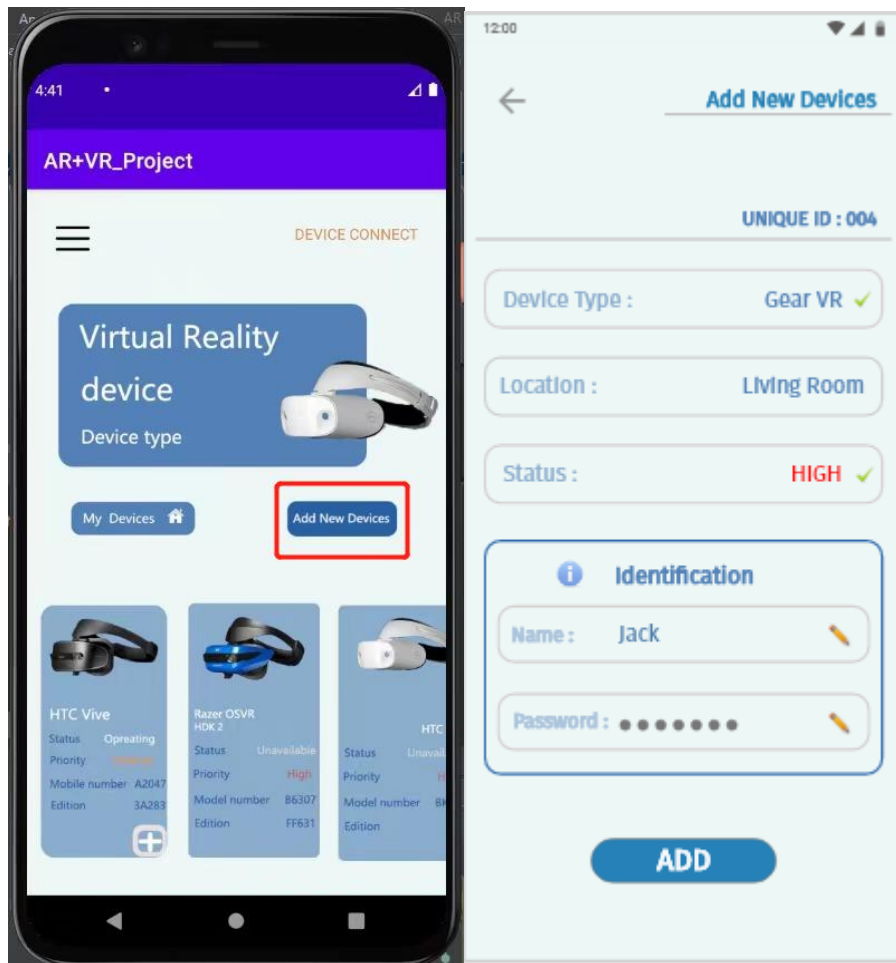
The whole interface is used in conjunction with the user profile interface. In the user profile, you can see a pencil pattern in the upper right corner, which is an icon button to jump to the profile edit page. Click him to edit the user's photo, name, gender, DOB, email and phone number.

Trello card:

<https://trello.com/c/kQcwpvg0>

4.10 Add New Device page

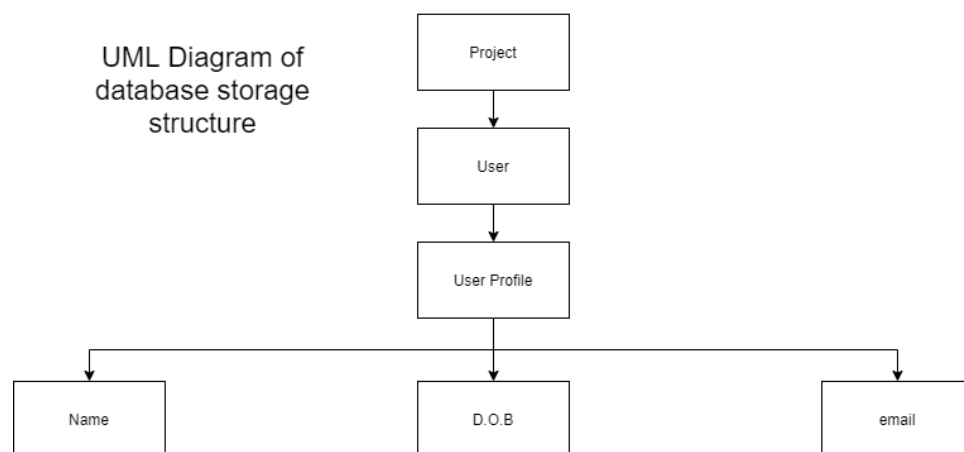
Because the main plan of the software we designed is to design an application that can display the data recorded on a virtual reality platform such as HTC VIVE and save it to the database. The application should be able to load their data and / or allow them to enter their data by linking their virtual reality device to the phone itself (send the virtual reality data to the database and then use the data to send it to the device), so in order to cater to this function, we need to add some new or different VR devices to help users record and load these data. As shown in the figure, we can click add new device in the red box to jump to the add new device page and set to add a new VR device.



Trello card:

<https://trello.com/c/iNdLwHB5>

UML Diagram



Database

mind-lab-translators-project-default-rtdb

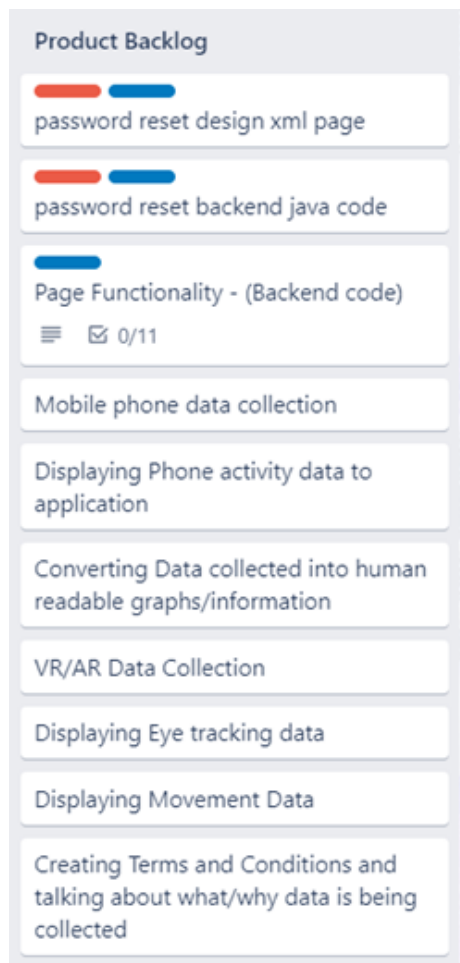
Users

- 4iYGVw3RrzWfUI2i3vTfYBnb8mf2
 - email: "chris19990305@gmail.com"
 - familyName: "GAO"
 - givenName: "Chris"
- 8C84p7Smjkg9zxtD5YDw6pIAfur2
 - email: "faiz.qureshi999@gmail."
 - familyName: "Qureshi"
 - givenName: "Faiz"
- GJicshh69EMSxq8Rmsu9vFe85So2
 - email: "hew.bryan@yahoo.com.au"
 - familyName: "Hew"
 - givenName: "Bryan"
- Qj4s7RIFjPzfF6HnqpBoNf0Wz6s2
 - email: "champagnefaizi@gmail.com"
 - familyName: "Qureshi"
 - givenName: "Adam"
- ehXxCTwEuQWxmKJzaNEaP4e8C8w1
 - email: "philfish98@hotmail.com"
 - familyName: "Bhuilda"
 - givenName: "Bobda"

5. Roadmap

For the tasks we plan to complete in the future, we may add more external connection devices, not just VR. Enhance the usability of existing functions and add some new ones to assist existing functions and improve their availability.

At the end of this semester, we will hold a meeting to check and fill the gaps in this project, so as to expand and improve this project in the future.



The image above is of the Trello Card which has all the planned tasks which needs to be completed at some point during the Project Life Cycle. These tasks include:

- Password reset design xml page + Backend Code
 - Design team needs to create a mock-up of what the Password reset page looks like. This feature allows a user to change their password if they decide to change or if they have forgotten their password. The Backend code will also need to be completed for the functionality of the Password reset to take place.
- Page Functionality
 - In this task, our design team and back-end code team have designed relatively perfect interface content, including some basic contents of the main needs of the relevant apps of the project. Such as login registration interface, addition and modification of some personal information, addition of VR equipment and addition of location heat map. And related content related to the software. I think more functions can be added in future work.
- Mobile Phone Data Collection
 - In this task, we want to research what type of sensors are available in common everyday mobile phones and what data might be relevant to display in the vision space application, things like user pace are something we see as valuable information. To do this we can measure using the phones accelerometer sensor
- Displaying Phone activity to application
 - This task is currently planned so that we can test the application using the mobile phone's gyroscopes and sensors which can then be relayed to the app to show real

time data based on the phone activity. This is more for software team as it is back-end code

- Converting Data collected into human readable graphs/information
 - The purpose is to enable designers and architects to visualize the movement and interaction of people / users in a 3D environment using virtual reality eye tracking data and mobile applications.
- Research VR/AR Data Collection Methods
 - By connecting the virtual reality device to the mobile phone, the application should be able to load their data and/or allow them to submit data (send the virtual reality data to the database and then use the data to the device). As a result, we'll need to introduce some new or modified VR devices to let users collect and load these data in order to meet this function.
- Displaying Movement Data
 - Through the dash board interface, we display useful data for users, such as steps, km / h, side and SEC, to provide users with their information, and relevant graphics and data to provide information. All motion data can be displayed here. This will also be an important part based on the back-end code.

6. Open Issues

During this Trimester, the main problems the squad encountered were:

- Squad Hardware issues
 - One of the key issues we faced throughout this trimester was the fact that some seniors and some juniors had issues working with the Technology stack of Android Studio, Adobe XD, and Google Firebase. As COVID 19 has also rendered everyone to stay at home, it is difficult to go to university or libraries to access/use their resources.
 - To Rectify/Minimise this problem in the next Trimester, we want to look for specialised juniors who have hardware capable of handling all these programs in the technology stack
- Working with the Database for Data Validation
 - One of the set tasks set for iteration 2 was the data validation task. This task required the code to check the user sign in credentials however, another issue arose where only a few squad members can create an account and store that data into the database. There were some instances where some computers were not able to save the newly created data to the database.
 - Faiz and Bryan as attempted to resolve this issue, however, it is quite a unique issue to certain people and there are not a lot of resources around that solve this problem.
 - One Fix for this issue is to research other free databasing providers out there so that we can use an alternative database source
 - Another Fix is to attempt to re write/format the code for saving data into the google Firebase

- No real devices at the current moment to test and research with (Virtual Reality Side - Virtual Reality Headsets are expensive)
 - Because adding specific VR devices costs a lot of money, the team does not have enough funds to support/purchase their own personal VR device. Alongside this, it presents another issue of the squad members to also have higher tier hardware to support Virtual Reality.

7. Lessons Learned

Overall, as a team, we achieved our goal of building the project from scratch and updating various features. Faced with some challenges, the team must have clear goals, planned steps, and time constraints.

And overcome these difficulties, which is greatly beneficial to the whole project development process.

First, I hope that in the next semester, personally, I can have higher work requirements and better-quality output. For the team, I hope everyone has the same goal and thought, and everyone works in an orderly way.

For this project, I hope that if there is any problem, I can immediately report to the superior, the project leader and provide suggestions and feedback. In addition, during the three-month teamwork, everyone updated the work progress and the actual time of each task on the work log in a transparent form, which was an effective way to convey the progress.

8. Product Development Life Cycle

PDLC is divided into 6 stages:

1: Before the lifecycle begins, the team needs to develop a plan to consider the "needs" of the target audience

. By complying with customer requirements and feedback, we can update and improve functionality and frameworks in a timely manner to improve the affordability of our applications.

2 (design) : Definition of product structure during the system design phase, this part is about adding ideas to the plan. Establish process plan for product conception and description According to the needs of users, the final screening, find the most suitable scheme. The team will examine all

Approval or rejection of a plan.

3: implementation

This stage is the implementation plan. This section requires developers to satisfy the task design

Coordinate development time and demand.

4: Quality assurance

The product formally enters the iterative development cycle, conducts test cases on the product, evaluates and tests whether the product can meet customer requirements and performance. As the most important part of the iteration, all testing to ensure that the design/product meets the requirements of the design proposal (Phase 2) will be followed up by the project leader.

If the test is successful, the product will move on to the next release phase. If the code is not working well, you need to provide feedback on how the functionality is being completed and how the code bugs are being fixed. Plan the next release and make the release update, marking in the team channel to provide the latest information about the task.

5: the deployment of

Once this stage is reached, the code for the new implementation is pushed to all branches Everyone updates their code and displays it in the presentation. In addition, product acceptance and visual restoration are important prerequisites to ensure the quality of product delivery.

6: Supports maintenance

At this stage, it is necessary to sort out the remaining bugs in the code of one version, conduct version review, prepare for subsequent effect evaluation and iteration of the next version. In the future, the code may not be compatible with any new code, or the code may not be compatible

Out of date. We will standardize management to ensure that we provide the best

The product is the end user.

8.1. New Tasks

One week before each iteration, the seniors will work together to create items associated with the task board. A list of functions that can be implemented/adjusted has been created. Discussions between project leaders and senior leaders come from different backgrounds. Each area of expertise (design, software, hardware, etc.) will select tasks to be completed within three months and quality management.

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

Meeting to discuss

Communicate effectively with senior students

When writing functional code, team members may be aware of some overall gaps

Function, and may decide to implement additional code to improve the function.

Project leaders can create new tasks and assign them to people who are willing to take them on.

The project leader assigns tasks with an understanding of each team member's abilities and areas of expertise and can guide them to complete the task if they encounter any problems. If the suggestion seems achievable and fits the time frame, the task/idea can be executed in a Trello card.

8.2. Definition of Done

First, after we're done, we'll upload the source file with the code comments to Bitbucket is submitted to related groups, such as the design group's task, or the software group's task, or the hardware group's task, and then the team members all upload the tagged branch information of the code updates to the project lead trunk and check it for accuracy. The project leader will unit test the code to make sure there are no data or memory leaks that need to be tested. If the problem is fixed and the code works, the project leader will update the code for our project.

8.3. Task Review

After the task is completed, brainstorm the potential problems through different opinions of team members. The project lead will review the code and test for crashes or Error. Once the code test passes/is approved, the task is marked as completed on Trello. This will work according to our branch policy, where team members can send requests to individual branches or designated branches (e.g., software, hardware, design) Bitbucket. Only a pull request can validate or examine the updated code. Once the pull request for the specified branch is approved, it is consolidated into the main branch

Branch management by authorized personnel who perform code reviews.

8.4. Testing

Software testing is performed throughout its life cycle and can be defined as "done". Usually, software testing steps are divided into requirements analysis review, design review, unit test, functional test and system test. This subsequent requirement refers to what is recorded at or at the beginning of the task and displayed on the Trello card. Cards can be updated, which could mean

These requirements may not be met on time. However, the overall functionality must meet the desired outcome. Valid and appropriate standards.

8.5. Branching Strategy

We have two branches, one is the design team, the other is the software team

The other branch is the hardware team branch.

It is the main development branch. The developer will use this branch to start all new branches

Story/mission development, if approved by the authorized responsible team member

For code checks and Bitbuckets, the completed changes (via pull requests) are merged

Let's go back to this branch. Before a developer can start writing a new story, the developer must clone or copy the latest main branch and work on it. Story branch/function branch:

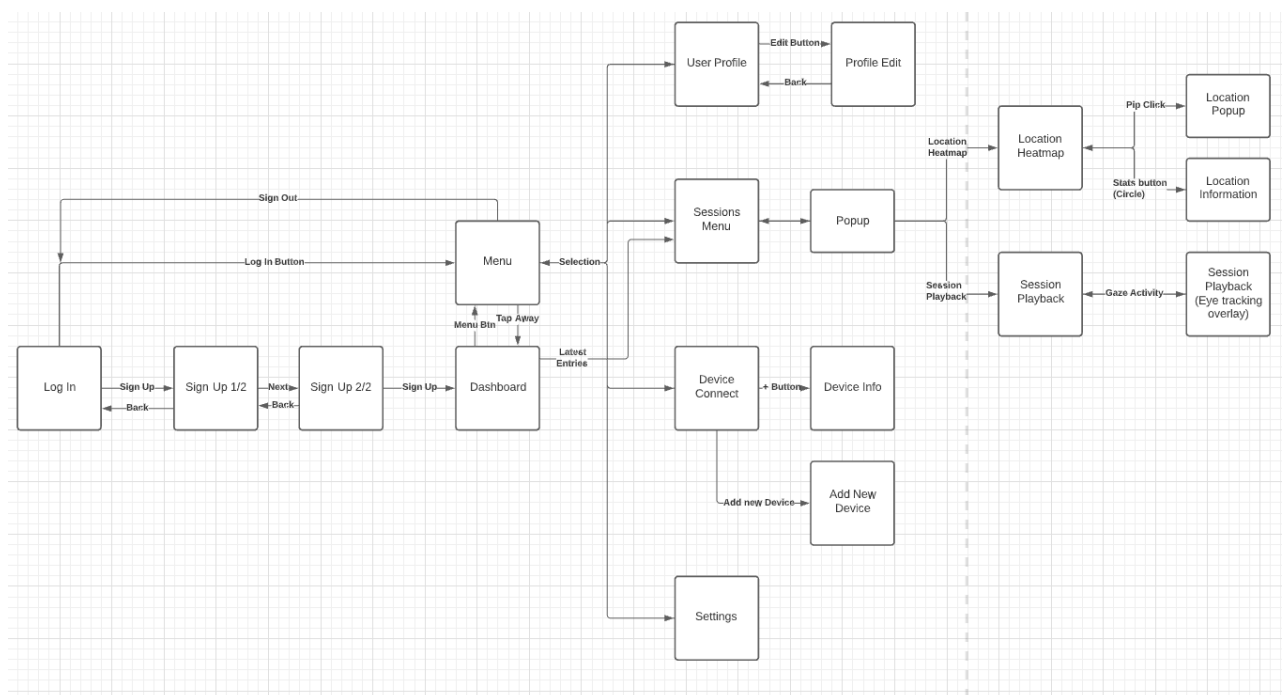
Story/feature branches will be created from the main branch and used for incremental product development. Enabling the test branch ensures the smooth release of maintenance releases and the stability of the test environment. There are some important rules:

Before making any changes, make sure you are in the right branch, then update the latest main branch and continue. After the quality of the work is appropriate, a pull request is issued for review. Provide a detailed description of the task.

9. Product Architecture

9.1. UML Diagram

The following UML diagrams are a good guide to product design, iteration, and planning. Define product development goals and user groups, sort out and analyze product needs according to the direction. Design product interaction and information architecture. Layout the page and show the core business to users. Visual design to improve user experience. Shows the main features and components of the project application and shows what users see when they first open the application. Different types of users (custodians and patients) may have different functions, starting from the menu page because it is the home page of the application.



9.2. Tech Stack

- Android Studio
- Android operating system

First, we chose the Android platform for our consideration: its application development features four major components: events, services, broadcast receivers and content providers, providing diversity to developers. Rich system controls easily edit out a beautiful interface, SQLite database speed extremely fast embedded relationships. Rich multimedia services. Design and layout pages with Android Studio for easy and visual design.

An application can run on different devices. It can run in an independent process and has its own VIRTUAL machine instance.

- Development tool Android Studio

Mainly use Java programming language

Development kit Android SDK

Android Studio is an official integrated development environment (IDE) based on IntelliJ IDEA and suitable for Android application development, powerful and practical experience effect is good, so

We chose to use the Android Studio IDE (Java) to develop our application, ensuring that we could handle front-end and back-end related tasks so that the design and functionality worked together to meet the requirements.

- Adobe XD (Mock-ups)

- Adobe XD

For design, we chose Adobe XD, a one-stop UX/UI design platform where users can design and prototype mobile apps and web sites. It is also the only cross-platform design product that combines design and prototyping with industrial-grade performance. Use Adobe XD for more efficient and accurate static compilation or conversion from block diagrams to interactive prototypes.

We can easily combine design prototypes with back-end code from Android Studios.

Complete application development.

- Google Firebase

- Database-Firebase Real-time database is a cloud-hosted database that is stored as JSON and synchronizes data with each client in real time. It also allows us to retrieve data in milliseconds. In addition, it has a low barrier to entry, low maintenance costs and fast queries.

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/bhew/repos/mind-lab-translators/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 an 'app' module contains all source codes for android phone

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/u/1/project/mind-lab-translators-project/database/mind-lab-translators-project-default-rtdb/data>

To use Android Studio, it can be installed by downloading for free from:

[Download Android Studio and SDK tools](#) | [Android Developers](#)

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: [Git - Downloads \(git-scm.com\)](https://git-scm.com)
- JDK: <https://www.oracle.com/java/technologies/downloads/>

11. Login Credentials

Firestore

App login:

- Email: mindlabtranslators1@gmail.com
- Password: Hello123#

12. Appendices

Project Pitch Video:

<https://deakin365.sharepoint.com/sites/DeakinResearchTechTranslators/Shared%20Documents/MInD%20Lab%20Translators/T2-2021/Handover%20Documents/Vision Space Pitch Video.mp4>