



# Assessment Task 3: Our IT Project

GROUP 2: PET FINDER

## Contents

<b>Team Profiles .....</b>	3
<b>Personal information .....</b>	3
Matthew Ahearn (s3884661) .....	3
Victor Van de Meer (S3824193) .....	4
Kanav Atri (s3177499).....	4
Mark George (s3886745).....	4
Connor Abdulai (s3886035).....	5
Quentin Schuster - s3885261.....	5
Group Processes .....	6
Career Plans .....	7
<b>Communication .....</b>	8
GitHub.....	8
MS Teams.....	8
MS Teams Meetings Records.....	8
<b>Tools .....</b>	9
YouTube.....	9
Adobe XD .....	11
Adobe – Photoshop .....	11
Adobe – Illustrator.....	11
MIT App Builder.....	11
GPS Tracker .....	12
Health Tracker.....	12
Geo-fencing.....	12
Storyboardthat.com.....	12
Adobe After Effects .....	12
Adobe Premiere Pro .....	12
Camtasia Studio .....	13
Sublime .....	13
Google Fonts .....	13
<b>The Project .....</b>	13
Project Description.....	13
Overview .....	14
About GPS Tracker.....	14

About health tracker.....	15
About Geo-fencing .....	15
Topic .....	15
Motivation .....	15
Market Research.....	15
Landscape .....	15
Detailed Description.....	17
Aims .....	17
Plans & Processes .....	17
Design & Development Process.....	22
<b>Documentation</b> .....	24
Website and Code.....	24
APP Interface Prototype .....	26
GPS Tracker Prototype.....	27
Health Tracker Prototype: .....	28
Geoalert Feature Prototype.....	32
Roles .....	33
Scopes and Limits.....	33
Tool & Technology .....	35
Testing .....	37
Timeframes .....	37
Risk .....	39
Group processes and communications.....	40
Skills and Jobs.....	40
Full Stack Developer.....	41
Hardware Engineer.....	41
Business analyst .....	42
Cyber Security Specialist.....	43
<b>Group Feedback</b> .....	44
Mark George .....	44
Connor Abdulai.....	45
Matthew Ahearn .....	45
Victor van der Meer.....	45
Quentin Schuster.....	46
Group Reflection .....	47

## Team Profiles

We are the Pet Finders, we are 100% Australian owned and ran however we all come from different parts of the world.



**Matthew Ahearn**  
Data Scientist



**Victor van der Meer**  
Web Developer



**Kanav Atri**  
Cyber Security



**Mark George**  
Cyber Security



**Connor Abdulai**  
Systems Analyst



**Quentin Schuster**  
Software Engineer

## Personal information

### Matthew Ahearn (s3884661)

My name is Matthew Ahearn, I am an Australian citizen who has lived and worked in four cities in Australia and two in New Zealand. For the last ten years I have worked as an airline pilot after completing my Commercial Pilots Licence and an associated Diploma of Aviation. I was fortunate enough to work with an amazing group of people from all around the world. Probably the most dramatic moment in my flying career was when one of my engines failed shortly after take-off. Thankfully, we were able to return the aircraft to the departure aerodrome safely! Like many people I have been interested in IT from an early age. I was fascinated by videogames growing up and am often amazed by people's ingenious ideas to apply IT to our daily lives. Aviation itself provides a strong example, the greatest safety improvements in the last 30 years were the traffic Collision and Avoidance System and the Ground Proximity Warning System. These two programmes have saved many lives. I was particularly inspired when I learned that a colleague of mine had created an app that could pull a pilot's roster from the airlines server and alert you to changes, as well as share those with family and friends. This was immediately useful as informing your family about last minute roster changes could get difficult. I particularly enjoyed sharing a monthly map of where I had flown. From there I started self-teaching for hobby projects using HTML, CSS and Java and am now working with SQL and XML in a client services role. I am excited to bring these skills to my role of Database Administrator with the Pet Finders!

### **Victor Van de Meer (S3824193)**

I am an Australian Citizen, born in regional NSW and have lived in Sydney for more than 12 years. My mum and dad were both born in the Netherlands and migrated to Australia post-WWII. I am an advocate and passionate champion of LGBTQI+ rights, contributing to the well-being of humanity on a personal level. My hobbies include running a business, DJ'ing, photography, web design and programming, I also enjoy creative arts, including writing, music, painting and graphic design. I have been building websites and developing web platforms for more than 2 decades and have also worked casually as a freelance web consultant, on the side of working full-time in the property and facilities management industry. I have now left that profession and aiming to pursue employment in fields related to Information Technology. I am excited to be creating the PetFinder collar and app with the new Pet Finder team!

### **Kanav Atri (s3177499)**

I was born in the city of Jammu, Jammu and Kashmir, India and spent most of my childhood and teenage years growing up in a joint family. I finished my high school in 2006 and decided to move abroad for higher studies, this was not an easy decision as I had never stayed away from my family even for a month so, moving to a new country all together was something which was quite a huge thing and at first my parents did not agree however after I kept insisting they finally agreed to send me abroad. I.T has always been an important part of my life. I can still remember that attending computer classes back in secondary school always excited me and I always looked forward to learning more about computers and how they work. My interest is in *Cyber security* and *AI*. I find both these fields very fascinating especially in todays era where cyber threats, robotics etc has become a part of our day to day lives and there is not even a shred of a doubt in my mind that these two fields will shape our future. I hope that I can bring my skills and experience to good effect with Pet Finders

### **Mark George (s3886745)**

I am Egyptian Coptic Orthodox, born and raised in Sydney Australia who can speak both English and Arabic. Growing up, I have always been fascinated in anything IT related from playing games to making them. Other than messing around with computers for essentially my entire upbringing, I have completed a Cert III in Information, Digital media and Technology; being my only IT experience and qualification with a passion and interest for Cyber Security (ideal job) A fun fact is that with both my parents being purely Coptic, it means that I am a direct descendant from the pharaohs of ancient Egypt. Being a part of the PetFinders team is something I pride myself in, I look forward to working towards our goal every day.

## Connor Abdulai (s3886035)

I am Connor Abdulai born in west Africa Sierra Leone, A menda Kono by tribe and English is my second language. Upon compilation of my high school to university I migrated to Australia in 2016. From then to now during which my interest in IT was established, I have completed my Certificate II in Information Digital Media and Technology through TAFE and Info exchange via a youth IT program. In Which I had the opportunity to make a presentation at J.P Morgan, Microsoft and Total Synergy on the topic Identity theft. I am ambitious and driven, motivated by challenges, energetic and compassionate. I like reading and analysing information. During my leisure time I like exercising, spending time with loved ones or watching basketball as it is my favourite sport. My interest in IT started unconsciously through the access to radios, telephones, mobile phones and computers. Growing up my uncle used to tell me a story of what they have to go through to make a 5 minute call to our families in the US. Firstly, they have to wait for the scheduled date that has been set for the call, then have to travel to the capital city if a line is not available in your district at that moment, wake up about 4-5am in the morning to join the long queue at the post office where the telephone boot was. One will have to wait in the queue for almost half the day, sometimes the whole day to get a call or make a call. And the most stressful part of it all was after going through all this sometime is either they do not end up calling or did not pick up their calls. Which means you will have to go back home and wait for a message from the post office for another schedule call. When telephones finally become accessible in most home, i will run closer to anyone I see making a call, wondering if the person is in the telephone, or how is that sound of the person coming in, are they talking through a pip from the US to Africa or is just some witchcraft or magician manipulating and making sound, I asked myself. Sometimes I and some of my friends will go around looking for long tubes or pips just to talk to each through it. Then finally mobile phones and computers became accessible. Even though I did not have one till I was old enough. What I always do when I get hold of people phones or computers, either by giving it to me to drop it off at the recharging boot when there is a surtage of electricity which is widely common or request it from someone to just have a look. I will go through the setting systematically and make sure I play around all the settings because I have no one to call. By doing so I started becoming so familiarised with phones and computers that could help my relatives successfully whenever they have difficulty with their phones or computer. The fact that i was able to help them makes me very happy. And so my interest in those computers hardware and software became more and more interesting to me. And today's world is highly embedded and basically everything is like a revolution in the hands of IT. as If not all but most aspects of life are associated with IT.

## Quentin Schuster - s3885261

My name its Quentin K Schuster and I am a part of PetFinders! IT has always and will always be a part of my life. I don't have an interest in a singular branch of IT, but I have always been interested in the field. I don't have any experience in IT, but I have been trying to learn Python in my spare time cause a friend recommended I learn it as it's the easiest and the most used out of all the coding languages used in the field. My hobbies include Gaming, Anime and reading Manga.

## Group Processes

Our group worked well together in assignment two. We were all impressed by the welcoming atmosphere we created that encouraged everyone to participate and to work together to build the Petfinder idea. We believe we can improve by having the team complete their work earlier, so we have more time as a group to review and compile the information.

To achieve this, we are formalising our roles in the meetings with Matthew chairing the meetings and creating agendas and Victor publishing the meeting minutes.

Matthew will maintain a running checklist of the tasks that need to be done and who is assigned to them.

Meetings will include deadlines for submission of smaller parts of the total project. The overall strategy will be to create many small submission deadlines throughout the process rather than a single big one, which should help us identify problem areas early and ultimately create a better result.

We chose these roles based in part on the results from our previous personality tests and felt that Assertive Protagonist and The Advocate were good matches. Below is a table of our results from three different personality tests. These are the 16 Personality Test, Learning Style and Big 5 Personality Test.

	Victor van der Meer	Matthew Ahearn	Mark George	Quentin Schuster	Kanav Atri	Connor
16 Personality Test	The Advocate (INFJ-T)	Assertive Protagonist (ENFJ-A)	Campaigner (ENFP-T)	Mediator (INFP-T)	The Advocate (INFJ-T)	Adventurer (ISFP-A)
Learning Style						
- Reflector	15%	22.5%	Auditory: 45%	Auditory: 30%	31.30%	20%
- Pragmatist	35%	37.7%	Visual: 25%	Visual: 35%	23.50%	10%
- Theorist	15%	29.7%	Tactile: 20%	Tactile: 35%	16.70%	20%
- Activist	15%	10.10%			16.70%	20%
Big 5 Personality Test						
- Extroversion	64	88	92	6	50	44
- Emotional Stability	2	43	62.5	62	48	53
- Agreeableness	76	62	44	21	95	35
- Conscientiousness	41	93	50	36	26	25
- Intellect/Imagination	84	93	40	18	65	60

## Career Plans

Matthew – Data Scientist

Victor – Multimedia Specialist and Web Developer

Kanav – Cyber Security Operations Engineer

Connor – Computer Systems Analyst

Mark – Cyber Security Specialist

Quentin – Software Engineer

The different career plans among our group show how diverse the IT field can be. Kanav and Mark have similar interests in Cyber Security whereas Quentin aspires to be a Software Engineer. Connor would like to be a Computer Systems Analyst and Victor aims to build further on his career as a Multimedia Specialist and Web Developer. Matthew is working towards a career as a Data Scientist. These careers have different emphasis.

Victor will have the most design focused job and will need to be exceptional at visual communication.

Matthew will be responsible for statistical analysis and will need to be able to communicate these results to people without the same technical or mathematical background.

Connors ideal job will require a lot of troubleshooting and communicating with users who have limited technical skills themselves. Quentin's ideal career will require creativity, collaboration and knowledge of several languages. Kanav and Mark in Cybersecurity will need to develop problem-solving skills, forensic ability, and attention to detail. These careers all require a mastery of different technical skills however they all call for similar interpersonal skills as they will all require us to work in a team. Communication, Teamwork, Organisation, Time Management and Attention to Detail will be essential for all of us.

The biggest difference in our career paths are the technical skills we will need to focus on developing. Victor for example as a Multimedia Specialist/Web Developer requires experience and knowledge in HTML, CSS and JavaScript, skills which are not needed by the other team members as there is no use for web development in Cybersecurity, Software Engineering or even as a Data Scientist.

Each person's skills reflect their ideal job and as such are differing. As a data scientist, Matthew needs skills in SQL in order to communicate with databases, in contrast Quentin needs C++ mastery as a Software engineer. Mark and Kanav have both opted for ideal jobs within the Cybersecurity sector of IT and will need an extensive knowledge of the administration and management of different operating systems such as Linux and Windows.

## Communication

Below are the links to our group's website and GitHub repository and other online tools we used for this project, including a brief description of what the team has done.

### GitHub

Used for tracking changes to files, so the team could work collaboratively and developing source code during project and app development. We created an organisation and forked the website and files across form assessment 2.

Website on GitHub: Click here or copy the link into your internet browser:

Link to GitHub Website: <https://PetFinder.GitHub.io>

GitHub repository link: Click here or copy the link into your internet browser:

Link to GitHub Repository: <https://GitHub.com/PetFinder/assessment3.git>

In assessment 2 the audit trail on the GitHub repository did not reflects our group's work because we found it easier to communicate and share updated files via MS teams, and upload the final versions into GitHub.

In assessment 3,we have been more active on GitHub as shown by our commit trail, however most of our conversations and interactions happens on MS teams because it was easier to use the same system for our meetings and file sharing, more user friendly and the live documents allowed effective collaboration.

### MS Teams

Used for chat and threaded conversations, meetings & video conferencing, calling, content collaboration and to share files and documents.

MS Teams Group 2 - PetFinders: Click here or copy the link into your internet browser:

Link to MS Teams:

<https://teams.microsoft.com/l/team/19%3a9f224a4fa9fe4f4ba0bc360a1c61a1a3%40thread.tacv2/conversations?groupId=55fae844-e0e5-40d6-8176-d073cd1dbea3&tenantId=d1323671-cdbe-4417-b4d4-bdb24b51316b>

### MS Teams Meetings Records

4/2/21 [Agenda Recording Actions](#)

8/2/21 [Agenda Recording Actions](#)

11/2/21 [Agenda Recording Actions](#)

12/2/21 [Agenda Recording Actions](#)

15/2/21 [Agenda Recording Actions](#)

17/2/21 [Agenda Recording Actions](#)

21/2/21 Final Submission Meeting [Agenda](#)

## Tools

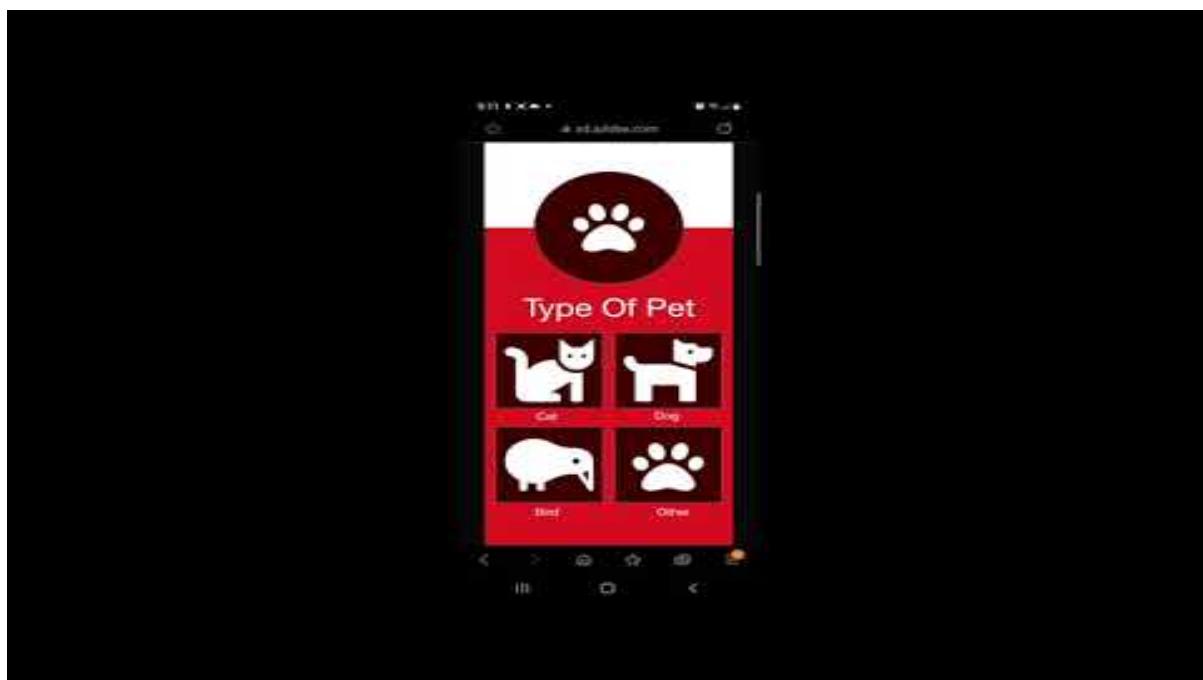
### YouTube

We have used YouTube to share our videos using unlisted links to maintain privacy and included the links below:

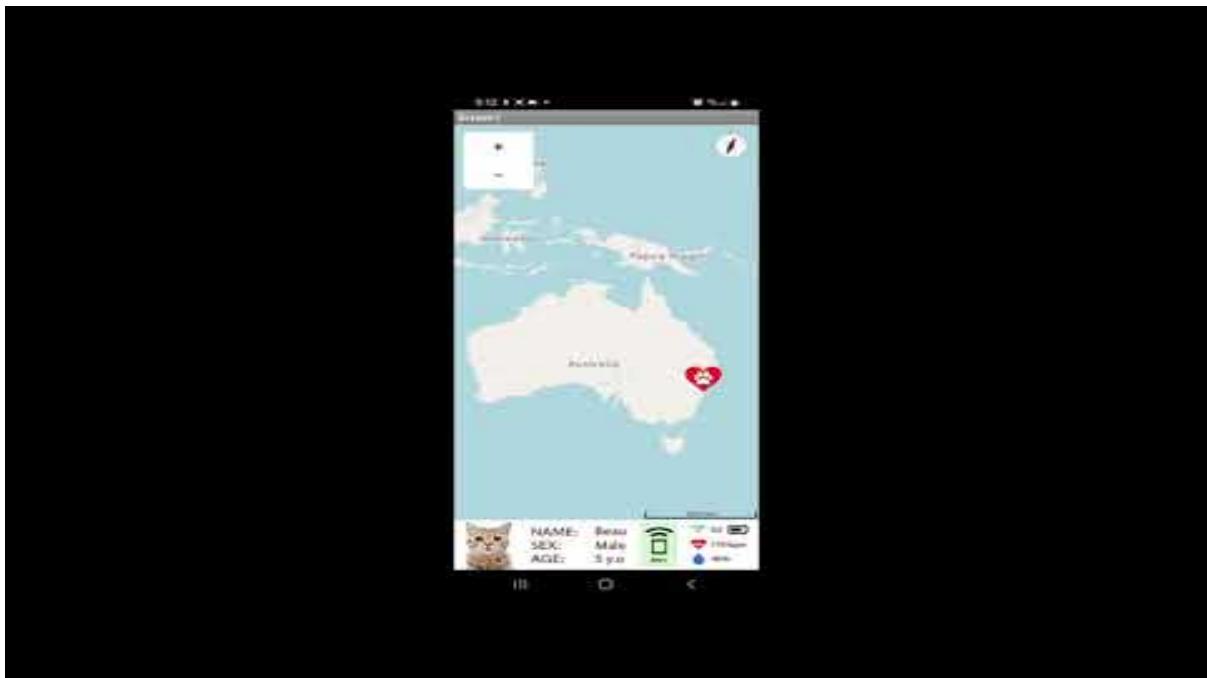
PetFinders television advertisement: <https://youtu.be/VX2A1ddiLsU>



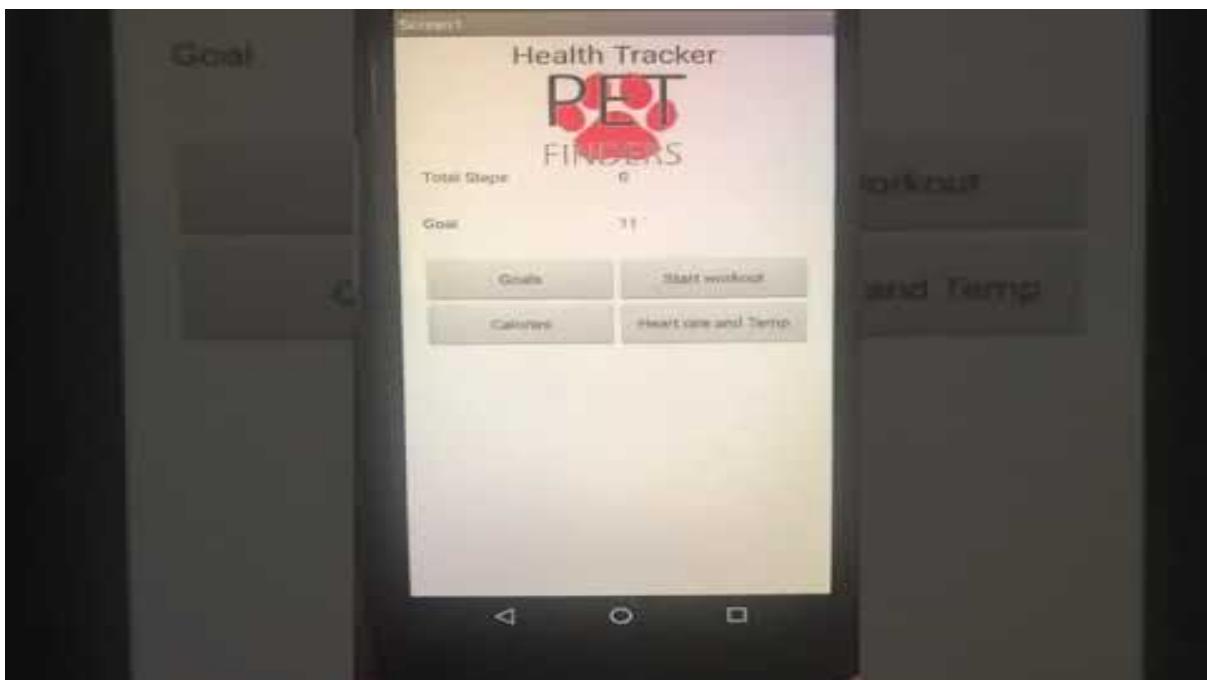
Pet Finder Demo - Getting Started: <https://youtube.com/watch?v=p8eVF6wCsJw>



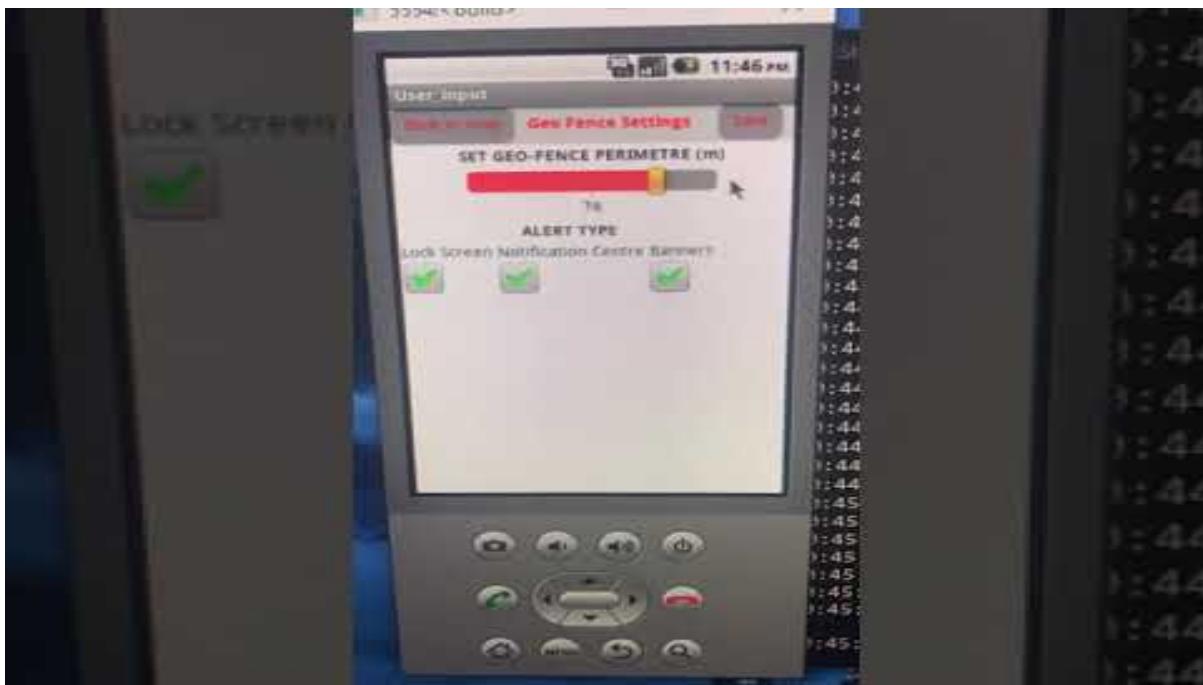
Pet Finder GPS Tracking System - <https://youtu.be/fgsXwNrapec>



PetFinder Health Tracker Prototype:  
<https://www.youtube.com/watch?v=SLbU4kvN2UA&feature=youtu.be>



Geoalert / Geo-Fencing Prototype - <https://youtu.be/uquSg3rONE0>



## Adobe XD

Adobe XD is a vector-based user experience design tool for web apps and mobile apps, and was used to assist us with building a prototype of the app interface.

Link to APP prototype: Click here or copy the link into your internet browser:  
<https://xd.adobe.com/view/c4c048ac-4a08-4392-80cc-68a1b92ab61f-9193/screen/9af33555-9046-408d-bb40-bfb27ed74863/>

## Adobe – Photoshop

Adobe Photoshop is an advanced image editing software created by Adobe. We used adobe photoshop to create the logo and edit images for the website and prototype of interface.

## Adobe – Illustrator

Adobe Illustrator is a program that deals with precise lines and is able to export as vector files, this was used to design prototype of pet tracking collar.

## MIT App Builder

The MIT App Inventor platform is both an app development platform used to create applications by dragging and dropping components into a design view and using a visual blocks language to program application behaviour. It was used to create interactive mockups of our three key features of the App.

## GPS Tracker

Link to interactive prototype of the Geo Tracking Feature: [Click here](#) or copy the link into your internet browser:

Permanent link: <https://gallery.appinventor.mit.edu/?galleryid=7184e18c-5467-45b2-adf5-e4487575b329>

GPS Tracker APK file: [https://rmiteduau-my.sharepoint.com/personal/s3824193\\_student\\_rmit\\_edu\\_au/Documents/Microsoft%20Teams%20Chat%20Files/GPS-app.apk](https://rmiteduau-my.sharepoint.com/personal/s3824193_student_rmit_edu_au/Documents/Microsoft%20Teams%20Chat%20Files/GPS-app.apk)

## Health Tracker

Link to interactive prototype of the Health Tracking Feature: Click here or copy the link into your internet browser:

Permanent link: <https://gallery.appinventor.mit.edu/?galleryid=6ee32ee1-7852-4436-90a0-b819a5b2911d>

Health Tracker APK File: [https://rmiteduau-my.sharepoint.com/personal/s3884661\\_student\\_rmit\\_edu\\_au/Documents/Microsoft%20Teams%20Chat%20Files/Health\\_Tracker.apk](https://rmiteduau-my.sharepoint.com/personal/s3884661_student_rmit_edu_au/Documents/Microsoft%20Teams%20Chat%20Files/Health_Tracker.apk)

## Geo-fencing

Link to interactive prototype of the Geo-Fencing Feature: Click here or copy the link into your internet browser:

Permanent link: <https://gallery.appinventor.mit.edu/?galleryid=31ddb0c3-cb13-47e5-af23-98c3cc133b71>

Geoalert APK file: [https://rmiteduau-my.sharepoint.com/personal/s3885261\\_student\\_rmit\\_edu\\_au/Documents/Microsoft%20Teams%20Chat%20Files/Geoalert\\_feature.apk](https://rmiteduau-my.sharepoint.com/personal/s3885261_student_rmit_edu_au/Documents/Microsoft%20Teams%20Chat%20Files/Geoalert_feature.apk)

## Storyboardthat.com

A website that allows users to create small projects by moving stock images onto different backgrounds. We used this to create storyboards to help guide our group video project.

## Adobe After Effects

Adobe After effects is a program used for advanced effects and animations. In our case, Mark George utilised the tool in order to create the Pet Finder's intro and outro.

## Adobe Premiere Pro

Adobe Premiere Pro is a video editing program, its support with After effects made it very easy and simple to combine rendered clips with raw footage.

## Camtasia Studio

Camtasia studio is a simple, easy to use but limited video editing software. It was used to finalise the video since it has a user-friendly UI that is perfect for small final tweaks.

## Sublime

Used to edit HTML and CSS files on the website. Sublime is a shareware cross-platform source code editor with a Python application programming interface (API).

## Google Fonts

Font service provided by Google Fonts API, used to style font on website.

## The Project

Our project comes with a lot of amazing features consolidated in one comfortable and wearable device. Instead of having to buy different devices for different purpose; below are the list of features that would give you a peace of mind for your pet and it all in one.

### Project Description

The idea is to launch an app and web portal, designed and developed in Australia. The app gives you full control of your pet's location and health from the convenience of your Smartphone and Devices with ease. It has a "reminder" feature, allowing you to set alerts for feeding time, playtime, walks, grooming and when they need to take medication etc.

Find My Phone helps you locate your lost Smartphone and get it back, our PetTrackr app is based on the same concept, but uses google maps and Global Positioning System (GPS) technology for real-time or live tracking and seeing location activity, giving you the ability to track your pet and manage your notification settings from anywhere in the world.

The health tracking feature tells you if your pet is too thin, overweight or obese and there's also a "recommended food and water intake" option that uses data from a range of pet brands and works out how much food your dog would need each day.

The PetTacker is lightweight and durable, its aim is to cover all aspects of your pet's health and safety. This forms the basis of a health check appointment and reminder service and is a really helpful tool for owners and their vets too, vets can use the data to focus on a particular area that requires attention and conduct further tests if required.

Your PetFinder has no range limitations. On the map, you will see your pet's approximate location. If your pet cannot be found, it will show you the last known location (if available). Pet owners can also setup virtual safe zones and receive notifications when their pet leaves the area, it can also easily be sync to your phone or digital device via Bluetooth and Wifi.

Alarm is sent to your smartphone/device if collar is removed, you can simultaneously lock or unlock the collar at any time, by pressing a button on your smartphone. Notifications and SMS's can be sent directly to your App and Online Portal. You can also request for SMS to be sent to your friends and family, however for this feature users are required to upgrade their subscription to an SMS pack.

Connectivity is a crucial part of product design and performance and the choice of connectivity technology must be considered early in the process. This is a challenging choice given the quick technology and market development. 2G and 3G networks are starting to be phased out and new 5G network technologies are becoming increasingly popular.

## Overview

PetFinder is a web app designed by Pet Finders, used to help pet owners track or find their furry friends.

If you are worried about your pet disappearing for long periods of time, worry no more, PetFinder will help you locate your pet, giving you a piece of mind at the touch of a finger.

We are launching an app and web portal, to give pet owners full control of their pet's location and health from any compatible Smartphone and Devices with ease, and easily be sync to your phone or digital device via Bluetooth and Wifi.

## Key Features:

- GPS location tracker - Pinpoint your pets' current locations from anywhere in the world.
- Health tracker - Track your pets heart rate, exercise routines and food intake (for weight gain or weight loss) and steps.
- Geo-Alerts - set and receive phone and push notification when your cat leaves an area or Safe Zone.

## About GPS Tracker

The transmitter is built into the collar, it has a chip inside which acquires the signal broadcast by GPS satellites that orbit the earth to find the pets location. Then, using mobile coverage and/or Wifi connection to send the GPS coordinates to the smartphone or device.

Google Maps Navigation will be integrated into the app and web platform using Google's APIs, for example, Geocoding and geolocation to help pet owners track their pet's location in real-time. The Geolocation API returns a location and accuracy

radius based on information about cell towers and WiFi nodes that the mobile client can detect, which is useful when GPS is not available.

### About health tracker

The health tracking feature is like a FitBit for pets. It can monitor your pet's steps, play time, nap time and temperature, sensors in the wireless device measures your heart rate it features two electrode strips underneath the collar that make contact with your pets' skin to take the vital readings. The information can then be read via the web platform or app, information is stored securely on the cloud for later access.

### About Geo-fencing

The GeoFencing feature helps in determining geographic areas and boundaries that your pet is allowed. Geofencing accuracy can reach 100-200 meters, an alert is issued when your pet leaves the area or boundary. Due to GPS inaccuracies, geofencing might not work reliably for pet's that live in apartment blocks. Why, PetFinder uses a combination of GPS, mobile data, and WiFi data to assist with accuracy.

### Topic

The primary purpose of this project is to create a platform using the latest technologies and trends designed to give pet owners a piece of mind when it comes to the health and safety of their pets. The process includes building a visual representation of what the app and website will look like, along with a concept of the design for our Pet Tracking Collar.

### Motivation

The idea came about after one of the group members cat went missing, when he was travelling for work. His friend called to say the kitten has been missing for 24 hours, and the fear was because of the breed, the cat might have been stolen, if only he had put on a tracking device on the collar before he left, he could check the location of his pet remotely.

During COVID-19, a lot of people went out and brought pets, some pets went missing or were stolen, why this project is so important and interesting.

### Market Research

Emerging IT trends in the Pet Industry is wearable monitors, pet owners want to keep tabs on your beloved animal or keep track of an ill pet's vital signs by fitting them with a wearable monitor. Other technology and trends in the industry are, online ordering, webcams and pet profiles on social media.

What would it show to a future employer if you were able to work on this project? We would show the prototype of the website and app, and digital illustrations of what the pet collar would look like.

### Landscape

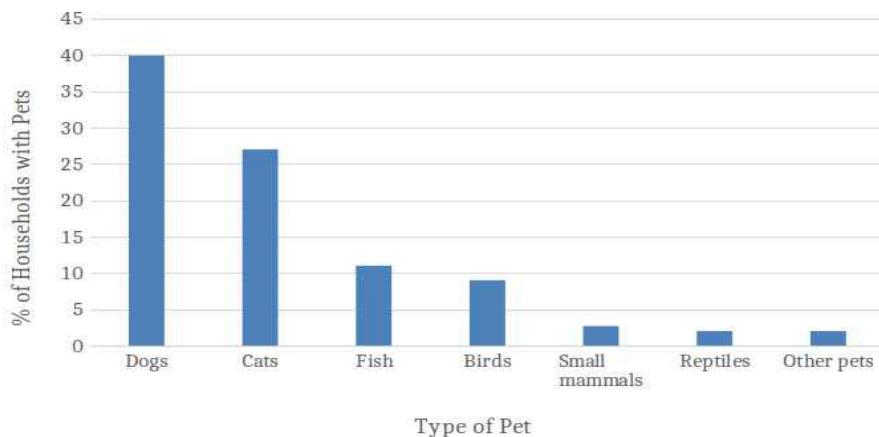
There are lots of pet finder or GPS tracker out there in the market today with loads of different features, which make it a bit of competition, but however there are differences that make some stand out than others, below are the top ranges of cat

tracking system for 2021 and their differences.

	Name	Type of device	weight	battery life	Include app	Accuracy level	Health Monitor And activities
1	TRACKER GPS COLLAR	-gps -sim -water proof	30g		yes	Longe range	
2	CUBE PRO	Bluetooth waterproof	12g		yes	short	
3	PETKIT P2	Bluetooth	8.8g		yes	short	yes
4	KIPPY VITA	-gps -sim -waterproof	46g		yes	longe	
5	LOCATOR TABCAT	-Radio frequency -waterproof	6g		no	longe	
6	WEENECT CAT2	-sim -waterproof	25g		yes	longe	yes
7							

Table Source: <https://www.t3.com/au/features/best-cat-gps-tracker>

There are over 29 million pets in Australia. Approximately 61% of households in Australia own pets, with dogs being the most common (40%), followed by cats (27%). According to the Pet Census report 2016, 1 in 5 pet owners have both a cat and a dog. [3]



### How much do Australians spend on their pets?

Overall, Australian households are estimated to have spent over \$13 billion on pet services and products in 2019 [1]. Dog owners spent the most, with an estimated average of \$1627 spent per animal each year. Cat owners spend an estimated average of \$962 per animal each year [1].

### Pets & Family

Animal Medicines Australia say, in 2019, over 60% of dog and cat owners considered their pet as a member of the family. Companionship is the main reason for Australians getting a pet, followed by rescuing animals, being given animals, teaching children responsibility and for relaxation.

## **Losing your pet**

Loosing your pet can be a devastating and traumatic experience. Humans tend to develop a lasting attachment with their pets, which breaks at the loss of the pet.

## **Stolen/Missing Pets**

A pet detective Anne-Marie told 9 News. "When you find a lost pet, its actually not a case of finders keepers, you actually are required by law to make every attempt to reunite that pet with its rightful owner,".

Anne-Marie said thefts are on the rise right now because there is a supply and demand issue. More people want a pet because the pandemic has left them feeling lonely, and thieves are taking advantage of this by stealing furry friends to sell them for a profit.

## **Detailed Description**

### **Aims**

**Build a state-of-the-art web app and tracking collar, to give pet owners a 360 view of their best friends.**

Learn to use new software

Build prototype of key features, such as GPS/MAP, Health Tracker and Geo-alert to present to stakeholders and investors within 3 weeks.

Design web app and prototype of interface that is user-friendly and compatible across multiple devices/platforms to present to investors. We aim to have a demo of the app created and ready for testing within the next 3 months.

Provide drawings and illustrations of the Collar and build a physical prototype of it, ready for testing within the next 12 months - following the launch of a crowdfunding campaign.

## **Plans & Processes**

It is all fun and games until someone loses a pet. Well, in our case that's what the motivation was behind the idea of developing pet finder. Pet finder helped us by reuniting us with our lost pet, that made us realise that nobody should ever go through the pain of losing their beloved pet. We wanted everyone to experience the benefits of Petfinder as to some, pets are more than just animals, they are family.

Pet finder will not only help people by re-uniting them with their lost or stolen pets but also monitor their health. For us humans we have all the latest gadgets to show us even a minor irregularity in our heart rate, body temperature etc so why not have something similar for our pets that we so dearly love, something that would keep a pet owner up to date with the latest information regarding their pet's health. Pet

Finder does exactly that, it not only helps owners to keep track of their pets but also keep an eye on their health status e.g., heart rate by simply logging into the pet finder application one could see the average heart rate over a period of time e.g., weekly or monthly. It can monitor it as well as notify the owner by sending out a notification every time it detects an irregularity. It also stores data for a period of 12 months so you can always refer back to it when you need it.

Pet finder has revolutionised the way how we keep track of our pets as well as their health and based on the information it would provide its users, we can potentially prevent or at least reduce the risk of any unforeseen situation that could affect or harm our pet's health.

Another feature that we have included, is a safe zone monitor. The users would get to set a safe zone radius and if the pet goes out of that safe zone radius the app would immediately send out a notification and alert the owner with the GPS location of the pet at pinpoint accuracy. This would help many pet owners to act pro-actively and prevent any mishappening.

Pet finder can also be downloaded onto multiple devices so everyone in the family can keep track of the pet and stay updated with the latest data.

We also understand that stress and fears associated with your pets while you are away either on a vacation or at work. That's why we have included a live streaming option. The camera on your pet's collar can show what your beloved pet is up to with just click of a button. It also gives you an option to record a video which can be easily accessed anytime on the app.

Ever felt like talking to your pet while you are away? well, now you can. You can now speak to your pet through the pet finder app installed on your phone and your pet can hear your voice through the per finder collar which has an inbuild speaker that communicates with the app.

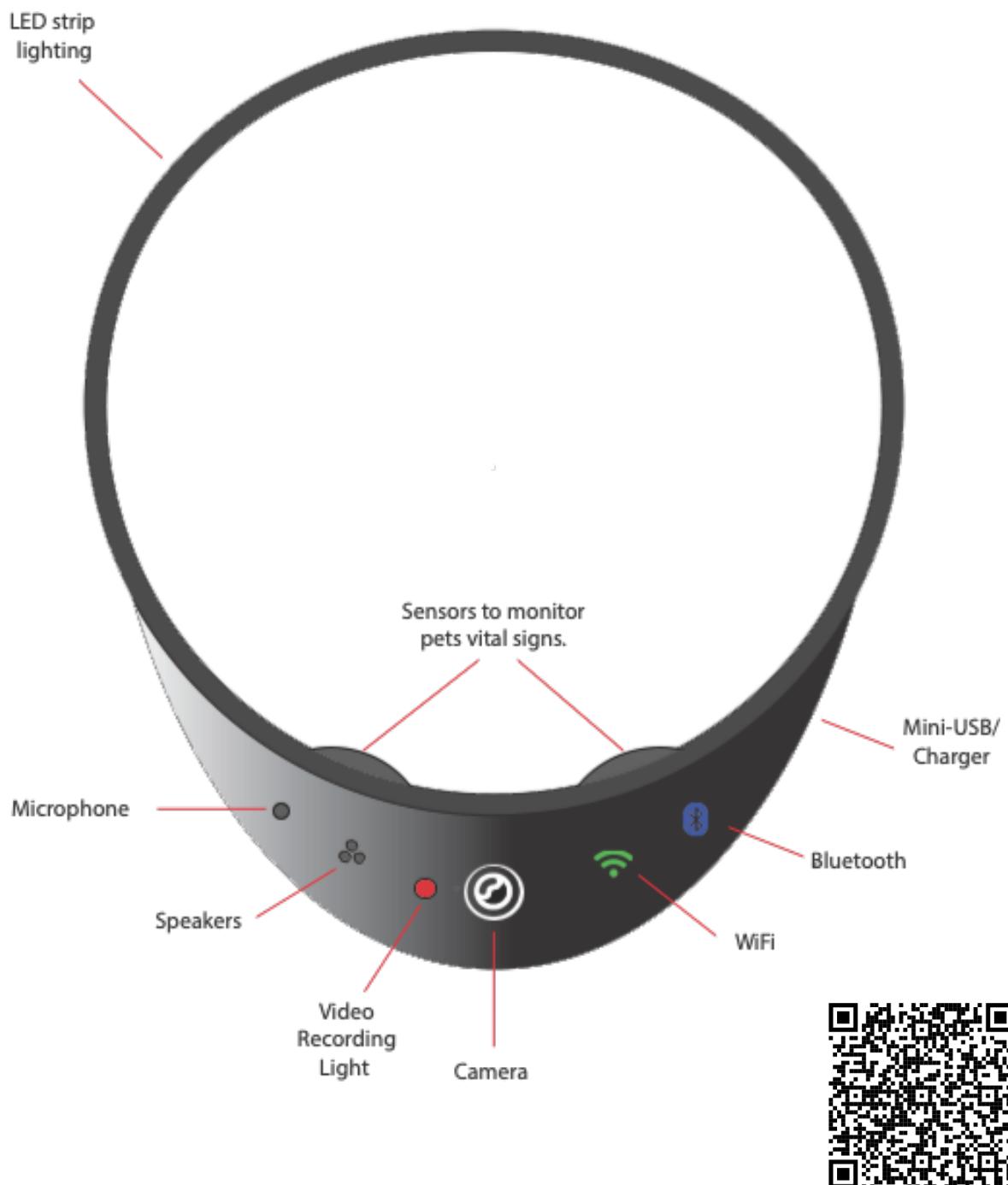
The collar has been designed keeping in mind the comfort of your pet. The collar is not only durable for everyday wear but has been designed to last for a longer period of time. We understand pet's everyday adventures and hence we made sure that these collars can stand up to their everyday adventures.

We have manufactured the collars with best quality padding to provide that extra bit of comfort to a pet. It has been designed to curb pulling without using a body harness or causing pain .

We have designed this collar keeping in mind our eco system. The material that we have used has been made from recycled material.

Pet finder collar and app has been equipped with the latest technology which lets users check and do multiple things. As explained above, it can help you check your pet's heartbeat, notify if your pet leaves the safe zone, let's you speak to your pet etc, track your pet's location etc.

# THE PET FINDER TRACKING COLLAR



Please Note: QR Code redirects to <https://xd.adobe.com/view/c4c048ac-4a08-4392-80cc-68a1b92ab61f-9193/screen/9af33555-9046-408d-bfb27ed74863/> .(by https://www.qrcode-monkey.com)

Let's go over some of the technologies that we have incorporated in our product:

**GPS tracker:**

Using cell coverage, the Pet Tracker sends **GPS** coordinates to your smartphone and devices. This means you can pinpoint your pet's current location from anywhere in the world.

GPS tracking system is capable of tracking the exact location of your pet in real time. our GPS tracker can easily be attached to the collar of your pet and it can generate real time data which can be viewed anytime by simply logging into the app on your phone or any other smart device. we use state of the art cutting edge technology and gsm module as well as sim card to track every single movement of your beloved pet. the gps system can also detect if your pets leave the set safe zone and can send a notification straight to your phone.

**Wi-Fi/Bluetooth:**

The Pet Findr comes with built-in Wi-Fi and Bluetooth connections and can be easily paired to your phone or other device.

**LED Light**

There is a built-in LED colour changing light to draw attention to your pet at night, the colour codes are as follows:

Red - when you pet is reported lost/stolen.  
Blue - when pet goes outside allocated safe-zone.  
Green – when camera is recording.

There is a built in Pet Health Tracker to monitor you pets hearts rate, exercise routines and food intake, we have a built-in barcode scanner so you can record nutrition information – and keep a pet food journal. Pet owners can check pet's hydration level and report on the overall health of the pet, as well as store information about vaccinations and next pet appointment reminders. The health tracking feature tells you if your pet is too thin, overweight or obese and can also work out how much food your dog would need each day.

**ACTIVITY TRACKING** – Monitor your pet's activity – see changing trends; set activity goals.

**TEMPERATURE** – Monitor your pet's body temperature with Pet Tracker Collar – detect fever, heat stroke, hypothermia, etc.

**HEART RATE** – Monitor your pets (Heart Rate Variability) and for any changes or abnormalities that could indicate pain, stress or underlying disease.

**CALORIES** – Track calories burned by your pet's, water intake and help them in weight loss programs and prevent obesity.

**More about the heart rate monitor:**

The LED lights installed on the collar are paired with light-sensitive photodiodes to detect the amount of blood flowing through the veins at any given moment. These LED lights can easily calculate the number of times the heart beats and based on the data stored on the app it can raise an alert in case if it detects any irregularities in the heartbeat and instantly notify the owner. This state-of-the-art technology can prove to be quite significant in preventing any medical emergencies and can ensure that the pet is provided the care it needs on time.

**Safe zone tracker:**

The app gives its users an option to set a pinpoint location that can either be your home or office and allow the user to set a desired radius around that location. If the pet goes out of this radius the app would send a notification with the exact pinpoint location. This is done with the help of global positioning system, the sim card installed pet's collar and google APIs. Google APIs are application programming interfaces (APIs) developed by Google which allow communication with Google Services and their integration to other services.

**Roadblock's**

Roadblocks are an unavoidable part of any new project. Every team that works on a new project at some point comes face to face to roadblocks or issues that in some way halt or effect the progress of the project. These roadblocks can come in different shapes and sizes, some common examples of roadblocks are - fear of failure, negativity, communication gap, no clear vision ,no clear plan ,poor time management etc .Every road block is different and unique in its way and hides an opportunity to learn as well as enhance your skills provided you know how to use these roadblocks to your advantage and not let them effect your determination and passion to succeed or complete your project on time in any way. What is required is an unique approach depending on the type of situation, the solution could be writing algorithms on how to resolve a type of problem. Some roadblocks can be easily solved, and some require an extra bit of effort.

When we started working on pet finders, we had a clear vision on exactly what we wanted it to look like however we are not really confident about resolving the risks that we might face along the way as this was our first project as a team and we had only known each other for a few weeks. During our journey we came across roadblocks at so many points and faced situations that we hadn't anticipated. Situations that almost demotivated us and made us wonder if we would ever be able to finish the project on time.

Some of the roadblocks that we faced were:

1. Difficulty learning software: Most of us don't have an IT background and had no previous experience of working on an I.T project. This was a major challenge as learning software and then using it build our product was as difficult as learning to drive in a day.

2. Trouble coordinating between different environments (android/apple) : We all know how different IOS and android are from each other. To a user its services the same purpose they might not notice significant differences however for a programmer to develop an application that would function well on both the environments was bit of a challenge.
3. COVID-19 – Due to lock-down and social distancing it is hard to collaborate with the team face to face.
4. Limited access to features and software without paying subscription fees. Most of the websites only offer limited access to unpaid access and to require payments to fully access all the features. This made it difficult for us to access all the resources that we wanted to access for our project as a result we had to turn to multiple websites to gather information and resources.
5. Not enough time to create a prototype of the collar and web application-Most of us work full time and have different work schedules. This made it difficult for us to spend the desired amount of time working on the project as we would like. Also, comparatively to a 24-week duration course, we only had a limited amount of time to work on the project.

We overcame these challenges by having regular meetings using Microsoft Teams, using freeware and prioritised and split up the work tasks evenly among the group.

Despite the fact that most of work full time and have different work schedules we were committed to have regular team meetings to discuss project development plans and strategies. Despite having work early, the next day we have had meetings at late at night. This helped us to stay on track and finish the project before the deadline. This also gave us enough time go through the challenges and come up with strategies to overcome them.

We used freeware and open-source applications for our project that helped us with our project development to a great extent. We were able to incorporate the options and features that we wanted include and design a prototype of our project.

Splitting and distributing work evenly between all team members proved to be a game changer. It increased the overall productivity and helped us to complete the project as per the deadlines set. We also assigned a project manager to the group responsible of overseeing the project and ensuring that all deadlines are met.

#### Design & Development Process

We are currently designing and developing a prototype of the APP for smartphones and testing the user-interface. This would give us an overview of how our app would look and what other features we could add to the app in the future. This will also help us understand any shortfalls. To create a live prototype of the collar with built in sensors and other features. We also want to create an application and conduct debugging tests of the app .We would also like to get user feedback on the app before publishing it, one way do to it could be by conducting market research and

getting feedback from a group users with different types of pets and getting feedback on the application and based on the feedback we would work on final changes if any and once tested and approved we would like to publish the application on app and play store so it can be accessed by the users. We would also like to work on adding a new feature such as assistance for the elderly and blind.

# Documentation

## Website and Code

Our website link is <https://petfindr.github.io>

## Code - Sublime Editor

## Stylesheet - style.css

```
project.html

1 <html>
2
3 <head>
4   <title>Project Idea</title>
5   <link href="css/style.css" rel="stylesheet">
6 </head>
7
8 <body>
9
10 <header>
11   <h1> Project Idea</h1>
12 </header>
13
14 <main>
15   <p>Our project comes with a lot of amazing features consolidated in one comfortable and wearable device. Instead of having to buy different devices for different purpose; below are the list of features that would give you a peace of mind for your pet and it all in one.</p>
16
17 <h2>Project Description</h2>
18   The idea is to launch an app and web portal, designed and developed in Australia. The app gives you full control of your pets location and health from the convenience of your Smartphone and Devices with ease. It has a "reminder" feature, allowing you to set alerts for feeding time, playtime, walks, grooming and when they need to take medication etc.</p>
19
20   Find My Phone helps you locate your lost Smartphone and get it back, our PetTrackr app is based on the same concept, but uses google maps and Global Positioning System (GPS) technology for real-time or live tracking and seeing location activity, giving you the ability to track your pet and manage your notification settings from anywhere in the world.</p>
21
22   The health tracking feature tells you if your pet is too thin, overweight or obese and there's also a "recommended food and water intake" option that uses data from a range of pet brands and works out how much food your dog would need each day.</p>
23
24   The PetTrackr is lightweight and durable, it is aim is cover all aspects of your pet's health and safety. This forms the basis of a health check appointment and reminder service and is really helpful tool for owners and their vets too, vets can use the data to focus on a particular area that requires attention and conduct further tests if required.</p>
25
26   Your PetFindr has no range limitations. On the map, you will see your pet's approximate location. If your pet cannot be found, it will show you the last known location (if available). Pet owners can also setup virtual safe zones and receive notifications when their pet leaves the area, it can also easily be sync to your phone or digital device via Bluetooth and Wifi.
27 </p>
28   Alarm is sent to your smartphone/device if collar is removed, you can simultaneously lock or unlock the collar at any time, by pressing a button on your smartphone.
29 </p>
30   Notifications and SMS's can be sent directly to your App and Online Portal. You can also request for SMS to be sent to your friends and family, however for this feature users are required to upgrade their subscription to an SMS pack.
31 </p>
32   Connectivity is a crucial part of product design and performance and the choice of connectivity technology must be considered early in the process. This is a challenging choice given the quick technology and market development. 2G and 3G networks are starting to be phased out and new 5G network technologies are becoming increasingly popular.
33
34 <h2>Overview</h2>
35   PetFindr is a web app designed by Pet Finders, used to help pet owners track or find their furry friends.</p>
36
37   If you are worried about your pet disappearing for long periods of time, worry no more, PetFindr will help you locate your pet, giving you a piece of mind at the touch of a finger.</p>
38
39   We are launching an app and web portal, to give pet owners full control of their pet's location and health from any compatible Smartphone and Devices with ease, and easily be sync to your phone or digital device via Bluetooth and Wifi.
40
```

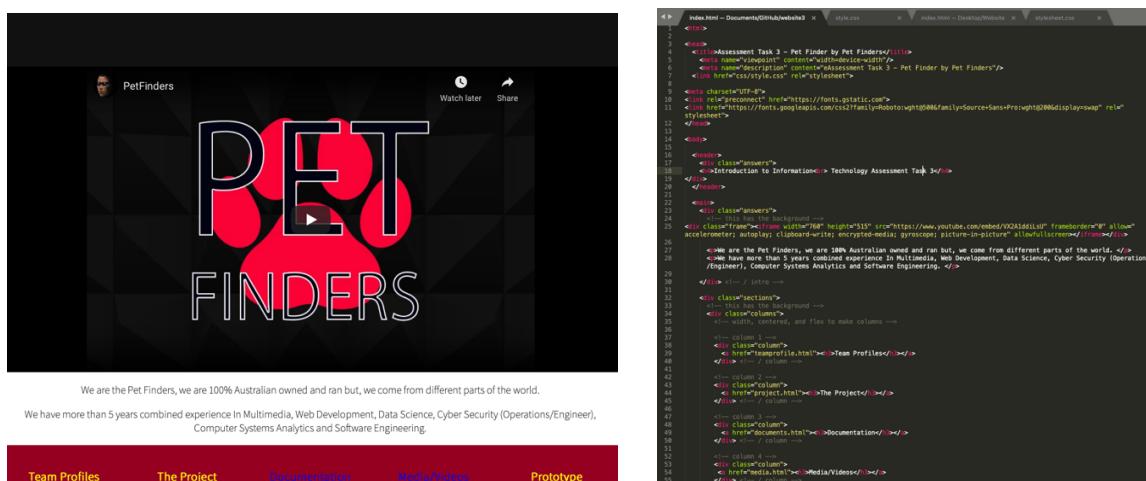
```
index.html - Documents/GitHub/website3.x          style.css x

1  body {
2      margin: 0;
3      /* set default font size */
4      font-size: 18px;
5      font-family: 'Source Sans Pro', sans-serif;
6  }
7
8  <style>
9  a:link {
10     color: yellow;
11     background-color: transparent;
12     text-decoration: none;
13 }
14
15 a:visited {
16     color: yellow;
17     background-color: transparent;
18     text-decoration: none;
19 }
20
21 a:hover {
22     color: #fff;
23     background-color: transparent;
24     text-decoration: underline;
25 }
26
27 </style>
28
29 /* =====
30 Typography
31 ===== */
32
33 h1 {
34     font-size: 40px;
35 }
36
37 h2 {
38     font-size: 30px;
39 }
40
41 h3 {
42     font-size: 22px;
43 }
44 h3 {
45     font-size: 20px;
46 }
47 h4 {
48     font-size: 18px;
49 }
50
51 /* =====
52 Layout
53 ===== */
54
55 header {
56     background-color: #111111;
57     color: #E0E0E0;
58     padding: 30px 0;
59     text-align: center;
```

[View/Download code](https://github.com/PetFindr/petfindr.github.io/blob/main/css/style.css): <https://github.com/PetFindr/petfindr.github.io/blob/main/css/style.css>

Homepage - index.html

## Code - Sublime Editor



**View/Download code (GitHub):** <https://github.com/PetFindr/petfindr.github.io/blob/main/index.html>



## APP Interface Prototype

Prototype Of APP Interface: <https://xd.adobe.com/view/c4c048ac-4a08-4392-80cc-68a1b92ab61f-9193/screen/9af33555-9046-408d-bb40-bfb27ed74863/>

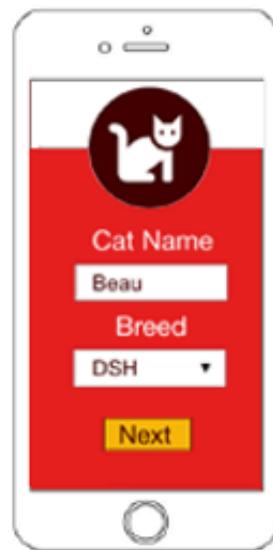
Watch full video on YouTube: <https://www.youtube.com/watch?v=p8eVF6wCsJw>



Enter your full Name and Email, press 'next' to continue.



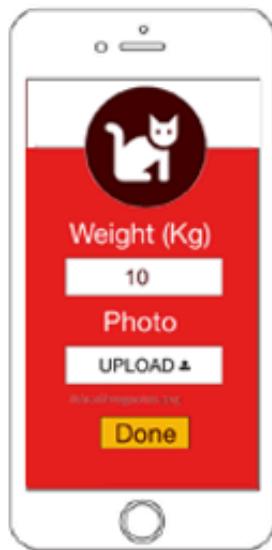
Click on the screen and select 'Type Of Pet' e.g. Cat.



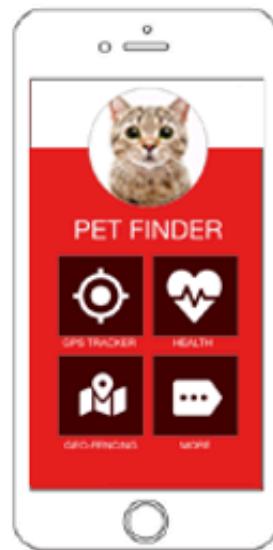
Enter your Pet's Name and breed, press 'next' to continue



Enter your Pet's Birthday and Sex, press 'next' to continue.

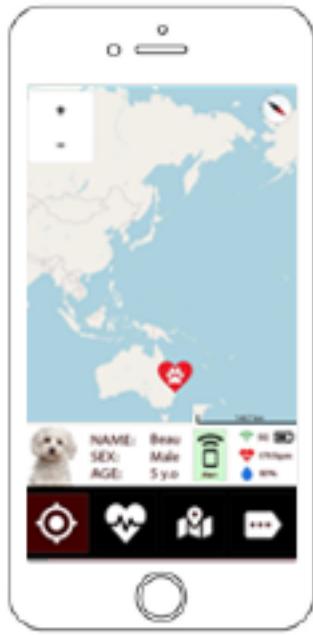


Enter Weight and Upload photo. press 'done' to continue.

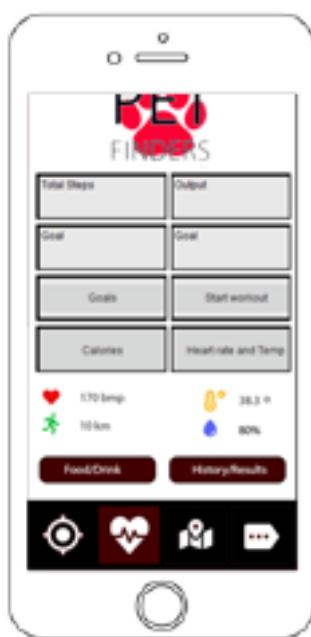


You are now ready to use your pet finder app. Next, we will setup the collar

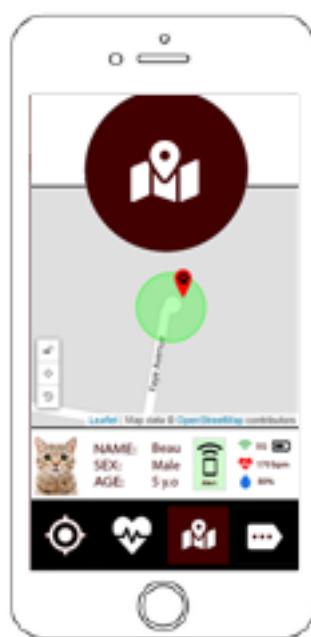
GPS Tracker Prototype



Health Tracker Prototype



Geo-Fencing Prototype

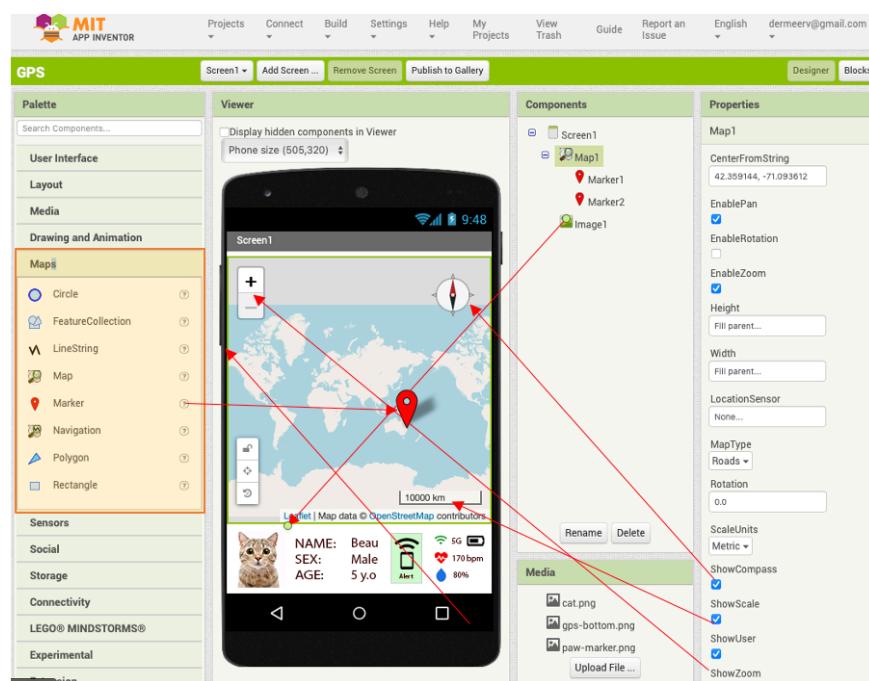


GPS Tracker Prototype

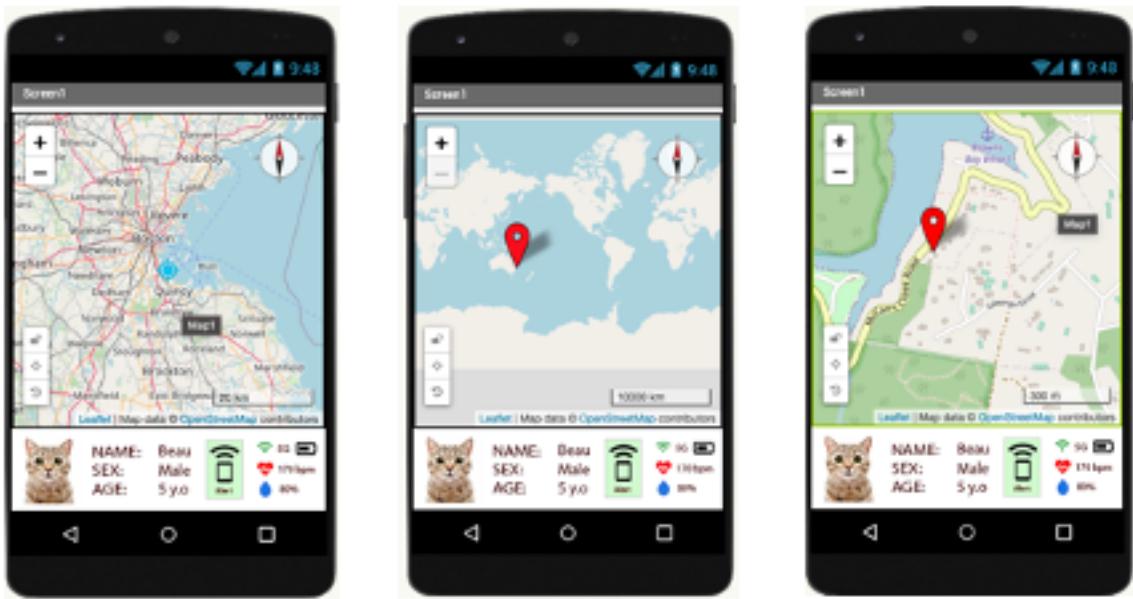
#### GPS APK file:

[https://rmiteduau-my.sharepoint.com/personal/s3824193\\_student\\_rmit\\_edu\\_au/Documents/Microsoft%20Teams%20Chat%20Files/GPS-app.apk](https://rmiteduau-my.sharepoint.com/personal/s3824193_student_rmit_edu_au/Documents/Microsoft%20Teams%20Chat%20Files/GPS-app.apk)

#### GPS Feature Documentation



[Open MIT App Inventor Interface and create a new screen for your project.](#)



The blue dot shows you where you are on the map.

The red pin marks your pets' locations on the Maps.

Control the zoom level of the map by clicking on the "+/-" buttons.

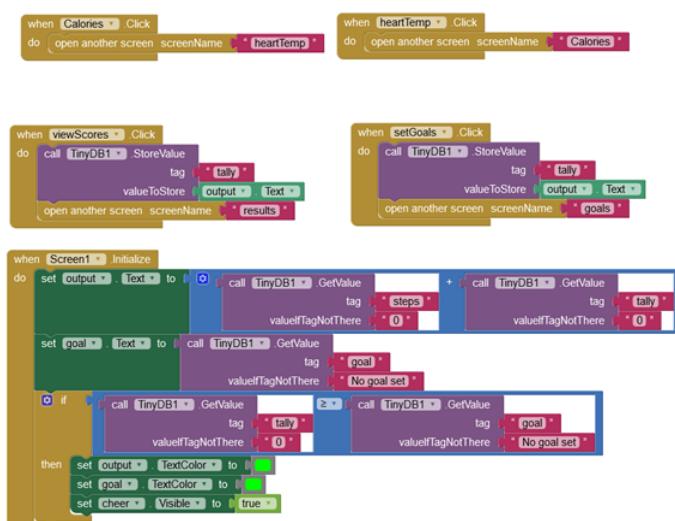
### Health Tracker Prototype:

**HealthTracker APK file:** [https://rmiteduau-my.sharepoint.com/personal/s3884661\\_student\\_rmit\\_edu\\_au/Documents/Microsoft%20Teams%20Chat%20Files/Health\\_Tracker.apk](https://rmiteduau-my.sharepoint.com/personal/s3884661_student_rmit_edu_au/Documents/Microsoft%20Teams%20Chat%20Files/Health_Tracker.apk)

Landing Screen:



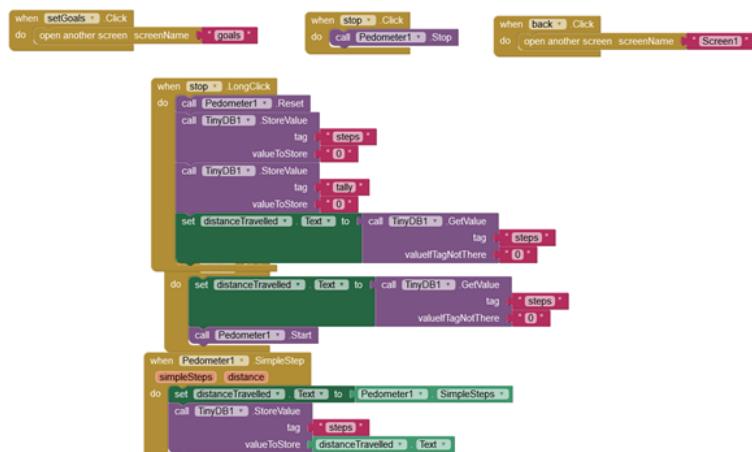
Block Code



The landing screen includes a readout of the current Total Steps and Goal at the top of the screen. When Total Steps exceeds the Goal the numbers turn green and a green cheer message appears at the bottom of the screen. Four buttons are included as a navigation menu. The TinyDB1 non visible component is required to retrieve the Total Step and Goal values from other pages. The other non-visible components are placeholders for a later prototype.

## Workout Page:

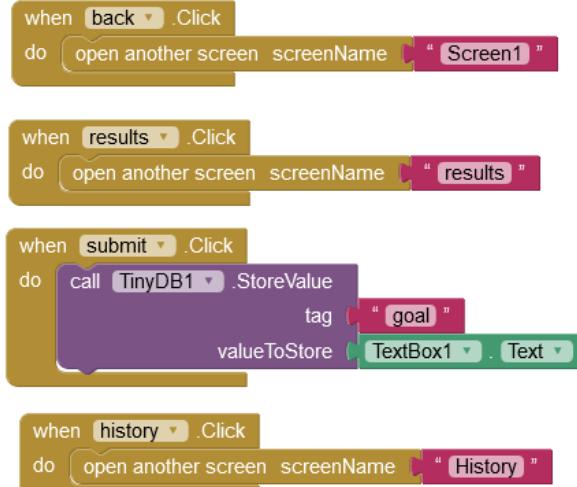
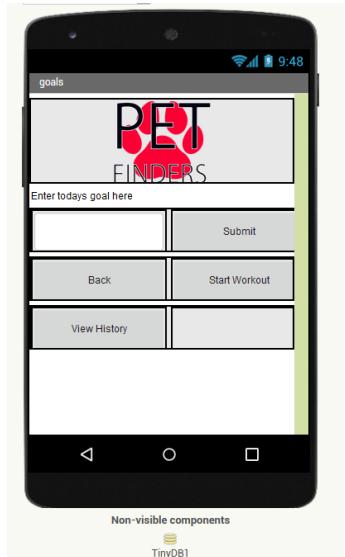
### Block Code



The workout page uses the pedometer non visible component to count steps and the TinyDB1 component to store them. Due to limitations in MIT app inventor the app cannot be continuously running in the background, so the counter is set up as a stopwatch before we move to more advanced coding tools. Pressing start begins the count, tapping stop working out pauses it and holding the button zeros the counter on this page and the landing page. Menu options to the landing page and goals page are included.

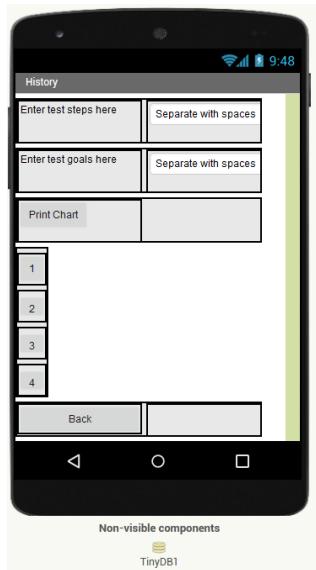
## Goals Page:

### Block Code



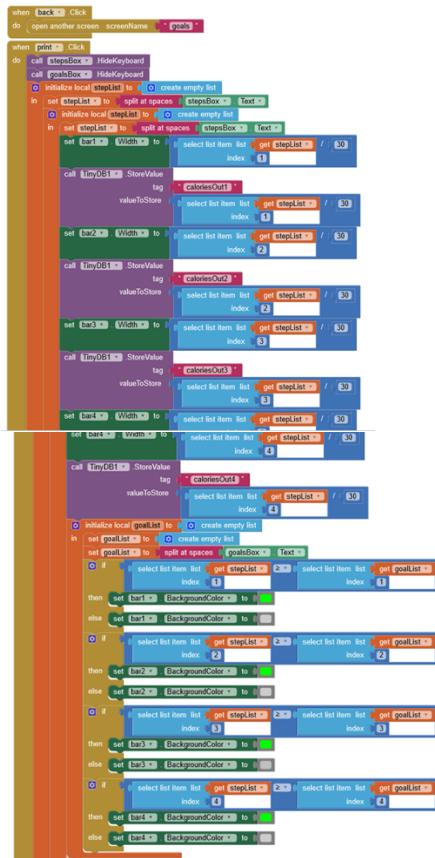
The goals page uses the TinyDB1 component to store the user entered goal.

## History Page:



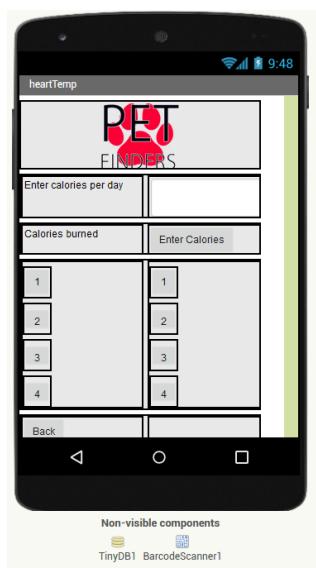
Non-visible components  
TinyDB1

## Block Code



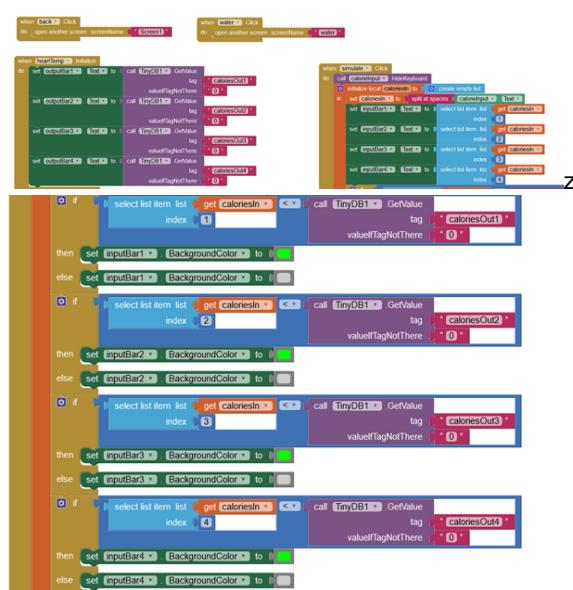
The History page simulates a later function where the app will record the continuous data it receives and generate graphs to present the information to the user. Due to limitation with the MIT app inventor this is simulated by having the user enter test step and goal data and then adjusting the size of the following bars based on the step data to create the graph. The bars change colour if the step in that position in the array exceeds the corresponding goal. The TinyDB1 is used here to store the step data to be used as calories out information on the Calories page.

## Calories Page:



Non-visible components  
TinyDB1 BarcodeScanner1

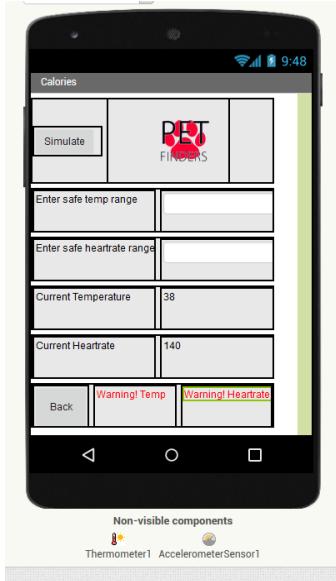
## Block Code



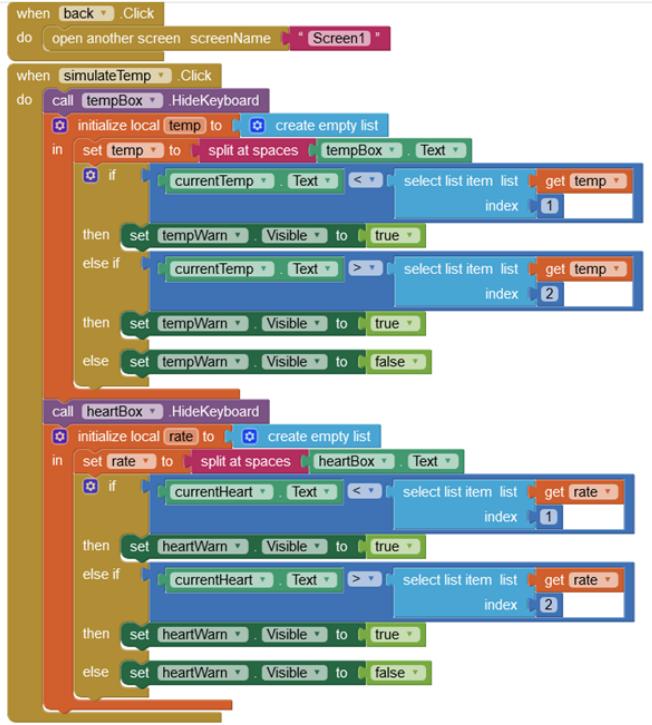


The Calories page uses TinyDB1 to populate a data for calories burned based on the test step data entered by the user on the History page. The user enters test values for calories eaten per day to create the calories eaten. If calories burned exceeds calories eaten the relevant bars turn green. The barcode scanner non visible component is included as a place holder for a later version of the prototype that will receive the calories eaten by scanning pet food barcodes.

### Heart-Temp Screen:



### Block Code



The Heart-Temp screen simulates a function that will later receive data from sensors on the PetFinder collar. Current temp and heartrate are static values and the safe range for temp and heartrate are entered by the user. If the current value falls outside of the safe range a red warning message for the exceeded parameter is displayed. Later prototypes will include a push notification in this scenario. The thermometer and Accelerometer sensors are used as placeholders for the sensors on the collar.

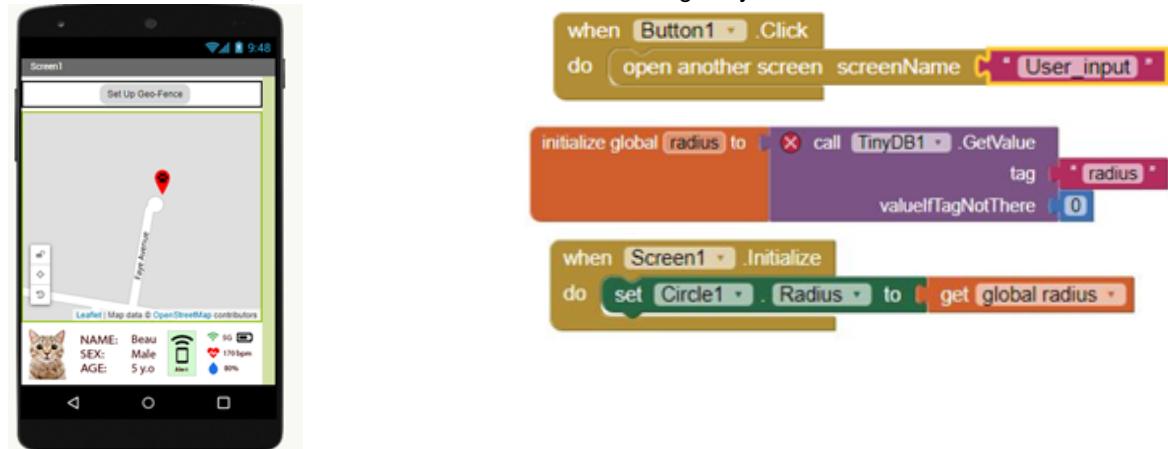
# Geoalert Feature Prototype

## Geoalert Feature APK file:

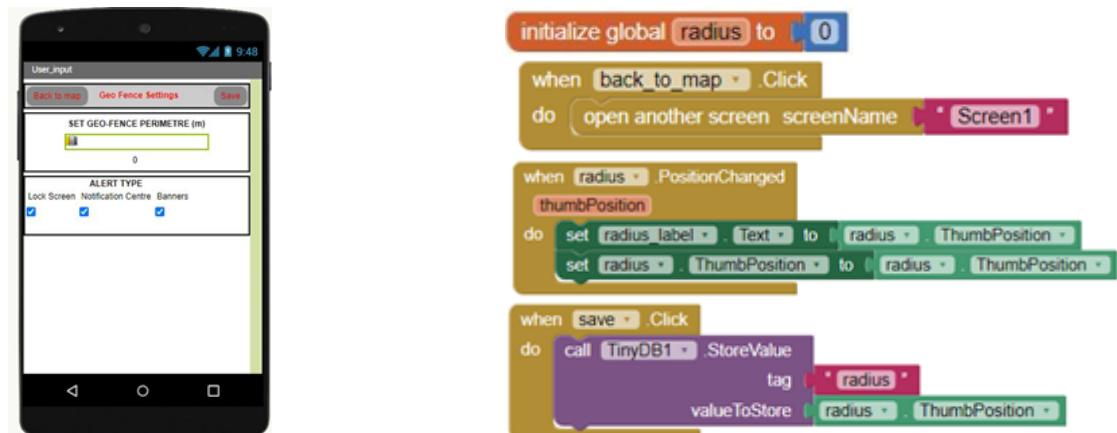
[https://rmiteduau-my.sharepoint.com/personal/s3885261\\_student\\_rmit\\_edu\\_au/Documents/Microsoft%20Teams%20Chat%20Files/Geoalert\\_feature.apk](https://rmiteduau-my.sharepoint.com/personal/s3885261_student_rmit_edu_au/Documents/Microsoft%20Teams%20Chat%20Files/Geoalert_feature.apk)

## Geoalert Feature Documentation:

When first starting the geo-alert, it will be integrated into the GPS tracking screen as an optional feature. When the screen is initialised, the radius will be set to 0 until it is changed by the user in the next screen.



The button above will send the user to the settings page in order to set up the geo-alerts



In the geo-fence settings, the slider will determine the radius of the geofence. When the slider position is changed and the save button is pressed, the value of the slider will be stored when returning to the map screen.



The value of the slider that was stored in the previous screen will be returned when the screen is initialised. The value will be called, and the fence will be set. Once complete a green circle around the user's home will appear indicating the pre-set area of the designated as the geo-fence and should the pet leave the area, you will still be able to track the pet, however the user will be notified on their mobile device. The above image shows the radius set to 20m.

## Roles

All roles work hand in hand almost like a relay race; not one can be fully and efficiently completed without the other.

In this scenario, Quentin is playing our lead developer. The lead developer has the great responsibility of mentoring, providing general guidance on design and putting work into the foundation and early stages of the development of a product.

Victor is playing our interface designer. The importance in this role is to take the code from Quentin and any other developers and turn it into a nice looking, easy to use layout and design for users to enjoy.

Mark and Kanav are playing our cyber security team. Cyber security is very important when starting any company, not only are cyber security specialists responsible for keeping our code and servers secure, they also need to put security in place in order to avoid possible any possible fraud whether it is in app purchase fraud to identity fraud, it is all accounted for.

Matthew is playing our database administrator. What this means is that Matthew is responsible for ensuring databases run efficiently using specialized software to store and organize data such as financial information and customer shipping records. Matthew will be working hand in hand with Mark and Kanav (our cyber security team) to ensure that limited data is available for users and other data is secure from unauthorized access, the cyber security team will be attempting to infiltrate the system in order to find any possible security breaches.

Connor is playing our lead tester. Test results must be passed through Connor first before being published. The lead tester must either conduct experiments and tests themselves or improve and approve the rest of the team's completed tests.

## Scopes and Limits

Due to the time constraints, it is understood that the project in its entirety cannot be realised. The scope of what this project entails is massive and for a small group to be able to design, develop and finalise such a project in the time given is unrealistic.

It is however possible to show the essence of the project and what you might expect if more time was given to execute the full process. With respect to time, the functionality of the project can still be communicated through wireframes of the app and blueprint plans of the collar.

Using MIT App Inventor, app screens can be designed such that they are visible and can be understood as to what function each screen has. We used MIT app inventor to create wireframes for 3 of the core functionalities of the app.

Three functions from the app will be shown as a representative of the app's full functionality and capabilities: a health tracker, a GPS tracker and a geo-alert feature.

A health tracker function that measures the pet's steps taken, heart rate and temperature as well as keep track of caloric burn for your pet. It keeps track of the

pet's steps and calculates the how much calories your pet has burned as well as a history of steps per day and presents that on a graph. The tracker can also compare caloric intake (manual input) to calories burned. The heart rate is monitored, and a safe range can be manually set which alerts you if it detects an abnormal heart rate.

In regard to the health tracker, it cannot measure data without sensors. As such simulated and static data has been used as placeholders. Also, a limiting factor in using the MIT app inventor is that it cannot run continuously in the background, a user must tell it when to start and stop counting. Similarly, the heartrate and temperature readings only appear when asked to simulate those measurements.

A GPS tracker will provide a visual representation of the pet's location using a GPS module inside the collar, this will work in tandem with the Google maps APIs and SDKs in order to give a precise and accurate location. The screen shown will show a map using Google Maps and will show your location as well as the location of your pet (wearing the collar). You can see how far you are to the pet in relation to the time as well as distance.

A geo-alert feature is an extension of the GPS tracker that allows the user to set an invisible perimeter around the property and can alert the user to the pet having left the designated area. The geofence can be created using the app and all the user does is set it and if the pet wearing the collar, leaves the area, you will be alerted on your mobile device.

Obviously making a functioning geo-fence is difficult without first setting up the APIs to be used and considering the time frame, that is very difficult. The app screen will show an example geo-fence as well as 'setting-up screen'.

The app will not have a lot of functionality in some respects, but the app screens will provide adequate visualisation in order for it to be understandable and comprehensible. It will not be able to be demonstrated as there is no physical collar but considerable efforts will be put into demonstrating what it could look like if it was to exist.

In terms of the actual collar, the blueprint, plans and a visual representation of the collar will be shown, however the physical collar will not be made. All the specifications will be shown as to how and what will be used to build and program the collar.



## Tool & Technology

The PetFinders project is made up of 3 core parts: app, website and collar. Each has its own functionalities and capabilities. This section will explore the tools and technologies we use in order for our project to work.

### The App

- MIT App Inventor - Proof of concept - <https://appinventor.mit.edu/>

- XCode
- Android SDK
- AdobeXD

### The Web Portal

- GitHub

### The Collar

- ARDUINO UNO REV3
- Arduino IDE
- U-blox NEO-6M GPS Module
- Leather
- LEDs
- Microphone and small speaker
- QR Code
- Dog Tags

### APIs and SDKs

- Google Maps SDK for Android
- Google Maps SDK for iOS
- Google Calendar API
- Google Maps JavaScript API
- Google Maps Embed API
- Google Directions API
- Google Distance Matrix API
- Google Geocoding API
- Google Geolocation API
- Vonage In-App Messaging SDK
- Vonage In-App SDK
- FitBit Heart-rate API

### Backend - use cloud technology – SaaS

- Microsoft Azure
- IBM Cloud
- Relational Database - MySQL
- Database management tools

### Presentation

- Camtasia Studio 2020
- Premiere Pro
- After Effects
- Phones for Video recording

There is a lot of technology that works in the background to realise our project and those were also included for full transparency. One of the PetFinders, Victor, has

experience using most of the tools and technologies above. He has experience in using AdobeXD as well as using a few of the APIs and SDKs we listed above.

#### Testing

We plan to use the following software for testing, developing and debugging app.

#### Xcode

Is Apple's integrated development environment and used for creating apps for MAC, iPhone, iPad and apple watch. This software is not available on windows PC. The cost of membership for an Apple Developer Program is \$99USD per year.

#### Android Software Development Kit

AKA Android 'SDK' is freeware and is used for developing and testing applications running on Android Operating System.

After every technical addition, it will be tested for functionality against all other features to ensure there are no bugs. For example. The QR code feature will be tested while the GPS feature is running in the background and every other combination of features tested back and forth etc.

The aspect that will be the most time consuming in testing will be the pet compatibility. Heart rate and other data must be readable on most if not all species of pets and thus much testing is needed in order to find the perfect balance for an all in 1 collar.

The collars will be tested on every species we can get our hands on. The sensors must not hurt the animals in any way so we will test different locations to attach the product onto each species and include the optimal position for each tested animal in the user manual.

After all the technical and variable testing is complete, another compatibility test will be performed over different devices with the polished product. This will be left to last as it is more efficient to have a working product which requires minimal tweaking and adjustments for compatibility on different operating systems and devices.

#### Timeframes

Week	All	Matthew Ahearn	Victor Van der Meer	Kanav Atri	Connor Abdulai	Mark George	Quentin Schuster
1		Explore possible tools and technologies	Write report section aims Set up team GitHub profile	Write report section team profile	Write report section tools	Explore possible tools and technologies	Further research into project idea
2		Write report section Timeframe and risk	Write report section tools and technologies	Investigate tools for prototype	Write report section Topic Write report Section Motivation	Write report section Roles	Write report section scope and limits
3		Learn mit app developer	Learn mit app developer	Determine preferred coding language	Write report section Landscape	Write report section testing	Learn mit app developer

				for combined prototype			
4		Develop Health Tracker app prototype	Develop GPS tracker app prototype	Investigate sensor options for location, steps, heartrate and temp	Write report section skills and jobs	Compare API's i.e thingSpeak and Arduino for compatibility with app language	Develop geoalert app prototype
5	Reflect on Assignment 2 Feedback	Create Health tracker app prototype documentation	Create GPS tracker prototype documentation	Write report section plans and progress	Test Health Tracker app prototype	Test geoalert app prototype Test GPS Tracker app prototype	Create geoalert app prototype documentation
6	Write group reflection	Assist as required for final report submission	Compile Presentation	Write report section plans and progress	Compile Presentation	Assist as required for final report submission	Assist as required for final report submission
7	Submit group feedback	Learn agreed coding language	Learn agreed coding language	Build prototype of PetFinder collar with location, step, heartrate and temp sensors	Build prototype of PetFinder collar with location, step, heartrate and temp sensors	Build prototype of PetFinder collar with location, step, heartrate and temp sensors	Learn agreed coding language
8		Develop combined app prototype	Develop combined app prototype	Build basic pet food database with some common brands and items	Investigate sensor options for barcode and water	Create small database of pet types with different outputs based on type breed and weight	Develop combined app prototype
9		Adjust app prototype to take data inputs from collar prototype	Adjust app prototype to take data inputs from collar prototype	Build prototype of collar with barcode and water sensors added	Build prototype of collar with barcode and water sensors added	Build prototype of collar with barcode and water sensors added	Adjust app prototype to take data inputs from collar prototype
10		Expand app to include water intake and food database, alter calorie input data to be collected	Expand app to include water intake and food database, alter calorie input data to be collected	Test collar and combined app	Test collar and combined app	Test collar and combined app	Expand app to include water intake and food database, alter calorie input data to be collected

		from barcode scanner	from barcode scanner				from barcode scanner
11		Create new app function that allows user to specify type, breed and weight of pet	Create new app function that allows user to specify type, breed and weight of pet	Test collar, app and database	Test collar, app and database	Test collar, app and database	Create new app function that allows user to specify type, breed and weight of pet
12		adjust output parameters for calories temp and heartrate to be based on type of pet	adjust output parameters for calories temp and heartrate to be based on type of pet	Create advertising and promotional material	Create advertising and promotional material	Create advertising and promotional material	adjust output parameters for calories temp and heartrate to be based on type of pet
13		Expand pet database	Expand pet database	Test collar and app on different pets	Test collar and app on different pets	Test collar and app on different pets	Expand pet database
14		Review and expand promotional material	Review and expand promotional material	Perform stress testing of collar – water, dust, bites, impact, temp etc	Perform stress testing of collar – water, dust, bites, impact, temp etc	Perform stress testing of collar – water, dust, bites, impact, temp etc	Review and expand promotional material
15		Review bugs from testing	Review bugs from testing	Additional testing on new pets	Additional testing on new pets	Additional testing on new pets	Review bugs from testing

## Risk

There are two primary forms of risk for this project, those being software risks and hardware risks.

The first software risk we will encounter is difficulty for our team in learning to use the programming languages, API and other software we will need to use to create the project. Using mit app inventor for the initial prototype will alleviate this risk in the early stages as it is intended for use by beginners and has dedicated tutorials aimed at newer programmers. However mit app inventor has some limitations for example the apps can't run continuously in the background. We will need to move to more advanced programming language and platforms as the project progresses and our ability to learn these may be roadblock. It is possible we will need to adjust the scope of the project to accommodate our abilities as we continue.

Lack of uniformity in our devices will also pose challenges. Some of us are using Android devices and others use apple. This means that we will need be careful to select languages that work in both environments and make time for testing both settings. We have attempted to allow for both additional coding and testing time in the timeline. On the plus side this challenge means we need to build cross platform functionality into our project from an early stage rather than trying to port it later, which may well save us time in the long run.

Selecting the correct sensors will likely be a significant challenge. We need to ensure that they have API support that we will be able to use in our application and are also robust and effective on a variety of different pet species. It is very likely that we will need to experiment with several different sensor and as such significant time has been devoted to investigating sensors and testing the combined functionality of the app and collar.

We will also need to be mindful that the nature of the product will expose it to some stressful environments. The PetFinder will regularly get wet, muddy, exposed to dust, subjected to impacts and possibly bite force as well as see a variety of temperature and humidity. For this reason, we have included dedicated stress testing in the timeline.

Finally, it is worth noting that the PetFinder project is ambitious in scope with its range of sensors and functions. To help give the best chance to meet these objectives we have split the group into a hardware and a software team to allow us to develop specialisation and maximise our efficiency. It is recommended that whenever the software team present a new update of the app to the hardware team the group compare our actual progress with expected progress from the timeline and consider adjusting our scope to ensure we have a minimum viable product at the end of the fifteen weeks.

### **Group processes and communications**

We will continue to base our communications primarily through Microsoft Teams. We will commit to a minimum of two meetings per week, one midweek and one on the weekend with the frequency of meetings increasing as we get closer to the due date or as required by the group. Additional ad hoc communication for assistance, clarification or review is also to be done through the MS teams group chat to help the team feel connected and collaborative.

Our first meetings will be dedicated to understanding the assignment and breaking it down into smaller tasks. These will then be assigned to different group members with staggered deadlines through the course prior to the deadline. A checklist of these tasks will be maintained to allow easy visual reference of how the assignment is progressing. Work to date will be compiled prior to each meeting into a master document to show progress and help motivate the team. The goal is for the smaller, earlier deadlines and the checklist to be used to help us identify problem areas early in time for us to correct them.

To prevent breakdowns in communication we adopt the following policy. If a group member misses either two back-to-back deadlines, meetings or one deadline and one meeting they will be contacted individually. If there is no reply, they will be considered non-contributing and we will begin contacting out tutors to help resolve the issue.

### **Skills and Jobs**

In the case that a group of venture capitalists comes across the Pet Finders project and wish to fund us in order to help develop the product and business further.

Given we have 6 months where we are being funded, as the manager of a team of 4 people with the goal of working together to deliver a polished product and running business; the following skills and jobs are what will be sought after:

Full stack developer (with full fluency and proficiency in most coding languages and advanced design skills) To maximise efficiency, a full stack developer (deals with back and front end) is the best choice for a web developer and/or engineer. Advanced design skills are needed so that the entire software is handled by the full stack developers, this will reduce not only time but also confusion and thus much more efficient.

### Full Stack Developer

In this newly created role, we are currently seeking a full stack developer with industry experience to work with our highly competent, committed and enthusiastic Digital Development team. In this permanent full-time role, you will work closely with the team to develop, test, deploy and maintain new and existing products and features.

Through this role you will have a user experience approach to application development and be a highly organised, proactive team player with a creative flair.

### Key Competencies

- Tertiary IT degree or equivalent industry experience
- 2-3 years experience in a similar role
- HTML/CSS/JavaScript/jQuery responsive web design
- SQL database table design and queries
- High proficiency in PHP
- Experience with Git
- Excellent communication skills, both written and oral
- Self-starter with ability to work independently and within a team environment
- Energy, drive and passion
- Self-motivated
- Ability to multi-task

### The following additional skills and experience would be beneficial for the role:

- Experience with Microsoft Azure Cloud (and/or) Experience with IBM Cloud
- Experience with online storage, such as Google Cloud
- Other programming skills (Eg. Python, Node.js)
- Adobe Creative Cloud

### Hardware Engineer (with specialisation in animal tech)

The Pet Finders collar is a very sophisticated piece of technology. With many sensors in the product, it must have the desired outcome while being harmless to animals.

Hardware engineers will research, design, develop, and test processors, circuit boards, memory devices, networks, and routers; this means not only would the

hardware engineers mostly man the development of the collar but will also be a great help to everyone in the PetFinders team.

Skills needed:

- Specify and design new hardware (PCB, schematics, design documentation) in line with requirements by understanding new development roadmaps and existing products.
- Create design documentation in line with existing standards including detailed design, specifications, drawings and manufacturing limitations.
- Provide technical support to manufacturing including ease of manufacturing within the design if it makes sense for the requirements
- Contribute to project plans by providing time-scale estimates.
- Use existing tools to develop designs and to manage documentation

Qualifications and Requirements Expected:

- 2 years' experience
- BS degree in electrical or electronics engineering
- Proven track record in building hardware at a similar level as a security control panel
- Design PCB layout and design experience
- Experience in developing products that have been released to market.
- Experience in the complete development life cycle of products

**Business analyst**

to help us with enhance our processes and structures, Business analysts are needed. In order to come up with solutions to business issues, research and analysis and help to take our products to our customers.

Furthermore, there are a few requirements for all employees. Every person in the team must be able to effectively work in a team, be able to take leadership when necessary and must think innovatively. This is because in the 6 month time frame, there is no room for dissatisfaction caused by the employees. To be suitable for this position with PetFinders the ideal candidate will have:

- 2 years experiences as a Business Analyst
- A proven track record in working in Agile environment to develop high quality requirements artefacts for complex IT systems including websites and mobile applications.
- Demonstrated experience coordinating and leading consultation with internal and external consultants to elicit user and business requirements.
- Excellent verbal and written communication skills
- The ability to self motivate, work independently and in a team.
- Attention to detail
- Ability to manage own work time and priorities in accordance with aggressive timelines and budgets.
- Bachelor qualification in business, business administration, information technology or a related field.

## Cyber Security Specialist

With the addition of in app purchases and personal information being on our servers, keeping it all secure and inaccessible to unauthorised personals is a must.

As a cyber security specialist, it will involve Monitoring emerging cyber-crime patterns, the latest techniques and vulnerabilities used to hack networks by attackers, and new technology advancements in order to protect Pet

Finders live and put high end preventative measures in the 6 months they are working to set a basis for future adjustments and improvements.

### Qualifications & Skills Expected:

- I.T or Computer Science qualification.
- Knowledge of NIST (National Institute of standards and Technology) CSF (Cyber security framework)
- Knowledge of OWASP (The Open Web Application Security Project)
- CISSP (Certified Information Systems Security Professional)
- CCNA 2020
- LINUX
- COMP TIA Network +
- MSCA windows server 2016
- COMP TIA LINUX +
- CYSA+
- COMP TIA Pen Test+
- Working knowledge of ITIL aligned service delivery processes

Cyber security also requires a good knowledge of a programming language such as JAVA, Python, C++ etc .

As this project has been designed for the consumer market, we also may require working knowledge of PCI DSS (Payment Card Industry Data Security Standard) - It is an information security standard for organizations that handle branded credit cards from the major card schemes.

The PCI Standard is mandated by the card brands but administered by the Payment Card Industry Security Standards Council. The standard was created to increase controls around cardholder data to reduce credit card fraud.

Also, to assure customers and investors data security. Working knowledge of ITIL aligned service delivery processes could prove to be beneficial - ITIL service delivery occurs when an organization performs an IT service for a customer that meets two criteria: First, it should produce an outcome that the customer values. ... Services are designed, deployed, delivered, improved, and retired by using the ITIL framework.

Also, to constantly assess vulnerabilities of our system and application so that customer's personal details compromised and we are not in violation of the privacy

and data security act CEH is a must-Certified Ethical Hacker certification, is a qualification obtained by demonstrating knowledge of assessing the security of computer systems by looking for weaknesses and vulnerabilities in target systems, using the same knowledge and tools as a malicious hacker, but in a lawful and legitimate manner to assess the security posture of a target system.

## Group Feedback

### Mark George

Suggestions and agreements were swift; we all agreed that this time we all want to have an equal workload according to our skills, making it equally challenging for everyone. We have learned from Assignment 2 that we may not achieve the mark we are expecting even if we thought we did everything flawlessly Matthew created a checklist to keep everything in order; it was successful. If we get the chance to create another video; we should spend more time planning that; the video we created was very hard to get flowing. Having one person allude to the other before

cutting and making sure audio is clear are the main changes I would make. Getting everything done as fast and efficiently as we did was surprising. I learned that group work is no easy feat but is much more rewarding than individual work when it comes to results. Everyone has their own skillset and work hand in hand to create a product that could not otherwise be achieved individually. Being able to see the progress of our teamwork through GitHub was a great way to track progress for those (like myself) who didn't get to create a checklist.

#### [Connor Abdulai](#)

Considering when we started this project to where we are now has been an amazing joining with a much greater improvement. The teamwork among members and the coordination of this project has proven how well and confident each member in my team is and reflects a leadership role. Which has help in fast tracking our project. Public speaking is challenging, if we could develop a way of encouraging one another to speak up, I believe that could trigger one initiative or confidence to be more active in a meeting than being passive or a recipient of the conversation. I do not realize at any point that there was a conflict amongst team members at all since the establishment of our team, which is quite amazing for me. In my assessment one, it was quite a challenge for me as to where to start and wondering whether I was going to finish my task. It was different when it came to working with a group. GitHub has been quite an interesting platform to collaborate in with my team, as we can see the logs and activities of team members as we progress in our project by uploading our work.

#### [Matthew Ahearn](#)

The biggest improvement for the Pet Finders moving from assignment two to assignment three has been our organisation. Nominating myself to lead the meetings, create agendas and manage deadlines and tasks and Victor to maintain the minutes has made our meetings more efficient and focused. Implementing a policy of many small deadlines throughout the course rather than one big one at the due date has significantly improved the rate of work being submitted by the team and has helped us now come into the final stretch aware of our pain points and with time to consolidate. The running checklist and master copy have improved our situational awareness over the project and help kept the team focused. However, there is still room for improvement with version control as sometimes documents and links are spread over different chats in Microsoft Teams and this can cause some confusion and delay. In the future I will make a more concerted effort to increase the participation in our GitHub page to see if that improves the workflow. I was surprised by how well we handled working on two assignments at once. I have learned how important it is to break large tasks into smaller ones.

#### [Victor van der Meer](#)

Overall, the group performed well. We broke complex tasks into parts and steps and delegated them out evenly among the group. I was surprised how well group was able to give and receive feedback, and how the group was able to take the feedback from assessment 2 and implement it into the project idea for assessment 3.

- We all communicated well with each other.
- Everyone contributed their fair share.
- We offered support for each other.

We all took part in deciding how work should be allocated, I think the group felt more comfortable and relaxed around each other this time around. We handled any disagreements constructively within the team, and respected each other's input. I think we could improve the teamwork by outlining our roles and responsibilities at the beginning of the project and having more brainstorming sessions where the team can share more of thoughts, ideas and opinions. We were all more active on GitHub and encouraging the team use it as backup for their work. We posted meaningful commits and created a separate repository to host the website files. I was glad to get our website published online this time.

#### [Quentin Schuster](#)

What went well was that we divided the work equally. We also helped each other on reviewing the work and making sure everyone's happy. We also decided to get the bulk of the work, the report finished about a week so we can spend a week on reviewing and working on the artefacts. This worked in creating a good report in my opinion. I feel like my communication was a poor during this assessment and I wish I did more to communicate with my group and put more of my input in to provide my insight and voice my concerns if I had any. I was very surprised how fired up everyone was after we got our A2 marks back, we all thought we deserved better, and we were fired up to make this assignment the best we could. We worked hard to make sure we get a great mark and I'm proud of the group. One thing learnt about groups is to a common goal and the team will do their best to work towards it. What made us work as hard as we did was wanting to improve and the effort we put in I fell will surely be rewarded.

#### [Kanav Atri](#)

As a team we were focused to meet targets by the deadlines. We were open to ideas as well as communicated consistently to overcome roadblocks. We providently assisted each other as a team and expressed ourselves freely.

Tasks were well defined and distributed so everyone was clear about their portfolios. Everyone displayed TOFU (Take ownership and follow up) which in return simplified action items resulting in on time completion of tasks.

We could consider introducing reward & recognition to reward ourselves as a team on successful completion of a task. We could also work on each other's strengths and weaknesses to further improve productivity. We could also work on improving our time management skills.

I found everyone's level of commitment very surprising. Everyone was assiduous towards the project and went above & beyond. Everyone willingly participated and made significant contributions.

We maintained constant communication throughout the project that helped us with challenges at initial stages and to prevent roadblocks. Supporting each other in a team can help build trust and boost morale of the team.

We all uploaded tasks actioned on GitHub proactively. This helped us with keeping track of work done and meeting deadlines.

## Group Reflection

416 words

The team showed a high level of commitment towards the project, everyone was willing to engage by due to our busy work schedules organising regular team meetings was quite difficult during the day as a result we decided to meet late at night once a week.

We can all agree that maintaining regular communication was the key which freely allowed us to express our ideas and tackle challenges at early stages to identify any roadblocks. As a group we have learnt the importance of supporting each other, and helping others build confidence in the team, we now understand each other a lot better and we found it easier to be able to delegate tasks, once we identified what each other's strengths and weaknesses are.

Some members found it hard speaking out — those feelings of unease, anxiousness, or fear that take over in stressful social situations. A way we could overcome this this roadblock in the future we could look at introducing a reward and recognition system, on successful completion of a task. We could not find an app for this, maybe this could be our next project.

Once thing we did learn is the importance of breaking larger tasks into smaller ones, we were quickly able to go through the requirement of the task, summarise the whole question and immediately start working on the tasks, even though it took us a bit longer for the group to define our individual roles, which we also found changed over the time. Surprisingly everybody was able to adapt very well to the dynamic environment. The other thing we were surprised about was how well we handled working on two assignments at once.

There is still room for improvement when it comes to things like version and document control. We found links are spread over different chats in Microsoft Teams and this can cause some confusion and delay. In the future we will make a more concerted effort to increase the participation in our GitHub page to see if that improves the workflow. We will also work towards establishing more clear team rules and bring more clarity and discipline when it comes scheduling tasks.

We created a repository for our project and as we finished the tasks that were assigned to us, we uploaded our work on GitHub repository on regular basis, including updates to the website. This also made it easier for other team members to keep track of the work that has been done and work that's pending.