# Assignment 3 – Team Report

Contents

[**Team Profiles** 2](#_Toc62759862)

[**Personal information** 2](#_Toc62759863)

[**Tools** 2](#_Toc62759864)

[**The Project** 2](#_Toc62759865)

[Project Description 2](#_Toc62759866)

[Overview 3](#_Toc62759867)

[Detailed Description 4](#_Toc62759868)

[Aims 4](#_Toc62759869)

[Plans & Processes 4](#_Toc62759870)

[Roles 4](#_Toc62759871)

[Scopes and Limits 4](#_Toc62759872)

[Tool & Technology 4](#_Toc62759873)

[Testing 4](#_Toc62759874)

[Timeframes 4](#_Toc62759875)

[Risk 4](#_Toc62759876)

[Group processes and communications 4](#_Toc62759877)

[Skills and Jobs 5](#_Toc62759878)

[Feedback 6](#_Toc62759879)

[Group Reflection 8](#_Toc62759880)

# **Team Profiles**

You will have submitted a Team Profile as part of Assignment – on website.

Team Name: Pet Finders

# **Personal information**

One paragraph per person

* including name
* student number
* background
* hobbies
* IT interest
* IT experience

Career Plans Compare and contrast the career plans including

* ideal jobs, for each person in the group.
* What common elements are there, if any?
* What differentiates each position from the others, if anything?
* How similar or different are your career plans across the group? This is new for this assignment.

# **Tools**

group’s website:

Git repository (GitHub)

# **The Project**

## Project Description

take the following into account when making your decision.

* The passions, interests and skills of your group
* IT industry trends
* What would assist you in your career plan
* Feedback from Assignments 1 and 2 Your group will have developed some ideas in Assignment 2

## 

## Overview

**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 where stolen, why this project is so important and interesting.

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 lot 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 makes some standout 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>

### PetTracker Features (USP)

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.

**GPS/WiFi/Bluetooth**

Using cell coverage, the PetTrackr sends **GPS** coordinates to your smartphone and devices. This means you can pinpoint your pet’s current location from anywhere in the world. The PetFindr comes with built-in WiFi and Bluetooth connections and can be easily p**aired to** your phone or other device.

**Health Tracker**

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.

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.

* **ACTIVITY TRACKING**  
  Monitor your pet’s activity – see changing trends; set activity goals.
* **TEMPERATURE**  
  Monitor your pet’s body temperature with PetTrackr 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.

**Geo-alerts**

Users can set and receive custom phone and push notification when your pet leaves an area and Safe Zone or gets disconnected from your wifi or Bluetooth 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.

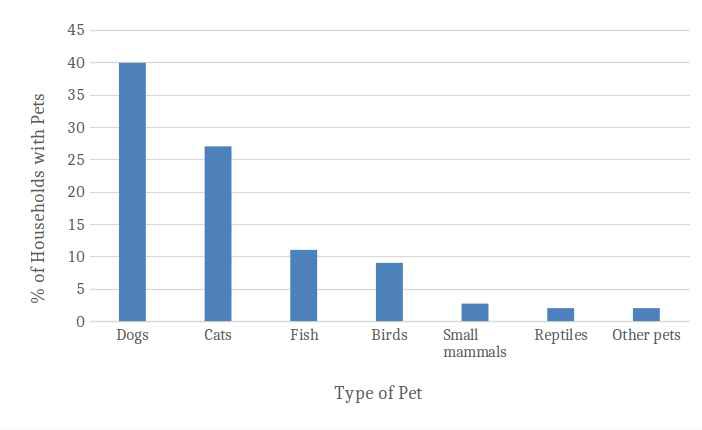
**Audio/Video**

Monitor your pet remotely and keep them company with a pet camera and built-in speaker allows owners to communicate with their pets from far distances, it is also a useful feature for owners who have pets that have poor hearing.

**Internet/Connectivity**

SIM included, so your device is ready for use out of the box, PetTrackr is 2G, 3G, 4G and 5G compatible and supports both SMS (56 kb/s) and Internet of Things (IoT – 1Gb/s).

### Market Research

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. [2]

### Overview

PetFindr 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, PetFindr 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-Alets - set and receive phone and push notification when your cat leaves an area or Safe Zone.

### 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 PetTackr 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.

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.

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.

**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, PetFindr uses a combination of GPS, mobile data, and WiFi data to assist with accuracy.

## 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.

Our goals for the project are:

* Build prototype of key features, such as GPS/MAP, Health Tracker and Geo-alert.
* Provide digital drawings and illustrations of pet tracker collar.
* Creating a video about the product to demonstrate what the app can do.
* Design web app, ensuring the interface is user-friendly and compatible across multiple devices/platforms.
* Develop existing website and include a prototype for the backend login page.

### Plans & Processes

Texted goes here

### 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. 3 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 it 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

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 Gecoding API
* Google Geolocation API
* Vonage In-App Messaging SDK
* Vonage In-App SDK
* FitBit Heart-rate API

Backend - use cloud technology – SaaS

* Amazon Web Services(AWS)
* 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.

### Testing

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 for combined prototype | Write report section Landscape | Write report section testing | Learn mit app developer |
| 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 Assingment 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 PetFindr collar with location, step, heartrate and temp sensors | Build prototype of PetFindr collar with location, step, heartrate and temp sensors | Build prototype of PetFindr 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 from barcode scanner | Expand app to include water intake and food database, alter calorie input data to be collected from barcode scanner | 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 |
| 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 will we 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 PetFindr 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 PetFindr 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

Texted goes here

# 

# Skills and Jobs

Texted goes here

# 

# Feedback

Texted goes here

# 

# Group Reflection

Texted goes here