**Project Description**

For our project we are looking to combine a hardware and software package that would create a heatmap of a given floorplan. Ideally this would be used in a retail floor space, allowing store owners to see a map of where the most concentrated foot traffic would be on their showroom. Using this information, they’ll have a better understand of how foot traffic flows within a store, allowing them to strategically place key items, signage and promotional offers for maximum penetration.

**Overview**

*Topic*Creating this type of hardware and software package will be no easy feat, however pitched to the right business owners we believe it could be quite the lucrative venture.

\*\* Expand more on this

*Motivation*The motivation for starting a project like this comes from a few places. As far as interest goes, this is a perfect project to embark on when it comes to learning about new technologies. The hardware and software involved are quite versatile and useful for an array of projects. Being a small-scale project to start with, the hardware used would be the Raspberry Pi minicomputers. These pieces of hardware are extremely versatile and can be used for several projects, so getting to know how they work and how to program them is great information. The concept behind the use of these Raspberry Pi’s can also to be scaled to larger projects in our future careers.

The project itself would also provide a great service to a business and as such is a concept that is being actively pursued by quite a few businesses. There is an increasing need for data and analytics in every industry today. The retail market is fiercely competitive and any edge that a business owner can get to help plan and execute the best practice of operations on their shop floor is vital. If we were able to full realise the potential of our project, it would show future employers that we were out to innovate and fill a hole in the market by offering an affordable tool to business.

*Landscape*Heatmapping retail showrooms is still in its infancy. There are certainly other companies out there putting packages on the market. There are different technologies used to achieve the heatmapping of a retail showroom. Primarily the main technologies that are used are, heatmapping through specialised security cameras and heatmapping using Wi-Fi or Bluetooth pings. The difference is in how the data is displayed and the cost of the package to the end consumer.

Our point of difference will be cost, as we are looking to create our package using affordable pieces of hardware and open source software. The scale of the product will undoubtably be smaller than some of our competitors, however it would create a great entry level price point for the consumer to delve into an emerging technology and learn some invaluable data about their business.

**Details Description**

*Aims*

The aim of our project is to create a hardware and software package that will enable a business to see how floor traffic flows through their stores. We will use an array of Raspberry Pi’s with wireless adapters, these will be placed around a floor space to triangulate how someone is moving within said space. Using software, which we will program, each Raspberry Pi will look to catch wireless pings that a mobile phone sends out. This data will then be overlayed onto a map of the floorspace and as more people move around, hotspots will form on the map showing where traffic moved over a given period.

Our first goal will be to purchase our Raspberry Pi’s, to start with we will start on a small scale of 3 to 4 units. These would be purchased from on online supplier, there are many of them available online now. Down the track, once we got the basic concept working 100%, we would then look to add more Raspberry Pi’s to the array and increase the scale of the floor space.

Next, we will need to investigate what software languages will be necessary to program our desired outcome. Research will need to go into what is going to be the most efficient language, what’s going to work with the Linux system these Raspberry Pi’s will run on and what will allow us to produce a web interface for the end user to log into and view the data that has been collected. This will have to be split into the two sections previously mentioned. Programming the software that will take the input of the Wi-Fi ping locations and mark them to a point. Once this is done, we will then need an application that will run through a web interface that will overlay this information onto a floor map.

Finally, we will need to test the product. This will be achieved by first alpha testing in a simulated environment, allowing us to map out any problems to be addressed. Once these problems we have addressed any raised issues beta testing with a volunteer in a retail environment will iron out the last of the problems before taking it to market for sale.

**Plans and Progress**

*The story of our project*

\*\* Mat to write about how he came up with this original plan for his first project  
\*\* Talk about why you chose it, saw it on reddit etc.., talk about how it started as a project to be used in with councils to map foot traffic around towns and cities

*How its progressed*

\*\* Here we talk about how we felt the scope of the original project, while a great idea, was probably out of reach to start with. We have since decided to move to a smaller platform to start with, once the technology is proven and found to be successful, we can then move onto scaling it for multiple floor-maps, buildings and city blocks

*Plan*

* To start with will go into a brief history of heatmapping
  + What technologies have been used (Video surveillance, Wi-Fi, Bluetooth)
  + Why we have chosen to use Wi-Fi pings
  + Some details on how we are able to capture Wi-Fi pings
* Here we go into full detail on how we will achieve our goal
  + What’s needed to make this work?
  + What types of hardware are available?
* Researching available technologies to begin with
  + Why did we chose to use Raspberry Pi’s (Small footprint, low cost etc..)
* Next, we will talk about how the Raspberry Pi’s
  + How will they be arrayed?
  + How do they talk to each other?
  + How do they capture Wi-Fi pings
  + What programming languages will we use
  + How will they interpret data?
  + How is this data stored?
* Next we talk about how we use the data
  + How is this data displayed to the end user?
  + What type of interface will we use (web interface more than likely)
  + How can the use manipulate this data?
  + What’s useful about this data?
* Finally we will need to package and sell this product
  + How will we pitch it to potential consumers?
  + How will we market it? (Website etc…)
  + How will we make the website?
  + Who will install the hardware onsite?

**Roles**

* In this section we will give each other roles
* Will need a
  + Project Manager
  + Technical Designer (for the hardware)
  + Lead software designer
  + Back end software engineer
  + User interface engineer / Web developer
  + Technician for installation

**Scope**

* Here we go back and touch on our original plan and how its changed
  + We talk about moving to a more manageable scope
  + We talk about what’s achievable in a reasonable timeframe
  + We talk about how increasing scope to larger scale may be possible in time

**Tools and Technologies**

* Here we go back to what hardware and software we are using
* We will be using Raspberry Pi’s
  + Are there any licencing issues with using these commercially?
  + We are using opensource software, free to distribute and manipulate etc

**Testing**

* Once again here we talk about our testing
  + Alpha testing in a closed environment
  + Beta testing with a willing participant in a retail environment

**Timeframe**

* Map out a timeframe what how long this project would take
* How long to research what we’ve learnt so far?
* How long to get the hardware?
* How long to write the software?
* How long to integrate everything?
* What could we really achieve in 6 weeks and what would we achieve with another 10?

**Risks**

* Some example risks to elaborate on…
  + We may have over-estimated our ability
  + We may need to use programming languages that are hard to learn
  + Our hardware may fail as it’s cheap
  + We may find some locations suffer from Wi-Fi interference
  + Competition on the market for these products may push us out
  + We may find it difficult to adhere to timeframes as we all have other responsibilities
  + We may find it difficult to communicate being based around the country