Bournemouth Blind Society is a local charity that helps those who have limited or no vision to live independent lives, and give them freedom they wouldn’t have otherwise, because of the unique needs of the people who rely on this charity, we have been tasked with creating an application that addresses what we feel are the key points.

It needs to provide crucial non visual guidance to assist the blind and partially sighted with the navigation of large buildings and the challenges that arise in them.

It needs to support users who are attempting to navigate a location for the first time, while also providing assistance for those who are revisiting.

And finally it shouldn’t just be available to be implemented at Chaseside, this solution should be extendable and adaptable for other locations where the more commonly used GPS solutions aren’t viable.

To develop our app we started by deciding on our development approach, we chose the agile method of scrum as it would give us the ability to break up the work, monitor and track our progress effectively. We used this in conjunction with an online burn down list to track what we wanted to achieve and our progress throughout the development cycle.

When opening our app, 4sight, the user will have the ability to setup the app by answering questions about their personal needs. Once set up these settings shouldn’t need to be changed, therefore allowing the user to start up the app whenever and have it ready to use. These options are taken to personalise how the app works and responds to certain situations.

When entering a new building the user will be able to check into the reception desk, where they can place their phone on a programmable NFC chip, or Bluetooth device for those who still use older devices. All the data they will need to set up the app for this location will be loaded, guest Wi-Fi details to allow free download of the maps and keep them updated, and the reception contact number to allow an SOS feature to be used in case of emergency. Once the map is downloaded the app will pick a route based on pre-selected user preferences. The guidance preferences allow the user to choose whether they want to take either the quickest or safest route. Safe routes take into account the number of obstacles and the amount of people estimated to be using it, while the quickest route will get them there in the shortest amount of time.

The maps we use will be a combination of floor plans and a heat map made from data collected from CCTV cameras, Wi-Fi tracking, and triangulation using iBeacons. From this we can learn about obstacles by seeing what areas people start avoiding and update the maps accordingly. Heat patterns can also be used to find out possible new routes by which routes are most popular, allowing the app to be accurate without having to be manually updated constantly.

The guidance menu allows a user to input a location via a search function, and the Points of Interest menu allows you to find important locations such as reception, the toilets, or an emergency exit.

To navigate, the app will notify the user using a combination of audio and vibration cues, but these are fully customisable in the settings menu if the user only wants to use one.

We understand that the cost of the hardware implementation that will ether need to be covered by the hosting company or the charity, therefore these costs will need to be as low as possible. In order to do this there are many ways we have considered, for example companies could donate spare storage space for map storage, or rent cloud storage from the charity for the fee of the rent plus a donation.

We spoke to visitors who are blind at the beginning of the brief and ask them various questions about what problems they face daily, one of the issues they have is not being able to use GPS inside majority of buildings accurately, also we needed to make sure we included ability for voice over text on all elements inside our code to allow a screen reader to communicate to the user. The use of colour, contrast and size are also important to partially sighted users, so we have used large, block colour with contrasting text colours to assist those with partial sight.

While our prototype is currently a webapp, our end goal is to create both an android and iOS accessible app based on the web prototype we put forward. Our plan for this application is to implement the ibeacons to act as digital sign posts and anchor points for the user, giving them information and directions. They should also to be able to place themselves in a map of the room using triangulation and a chain of ibeacons, giving them instructions to travel around the building. These beacons could also be used to locate the person should they need help. Our hope is that this application could be used to by the partially sighted as well as the completely blind so that they can become much more independent while still having help if they want or need it.