Document Title: Initial Plan

Project Title: Using indoor location technology to create an interactive experience for users through a mobile application

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Moderator:

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Module Title: One Semester Individual Project

Credits: 40

Project Description

Interacting with users based on their indoor location has always been a challenge with many drawbacks including ever changing environments, but with endless opportunities many companies including Apple, Google and Microsoft are investing in this industry [1]. With the majority of people in the United Kingdom now owning smartphones [2] this has made interacting with Indoor Positioning Systems (IPS) more accessible than ever. These technologies can be combined to deliver content to users in real-time based on their physical indoor location and allow organisations to track users physical location behaviour.

I will be working in collaboration with Hoffi whom I work part time for. The aim of this project is to evaluate the still relatively new Bluetooth IPS technology iBeacons [3] with regard to its locational accuracy and its use in tracking the path and "dwell times" of users moving within an indoor space. The project will involve implementation of an iBeacons mobile application that will be subject to a variety of tests in an experimental indoor setting. The mobile application will deliver content to users and push user behaviour data to a server allowing the tracking of user behaviour.

This will involve researching and evaluating different types of IPS's and comparing them with iBeacons. This will include developing smaller prototypes to test the different types of functionality offer. I will develop a mobile application which will interact with the iBeacons and deliver content to users depending on their physical location. The content will relate to the environment and differ depending on the user's previous behaviour. User's behaviour will be sent to a remote server from the mobile application when a network connection is available. The user behaviour stored on the server will be accessible via a web interface.

Project Aims and Objectives

- Research iBeacon technology and compare it with other Indoor Positioning Systems.
- Develop multiple prototypes to test the different types of functionality iBeacon technology can offer.
- Develop a final prototype.
    - Develop an iOS mobile application using Cordova which interacts with the IPS, delivers content to users and sends user behaviour to the server.
    - Set-up a server and database to store user behaviour data which can be accessed via a web interface.
    - Create a web interface that allows people to view user behaviour in a user friendly format.
    - Change the behaviour of hardware in the environment depending on user position by using data from the server (desirable)
    - Make the mobile application available on Android (desirable)
- Evaluate final prototype.

Ethics

There could be an issue regarding the observation of users. This will be addressed by making users anonymous through using a hash key.

Further enquiries are needed regarding the ethics and this will be documented at a later date.

Work Plan

I have agreed with my supervisor to have at least one meeting every week and three review points, one at the end of February (week 5), another just before Easter Recess (week 9) and another towards the end of the project (week 14).

Week Number	Start Date	Aims and Objectives	Deliverables
1	26/01/2015	Initial Project Plan consisting of the project title, description, aims, objectives and work plan. A meeting with my project supervisor to discuss the project and develop a clear understanding of the scope, aims and objectives of the project.	First draft of the initial plan.
2	02/02/2015	A meeting with my supervisor to discuss my first draft of the initial plan. Research iBeacon technology and compare it with other Indoor Positioning Systems.	Initial Plan (02/02/2015 at 23:00) Document iBeacon research with references. Summarise comparisons between the different types of IPS technologies.
3	09/02/2015	Review previous related studies and work that may help with the project. Familiarising with relevant software and technologies. Assess suitable frameworks, APIs, libraries and plugins for iBeacons.	Explain which technologies I have used before and why they will help with this project. Document different types of software, technologies, frameworks, APIs, libraries and plugins that may help with the project.

4	16/02/2015	Develop multiple prototypes to test the different types of functionality iBeacon technology can offer.	Document the designs, testing and findings from each of the prototypes.
5	23/02/2015	Review the different types of prototypes to aid the design of the final prototype. ***Review meeting with Chris Jones***	Detailed designs of the mobile application, database, web interface and iBeacon environment.
6	02/03/2015	Develop an iOS mobile application using Cordova which interacts with the IPS.	An iOS mobile application that can deliver content to users when they are within a certain proximity of the iBeacon.
7	09/03/2015	Set-up a server and install relevant software. Create a database to store user behaviour. Mobile application sends user behaviour to the database located on the server.	Server is set up and ready to host a database and website. FTP access is enabled. Database tables have been created on the server. The mobile application can push data to the server.
8	16/03/2015	Create a web interface that allows people to view user behaviour in a user friendly format.	Authorised people can view user behaviour in a user friendly format via a website on the server.
9	23/03/2015	Fully test the project against the initial aims and objectives. Test the system in a professional environment with real end users. ***Review meeting with Chris Jones***	Document the test results. Set-up the system in a professional environment. Document the behaviour and feedback of end users.

10	30/03/2015	Easter Recess (Contingency time) Make improvements if necessary. Implement the desirable features if possible: Change the behaviour of hardware in the environment depending on user position by using data from the server (desirable) Make the mobile application available on Android (desirable)	Completed Final Prototype
11	06/04/2015		
12	13/04/2015		
13	20/04/2015	Evaluate final prototype.	Document evaluation of final prototype.
14	27/04/2015	Bring together everything and produce a final report (dissertation). ***Review meeting with Chris Jones***	First draft of final report.
15	04/05/2015	Make changes to the final report if need be.	Final Report (05/05/2015 at 23:00)

References

[1] - Tony Costa. (2013). *Indoor Venues Are The Next Frontier For Location-Based Services.* Available: http://www.forbes.com/sites/forrester/2013/01/23/indoor-venues-are-the-next-frontier-for-location-based-services/. Last accessed 30th Jan 2015.

[2] - Mel Brenchley. (2014). *UK smartphone take-up is almost on a par with laptop ownership.* Available: http://theappgarden.co.uk/blog/business/uk-smartphone-take-almost-par-laptop-ownership/. Last accessed 30th Jan 2015.

[3] - Christopher Ratcliff. (2014). *What are iBeacons and why they might change marketing?.* Available: https://econsultancy.com/blog/64492-what-are-ibeacons-and-why-they-might-change-marketing/. Last accessed 30th Jan 2015.