

INITIAL PLAN

Project 186 – How IOT devices can be used in a household to collect meaningful data.



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CM3203 – One Semester Individual Project 40 Credits

Roles of Supervisor

- 1. To offer general guidance and feedback on the progression of the project at weekly meetings.
- 2. To assist in facilitating contact between myself and United Welsh who own the test location.
- 3. Provide support in obtaining the required hardware from the School of Computer Science.
- 4. Provide specialist advice on IOT issues that may arise.

Weekly will ideally occur with key meetings taking place during both week 8 and week 12.

Project Description

The Internet Of Things (IOT) is one of the fastest growing areas of computer science and there is an every growing desire to use technology in our daily lives, to make our lives easier and to provide data on the world around us. One aspect of this that interests many people is the use of IOT devices within the home. This was once the pipedream of the large technology companies and the very rich but with the continuing technological development of IOT devices the dreams can be reality for everyone.

This project is being used to see what data can be collected within a home environment without excessive cost to the user and the data being meaningful and understandable by a human. This will be done by assessing the data collection techniques currently available in the market, then using a selection of sensors to collect data in a real-world environment. Once data has been collected it analysed using statistical methods to see if it has yielded any meaningful results and using this evaluate to see what data collection devices have a place in the modern home.

The purpose of the data collection is to give people living in homes as much information about how they are living as possible as the clearer information you have the better decisions you can make about your living style. This may be identifying a more cost-effective way of living or might make you think there is a more comfortable way of living. It is not a case of trying to control lives or tell people how to live but instead giving people the means to make informed decisions on what is best for them, or even just allow them to understand how they live.

The final product of this project should explain what sort of data can be collected in a home environment and the devices that collect it. These devices and data sets will then be evaluated to see the most effective if any for a home environment and what would be suggested from the results for future home projects.

Project Aims and Objectives

- Use the School's Liberium sensor kit and any sensors already in situ at the test location to collect meaningful data.
 - Audit both the School's sensors and those in place to plan the most effective deployment of resources so as not to double up efforts and have multiple copies of a similar dataset.
 - Program the sensors to a suitable resolution so as not to hold excessive amounts of data that doesn't aid the overall study.
 - \circ ~ Test how effective the devices are in a real-world environment over a period.
- Analyse the data collected using statistical methods to see if useful data has been recorded.
 - Evaluate the statistics generated to see if the data can be useful to the people living in the house and if so what can it be used for.
 - Order the devices from most to least effective in the study so that recommendations based on usefulness can be drawn up.
- Evaluate the results of the study in comparison to similar studies to see if results agree.
 - Initially see how effective this study has been and if useful conclusions can be made and then compare to the results of other studies and advertised devices.
- Using both the study results and the comparisons drawn on other projects suggest possible futures applications of IOT data collection devices within the home if appropriate.

Ethics

Based on the project how it is currently outlined it does not seem to meet the requirements outlined for requiring ethical approval. No personal or sensitive information and all testing is being done in a secure environment. However, if the parameters of the project of the study changes or additional advice offered then I shall go forward in seeking ethical approval before continuing with the testing.

Work Plan

Task	Week													
	2	3	4	5	6	7	8		Easter		9	10	11	12
Background on IOT devices in the home														
Research on Liberium Sensors														
Gain understanding on how to set up a liberium sensor network and try with student kit														
Audit test location for sensors already in use														
Create a plan on what sensors to use and where within test location														
Plan what data should be recorded by the sensors														
Program the sensors to take required readings														
Test Functionalty of sensors														
Install sensors in in test location and begin data collection														
Once data has been collected apply statistical methods to gain meaningful information														
Evaluate the effectiveness of the sensors in test location														
Final report														

Figure 1

Green shows where tasks should be completed. The Yellow shows where I am allowing extra time for tasks that I think could overrun.

The cells that have been bordered with a bold line show tasks the produce deliverables.

Milestones

- 1. Completion of research and initial understanding of how a Liberium sensor network is set up, this is completion of the first 3 tasks shown in fig.1 and as seen should be completed by end of week 2 allowing for contingency up to week 3.
- 2. Completion of planning for the distribution and the type of data to be collected should be completed by end of week 3.
- 3. Completion of programming the sensors and installation in the test location with data collection in progress should be done by end of week 5.
- 4. Completion of data collection should be done by end of week 7 with contingency up to end of the first week of Easter.
- 5. Completion of data analysis and evaluation should be completed by the end of Easter with contingency up to end of week 9.
- 6. Completion of final report should be done by the end of week 11 with contingency of week 12 to submit.

Deliverables

In fig.1 the deliverables can be seen by cells marked in bold.

- 1. Completed plans:
 - a. Plan for sensor distribution throughout test location.
 - b. Plan for what data each sensor should be recording.
- 2. Completed data collection with all the data available for analysis
- 3. Statistical analysis of the data collected.
- 4. Final report including full evaluation of the statistical analysis and the project in its entirety.

Key meetings will take place during both week 8 and 12 to ensure that the milestones and deliverables and keeping in time with the plan and to ensure the project is running as it should be.