

INFT3970 Major Project Scope Document

Distributed Monitoring System using Embedded Devices

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1 Executive Summary

1.1 Background

Riding the wave of "IoT Revolution" [1], this project will develop a low cost, easily deployable IoT product in any setting.

IoT or *The Internet of Things* has proven to be an explosive trend within the consumer electronics markets. Never before have such small versatile devices been available for general consumption, leading to an estimated combined business and consumer spending value in excess of \$6 *trillion* dollars globally in 2018 [1]

For the vast majority of consumers, both corporate and end-customer [2], a large movement toward both minimisation of waste and optimisation of spending is occurring on a global scale in the developed world, with the developing world rapidly following this trend also [3].

Citing this movement, it would only be logical to create a simple to use set of devices that allow for the monitoring and therefore optimisation of such measurables.

1.2 Overview and Purpose

The concept of this project is to create a distributed system in which small devices are used to monitor, log and analyse a number of select metrics from a multitude of potential data points.

The purpose of the project is to deliver a viable product that could be replicated for a reasonable price for both end-user and business alike. We believe the market to be on a precipice of further explosive growth, with the consumer market partially realised, but far from tapped by current offerings.

1.2.1 Metrics

The metrics measured included will be:

- Temperature
- Humidity
- Motion

We anticipate further development on the project to be viable post submission date, however realise the limitations of the current timeframe.

Metrics measured would be viewable on a users dashboard, with data being able to be scoped to multiple filter requirements such as time, select edge cases or specific locations.

The end-goal being an ability for users to better determine inefficient or bad decisions they may make unwittingly in regards to home or business heating, coupled with the impact of room utilisation.

2 Project Objectives

Within the timeframe still available to this project, we aim to develop and deploy a number of IoT devices [4] to a home environment or two and to track heat, humidity and motion of the dwelling to better understand the potential correlations of room use, heating and potential inefficiencies created in areas such as 'High Traffic' spots (Loungerooms and Hallways)

Optimally we aim to couple this with a mapping of the dwelling, allowing a more intuitive expression of the data collected.

We intend on using student subscriptions to leverage Azure for both website hosting and databasing coupled with a small budget of roughly \$100-\$200 to purchase all required equipment which currently is expected to be:

- ESP8266 boards
- DHT11 Temperature and Humidity sensors [6]
- XC-4444 PIR Motion sensors [5]

- Various required breadboards / generic electronics items

Overall goals of the project
Remember Objectives must be SMART!
Answers What, When, & How Much

2.1 Deliverables

Expected outcomes of the project
A list of specifications

2.2 Milestones

Is always “The Schedule”
Assigns the major segments of project with time estimation

3 Technical Requirements

Majority of product/service has the “requirements”
More details than deliverables.

4 Limitations

“Limitation” of the project
Managing expectation, not over-promising

References

- [1] <https://www.forbes.com/sites/danielnewman/2017/12/19/the-top-8-iot-trends-for-2018/>
- [2] <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-internet-of-things-the-value-of-digitizing-the-physical-world>
- [3] <http://sunnewsonline.com/china-is-worlds-largest-renewable-energy-producer-consumer/>
- [4] <http://esp8266.net/>
- [5] https://www.jaycar.com.au/medias/sys_master/images/9105858396190/XC4444-dataSheetMain.pdf
- [6] https://www.jaycar.com.au/medias/sys_master/images/9091897786398/XC4520-dataSheetMain.zip