Software Engineering & Group Project (COMSM1401) - Assignment Brief

Revised for COVID-19 March 2020

Overview

The assignment for this unit is to design and build a novel new Internet of Things (IoT) product or service. Due to the nature of the domain, such a system will be required to operate across a diverse range of devices and platforms. Due to the scale of this challenge, you are not required to fully implement all aspects of this application - you must develop your idea to a level that would be presentable as a proof-of-concept prototype to potential investors. Support will be provided in the practical labs to help teams identify and enumerate a suitable project concept.

Due to the fact that this is a significant piece of work, you will need to work in small teams in order to complete the assignment. This brief is designed to balance ambition with the challenge of technical implementation. The markers will expect to see a blend of low-fidelity / high concept design, coupled with the solid and significant implementation of certain key elements. The extent to which your team successfully achieves this balance will be reflected in the marks awarded for this assignment. Although you are not required to create a fully working system, each element that you do build and its relation to the other components of the system must be clearly explained and justified.

Essential Components

Your project ***must*** include at least the following key components:

- **IoT device**: This will be developed using the M5Stack platform - a small Arduino compatible device with in-built screen, accelerometer, gyroscope, battery, GPIO pins, buttons, Wifi and Bluetooth. We will provide one such device to each team.
- **Desktop application**: This will focus on data visualisation, management and control tasks for your application. This could be used by someone managing the service, or potentially by the end user. This element of the system must be prototyped using Processing.
- **Web application**: Some aspects of the system must be implemented as a platform independent web application. This component of the system is likely to be used by clients of your service, or end users of your concept product. We suggest implementing this element using p5.js, however you are free to use alternative technologies should you wish.
- **Data communication**: Some application data must move between components of the system (e.g. web to desktop / IoT device to web / IoT to desktop). A range of relevant data communication mechanisms will be introduced in the practical sessions to enable this.
- **Data repository**: An element of the core business data must be made persistent in some form. This can be anything from simple flat-files, all the way through to a fully-fledged relational database. Your aim should be to provide *good enough* functionality to illustrate your concept at the final product pitch.

Updated Deliverables

The assignment has been revised to reflect the challenging circumstances surrounding the COVID-19 pandemic. The Pitch, Product and Practices elements have been removed from the required deliverables - we felt these were an unreasonable expectation given the circumstances. The performance of your team will now be assessed solely via the Portfolio deliverable, making up 100% of this module's marks - there is no individual component to the assessment. We have adjusted the expectations of the report to better reflect the current working circumstances. This includes points 3c and 3d to reflect on group practice and the effect of the COVID-19 pandemic on your project.

The deadline remains the end of term, which is now **5pm on Friday 15th May**. You will need to download the zip archive of your repository and upload this to Blackboard by 5pm latest.

Report collating Github Portfolio [100%]

You must use GitHub to collect together all your work as a portfolio. Please include the names of your group members at the top of your Github front page. You must write a front-page document (readme.md) to clearly represent the design of your system and your use of GitHub, addressing:

1. System Design [40pts]:
    a. Architecture of the entire system
    b. Object-Oriented design of key sub-systems (e.g. Desktop Application, Web Application etc.)
    c. Requirements of key sub-systems (in the form of selected user stories)
    d. The evolution of UI wireframes for key sub-systems
    e. Details of the communication protocols in use (including a rational for your choice)
    f. Details of the data persistence mechanisms in use (including a rational for your choice)
    g. Details of web technologies in use (including a rational for your choice)
2. System Implementation [40pts]:
    a. Breakdown of project into sprints (showing the users stories implemented in each).
    b. Details of how you evaluated your designs (techniques used & awareness of their limitations)
    c. Discussion of Social and Ethical implications of the work
3. Project Evaluation [20pts]:
    a. Reflective discussion of the success of the project
    b. Discussion of future work (in terms of design, development and evaluation)
    c. Reflect on the working practices of your group, how well they did or did not work, e.g, management of issues, communication, Agile (etc).
    d. This is a chance to reflect on how coronavirus has affected your project (remote working practices etc)

Your front-page document should be written in Markdown, with the various sections version controlled in a “Portfolio” folder on your GitHub repository. Marks will be awarded for the clarity and detail of each of the above sections. We may review your code for questions relating to your project, however there will be no marks attributed to the quality of your code.