School of Computer Science and Informatics

Coursework Submission Cover Sheet

Please use Adobe Reader to complete this form. Other applications may cause incompatibility issues.

Student Number	C1525379
Module Code	CM3203
Submission Date	10/02/2020
Hours spent on this exercise	~10
Special Provision	

(Please place an x in the box above if you have provided appropriate evidence of need to the Disability & Dyslexia Service and have requested this adjustment).

Group Submission

For group submissions, *each member of the group must submit a copy of the coversheet.* Please include the student number of the group member tasked with submitting the assignment.

Student number of submitting group member	

By submitting this cover sheet you are confirming that the submission has been checked, and that the submitted files are final and complete.

Declaration

By submitting this cover sheet you are accepting the terms of the following declaration.

I hereby declare that the attached submission (or my contribution to it in the case of group submissions) is all my own work, that it has not previously been submitted for assessment and that I have not knowingly allowed it to be copied by another student. I understand that deceiving or attempting to deceive examiners by passing off the work of another writer, as one's own is plagiarism. I also understand that plagiarising another's work or knowingly allowing another student to plagiarise from my work is against the University regulations and that doing so will result in loss of marks and possible disciplinary proceedings.

Placement Management System

Final Year Project - Initial Report

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Title: System Development for Placement Modules

Supervisor: Dr. Martin Caminada

Moderator: Steven Arthur

Overview

The Cardiff University School of Computer Science, like many other university schools, runs a one year placement module for it's students. Students who choose to take this module spend one year working in an external company, whilst still maintaining contact with the university and producing various documents to track their progress.

This process requires collaboration between students, supervisors, placement officers and employers in order to facilitate a smooth transition from university to workplace and vice versa, and to make sure students are getting the most out of the year in industry.

During the placement year, the school currently coordinates most of this process via emails, requiring large amounts of time and coordination for the schools placement staff. Due to increasing numbers of students taking the placement module (and thus increased workload) the school is now looking for a way to centralise the placement-related tasks and processes in order to make it as easy as possible for students and staff to carry out their required activities during the year.

The aim of this project will be to create a fully operational, well-tested web-based platform that allows students, supervisors and staff to carry out their tasks and track their progress during the time that students are on placement. The goal is to create a bespoke, purpose-driven system that is designed to make collaboration as easy as possible for all stakeholders. It is integral that the final system is well implemented, using good software engineering practices in order to facilitate the future maintenance and possible expansion of the software by the school in years to come.

Project Goals & Objectives

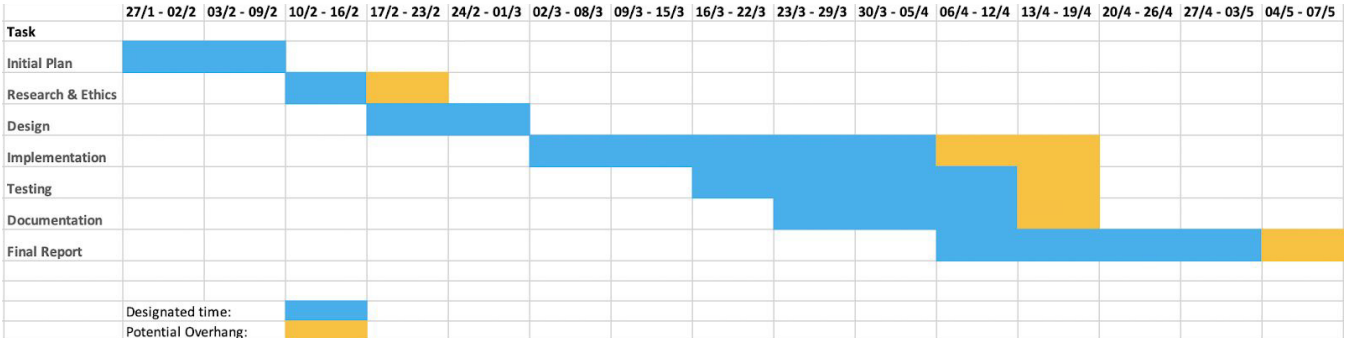
1. The end system should allow students to carry out and track their placement-related activities
    - Students should be able to log in to their placement tracking system account using their university ID and password
    - Students should have access to a dashboard to track their completed/to-do activities beginning at least 1 week prior to their official start date
    - Students should be able to upload all necessary forms during their placement
    - Students should be able to upload their draft and final reports for marking by their supervisor

- Students should be able to see information about their supervisors, and their marks when released

2. The end system should allow supervisors to carry out and track tasks in order to monitor, advise and evaluate placement students
    - Supervisors/moderators should be able to log in to their placement tracking system account using their university ID and password
    - Supervisors should have a dashboard which allows them to track the students they supervising and/or moderating, and the tasks pertaining to each of these students
    - Supervisors should have access to relevant information about each student to allow them to schedule visits to meet the students at their workplace
    - Supervisors (and moderators) should have access to work completed by students they are supervising and ability to upload marking information once marking is completed
    - Supervisors should be able to upload documents relating to their visits
3. The end system should allow Cardiff University Computer Science placement/employability staff 'admin' access in order to monitor students and supervisors, as well as make changes to processes, documents and deliverables
    - Staff should be able to log in to their placement tracking system account using their university ID and password
    - Admins should be able to monitor activities related to both students and academic supervisors
    - Admins should be able to manually make adjustments to automated processes (such as overriding a supervisor assignment or start date)
    - Admins should ideally be able to adjust task deadlines, descriptions and requirements via their view of the system
    - Admins should ideally be able to adjust (or create) templates for automated emails to be sent out to students/staff
    - Admins should be able to assign a 3rd marker for final reports if there is a large discrepancy between the marks given by the supervisor and moderator
    - At least 1 admin must be able to give final approval on marks for tasks
4. End system should be able to carry out automated tasks and send out automated alerts in order to support placement staff and academic supervisors

- The system should be able to allocate supervisors and moderators to students (which students are allocated to which supervisors will be decided by a member of the employability team)
- The system should send out alerts to students at particular intervals/deadlines based on the students start date
- The system should send out automated emails/notifications to supervisors/moderators when work is submitted by a student they are supervising, or a deadline is approaching
- Once all marks are ready, emails should be automatically sent out to students

Work Plan



Initial Plan

This is the document you are currently reading - highlights aims and objectives of the project and a plan of how to achieve these in a realistic time frame.

Research

This time is to allow for me to do research, including:

- Research into the current placement tracking software on the market
- Research into the best languages and frameworks to use to achieve the required functionality
- Consideration of alternative implementation methods such as Microsoft Power apps that the university already have access to
- Research into web application development best practices that can be used during the implementation stage to ensure good coding standards

Design

Once research has been completed, the design process will begin, which includes:

- Specification of function/non-functional requirements
- Risk assessment
- Design of system architecture and languages/frameworks to be used
- Component design: how constituent parts of the application should work together and what the data flow and user journey should look like
- Decisions on look/feel of the applications and visual designs of dashboards etc via wireframes

- Setting out of testing criteria in order to measure progress

This process should set me up with a clear idea of how the application will be put together during implementation. It should also allow me to look for any potential issues that may arise during the implementation process and try and design the system in a way such as to minimise these problems.

Implementation

After completing designs, I will begin on the implementation of the actual system, specifics of how I will go about this are somewhat dependent on the results of the design stage, but my rough plan is as follows:

- **Week 1** - set up necessary hosting, databases etc to facilitate system development
- **Week 2** - begin implementing necessary backend APIs and databases required for student data and application functions - take steps to implement user authentication via Cardiff University credentials
- **Week 3**- start work on skeleton Frontend system, prioritising key features for students/supervisors/admins
- **Week 4** - further work on both Frontend and backend - implement automated features such as emails and supervisor assignment
- **Week 5** - polishing of look and feel of system and code cleanup

By the end of the implementation process I should have a fully working prototype application which meets most, if not all, of the aims and objectives set out earlier in this document. If there are any outstanding features that remain to be implemented then they should be minor or optional, and I should have a clear understanding of how to develop them and how long this would take.

Testing

I plan to test the system throughout the implementation stage as I develop the application, as well as having a period dedicated purely to testing after the bulk of the implementation is complete.

The way the system is tested will be dependent on the languages/frameworks used to build the system, however I imagine this will include:

- Unit tests in the Backend, and possibly the Frontend to ensure modular testing of application features
- Journey testing using localhost with mock API data in order to test the Frontend
- Full end-to-end testing using Frontend, Backend, databases etc deployed on server
- Some form of contract testing to ensure correct backend responses

It is integral to the project that the system be well tested in order for it to be fit to be used for its intended purpose within the university - ensuring good code quality and maintainability of the application in the future.

Documentation

In an attempt to maintain good coding standards and improve the maintainability of the system in the future, I plan to document the system architecture as I go through the implementation process.

This should include documentation of the various components which make up the system (along with their jobs), explanation of how to test and use the system, and reference to any standards, frameworks and technologies I have worked with throughout the development.

Hopefully this should help to make the system easy to maintain and extend for any future development by myself or any other developer. Added to this, documenting in this way will be useful when it comes to writing the final report.

Final report

The final stage of the project will be compiling everything I've done into a single report to document the work I have completed, what I have achieved, and evaluation of my work against the aims and objectives I set out at the beginning.

I will also address any issues I encountered along the way, and the way in which I went about tackling these issues.

This report will also contain brief speculation as the potential of the project in a wider business context - consideration of how easy it would be to extend to a wider user base of different institutions, and how marketable it could be moving forwards.

Supervisor meetings

I will be meeting with my supervisor on a weekly basis (every Thursday at 11am) in order to discuss my progress and any issues I may have.

If I require additional assistance then I will schedule further supervisor meetings.

Deliverables

1. **Initial Report - 10/02/2020**

   Document that you are currently reading, outlining aims and objectives along with work plan / timeline

2. **Design Documentation - 02/03/2020**

   Documents detailing the specifics of my design for the system including architecture, visual designs / wireframes, and any standards/practices I'll be following

3. **System prototype - 06/04/2020**

   Possibly the largest single deliverable. A working prototype of the final system, this should come with some kind of documentation regarding any assumptions or concessions that have been made

4. **Documentation + test results - 13/04/2020**

   Up-to-date system documentation explaining how the system works, along with testing results and reports

5. **Final report - 07/05/2020**

   Full report detailing the process of designing and developing the system and how I resolved any issues I came across

Risk Assessment

Risk	Severity	Likelihood	Solution
Change of scope/specifications	Medium/Low	High	Meeting with my supervisor and a member of the Cardiff University Computer Science employability/placement team on a weekly basis to stay updated with any changes to specs and discuss any issues that arise. Time has been incorporated into the work plan to account for minor changes/problems.
Illness	Low	Medium	I have already had an extension for my initial report due to a hand injury. I have incorporated time into my work plan to account for any further minor illness and will be applying for a further extension if the injury is causing further issues over the next 2 weeks.
Loss of data	High	Low	I will be regularly backing up my data in backup drives and in cloud storage, as well as using version control software such as GitHub to maintain the project.
Schedule delays	Medium	High	I will start all tasks in appropriate time in order to give myself maximum possible time to deal with delays, starting on tasks early if I finish previous tasks earlier than scheduled.