

# **ELEC5620 Project (Semester 2/2016)**

## **Learning Management System**

### **-Architecture Design, System Modelling and Proof-of-Concept Implementation**

#### **Scenario**

The company PerfectSoftware Pty Ltd. has a special commitment to produce high quality large enterprise software applications. Aussie College is a potential customer of PerfectSoftware, who needs a Learning Management System (LMS) to manage students and their units of study in the college. You are hired by the company as the principle software architect to be in charge of the LMS project. For that, you need to meet the customer, analyse the requirement, design the system architecture, develop system models, implement the proof-of-concept prototype, etc.

Note:

Students in the University of Sydney are using two systems to manage their units of study. Sydney Student is the system that manages students' enrollment, unit selection and credit points. Blackboard is a teaching support system that manages the units of study and provides functions like materials sharing, assignment submission, marking, etc. These two systems could be good references. The pros and cons for developing an integrated system could be further discussed.

#### **Stage 1. Architecture design and system modelling (Marks: 35)**

##### **Submission Requirements: (Group Submission)**

Identify and document the whole design and modelling process. A document should be submitted via Blackboard, which should include:

1. A formal requirements document which contains (10 Marks):
  - a. A clear classification of the mandatory capabilities and optional features.
  - b. User requirement diagram and Feature diagram.
  - c. A description of the use cases for the principal features, including sequence diagrams detailing out how users interact with the system.
2. A first cut at the architecture of the software system, specified as a model. This should comprise at least the following elements (20 Marks):
  - a. A description of the proposed system structure; that is, the set of high-level components and their interconnections, class diagram, etc.
  - b. A description of the behaviours of the key components including activity diagram, state machines and sequence diagrams (in executable forms which will be demonstrated in class).
  - c. The assumptions made during the design.

- Contributions of each group member should be specified clearly in the document.

An in-class presentation (group-based) will be delivered (5 Marks). Slides should covers:

- The proposed requirements and their classifications (to facilitate finalization of the requirements)
- The proposed design, including the rationale for the design choices made (including discarded choices)

After the presentation, every group should demonstrate the model execution.

### Highlights:

- Use scheduled lab time to do your work (of course, you can also do this at other times).
- Meet with the stakeholder (Mr. Yu Zhao) during labs to discuss requirements and raise issues.
- Submit your work (the document) at the end of the September 14 lab session.
- Be prepared to present in the lab on in Week 11 and Week 12.

### Deadline of Stage 1 Submission:

23.59pm, September 25 (Sunday). Delay penalty applied, i.e., 10% per day.

## Stage 2. Prototype Implementation (Marks: 15)

In this stage, a proof-of-concept prototype should be implemented based on the architecture design. The prototype will be demonstrated to the stakeholders. For every group, members should work together to practise the DevOps software development model, which will be discussed in the lectures. The prototype should be:

- Developed based on the design in Stage 1 and implement all the models. (7 Marks)
- Deployed in Amazon Web Services (AWS) using at least EC2, S3 and RDS. (5 Marks)
- Encouraged to explore more features of AWS and use more services. (3 Marks)

### Assessment

Group-based prototype demonstration will be in the lab session on Oct. 24. Each member in a group will be asked questions about the prototype and his/her contributions.