SET10101 Software Architecture Coursework

Hand Out Date : 11 October 2019 **% Module Marks : 50%**
Hand In Date : 3:00pm on Monday 2 December 2019
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Description

A nationwide retailing corporation (such as Homebase http://www.homebase.co.uk/ or B&Q http://www.diy.com/) is planning to develop a new distributed store management system for their retail branches to provide better coordination of their business. It has named the proposed system *DE-Store*.

Diagrams from http://www.lynxinternet.com/

Your company want to pitch for the software development contract and plan to do this by developing a software prototype of an architecture that you believe would show that you could meet the needs of the project.

DE-Store is NOT an online shopping system; instead it is a DISTRIBUTED business management system. Please note that **DE-Store is a DISTRIBUTED system**. You are supposed to use the appropriate architecture styles and technologies you've learnt to develop an effective solution, such as client/server, peer to peer, service-oriented, RMI, three-tiered, etc. DE-Store is expected to be an expandable and adaptive system to accommodate changing business requirements in the future.

DE-Store aims to have a suite of store management functionalities such as price control, inventory control, delivery charge, approval of financial support, and performance analysis.

- *Price Control*: DE-Store allows the store manager to set the price of the products and to select products on a variety of sale offers, which include 3 for 2, buy one get one free, free delivery charges.
- *Inventory Control*: stock is monitored all the time by uploading data from the warehouse database. Items out of stock will be ordered from the central inventory system at the headquarters. DE-Store generates warning messages for items in low stock automatically and also sends them to the mobile message box or email box of the store manager.
- *Loyalty Card*: the store can make further special offers to customers who regularly use their branches.

- *Finance Approval*: DE-Store offers its customer the opportunity to buy now and pay later using an online finance system, *Enabling,* which is linked to DE-Store via a portal.
- *Reports and Analysis*: DE-Store tracks the purchase activities of customers from the accounting database and generates reports on how the store is performing.

DE-store is expected to be an expandable and adaptive system to accommodate changing business requirements in the future.

You should make a pitch to win this contract as follows:

1. Make a recommendation for **two** architectures that could be adopted, explaining the components and connectors and the protocol for information exchange.

2. Select one of the two candidate architectures and justify your choice in terms of the quality attributes you would expect it to possess.

3. Design and develop a prototype which will demonstrate the principles of the system. For example, you could establish an outline system with prototype components and connectors. This would then be used to demonstrate your competence when you pitch for the contract.

4. Evaluate your system. Try to reassure the company that the completed version will exhibit the quality attributes you identified in 2.

Submission Guidelines

S1. Software Architecture Specification Your first chapter should contain your discussion on the two architectures you have considered (1) and your reasons for selecting one to develop into a prototype (2). Subsequent chapters should include design (3) of your full system and your evaluation (4). This document should be no less than 8 pages in font size 12, including diagrams. Feel free to use more pages if you need – we don't set an upper page limit but make sure you only put the relevant material into your report.

S2. Source Code Please submit all the source code of your prototype via the Moodle coursework submission link. Please note that only a prototype is required but you should explain how the full system would be developed (3).

Zip your report together with your source code into one file and submit the file to the Moodle coursework submission link.

S3. Demonstration. You will be required to demonstrate your prototype in the D2 lab at your normal practical slots in week 12.

Marking Schedule

S1 Software Architecture Specification	60 %
i) Description of the two architectures you have considered	15%
ii) The reasons for your selection of one of the architectures	

to develop the system	15%
iii) The design of your full system	20%
iv) The evaluation of your design and implementation	10%
S2 Implementation	30 %
i) Functionality delivered by your prototype	20%
ii) Quality features delivered by your prototype	10%
S3 Demonstration	10%
Total	100%

Relationship to Aims and Expected Learning Outcomes of SET10101 Software Architecture

The aims of the module are:

LO1: Recognise major and emerging architectural styles and architectural patterns

LO2: Specify and analyse components and connectors of a software system

LO3: Generate architectural alternatives for a problem and choose between them

LO4: Design and construct a software system that satisfies an architectural specification

LO5: Design and analyse architectures in emerging contexts

The coursework is designed to use your ability to generate architectural alternatives for a problem and choose between them (LO3), then design and construct a software system that satisfies an architectural specification (LO4, LO5). To a lesser extent LO1 and LO2 will also be implicitly covered. These will be explicitly covered in the exam.