Two hours

UNIVERSITY OF MANCHESTER
SCHOOL OF COMPUTER SCIENCE

Patterns for E-Business Applications

Date: Wednesday 26th May 2010
Time: 14.00 – 16.00

Answer ALL Questions in Section A
and
ONE question out of the three from Section B.

Note: Do not answer more than the required number of questions. Clearly cross out anything you do not wish to be marked.

This is a CLOSED book examination

The use of electronic calculators is NOT permitted
Section A

Answer ALL questions in this Section

A1. What is a pattern? Briefly explain the concept of a pattern and give three examples of non-software patterns. What is a software design pattern? What are the three essential elements of a software design pattern? Give two main purposes of using software patterns. (5 marks)

A2. Concisely describe and critically evaluate the Patterns for e-business approach in terms of its fundamental assumption, its steps and the relationship between these steps and their target architectural layers. (10 marks)

A3. What are the main problems in developing e-business application systems? Briefly describe each one. Critically and concisely explain how Patterns for e-business can solve these problems. (15 marks)
FutureStep is an internet-based company. The company sells laptops and personal computers and offers discount prices to students. The diagram below (Figure 1) shows the business functions (i.e. services) supported by FutureStep’s e-business system. The system only accepts three types of payment method: by credit card, debit card and store card. There is a charge associated with the credit card payment. Customers can access the system from their computer or mobile phone.

Figure 1. FutureStep’s e-business system.
B1. According to Figure 1, identify ALL the business interactions and actors supported by FutureStep's e-business system. For each interaction, select an appropriate business pattern. Critically and concisely justify your choice of patterns. Identify integration needs for this system. For each integration need, select an appropriate integration pattern. Critically and concisely justify your choice of patterns. (20 marks)

B2. According to Figure 1, use one or more software design patterns you have learned from this course to create a UML class diagram to represent “Make payment” (a sub-process of “Place the order”). Show the main actors and entities involved and their relationships; show sample attributes and operations. Critically and concisely justify your design. (20 marks)

B3. According to Figure 1, represent the following business processes: Select a product and Place the order. For each process, describe the actors involved and the interactions between them. Critically and concisely discuss the limitations of Patterns for e-business and the role of business process modelling in the development of e-business systems. (20 marks)