Two hours

UNIVERSITY OF MANCHESTER
SCHOOL OF COMPUTER SCIENCE

Patterns for E-Business Applications

Date: Friday 5th June 2009
Time: 09:45 – 11:45

Please answer ALL Questions in Section A
and
ONE question 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

Please answer ALL questions in this Section

A1. What are the basic four business interactions captured by Patterns for e-business? *Concisely* describe each interaction with one example. Name the business patterns that represent these interactions. (5 marks)

A2. *Concisely* describe the relationship between Patterns for e-business and architecture for e-business. Use a diagram to illustrate the overall architecture for e-business produced by Patterns for e-business. (10 marks)

A3. *Concisely* describe each step in the approach for using Patterns for e-business to design e-business architectures. *Critically* evaluate this approach in terms of its fundamental assumption, its strengths and its weaknesses. (15 marks)
B1. A retail company has an online shopping system which enables customers to search for products, select products, and purchase products. Customers can perform these functions using a computer or mobile phone. For purchasing products, customers need to enter their credit card details and shipping address into the system through a secured server. The system verifies this information, places the purchasing order, and confirms the order to the customer. Customers can contact the company’s customer support via email for questions or comments. Customers can also telephone the company to return products within 28 days of purchasing, but the return service is not part of the online shopping system. Figure 1 illustrates this shopping system, where boxes represent high-level business functions and arrows denote message flows.

![Diagram of an Online Shopping System](image)

**Figure 1. An Online Shopping System**

a) Identify ALL the business interactions and actors supported by this online shopping system. For each interaction, select an appropriate business pattern. Critically and concisely justify your choice of patterns. (10 marks)

b) Identify integration needs for this system. For each integration need, select an appropriate integration pattern. Critically and concisely justify your choice of patterns. (10 marks)

[PTO]
B2. a) What is a pattern? Give a concise definition and three non-software pattern examples. What is a pattern language? Give a concise definition. Critically and concisely justify why Patterns for e-business form a pattern language. (10 marks)

b) Critically and concisely discuss how patterns can improve the quality of software and how they can facilitate communication between software developers and clients. Use Patterns for e-business as examples in your discussion. (10 marks)
B3. Figure 2 shows a context diagram for a hypothetical e-business system you have learned in lectures.

![Context Diagram](image)

**Figure 2. The FutureStep Customer Service System**

a) List ALL the high-level business processes in Figure 2 and briefly describe the services offered by each business process. Critically and concisely summarise the relationships between these business processes and the business patterns in IBM’s Patterns for e-business. (10 marks)

b) Represent, using an appropriate notation, Customer Financing and Inventory Control processes. Use the knowledge gained in your coursework to guide your modelling. Do not provide more than 3 levels of process decomposition. (10 marks)