

**BOWIE STATE UNIVERSITY
COMPREHENSIVE EXAMINATION FOR
MANAGEMENT INFORMATION SYSTEMS
28 June 2008**

Instructions:

The Comprehensive Examination for Management Information Systems is a three hour examination. You must answer one question from Part A (the technical portion of the curriculum) and one question from part B (the management-related portion of the curriculum). You have the option of answering a second question, in either part A or part B, if you are not confident about your first answer. You must pass one question from part A **and** one question from part B to receive a grade of "pass" for the comprehensive examination.

Grading the comprehensive exam requires approximately three weeks. No results will be released until all examinations, in all degree programs, have been graded. Answers to each question are graded "blind" by three faculty members with expertise in the subject matter.

Answers are graded as either "pass" or "fail." "Pass" indicates a minimum grade of B. In the event of a "fail" on the exam written comments from the graders explaining why the student's response was insufficient and what would be required for a passing grade will be supplied to the student.

A set of URL's previously provided describe the general scenario, described in summary below. While the URL's provide additional background to the scenario, the summary below provides sufficient background for good responses to the comprehensive examination questions.

General Scenario:

The questions for this MIS comprehensive exam are focused on the eagerly anticipated opening of Heathrow Airport's new Terminal 5 late in March, 2008, and the major problems that actually surfaced on opening day.

The URL's provided gave several pages of background information. As you answer the questions on the comprehensive exam, please remember that the scoring of your responses will be based on how well you can *apply* what you have learned in the core courses and additional reading of professional literature to specific questions, some of which invite reasonable speculation that outsiders cannot know as fact about what has taken and is taking place. Where speculation is needed in your responses, you should state the assumptions on which the speculation is based. The information provided in this introduction and within the questions themselves should be sufficient to allow you to demonstrate your knowledge and your ability to apply it to what is asked.

Comprehensive Examination Questions:

Part A

(answer at least one question from Part A)

1. A major problem on opening day at Heathrow Terminal 5 was the failure of the automated luggage-handling system to transport luggage correctly. Assume that within the system an RFID (radio frequency identification) tag has been attached to each piece of luggage to identify its owner, point of origin, final destination, and all intermediate destinations. Assume that automated transport devices (conveyors) are running along tracks that connect the loading/unloading areas for specific planes/gates and the checking points and the baggage carousels.
 - a. Demonstrate your knowledge of computer hardware and software by **comparing and contrasting** in detail **polling** vs. **interrupt** (you probably met these as ways that peripherals get serviced by the operating system, but generalize a bit here – for purposes of this question it could be interaction with the operating system and/or with special-purpose programs written specifically to control the luggage transporting) as the method by which the RFID signal comes into the system that controls transporting of pieces of luggage.
 - b. Demonstrate your knowledge of hardware and software by discussing the logic and actions the hardware and software need to perform to route luggage from the point of check-in to the correct airplane's loading point. Be sure to allow for the fact that most pieces of luggage will have to ride more than one conveyor to get to the appropriate destination.
 - c. There will be some functions of the luggage transport system that are most appropriately performed by a **centralized** computing system, and some that are most appropriately performed by **decentralized** systems (possibly mounted on the carts). Identify, with supporting explanations, **one** significant function in each category.
2. For each of **two** from among the four “traditional” programming language paradigms (procedural/imperative, object-oriented, functional, logic), discuss what would be its strengths and its weaknesses if used to implement the sub-systems specified below. Consider the sub-systems independently. Be sure to demonstrate your knowledge of the commonly compared characteristics of paradigms/languages within the context of the requirements of the information system needs to support this modern new terminal. Try not to repeat yourself in answering the two parts of the question – take the opportunity to demonstrate more knowledge, not just redundant knowledge.
 - a. Sub-system to allow individual customers to check in, and to check luggage, for international flights as well as for flights within Europe.
 - b. Sub-system to route and track luggage from check-in to the correct airplane.

3. In answering these questions, you are to demonstrate your knowledge of the hardware and software that comprise networks, both internal and external, as appropriate. You are also to demonstrate your awareness and understanding of current issues associated with networks and their uses.
 - a. Heathrow Terminal 5 is new relative to the other terminals in Heathrow airport. Obviously, there would have been networks in place to provide communications between the existing four terminals, control tower, ground support services, and so forth. During the nearly 20 years of design and construction of Terminal 5, there would have been several significant design, and redesign (as network technology advanced), decisions made by those charged with integrating the Terminal 5 network(s) into the existing airport-wide network. Discuss *three* significant issues (not covered by the part b question – see below) with which they likely had to deal, and be sure to include discussion of likely solutions.
 - b. Discuss the advantages and disadvantages of using *wireless* for the airport-wide network(s). Note that in discussing advantages and disadvantages of *wireless* you have a significant opportunity to display your knowledge about *wired* networks.

Part B (answer at least one question from Part B)

4. BBC News (2008, April 2) reported that “Thousands of suitcases are being sent to Milan by British Airways to try to help clear a backlog of 19,000 bags at Heathrow’s new Terminal 5. BA said it would be quicker for some bags to be sorted by a Milan courier company and then driven to home or holiday addresses in mainland Europe.”
 - a. Discuss how information systems could have provided decision support for the executive(s) who made this decision. Be sure to include discussion of specific types of information needed, and of the questions the executive(s) would reasonably have asked.
 - b. Obviously opening day at terminal 5 was a public relations nightmare for British Airways (BA). Assume that BA has a Customer Relations Management (CRM) system. Discuss *three* significant ways the CRM can support BA in trying to re-establish relationships with now-unhappy customers.
 - c. Luggage is usually labeled with the traveler’s home or business address, not with the travel destination address. Possibly some luggage could have been delivered to travelers while still on holiday if information regarding travel destinations and dates had been included in the luggage labeling. Discuss *two* ethical, cultural and/or security issues that could arise in the requiring of this more detailed information.

5. The design and construction of Terminal 5 took place over nearly 20 years. You have studied the Systems Development Life Cycle (SDLC) primarily in the context of the development of information systems, but here you are to apply your knowledge of the SDLC to the design and construction of Terminal 5, including the design of internal facilities and processes to be performed by the people working there.
 - a. Demonstrate your understanding of the functions and purposes of the SDLC by discussing how its phases would be employed in the creation of Terminal 5.
 - b. Discuss *where* within the SDLC phases the opening day problems might have been identified, and what could have been done within the SDLC framework to prevent them.
 - c. The makeup (actual people on the team) of the design team presumably changed multiple times during the nearly 20 years – discuss *two* significant ways to maintain continuity within this large project.

6. British Airways (BA) and other airlines need (a) database(s) containing information on customers, flight schedules, reservations, gate assignments, checked luggage, and so forth.
 - a. Describe, including being sure to specify relationships among them, at least *three* significant tables that could be part of the database(s). Do not spend time giving details of aggregate information. For example, say something inclusive such as “name and location” rather than giving such details as first name, last name, street address, city, country, postal code, area code, etc.
 - b. Generally when designing databases one worries about concurrent updating, and wants to appropriately tell the DBMS (database management system) to appropriately control such, at the record or field level as needed. One of the articles discussing the opening day problems at Terminal 5 mentioned that the system erroneously reported that all luggage had been loaded onto some planes, and that those planes then flew with totally empty cargo holds. Discuss in convincing detail the extent to which concurrency issues were the likely cause of this problem.
 - c. Assume that BA’s database system has some *centralized* (one database for the entire company, located at its home-office headquarters) components and some *decentralized* components (located at the individual airports where BA has operations). Demonstrate your understanding of database issues by discussing, with explanation of *why*, *two* components that could appropriately be centralized. Then, discuss *two* components that could appropriately be decentralized.

Reference

BBC News. (2008, April 2). T5 Backlog Sent to Milan. Retrieved April 3, 2008, from http://news.bbc.co.uk/2/hi/uk_news/7325723.stm