

**BOWIE STATE UNIVERSITY
COMPREHENSIVE EXAMINATION FOR
MANAGEMENT INFORMATION SYSTEMS
22 March 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 concerns associated with tracking cargo transported from the arrival port, without appraisal or payment of duties, to another U.S. port for official entry into U.S. commerce or for exportation, as discussed in some of the links previously supplied. Note that you are not expected to be intimately familiar with the details of any of their systems, existing or planned, but are expected to demonstrate your knowledge of MIS by applying that knowledge, along with reasonable speculation about what the actual systems are or should be, to the specific questions asked in the comprehensive exam.

The U.S. Customs and Border Protection (CBP) must strive to balance its competing goals of facilitating trade, providing port security, and collecting trade revenues. CBP's in-bond system, which allows goods to transit the United States without formally entering U.S. commerce, must also balance these goals. In response to concerns that previously identified weaknesses in the in-bond system have not been remedied, GAO (Government Accountability Office) examined (1) the purpose of the in-bond system and the extent of its use (2) CBP efforts to ensure that revenues are collected and trade concerns are minimized, and (3) CBP efforts to ensure that security related inspections are properly targeted. GAO examined audit reports and agency documents, interviewed officials at CBP headquarters and at 10 CBP port offices. GAO also discussed the in-bond system with trade groups impacted by the in-bond system. GAO is recommending that the Commissioner of CBP take action in three areas (1) collect and use improved

information on in-bond shipments to enable better informed decisions, (2) assess the systemic problems associated with identifying open in-bonds and take steps to resolve these problems, and (3) ensure that the compliance measurement system is performed to improve CBP's in-bond management (GAO, 2007).

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. One of the GAO recommendations (GAO, 2007) is to “require additional information on the in-bond form ... at the time of arrival. This information should include data elements that provide a more precise description of the cargo and that further identify the entities involved in the movement of these goods.”
 - a. Some shippers provide data electronically in advance of the arrival of the shipment; for others, information has typically been collected on paper forms. Demonstrate your knowledge of computer hardware and software by ***comparing and contrasting*** in detail how RFID (radio frequency identification), bar codes, and/or PDA-type devices (small, hand-held computers such as Palm or Blackberries) can be used on-site to capture the recommended information.
 - b. Part of the GAO's recommendation was that the 10-character ID field (HTS number) be captured for all in-bond cargo, as it is captured for cargo which is not just “passing through” a port of entry. They also recommended capturing a significantly more detailed description of the contents of each in-bond shipment. Demonstrate your knowledge of types of storage devices, data processing in general, and how data is stored, by discussing (1) the percentage increase of storage needed for capture of this additional data (note – you must make ***several*** assumptions here – be sure to say what they are, and what numbers you are assuming!), and (2) methods of backup of this critical data, including explanation of how frequently and on what devices (and why).
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 them 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. Try also not to repeat yourself in answering the two parts of the question – take the opportunity to demonstrate more knowledge, not just redundant knowledge. (*Note – parts (a) and (b) are on the next page.*)

- a. Sub-system to guide the dock worker through the process of collecting the data on a PDA device (Blackberry, Palm Pilot, etc.) when a shipment enters the port.
 - b. Sub-system to use data to produce reports “useful to CBP management in making prioritized, risk-based management decisions related to revenue and security risks” (GAO, 2007).
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. Over time, each port of entry has developed its own in-house information for data collection (this is probably not actually the case, but assume it for purposes of this question). You have been hired as a contractor charged with integrating these networks (that is, with making them work together nationwide). Discuss *four* significant issues with which you will likely have to deal, and be sure to include discussion of potential solutions.
 - b. Discuss the advantages and disadvantages of using *wireless* for the network within one port of entry. Then, discuss the advantages and disadvantages of using *wireless* for the nationwide network. 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. There have been obvious advantages to shippers in the “flexibility” of the in-bond system as it has existed. Some of these include not paying duty on goods until they have been shipped to the actual location of use, minimization of detailed paperwork on goods that are in reality just “passing through” the U.S. en route to some other country, and not having to give detailed “up front” information on the contents of a shipment (just being able to “describe” it as a whole).
- a. Suppose you are a public relations employee of the CBP (Customs and Border Patrol, the entity responsible for tracking the in-bond shipments and much else). Discuss *two* ways you might convince the shippers that use of information technology to provide more detailed information could provide a competitive advantage over other shippers.
 - b. Demonstrate your knowledge of information systems by giving convincing discussion of problems that would be likely to arise if (1) a shipper decides to implement in-house (that is, have its own information systems staff implement providing the more detailed data electronically), or (2) the shipper decides to contract with a third-party company for a system to provide that information. (This is a thinly disguised “compare and contrast” of those two approaches.)
 - c. Discuss *two* ethical, cultural and/or security issues that could arise in the requiring of more detailed information from the international shippers.

5. CBP is in the process of replacing its old information system (ACS) with a new one (ACE) “in 11 increments, referred to as ‘releases,’ with a scheduled completion in approximately 8 1/2 years. The first three releases are deployed and operating, and the fourth release is currently being deployed. Other releases are in various states of definition and deployment” (GAO, 2007).
 - a. Demonstrate your understanding of the functions and purposes of the SDLC by discussing how its phases would be employed to support such a series of releases.
 - b. Discuss *two* significant change management issues associated with this incremental approach, being sure to address (a) solution(s) to each issue.
 - c. IT personnel will be replaced throughout these 8 ½ years – discuss *two* significant ways to maintain continuity within this large project.

6. These database questions assume the existence of a nationwide database supporting the collection of the increased amount of information the GAO recommended collecting on all of the in-bond shipments.
 - 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. (analogously in the case of a ship, airplane, truck, etc.)
 - b. Generally when designing databases we worry about concurrent updating, and want to appropriately tell our DBMS (database management system) to appropriately control such, at the record or field level as needed. Discuss in convincing detail the extent to which concurrent updating will or will not be an issue within the CBP (Customs and Border Patrol, the entity responsible for tracking the in-bond shipments and much else) database.
 - c. Assume that the CBP database has some *centralized* components and some *decentralized* components. 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

GAO (2007). Persistent Weaknesses in the In-Bond Cargo System Impede Customs and Border Protection’s Ability to Address Revenue, Trade, and Security Concerns. Retrieved 5 February, 2008 from <http://www.gao.gov/new.items/d07561.pdf>.