

**BOWIE STATE UNIVERSITY
COMPREHENSIVE EXAMINATION FOR
MANAGEMENT INFORMATION SYSTEMS
20 October 2007**

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 sharing of medical (and other) information between organizations. The scenario is inspired by ongoing efforts by the U.S. Departments of Defense and Veterans Affairs to share medical records, as discussed in some of the links previously supplied. Note that you are not expected to become 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 URL's provided gave approximately 16 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. From the GAO summary (GAO, 2007),
“The departments have also established ad hoc processes to meet the immediate need to provide data on severely wounded service members to VA’s polytrauma centers, which specialize in treating such patients. These processes include manual workarounds (such as scanning paper records) that are generally feasible only because the number of polytrauma patients is small.”
 - a. Demonstrate your knowledge of computer hardware and software by explaining in detail how scanning of paper records can be done by hardware and software working together.
 - b. Demonstrate your knowledge of types of storage devices, data processing in general, and how data is stored, by discussing *three* reasons that a computer system can handle a small number of patients, but not be able to “scale up” well enough to handle all records for the large number of current military and veterans.

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 medical information sharing sub-systems specified below. Note that it is not necessarily the case that both of these sub-systems will exist in the ultimate system, and in fact that it is very unlikely that both of them would be needed (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.
 - a. Sub-system to convert all data in the VA system to the DoD format (or vice versa, doesn’t really matter which direction we go for purposes of this question) for use by both DoD and VA in the current system into which the data was converted.
 - b. Sub-system to use data from the existing VA system and the existing DoD system, and provide user-friendly display via dashboards, portals, or other forms of user-friendly screens, as appropriate.

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. Assume that both the DoD and the VA have networks in place that support their currently-existing, non-combined information systems and that you are not familiar with the actual exact characteristics of these networks. You have been hired as a contractor charged with integrating these networks (that is, with making them work together). Discuss *four* significant issues with which you will likely have to deal, and be sure to include discussion of potential solutions.
- b. The (combined) network is down. Discuss *two* possible non-trivial (power outage and connection unplugged are examples of what would be trivial for purposes of this question) problems, and their solutions.

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

4. Assume that the system in which the VA and DoD can share medical information has been implemented throughout both departments, at all locations where veterans and military personnel might receive medical care. Assume also that it has been decided that some of this medical care will be contracted to be performed by private providers (physicians, pharmacies, etc.).
 - a. Discuss *two* ways these providers might reasonably use information technology to gain a competitive advantage over other providers.
 - b. Demonstrate your knowledge of information systems by giving *two* convincing (and varied) examples of problems that would be likely to arise as the private-sector providers attempt to have their information systems communicate with the public-sector information system supporting the sharing of medical information between the VA and DoD that would *not* reasonably have been expected to have been foreseen by the people who designed the VA-DoD information system. For each, discuss a possible ad-hoc (devised at the time of the problem, as opposed to having been designed in advance) solution.
 - c. Discuss *two* ethical and/or security issues that could arise in the sharing of information between the private and public systems, being sure to give a potential solution for each issue.
5. You are the lead systems analyst (or project manager or other “important and responsible” person – exact title is not important here) in charge of developing *one* of the short-term initiatives/projects described below. Discuss, as specifically as possible, particular considerations that might arise (or have arisen, in the case of a completed project) in each phase of the SDLC (system development life cycle). Include discussion of how one makes projections of the expected costs and return on investment (ROI). Note that you are not actually asked to design the systems here, you are being asked to demonstrate knowledge of the design process(es) that would be used to do so. Do this for *ONE* of the following initiatives:
 - a. “one-way transfer of health information from DoD to VA when service members leave the military” (GAO, 2007).

- b. “interface between certain existing systems that allows a two-way view of current data on patients receiving care from both departments” (GAO, 2007).
 - c. Implementation of data repositories at “seven VA and DoD sites, allowing computable outpatient pharmacy and drug allergy data to be exchanged” (GAO, 2007).
6. These database questions relate to the exchange of information among the departments of DoD and VA, and/or among the private providers who may be contracted to work with them.
- a. Describe, including being sure to specify relationships among them, at least *three* significant tables that could be part of the database(s) supporting long-term initiative to have one large system supporting the medical information needs of both departments. 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. Discuss in convincing detail *two* significant database issues that must be addressed to support communication between the VA and DoD, and give potential solutions for these issues.
 - c. This question pertains to two of the short-term initiatives that have been accomplished or are underway – (1) “an interface between certain existing systems that allows a two-way view of current data on patients receiving care” from both the VA and the DoD, and (2) “projects to exchange data at limited sites” (GAO, 2007). Describe in convincing detail how the requirements of these two initiatives are similar, and how they are different. Demonstrate your knowledge of features commonly provided by DBMS (database management systems), as well as any additional features that might need to be customized.

Reference

GAO (2007). Information Technology: VA and DOD Are Making Progress in Sharing Medical Information, but Remain Far from Having Comprehensive Electronic Medical Records. Retrieved 15 October, 2007 from http://www.gao.gov/docsearch/app_processform.php.