

SE 3821 – Requirements Engineering and Specification
Fall Quarter 2004-2005
Final Exam

Name: _____

Open Book and Notes.
Show your work clearly for partial credit.

Q1	15	
Q2 (a)	10	
Q2(b)	15	
Q3	15	
Q4 (a)	15	
Q4 (b)	15	
Q5	15	
Total	100	

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Problem Context

Product purpose: The product shall enable optometrists and ophthalmologists to efficiently visualize a patient's history, including when various tests were performed and how the patient's visual ability changed over time.

Goal: Provide practitioner with quickly understood visualizations of patient history

Advantages:

- * Appointment preparation time reduced
- * Better diagnostic support for practitioner
- * Infrastructure can also be used to quickly and automatically screen consenting patients for research activities

The client: The product is being built for a nationally respected ophthalmologic clinic and research center.

The customer: Same as the client for now. The client, being a private company, hopes to license the system to a wide variety of large and small practices.

The stakeholders: Patients, with a full variety of minor and major, and routine and rare, conditions. The client, future customers, research scientists, and the government (patients records laws) are some of the other notable stakeholders.

The users: Clinical practitioners and support staff; research scientists.

Constraints: No infrastructure constraints have yet been imposed, but the client has noted that the system must eventually allow transfer or sharing of patient information (subject to applicable laws) and must support both small, large, and national practices.

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1. SYSTEM CONTEXT DIAGRAM

(15 points)

Create a partial system context diagram, showing at least 1 system of each of the 3 main types, and including business events supporting a non-trivial, purposeful use of the system for each of the two main user groups.

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2. USE CASES

A. (10 points)

Identify a triggering business event from your system context diagram and write the basic flow of a use case that allows one of the key users to accomplish some non-trivial, goal-oriented interaction with the system.

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B. (15 points)

Of the several strategies that we have studied in class, apply one strategy (show work) to identify potentially missing or conflicting requirements for the use case specified in (a). What are your conclusions? Explain.

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**3. Do either A or B. Clearly identify the problem you are working on.
(15 points)**

A. STATE TRANSITION DIAGRAM: Enumerate the states of a patient that are likely to be needed to support all the functionality discussed in questions 1 & 2 and for regular maintenance activities. Draw a state transition diagram showing how the patient entities transition among these states.

B. DATA MODELLING: Draw an E-R diagram/data model for the information that may need to be stored for the product described in the exam.

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4. CRITERION FOR REQUIREMENTS

Good requirements should be accurate, unambiguous, complete, consistent and verifiable.

(a) (15 points) Write two non-functional requirements that arise from your use case in part 2.A. The NFRs must be of different types (performance, operational, etc.). Complete as many fields from the requirement template ("snow card" or "list of elements") as possible, making reasonable assumptions about the stakeholders, domain, etc., as needed, based on the information provided thus far.

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(b) (15 points) For any 5 of the following requirements, identify a problem with the requirement and rewrite it.

- 1) The product shall allow a full-time employee to register for employee benefits.
- 2) The product shall ensure that an employee gets paid in a timely manner.
- 3) The product shall teach kids multiplication facts.
- 4) A maximum of 300 users will be able to connect to the product between 8:00 A.M. and 10:00 A.M.
- 5) The product shall disconnect after 15 minutes of un-use.
- 6) The product should be usable by visually handicapped users.
- 7) A college junior should be able to operate this product.

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**5. REQUIREMENTS MANAGEMENT
(15 points)**

Explain the difference between "requirements creep" and "requirements leakage" with an example for each from the product described the exam. What effect do they typically have on a project? Discuss one strategy each to deal with this phenomenon.