



National University of Computer & Emerging Sciences, Karachi
Faculty of Computing
Midterm II Exam (Fall-2023)



7th November 2023, 12:30 PM – 01:30 PM

Course Code: SE2001	Course Name: Software Requirements Engineering
Instructor Name: Dr. Syed Muazzam Ali Shah	
Student Roll No:	Section No:

Time: 60 minutes

Max Marks: 30 Points

Instructions:

- Out of order questions will not be graded.
- Return the question paper and make sure to keep it inside your answer sheet.
- Read each question completely before answering it. There are **3 questions and 2 pages**.
- In case of any ambiguity, you may make assumption. However, your assumption should not contradict any statement in the question paper.
- You are **not allowed to write** anything on the question paper (except your ID and section).

Question 1 [10 points]

[CLO 1]

- a) Answer the question at the end of the case study with valid justifications using the following case study: **[5]**

A business analyst is working on a project that requires extensive investigation of the current situation. They need to collect a limited amount of data from a wide range of stakeholders, and understand stakeholders' responses to a range of particular circumstances and processes. Due to the nature of the organization, these stakeholders are based in various locations around the world and usually communicate via video-conference.

- Which of the following pairs of investigation techniques would best meet the analyst's need?
 - i. Scenario analysis and observations.
 - ii. Scenario analysis and interviews.**
 - iii. Document analysis and interviews.
 - iv. Interviews and observations.

Solution:

Scenario analysis and interviews.

Scenario analysis assists us with a stakeholder understanding the context and understanding the particular situation so if you look at the context of what it says and understand stakeholders responses to a range of particular circumstances and processes. This now indicates that scenario analysis would be a better answer over document analysis because a document analysis may be where we sit with these stakeholders and we are going through documentation to generate responses from them but if we want these stakeholders to understand a particular situation that's where we would use scenarios. In this particular instance we know that interviews (online

interviews with the stakeholders instead of face to face interviews, because stakeholders are distributed over various geographical locations) are the most likely answer here and scenarios are the most likely answer.

- b) Describe three situations in which requirements can be reused. Provide valid justifications for your answer. [3]

Solution:

- ❖ Where the requirement is concerned with providing application domain information
- ❖ Where the requirement is concerned with the style of information presentation. Reuse leads to a consistency of style across applications
- ❖ Where the requirement reflects company policies such as security policies.

- c) What are the types of requirements that should be considered as the basis for throwaway prototyping and evolutionary prototyping, and why? [2]

Solution:

Throwaway prototyping:

The requirements which should be prototyped are those which cause most difficulties to customers and which are the hardest to understand.

Evolutionary prototyping:

The requirements which should be supported by the initial versions of this prototype are those which are well-understood and which can deliver useful end-user functionality.

Question 2 [10 points]

[CLO 3]

- a) Explain the following analysis checklist items by providing valid examples of each? [2]

- i. Requirements traceability
- ii. Requirements realism

❖ **Requirements realism:**

- ☐ Is the requirement realistic given the technology which will be used to implement the system?

❖ **Requirements testability:**

- ☐ Is the requirement testable, that is, is it stated in such a way that test engineers can derive a test which can show if the system meets that requirement?

- b) Create an interaction matrix for the following requirements using the given rules: Furthermore, identify which requirement/requirements are more problematic by analyzing the interaction matrix? **[5]**

R1: The color of the entire software should be blue.

R2: The buttons of the software system should be simply lite blue.

R3: The software system should provide different forms for each task.

R4: The color of the login page should be aqua.

R5: The buttons should be sharp and highlighted.

R6: Data entry page should be in gray color.

Interaction matrix rules:

- For requirements which conflict, fill in a 10.
- For requirements which overlap, fill in a 100.
- For requirements which are independent, fill in a 0.

Solution:

	R1	R2	R3	R4	R5	R6	
R1	0	0	0	100	0	100	200
R2	0	0	0	0	10	0	10
R3	0	0	0	0	0	0	0
R4	100	0	0	0	0	0	100
R5	0	10	0	0	0	0	10
R6	100	0	0	0	0	0	100
	200	10	0	100	10	100	

- c) Describe three differences between requirements analysis and requirements validation. **[3]**

Requirements Analysis:

- ❖ It is concerned with raw requirements as elicited from system stakeholders.
- ❖ The requirements are usually incomplete and are expressed in an informal and unstructured way.
- ❖ Make sure that the requirements meet stakeholder needs.
- ❖ We are concerned about answering “Have we got the right requirements”.

Requirements Validation:

- ❖ It is concerned with checking a final draft of the requirements document which includes all system requirements.
- ❖ Known incompleteness and inconsistency has been removed.

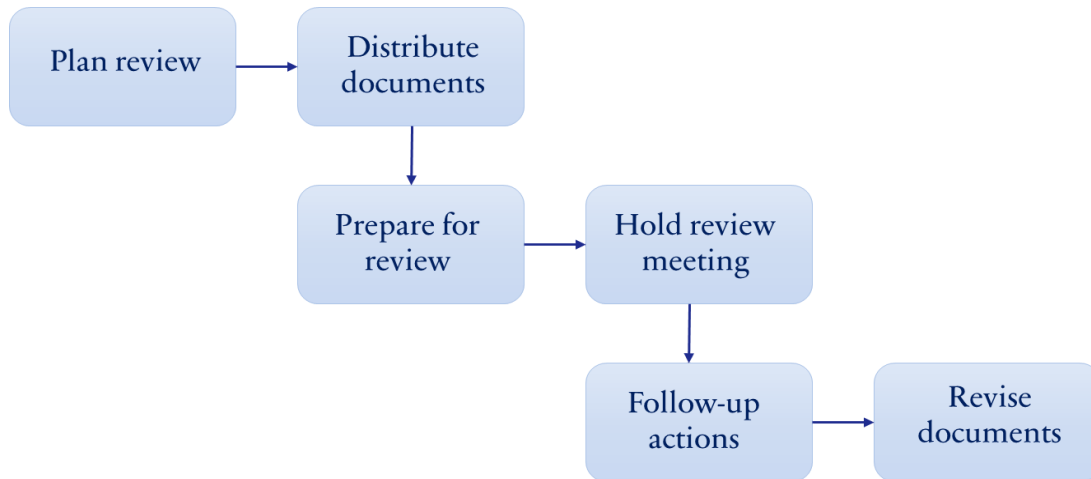
❖ We are concerned about answering “Have we got the requirements right”.

Question 3 [10 points]

[CLO 3]

What does it mean by requirements review? Explain each step of the requirements review process. **[5]**

Solution:



Plan Review:

The review team is selected and a time and a place for the review meeting is chosen.

Distribute documents:

The requirements document and any other relevant documents are distributed to the review team members.

Prepare for review:

Individual reviewers read the requirements to find conflicts, omissions, inconsistencies, deviations from standards and other problems

Hold review meeting:

Individual comments and problems are discussed and a set of actions to address the problems is agreed.

Follow-up actions:

The chair of the review checks that the agreed actions have been carried out.

Revise document:

The requirements document is revised to reflect the agreed actions. At this stage, it may be accepted or it may be re-reviewed.

- a) Identify which non-functional quality characteristics the following questions address by providing an example of each. **[2]**

- i. If a requirement makes reference to some other facilities, are these described elsewhere in the document?
 - ❖ **Completeness**
 - ii. Is the same service requested in different requirements? Are there any contradictions in these requests?
 - ❖ **Consistency, redundancy**
- b) Discuss how organizational and environmental factors lead to modifications to the requirements set. Explain each factor with the help of examples for each. **[3]**

Solution:

❖ **Environmental Changes:**

The environment in which the system is to be installed may change so that the system requirements have to change to maintain compatibility.

❖ **Organizational Changes:**

The organization which intends to use the system may change its structure and processes resulting in new system requirements.
