Course: Software Requirements Engineering

Week 14: Course Review

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Contents

- Introduction
- Overview of Software Requirements Engineering concepts
- Requirements elicitation, analysis, and specification techniques
- Requirement modeling, validation, and verification methods
- Requirement management, traceability, and change control
- Agile requirements engineering and supporting tools

Learning Outcomes

After completing this lesson, you will be able to:

- Explain core concepts and importance of requirements engineering
- Apply techniques for eliciting and documenting requirements
- Analyze, model, and validate software requirements effectively
- Manage requirement changes and maintain traceability
- Evaluate agile and traditional approaches in requirements engineering

Introduction

Having a problem, we need requirements for a system that solves the problem!!

Figure 1. *The problem, requirements and solution concepts*
Note. Image generated using Sora by OpenAI (2026).

What is SRE?

Figure 2. *The problem, requirements and solution concepts*
Note. Image generated using ChatGPT by OpenAI (2026).

Importance of RE

Minimizes project failure risks

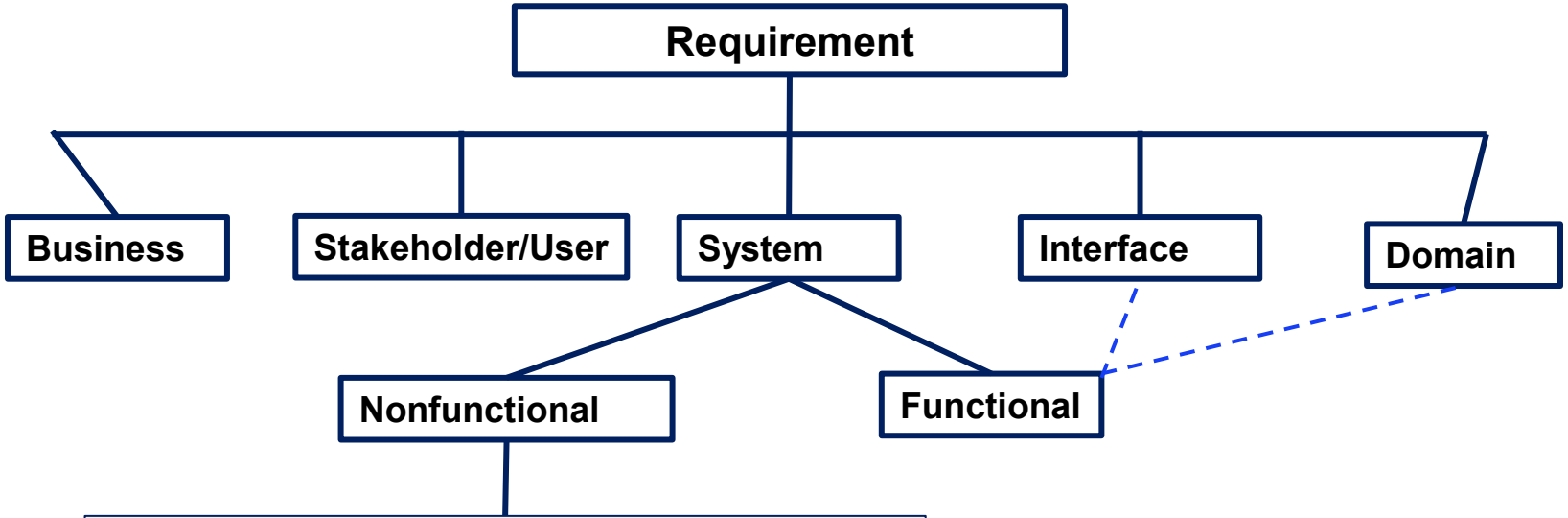
Reduces costly development errors

Improves stakeholder communication

Enhances software quality assurance

Supports customer satisfaction

Types of Requirements



- ✓ Quality Attributes (-ilities)
- ✓ Constraints / Implementation
- ✓ Compliance / Business Rules
- ✓ Other / Cross-Cutting Requirements

Stakeholders in RE

Figure 3. *Stakeholders in requirement engineering*
Note. Image generated using ChatGPT by OpenAI (2026).

Stakeholders – Types

- ✓ **Primary:** Directly **use the system**.

  Examples: End users, Customers, Operators

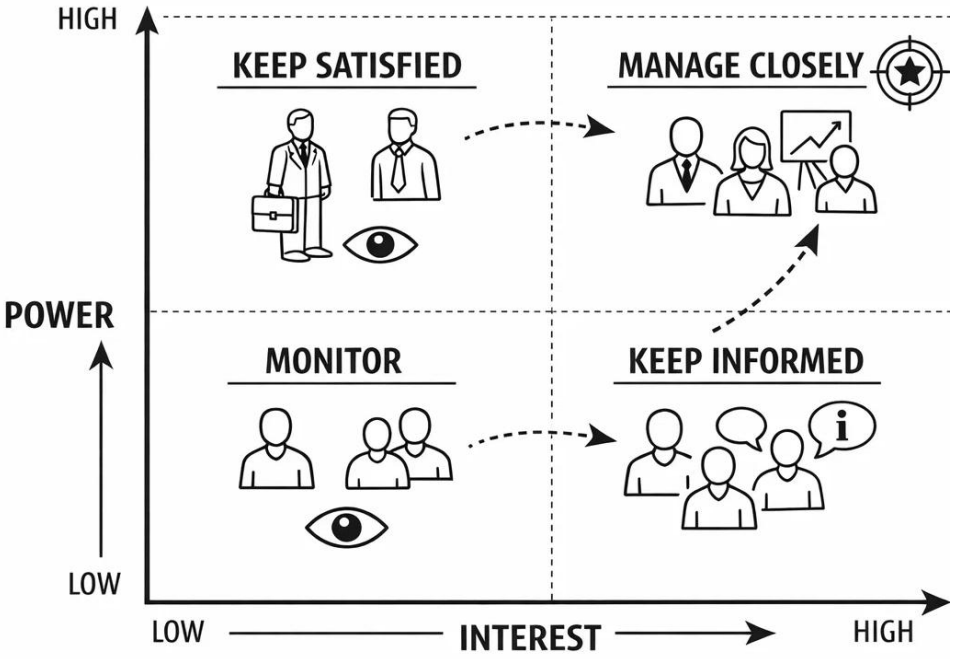
- ✓ **Secondary:** They **support or maintain the system** but may not use it daily.

  Examples: System administrators, Maintenance teams, IT support staff

- ✓ **External:** People or organizations **outside the company** but affected by the system.

  Example: Government regulators, Suppliers, Business partners

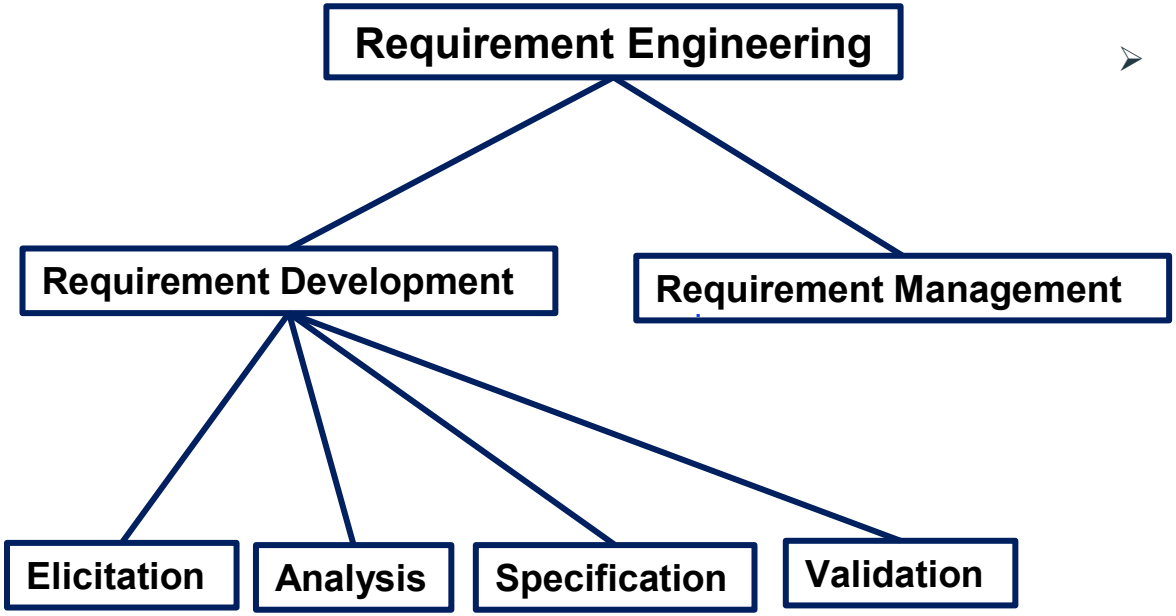
Stakeholders – Power-Interest Gride



The **Power–Interest Grid** is a stakeholder analysis **tool** used to

- ✓ **classify** stakeholders based on their **level of power and interest** in a project,
- ✓ helping project managers decide how to **manage** and **communicate** with them.

Components of RE

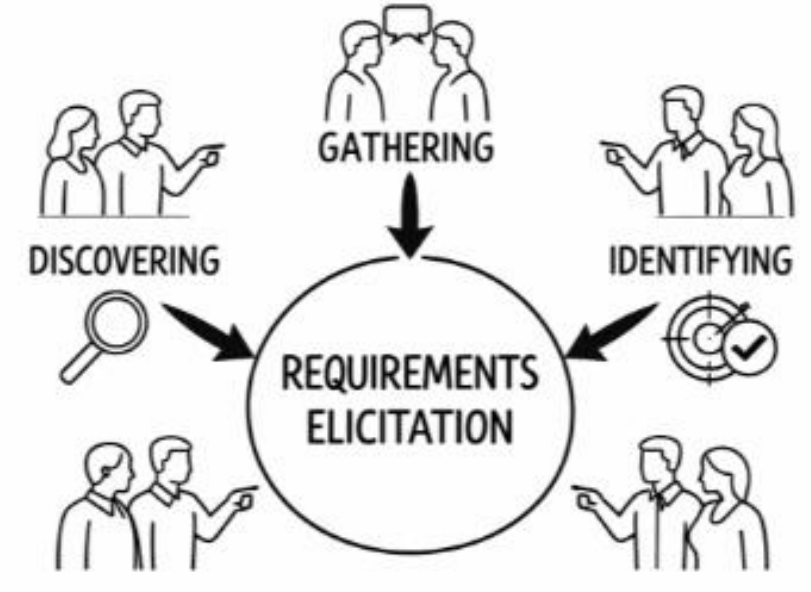


- Whether the approach is:
  - ✓ Pure waterfall
  - ✓ Phased
  - ✓ Iterative/Incremental
  - ✓ Agile or some hybrid

Requirements Lifecycle

Requirements Engineering: Process

Overview of Elicitation

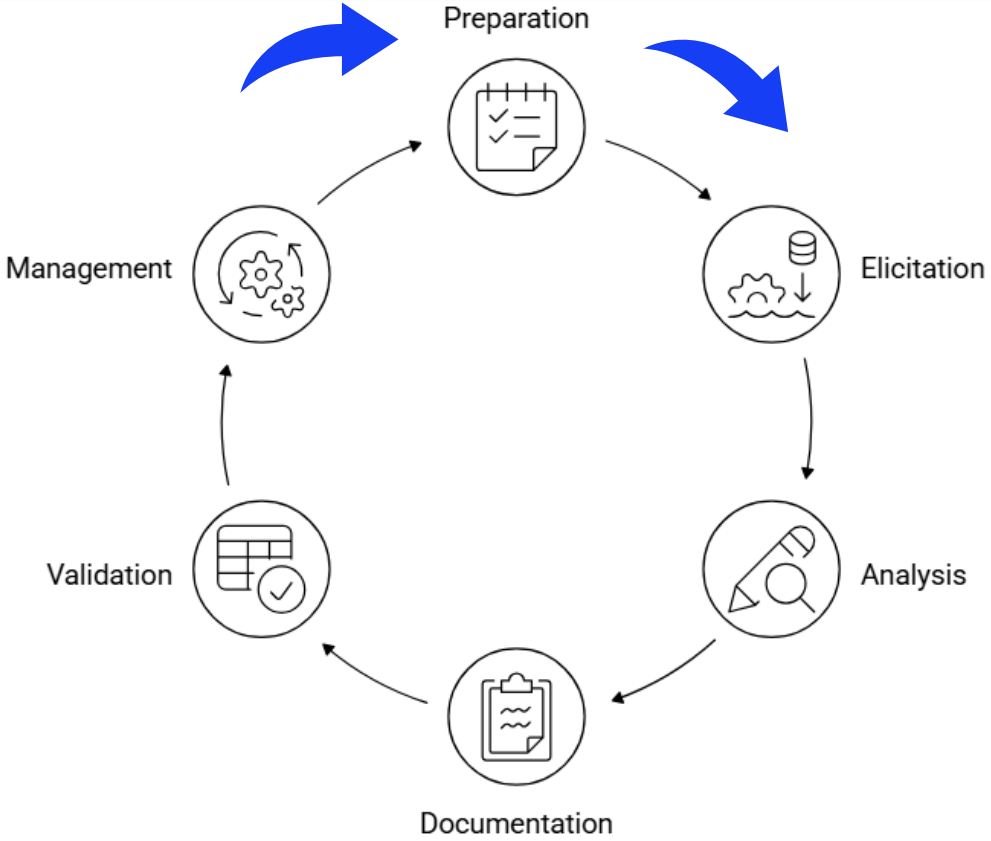


- The process of **discovering**, **gathering**, and **identifying** the needs and expectations of stakeholders for a software system (Beatty, 2013) (Chemuturi, 2013)

Elicitation transforms *ideas and expectations* into **clear, usable requirements**

Figure 4. *Concept of requirement elicitation*
Note. Image generated using Sora by OpenAI (2026).

Stages of Elicitation



Elicitation Techniques

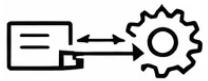
Interviews

Workshops

Brainstorming

Observation

Interface Analysis



System

User

Focus Group

Prototyping

Questionnaires (Surveys)

Document Analysis

Classification of Techniques

- ✓ Individual techniques
- ✓ Group techniques
- ✓ Observational techniques
- ✓ Creative techniques
- ✓ Facilitation-based techniques

Facilitated Activities	Independent Activities
Interviews, prototyping	Document analysis
Workshops, focus group	System interface analysis
Observations, brainstorming	User interface analysis
Questionnaires	

Requirements Analysis

Figure 5. *Requirements Analysis concepts*

Note. Image generated using Sora by OpenAI (2026).

Requirement Prioritization

Figure 6. *Requirements Prioritization concepts*
Note. Image generated using Sora by OpenAI (2026).

Prioritization Techniques

MoSCoW method

Ranking techniques

Scoring models

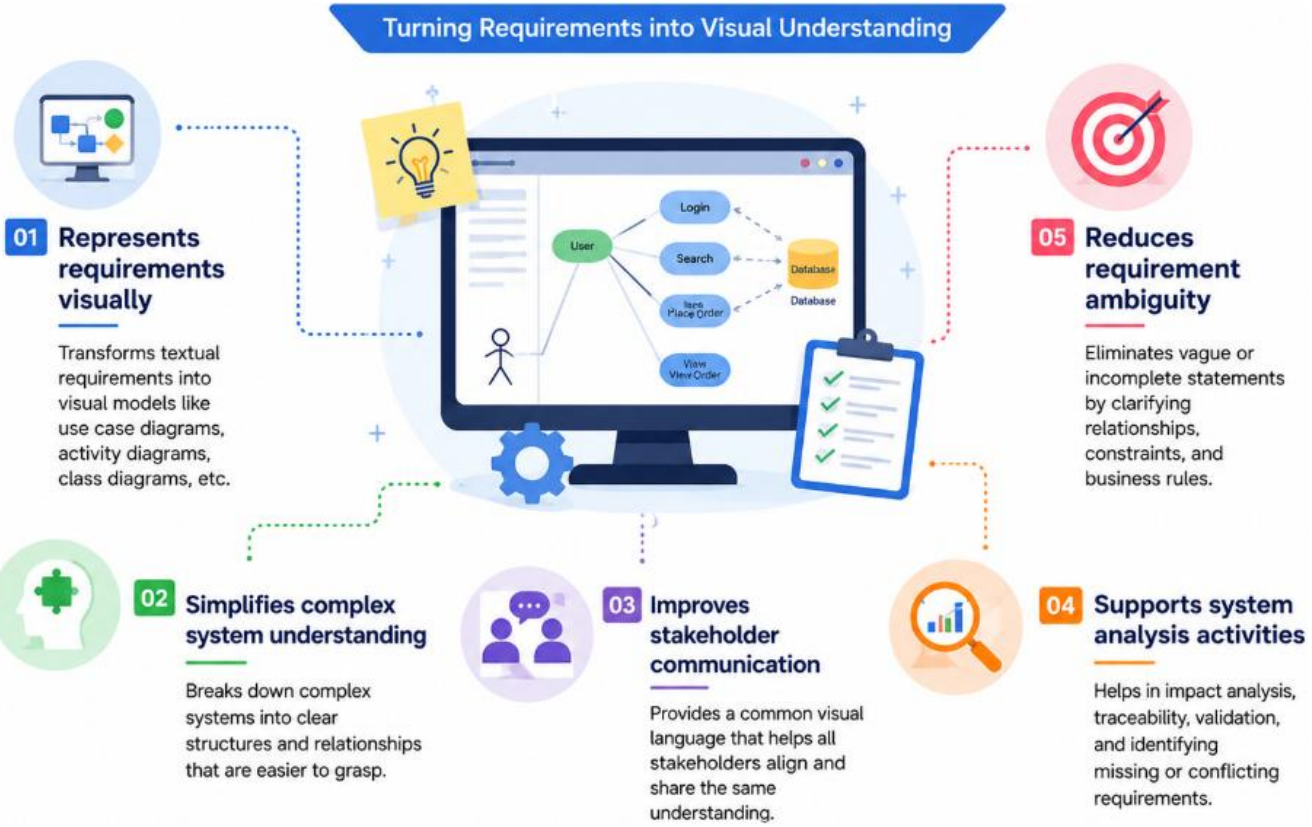
Value vs effort matrix

Kano model

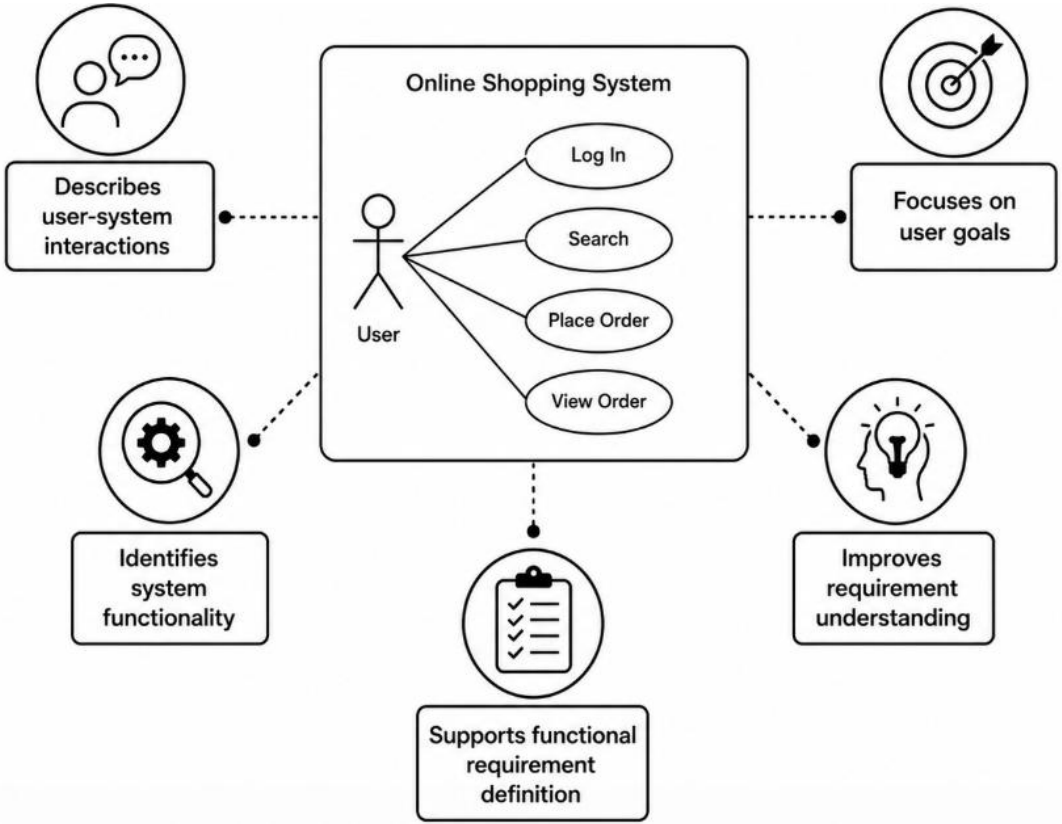
RICE Method

Risk-Based Prioritization

Requirement Modeling



Use Case Modeling



Software Requirement Specification (SRS)

Figure 7. *What is Software Requirements Specification?*
Note. Image generated using Sora by OpenAI (2026).

Characteristics of Good Requirements

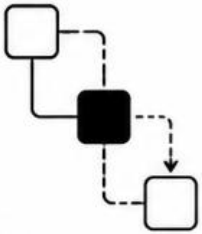
1. Clear and understandable

2. Complete and consistent

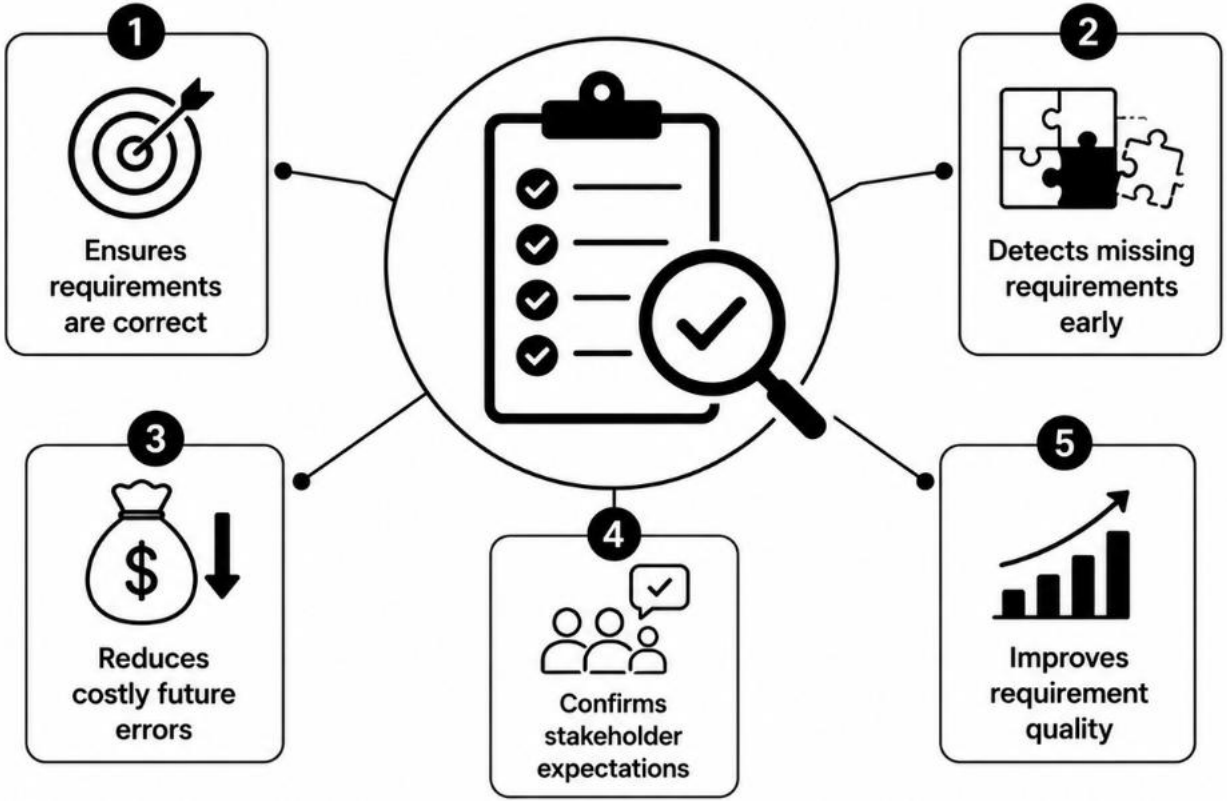
3. Testable and measurable

4. Feasible and realistic

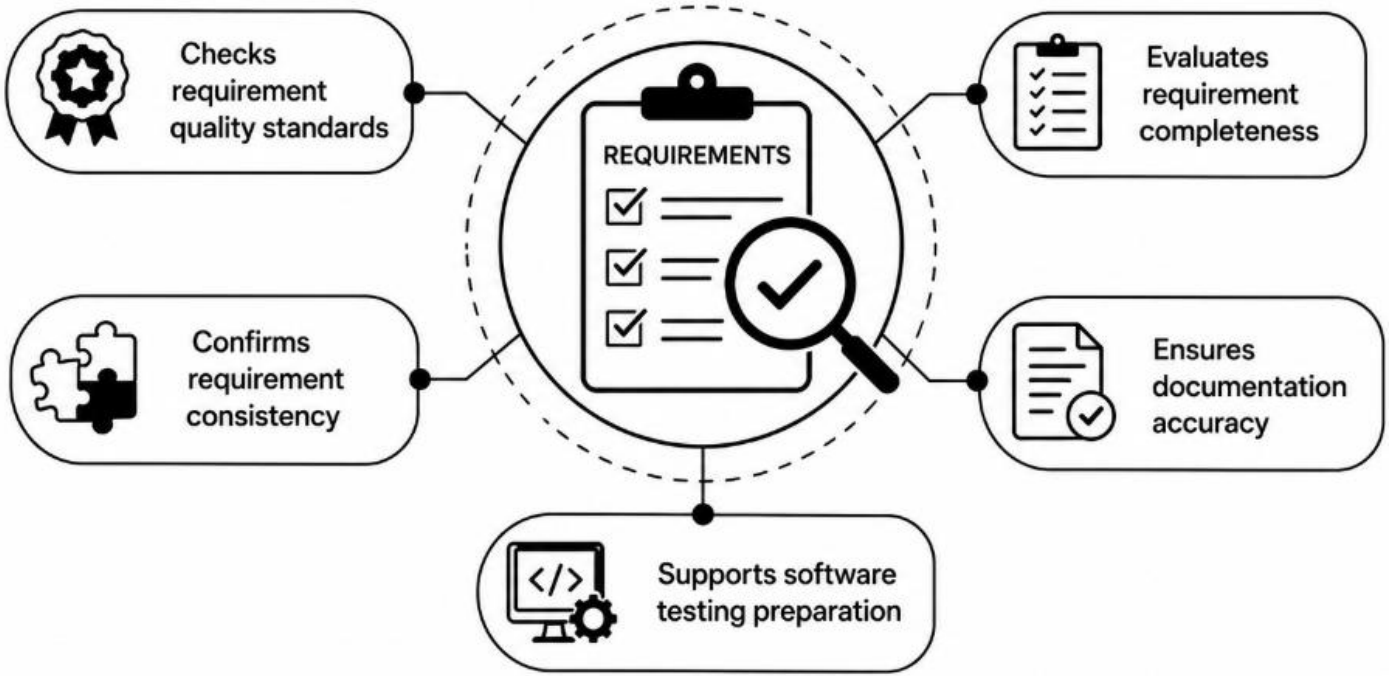
5. Traceable and prioritized



Requirement Validation



Requirement Verification



Requirement Traceability

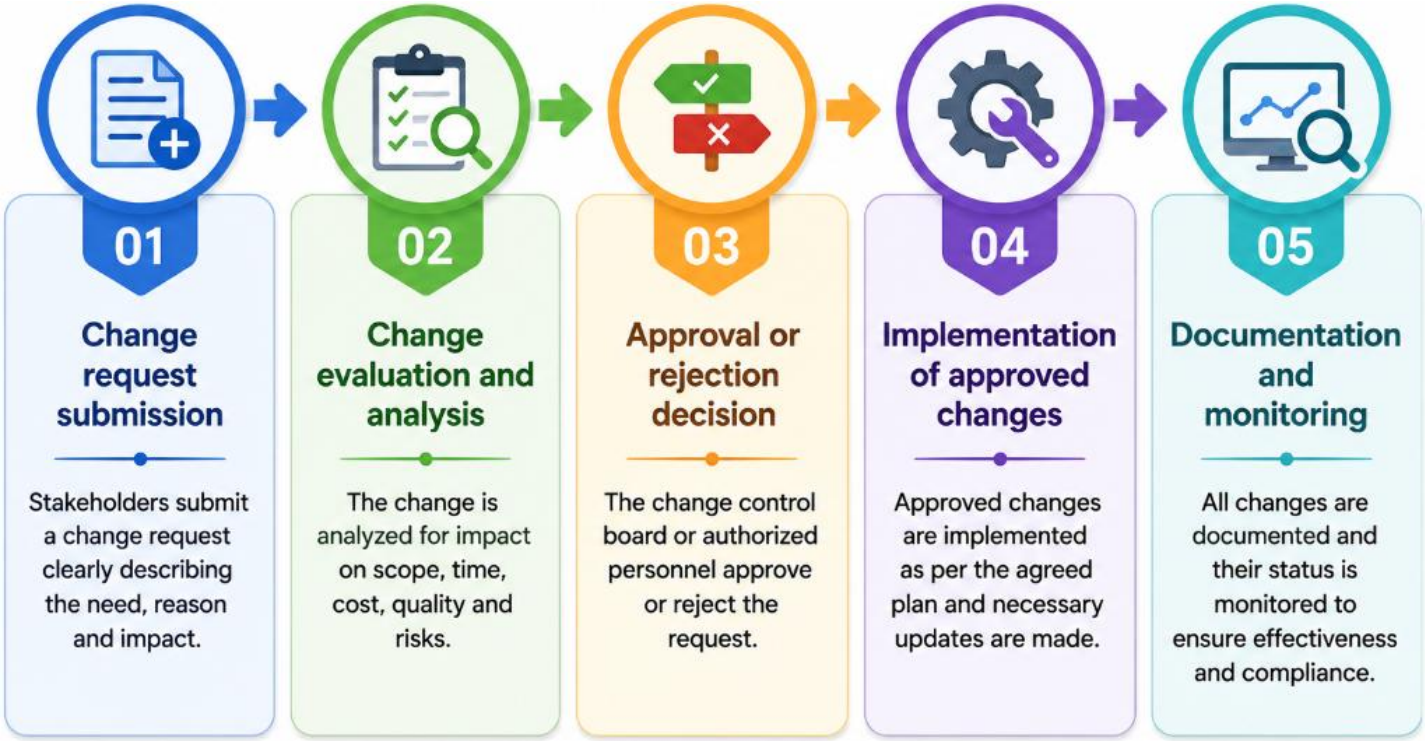
Requirement traceability is the ability to track requirements throughout the software lifecycle

- ✓ Links related project artifacts
- ✓ Connects requirements and testing
- ✓ Supports impact analysis
- ✓ Helps manage requirement changes
- ✓ Improves accountability and consistency

Requirement Change Management

- Handles evolving requirements systematically
- Evaluates change impact carefully
- Prevents uncontrolled scope growth
- Supports stakeholder approval process
- Maintains project stability

Requirement Change Management Process

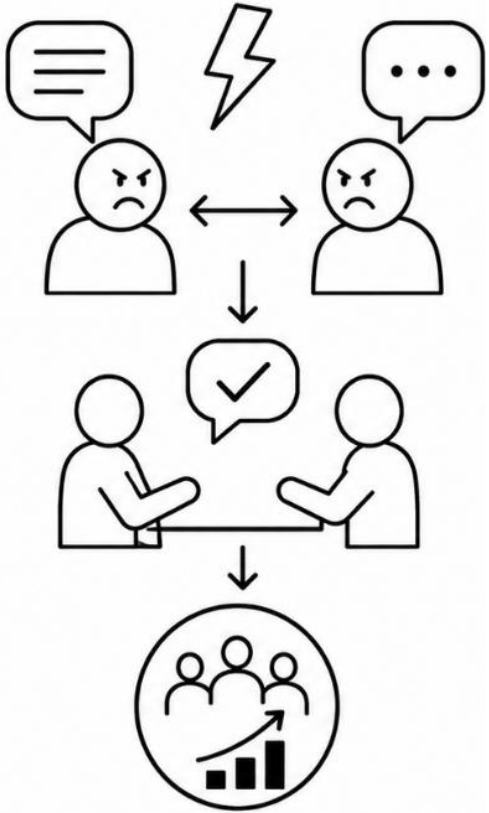


Requirement Documentation Techniques

- Organizes requirements systematically
- Improves communication clarity
- Supports stakeholder understanding
- Reduces ambiguity in requirements
- Enhances project consistency

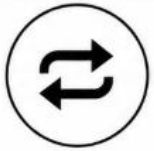
Requirement Conflicts and Resolution

- Conflicts arise among stakeholders
- Different priorities create disagreements
- Negotiation helps resolve issues
- Trade-offs balance competing needs
- Consensus improves project success



Requirement Risks and Challenges

Incomplete requirements cause problems



Scope changes affect schedules

Communication gaps create misunderstandings

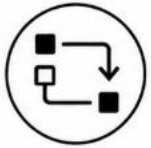
Stakeholder involvement may be limited

Poor requirements increase project risk

Requirement Management Tools

Support requirement documentation

Enable collaboration among teams



Improve traceability management

Assist requirement version control

Enhance project visibility

Agile Requirements Engineering

Supports iterative requirement development

Encourages continuous stakeholder feedback

Handles changing requirements quickly

Focuses on customer value

Promotes collaboration and flexibility

Summary

This lecture:

- ✓ Reviewed complete course concepts
- ✓ Connected major requirement topics
- ✓ Reinforced practical understanding
- ✓ Prepared for assessment and practice
- ✓ Ready for real-world application

References

1. Beatty, K. W. (2013). Software Requirements (3rd ed.). Washington: Microsoft Press.
2. Chemuturi, M. (2013). Requirements Engineering and Management for Software Development Projects. New York Heidelberg Dordrecht London: Springer. doi:10.1007/978-1-4614-5377-2

Thank You!