Course: Software Requirements Engineering

Week 4: Elicitation Stages and Practices

Lecturer: Yimer Amedie (MSc.)

Addis Ababa Science and Technology University

April, 2026

Contents

- Introduction
- Source of Requirements
- Stages of Requirements Elicitation
- Challenges and Best Practices of Elicitation

Figure 1. *The software requirements*
Note. Image generated using Sora by OpenAI (2026).

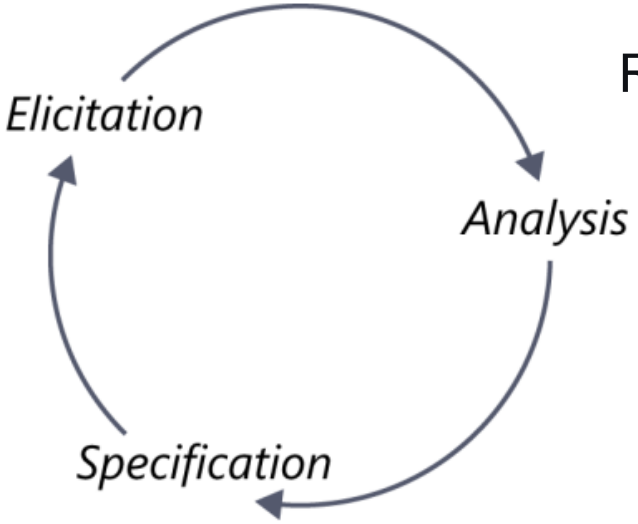
Learning Outcomes

After completing this lesson, you will be able to:

- Identify sources of requirements
- Explain stages of requirement elicitation
- Analyze common elicitation challenges and propose solutions
- Apply best practices to improve communication and requirement quality

.

Introduction



Requirements development is inherently cyclic.

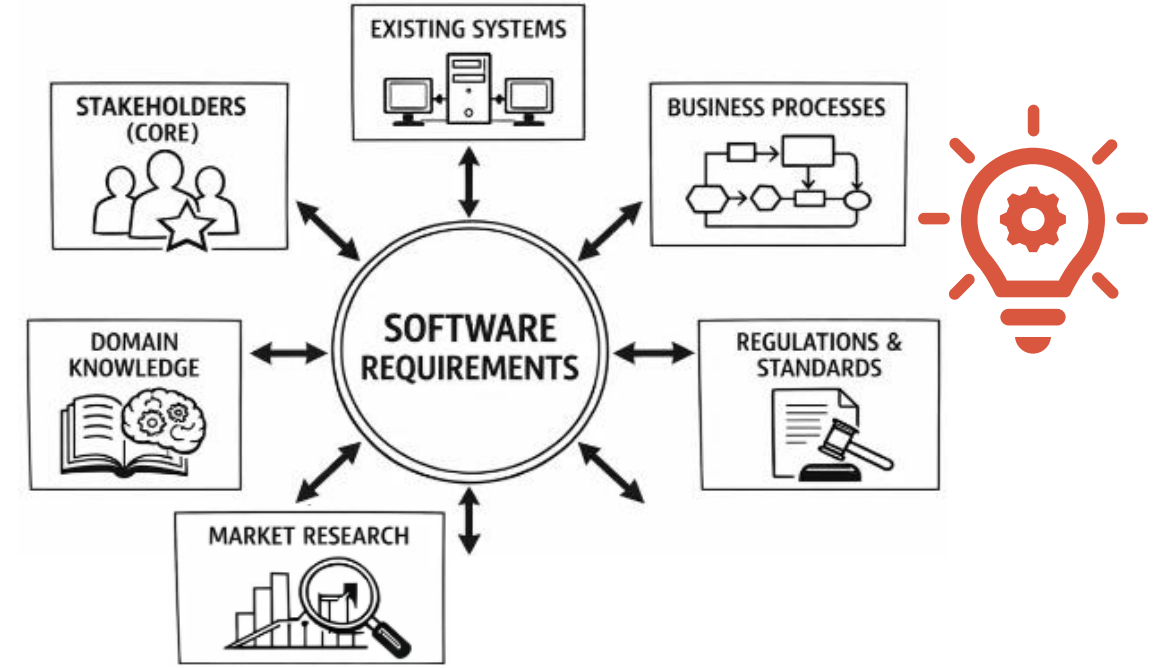
Elicitation ➔ Analysis ➔ Specification ➔ (Gaps Identified) ➔ More Elicitation

- ✓ This cycle continues until the requirements are sufficiently understood to proceed with design and coding at an acceptable level of risk (Beatty, 2013).

Sources of Requirements

- ✓ The people, documents, systems, or regulations from which system requirements are obtained.
- ✓ Important to:
  - ✓Ensure requirements are based on real stakeholder needs
  - ✓Improve accuracy and completeness of requirements
  - ✓Provide traceability to original information sources
  - ✓Reduce ambiguity and misunderstandings
  - ✓Support validation and verification of requirements

Sources of Requirements



The source of requirements is a **link** to the information on which the requirement is based (Chemuturi, 2013).

Figure 2. *Source of software requirements*
Note. Image generated using Sora by OpenAI (2026).

Sources of Requirements – Stakeholders

- ✓ **Stakeholders** provide direct requirements based on their roles, goals, and system usage
- ✓ **Users** describe functional needs such as system features and workflows
- ✓ **Managers** define business objectives, constraints, and performance expectations
- ✓ **External stakeholders** (customers, regulators) introduce compliance and usability needs
- ✓ Conflicting stakeholder inputs must be analyzed and resolved systematically.

Sources of Requirements – Existing Systems

- ✓ **Existing systems** provide baseline requirements through current functionalities and limitations
- ✓ **Legacy system** analysis reveals required features that must be retained/improved
- ✓ **System documentation** and user feedback highlight gaps and inefficiencies
- ✓ **Reverse engineering** helps identify implicit and undocumented requirements
- ✓ **Migration projects** depend heavily on understanding current system behavior

Sources of Requirements – Business Processes

- ✓ **Business process** define workflows that the system must support or automate
- ✓ **Process models** reveal inputs, outputs, and decision points
- ✓ **Inefficiencies** in processes highlight opportunities for system improvement
- ✓ **Requirements** ensure alignment between software functionality and business operations
- ✓ **Process changes** may lead to new or modified system requirements

Organizational workflow

- ✓ Company regulations, Internal policies, Business procedures

Sources of Requirements – Regulations & Standards

- ✓ **Regulations** impose mandatory requirements that systems must comply with
- ✓ **Industry standards** define best practices for security, data handling, and interoperability
- ✓ **Compliance requirements** often translate into non-functional requirements
- ✓ **Failure** to **meet regulations** can result in legal and financial penalties
- ✓ **Systems** must include audit trails, reporting, and security controls

Sources of Requirements – Market Research

- ✓ **Market research** identifies user expectations and competitive features
- ✓ **Customer feedback** reveals unmet needs and usability issues
- ✓ **Competitor analysis** highlights industry trends and innovation opportunities
- ✓ **Market demands** influence system features and prioritization
- ✓ **Research** ensures the system remains relevant and competitive

Sources of Requirements – Domain Knowledge

- ✓ **Domain knowledge** provides context-specific requirements based on industry practices
- ✓ **Experts contribute** specialized knowledge that stakeholders may not articulate
- ✓ **Terminology** and **rules** must be accurately reflected in system requirements
- ✓ **Domain constraints** influence system behavior and decision logic
- ✓ **Lack** of **domain** knowledge leads to incorrect or incomplete requirements

Sources of Requirements – Effective Elicitation

Combining Multiple Sources

- ✓ Provides a more comprehensive view of system needs
- ✓ Helps identify gaps and missing requirements
- ✓ Enables cross-validation of information
- ✓ Reduces bias from relying on a single source
- ✓ Improves overall requirement quality and reliability

Sources of Requirements – Activity

- ✓ **Scenario: Online Learning System Case**
  - ✓ A university is developing an online learning system for students and instructors
  - ✓ The system will support course registration, video lectures, assignments, and grading
  - ✓ Current processes use spreadsheets and basic learning tools
  - ✓ The system must follow education policies and protect student data
  - ✓ The platform should be user-friendly and competitive with modern e-learning systems.
- ✓ **Identify the source and classify each requirement as FR or NFR.**

Sources of Requirements – Answer

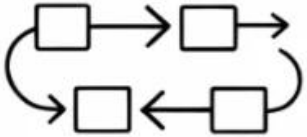
STAKEHOLDERS
(Functional)

- **Students:** Enroll in courses
- **Instructors:** Upload lectures, grade assignments

EXISTING SYSTEMS
(Functional / Non-Functional)

- Data migration from spreadsheets
- Improve slow/error-prone processes

BUSINESS PROCESSES
(Functional)



- *Course registration automation*
- *Assignment submission workflow*
- *Grading workflow automation*

Sources of Requirements – Answer … continued

REGULATIONS & STANDARDS
(Non-Functional)

- Protect student data
- Ensure privacy compliance

DOMAIN KNOWLEDGE
(Functional)

- Enforce academic rules
- Grading system rules
- Course prerequisites

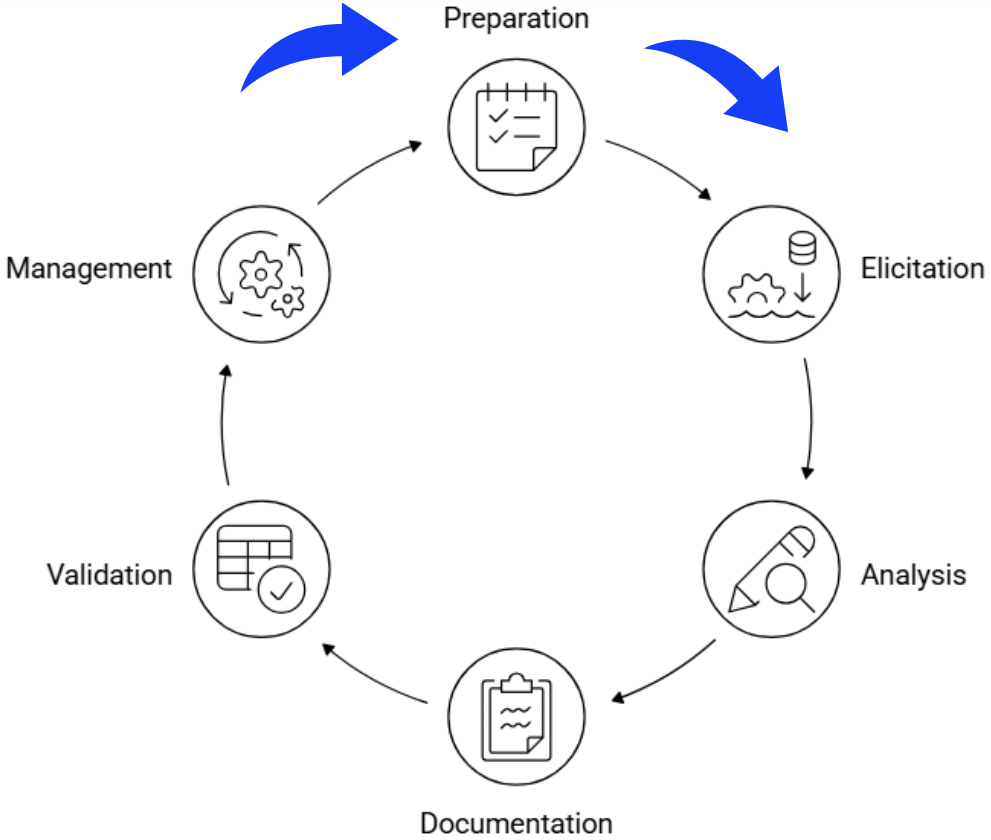
MARKET RESEARCH
(Non-Functional / Functional)

- User-friendly interface
- Video streaming
- Notifications

The Process/Stages of Elicitation … (1/2)

- ✓ Elicitation stages organize requirement gathering into **preparation**, **execution**, **documentation**, and **validation**
  - ✓ The process is **iterative**, allowing refinement as new information emerges
  - ✓ Each stage produces **outputs** that **feed** into the **next stage**
  - ✓ **Structured stages** reduce ambiguity and improve requirement quality
  - ✓ **Continuous feedback** ensures alignment with stakeholder expectations

The Process/Stages of Elicitation … (2/2)



1. Preparation

- ✓ In this initial stage, the project team prepares for the elicitation process by:
  - ✓ **Defining Goals**: Clarify what the team aims to achieve through the elicitation process.
  - ✓ **Identifying Stakeholders**: Determine who will provide input and ensure their availability.
  - ✓ **Choosing Techniques**: Decide on the methods that will be used to gather requirements.
  - ✓ **Planning Activities**

2. Elicitation/Execution

- ✓ This stage involves actively gathering requirements from stakeholders and other sources.

Figure 3. *Conduct Elicitations*
Note. Image generated using Sora by OpenAI (2026).

3. Analysis

- ✓ Once requirements are gathered, they must be analyzed to ensure clarity and feasibility:
  - ✓ **Categorization**: Organize requirements into categories (functional, non-functional, technical).
  - ✓ **Prioritization**: Determine which requirements are critical for the initial release and which can be deferred.
  - ✓ **Conflict Resolution**: Address any conflicting requirements from different stakeholders.

4. Documentation

- ✓ Requirements should be documented clearly and concisely.
- ✓ This documentation serves as a reference throughout the project lifecycle:
  - ✓ **Requirements Specification Document**: A comprehensive document detailing all gathered requirements.
  - ✓ **User Stories**: Short, simple descriptions of features from the perspective of the end user.
  - ✓ **Use Cases**: Scenarios that describe how users will interact with the software.
- ✓ Record requirements, Use standard formats, Ensure clarity, Maintain traceability, and Organize information

5. Validation

- ✓ Validation ensures that the documented requirements accurately reflect stakeholder needs:

Review Session: Conduct review meetings with stakeholders to confirm that the requirements are correct and complete

Prototyping: Use prototypes to validate requirements through user interaction and feedback

Traceability: Establish links between requirements and their sources to ensure accountability

6. Management

- ✓ Requirements management is an ongoing process throughout the software development lifecycle:
  - ✓ **Change Control**: Implement a process for handling changes to requirements as the project evolves.
  - ✓ **Version Control**: Maintain versions of requirements documents to track changes over time.
  - ✓ **Stakeholder Communication**: Keep stakeholders informed about changes and updates to requirements.

Elicitation Stages – Activity

- ✓ **Scenario: Online Learning System Case**
  - ✓ A university plans to develop an online learning system within 6 months
  - ✓ The system will support registration, lectures, assignments, grading, and reports
  - ✓ Different departments have unclear and sometimes conflicting requirements
  - ✓ Existing tools are inconsistent and lack proper documentation
  - ✓ The project team must follow a structured elicitation process to ensure success
- ✓ **Identify what activities should be performed in each stage.**

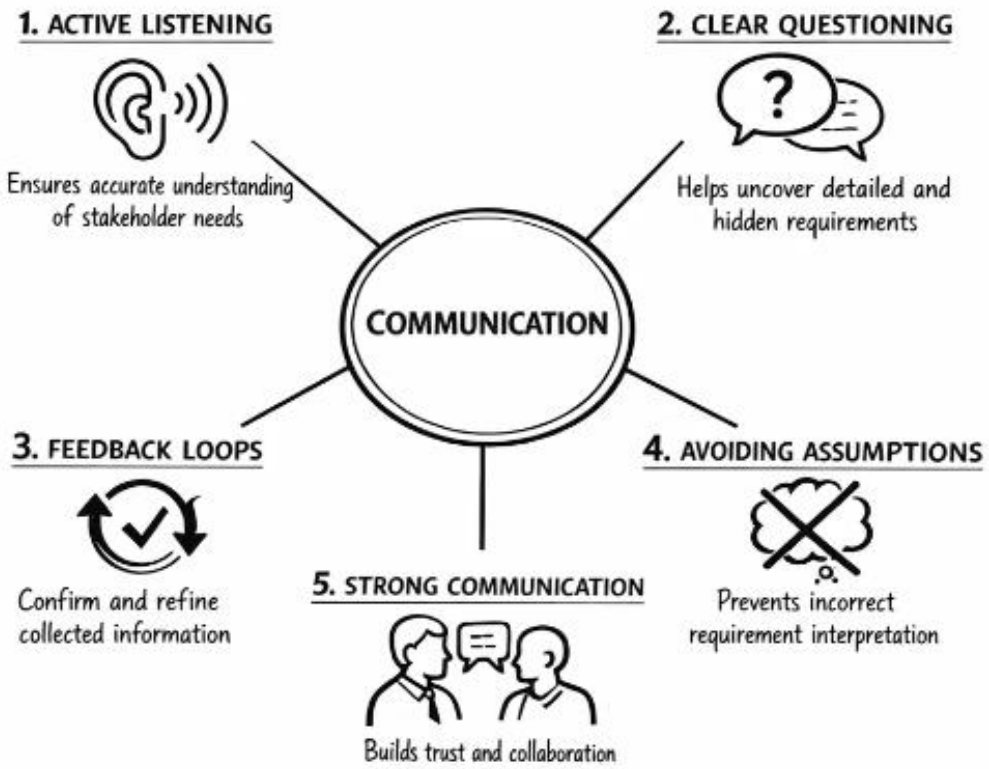
Elicitation Stages – Answer

Preparation	Elicitation	Analysis	Documentation	Validation	Management
✓ Define scope ✓ Identify key user groups ✓ Plan elicitation schedule & resources	✓ Conduct meetings to gather requirements on registration, lectures, grading needs	✓ Resolve conflicting requirements ✓ Prioritize features based on university goals	✓ Record requirements in structured format such as SRS with clear descriptions	✓ Review requirements with users ✓ Confirm correctness & completeness	✓ Track requirement changes, ✓ Maintain version control ✓ Ensure traceability

Importance of Structured Elicitation

- ✓ Minimizes missing and incomplete requirements
- ✓ It ensures systematic execution of requirement gathering activities
- ✓ Documentation becomes consistent and traceable across the project
- ✓ Communication between stakeholders and developers is improved
- ✓ It reduces project risks such as rework and requirement changes

Communication in Elicitation



Challenges in Elicitation

Major Challenges include:

- ≠ Stakeholders unclear about needs
- ≠ Communication gaps
- ≠ Conflicting requirements
- ≠ Limited stakeholder availability
- ≠ Cultural and organizational barriers

Best Practice

Engage stakeholders early

Ask open-ended questions

Validate frequently

Use multiple elicitation techniques

Document everything clearly

Knowledge Check

1. Identifying stakeholders and planning elicitation activities is part of:

   A. Discovery B. Preparation C. Analysis D. Documentation

2. A requirement to encrypt user data mainly comes from:

   A. Market research B. Business processes C. Regulations D. Existing systems

3. Resolving conflicting stakeholder requirements is performed during:

   A. Preparation B. Discovery C. Documentation D. Analysis

4. Requirements frequently changing during a project is an example of:

   A. Best practice B. Elicitation challenge C. Documentation issue D. Validation step

5. Maintaining continuous communication with stakeholders is considered:

   A. A challenge B. A documentation task C. A best practice D. A risk

Knowledge Check – Answer

1. Identifying stakeholders and planning elicitation activities is part of:

   B. Preparation

2. A requirement to encrypt user data mainly comes from:

   C. Regulations

3. Resolving conflicting stakeholder requirements is performed during:

   D. Analysis

4. Requirements frequently changing during a project is an example of:

   B. Elicitation challenge

5. Maintaining continuous communication with stakeholders is considered:

   C. A best practice

Summary

- ✓ Elicitation stages provide a structured approach to requirement gathering
- ✓ Effective execution ensures complete and accurate requirements
- ✓ Proper documentation supports development and testing activities
- ✓ Challenges can be addressed through best practices and communication
- ✓ Mastering elicitation improves overall software project success

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!