Unit 3

Requirement Gathering & SE Principles

What is Requirement Engineering?

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- Is the disciplined application of proven principles, methods, tools and notation to describe system's intended behavior and its associated constraints

- Provides appropriate mechanism
  1. to understand and analyze the customer needs
  2. feasibility assessment
  3. negotiating reasonable solution & specifying it clearly
  4. validating the specifications and managing the requirements

Point to remember:

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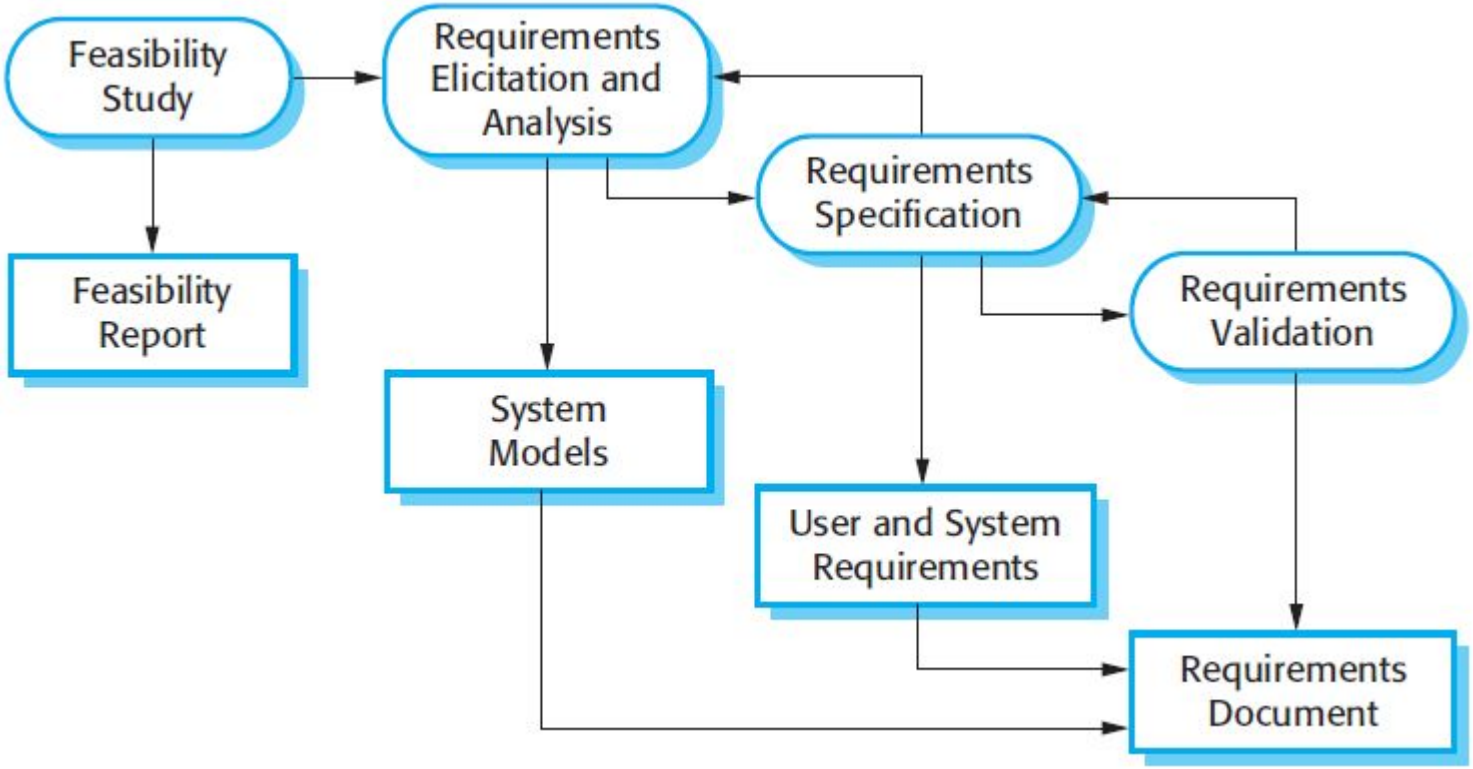
Requirements are finally transformed into a working system

Steps in Requirement Engineering:

1. Feasibility study
2. Requirement Elicitation and Analysis
3. SW requirement specification
4. SW requirement validation
5. SW requirement management

The overall flow



1. Feasibility study

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- To assess the practicality of a proposed plan
- Is this plan feasible?

Types:

1. **Technical Feasibility**
2. **Operational Feasibility** - How well the SW perform to solve business problems and customer requirements
3. **Economic Feasibility** - Checks the ROI (If the product can make profit)

Technical feasibility (Sources of Risk):

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- Users & Analyst poor knowledge on the business and application area
- Lack of familiarity with technology (Sometime new technology)
- Project size (#people, time frame, distinct features)
- Compatibility with the existing system (Degree integration required)
- Etc.,

Economic Feasibility:

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- Costs and benefits
- Determine cash flow
- Assess financial viability
- Etc..,

2. Requirement Elicitation and Analysis

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- AKA Requirement (Gathering, Discovering, Capturing and Defining)
- Requirements are identified (Customer or existing system / process)

Problems associated with this phase:

- Stakeholders often don't know what they want
- The term difference between dev team and stakeholders
- Conflicting requirements.
- Requirement change during the analysis process.
- Organizational and political factors may influence system requirements.

Possible questions to be answered:

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- Process
- How their process works?
- Frequency of tasks
- Volume of decisions or transactions
- Problems faced
- Efficiency of tasks
- Etc.,

Requirement Elicitation and Analysis

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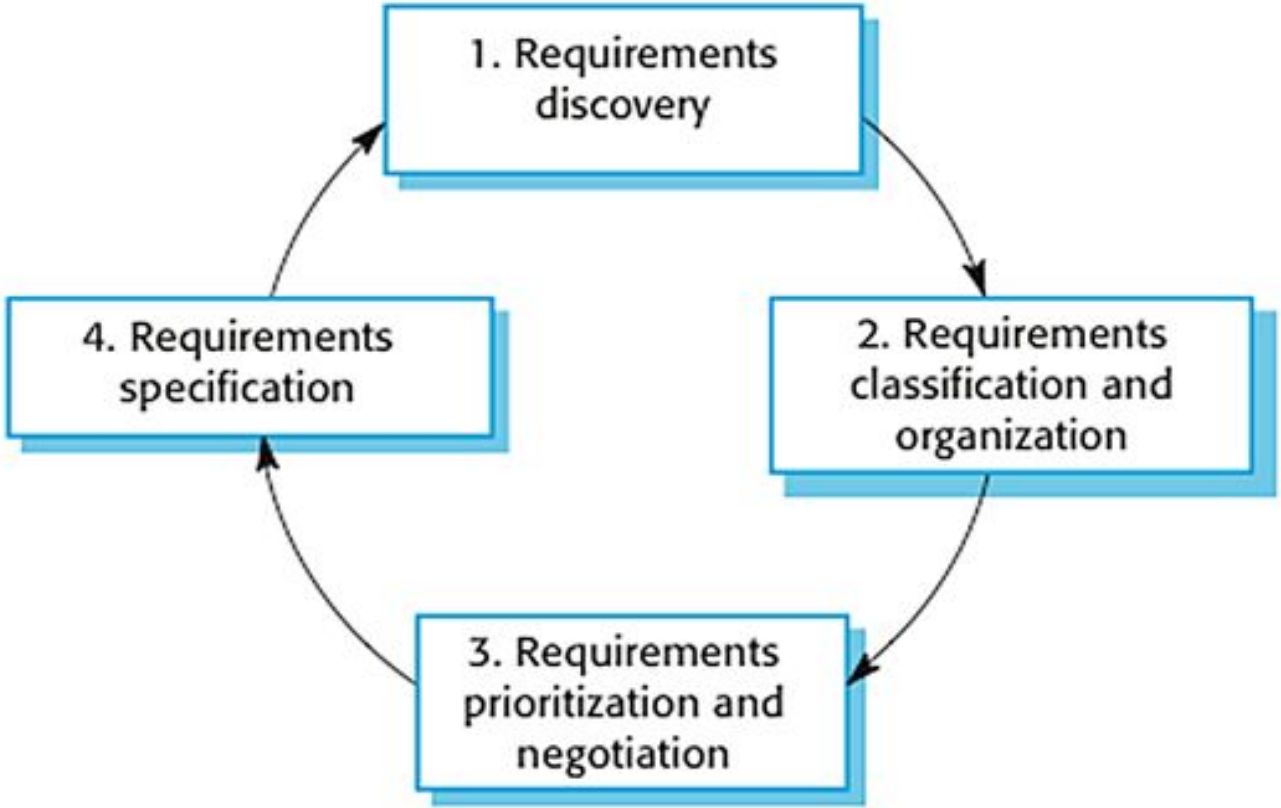
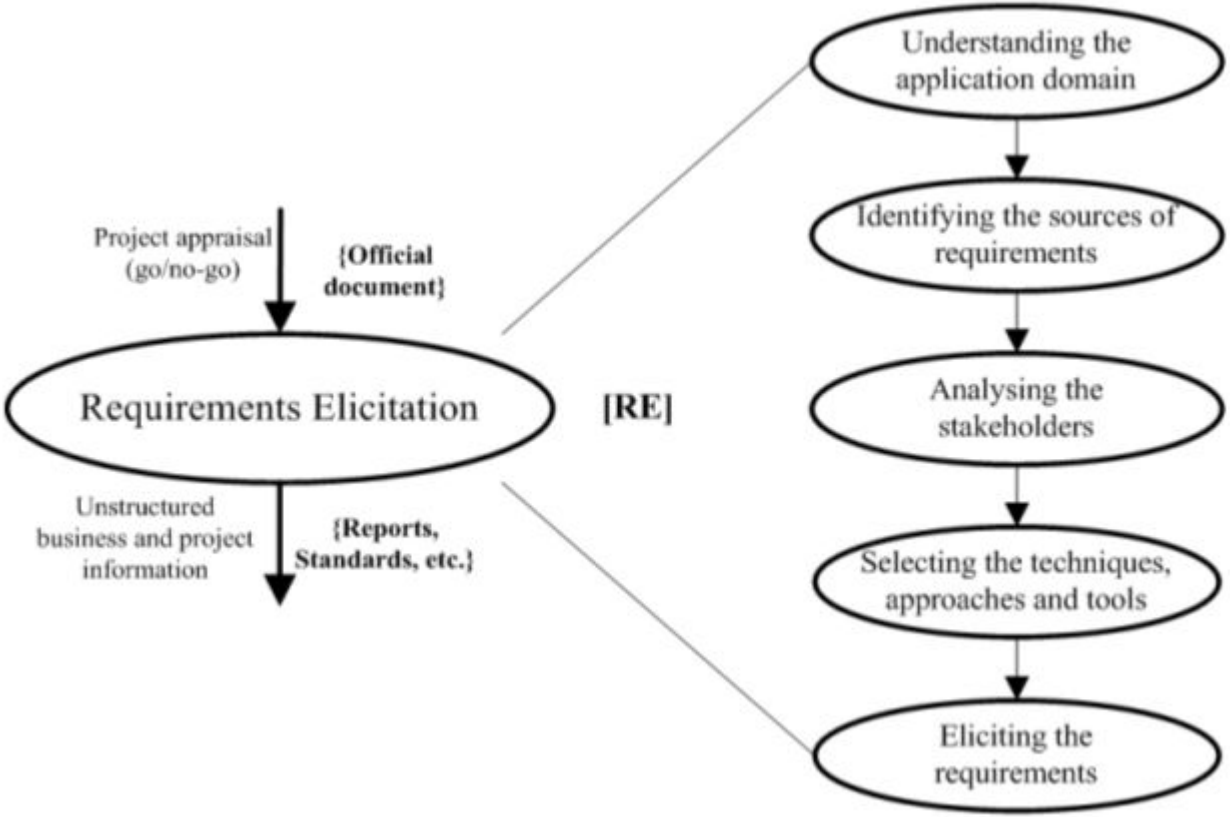


Requirement Elicitation and Analysis



Methods used for requirements gathering:

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- Interviews
- Survey/Questionnaire
- Analysing the existing system / Process
- Analyzing existing Business data

SMART Requirements:

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S - Specific

M - Measurable

A - Agreed upon

R - Realistic

T - Time based

3. Software Requirement Specification

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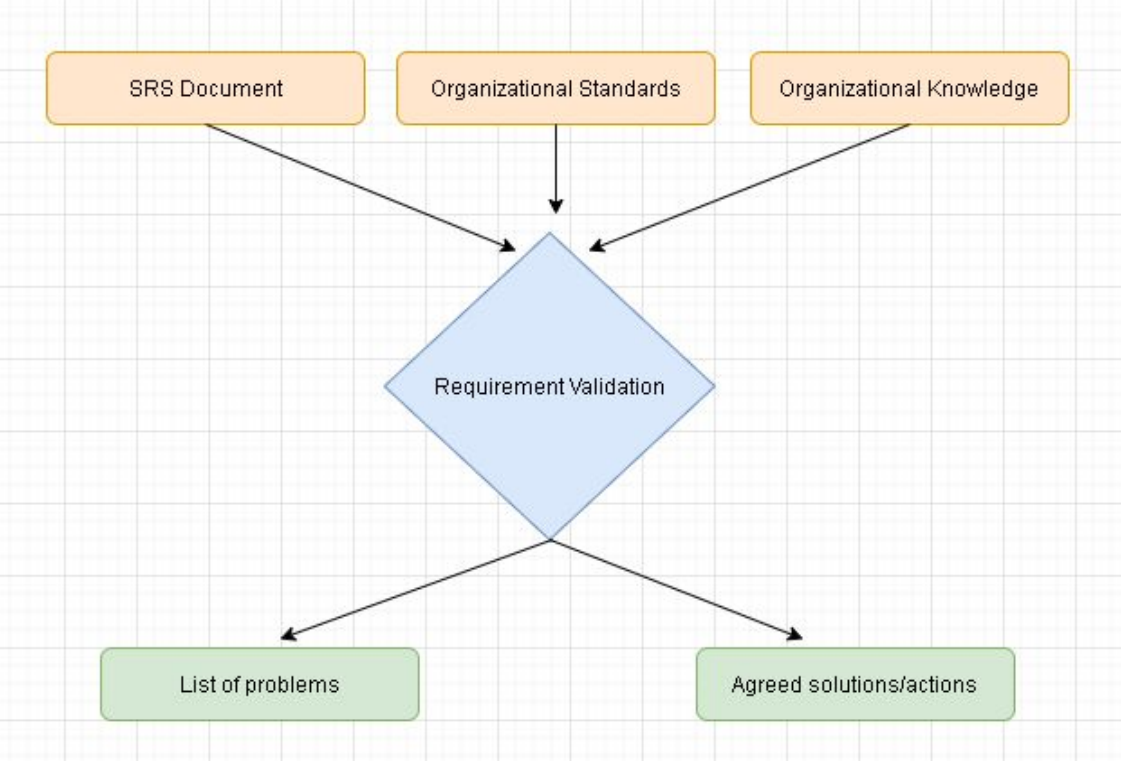
- created by a software analyst after the requirements
- Software analyst converts the requirement into technical language so that the dev team can understand

Diagrams used in the SRS:

- **Data flow diagram** - The flow of data throughout the system
- **Data Dictionaries** - Meta-data
- **Use case diagram** - The user's interactions with the system
- **Sequence diagram** - The interactions between objects of the system
- **Class diagram** - The classes, attributes, operations, and the relationships among objects
- **Activity diagram** - workflows of stepwise activities and actions with support for choice, iteration and concurrency

4. Software Requirement Validation

- The Requirements specified in the SRS document is validated



4. Software Requirement Validation

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Checklist:

1. Understandability
2. Redundancy
3. Ambiguity
4. Completeness

Of the Requirements is checked by the **“Validation Team”**

A possible good Validation Team:

Developer + Stakeholder + Domain expert + Tester

Requirements Validation Techniques

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- Requirements reviews: systematic manual analysis of the requirements.
- Prototyping: Checking with a prototype of the intended system.
- Test-case creation: Develop tests for requirements to check testability.

5. Software Requirement Management:

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- Process of managing changing requirements during RE process
- Chances are there for new requirements during the process based on client/business needs
- Few changes must be accepted due to the need of the system/business