

# Software Requirements Engineering (SE2001)



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# Requirements Validation - 1<sup>2</sup>

- ❖ Requirements Validation is the final stage of requirements engineering.
- ❖ The aim is to validate the requirements.
  - Check the requirements to clarify that they represent an acceptable description of the system which is to be implemented.

# Requirements Validation - 2<sup>3</sup>

❖ The process involves:

- System stakeholders
- Requirements engineers
- And system designers

❖ Who analyze the requirements for problems, omissions, and ambiguities.

# Analysis VS Validation - 1

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## ❖ Requirements Analysis:

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

# Analysis VS Validation - 2 <sup>5</sup>

## ❖ 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**”.

# Requirements Validation - 6

## Problems

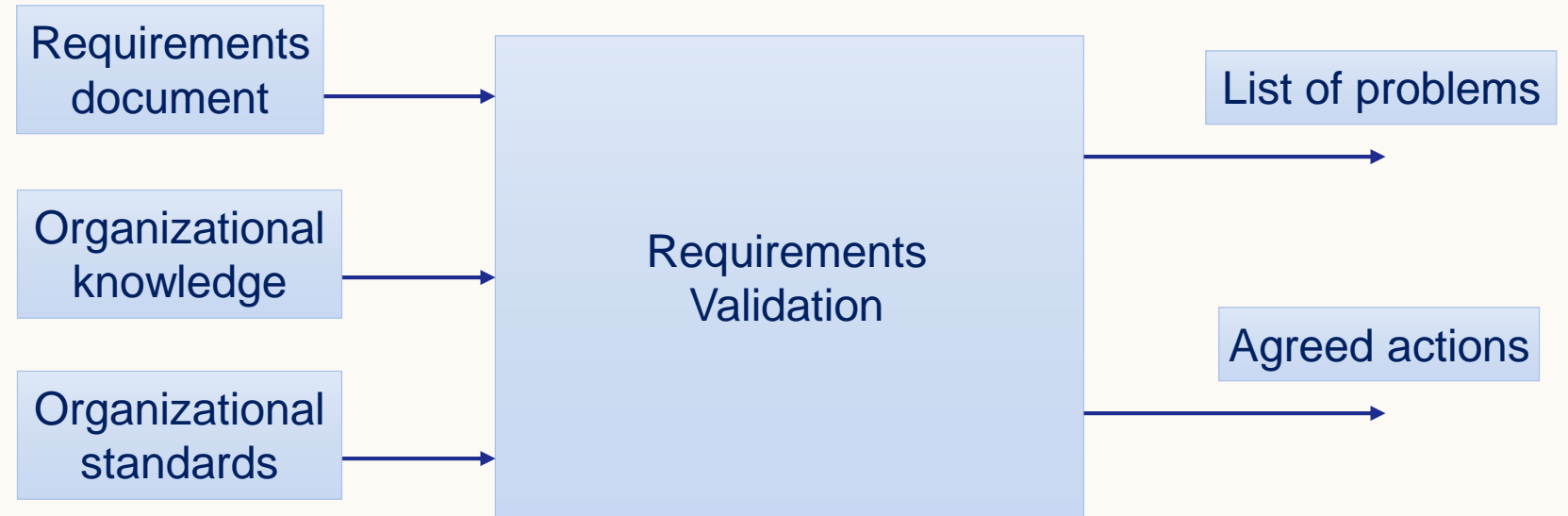
❖ Examples of requirements problems discovered during validation:

- Lack of conformance to quality standards.
- Poorly worded requirements which are ambiguous.
- Errors in models of the system or the problem to be solved.
- Requirements conflicts which were not detected during the analysis process.

# Requirements Validation

## Process- Inputs & Outputs

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# Requirements Validation

## Process : Inputs - 1

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❖ The inputs to the requirements validation process.

➤ **The requirements document:**

- This should be a complete version of the document rather than an unfinished draft.
- It should be formatted and organized according to organizational standards



# Requirements Validation

## Process : Inputs - 2

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❖ The inputs to the requirements validation process.

### ➤ Organizational standards:

- Requirements validation process should check conformance with company standards.
- Whatever standards are relevant for the requirements documents should be an input to the validation process.

# Requirements Validation

## Process : Inputs - 3

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❖ The inputs to the requirements validation process.

### ➤ **Organizational Knowledge:**

- The people involved in requirements validation may know the organization, its particular terminology and its practices and the skills of the people.

# Requirements Validation

## Process : Outputs - 1

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❖ The outputs to the requirements validation process.

### ➤ List of problems:

- This is a list of reported problems with the requirements document.
- It should be organized into problem types e.g. ambiguity, incompleteness, etc.

# Requirements Validation

## Process : Outputs - 2

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❖ The outputs to the requirements validation process.

### ➤ Agreed Actions:

- This is a list of actions in response to requirements problems which have been agreed by those involved in the validation process.

# Requirements Reviews

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Requirements reviews are the most widely used technique of requirements validation.

# Requirements Reviews

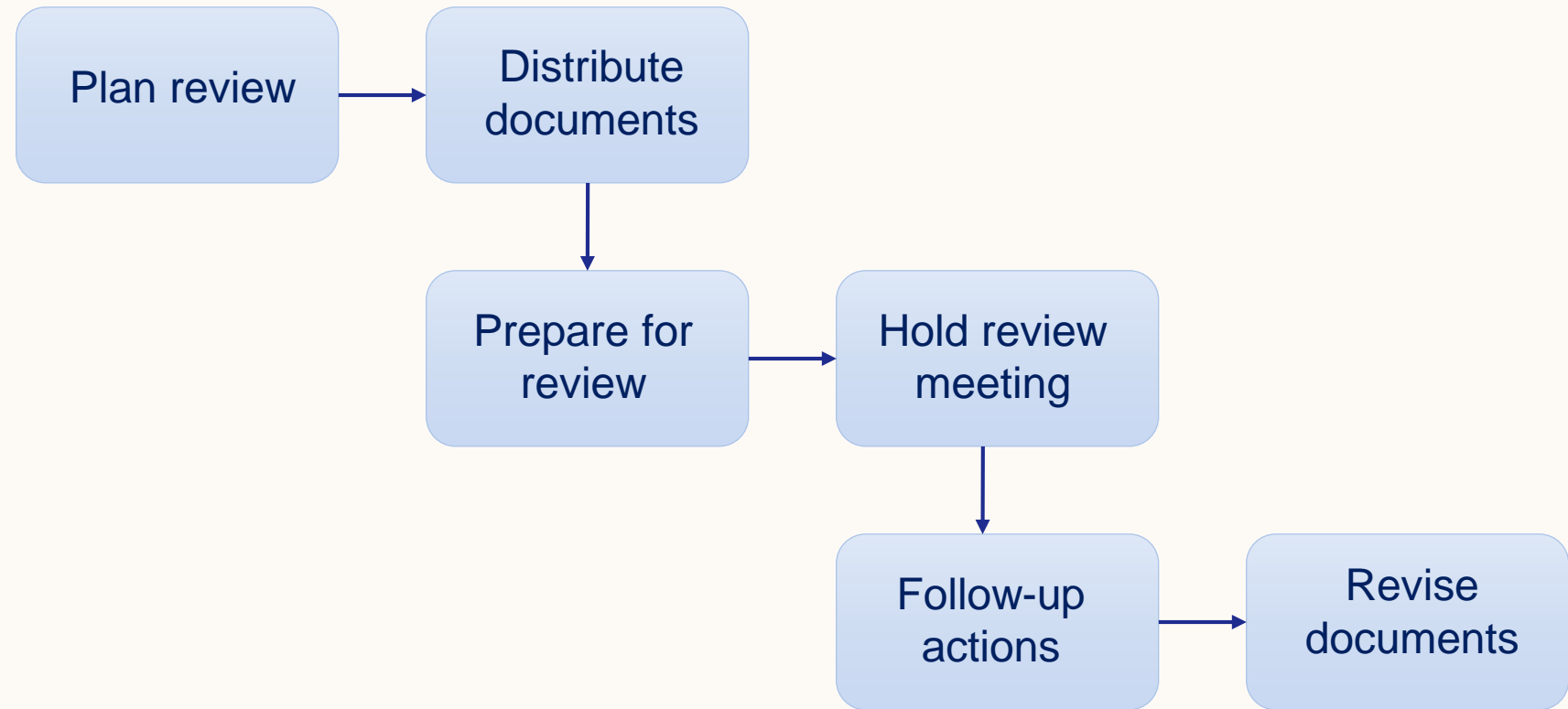
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❖ A group of people:

- Read and analyze the requirements
- Look for problems
- Meet and discuss the problems
- And agree on a set of actions to address the identified problems

# Requirements Review Process

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# Requirements Review Process : Activities 1

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## ❖ 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.



# Requirements Review Process : Activities 2

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## ❖ 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.

# Requirements Review Process : Activities 3

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## ❖ 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.

# Problem Actions - 1

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Actions which might be decided for each problem are as follows:

- ❖ Requirements clarification
- ❖ Missing information
- ❖ Requirements conflict
- ❖ Unrealistic requirement

# Problem Actions - 2

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## ❖ Requirements clarification:

- ❖ The requirement may be badly expressed or may have accidentally omitted information which has been collected during requirements elicitation.
- ❖ The author should improve the requirement by rewriting it.

## ❖ Missing information:

- ❖ Some information is missing from the requirements document.
- ❖ It is the responsibility of the requirements engineers who are revising the document to discover this information from system stakeholders.

# Problem Actions - 3

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## ❖ Requirements Conflicts:

- ❖ There is a significant conflict between requirements. The stakeholders involved must negotiate to resolve the conflict

## ❖ Unrealistic Requirement:

- ❖ The requirement does not appear to be implementable with the technology available or given other constraints on the system.
- ❖ Stakeholders must be consulted to decide how to make the requirement more realistic

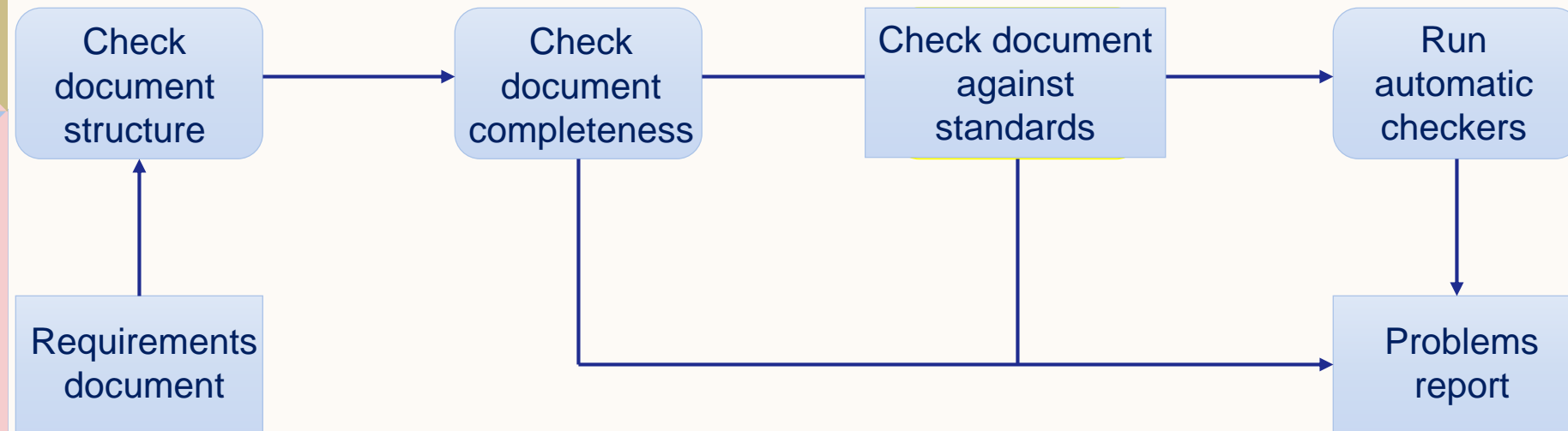
# Pre-Review checking - 1

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- ❖ Reviews are expensive because they involve a number of people spending time reading and checking the requirements document.
- ❖ This expense can be reduced by using pre-review checking where one person checks the document and looks for straightforward problems such as missing requirements, lack of conformance to standards, typographical errors, etc.
- ❖ Document may be returned for correction or the list of problems distributed to other reviewers

# Pre-Review checking - Stages

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# Review Team Membership

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- ❖ Reviews should involve a number of stakeholders drawn from different backgrounds
  - People from different backgrounds bring different skills and knowledge to the review
  - Stakeholders feel involved in the RE process and develop an understanding of the needs of other stakeholders
- ❖ Review team should always involve at least a domain expert and an end-user





# **THANK YOU**

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