

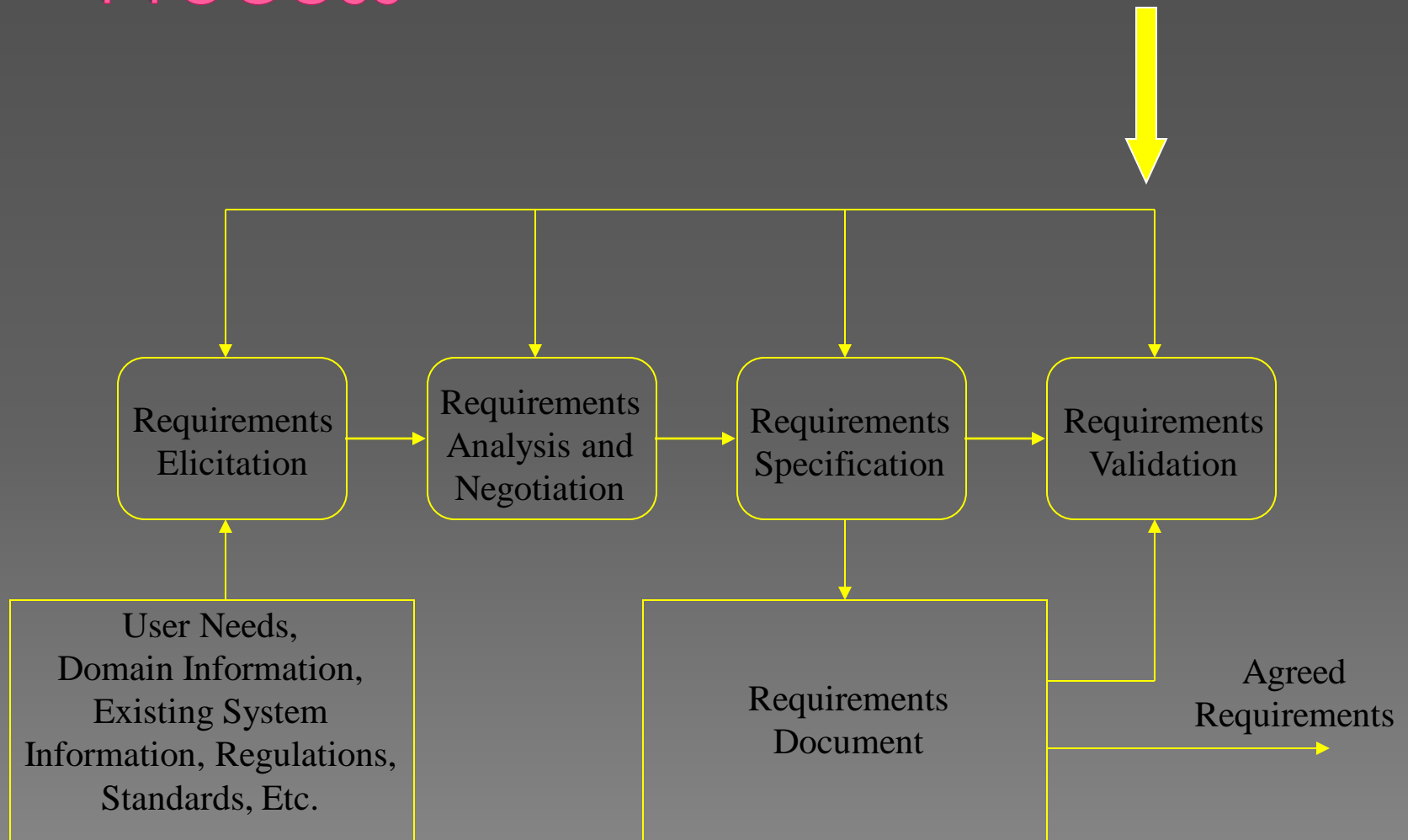
Lectures # 16

# Requirements Validation – I

# Today's Topics

- ⦿ Requirements validation
- ⦿ Validation techniques

# Requirements Engineering Process



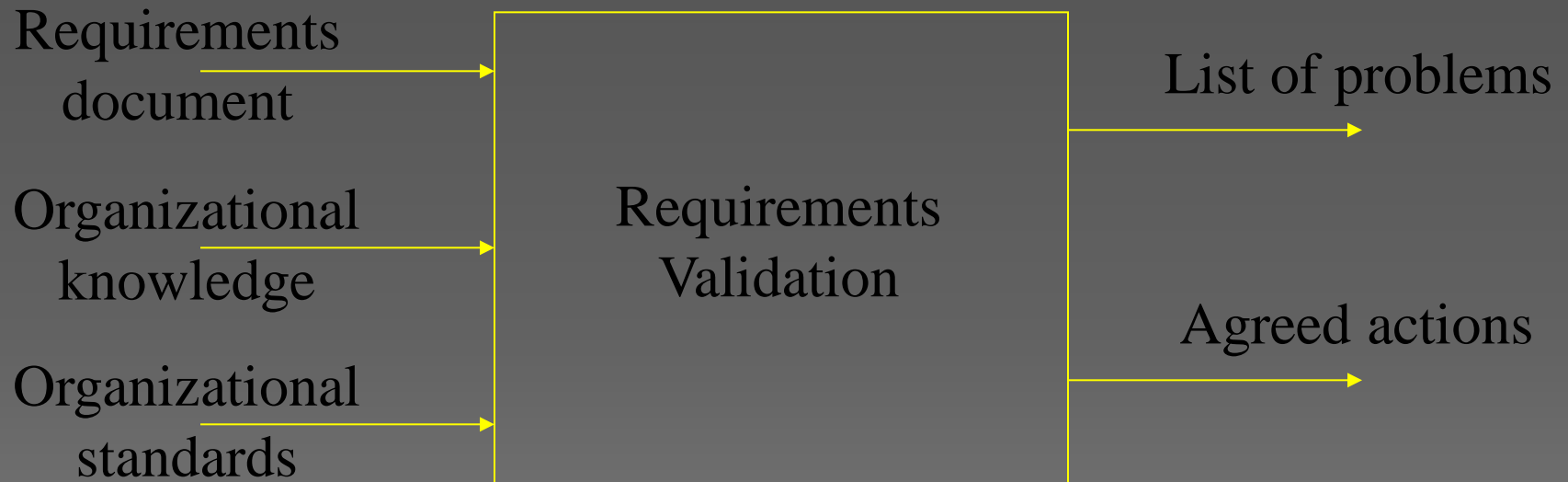
# Validation Objectives

- Certifies that the requirements document is an acceptable description of the system to be implemented
- Checks a requirements document for
  - > Completeness and consistency
  - > Conformance to standards
  - > Requirements conflicts
  - > Technical errors
  - > Ambiguous requirements

# Analysis and Validation

- Analysis works with raw requirements as elicited from the system stakeholders
  - “Have we got the right requirements” is the key question to be answered at this stage
- Validation works with a final draft of the requirements document i.e., with negotiated and agreed requirements
  - “Have we got the requirements right” is the key question to be answered at this stage

# Validation Inputs and Outputs



# Requirements Document

- Should be a complete version of the document, not an unfinished draft.  
Formatted and organized according to organizational standards

# Organizational Knowledge

- ◉ Knowledge, often implicit, of the organization which may be used to judge the realism of the requirements



# Organizational Standards

- ◉ Local standards e.g. for the organization of the requirements document

# List of Problems

- ◉ List of discovered problems in the requirements document

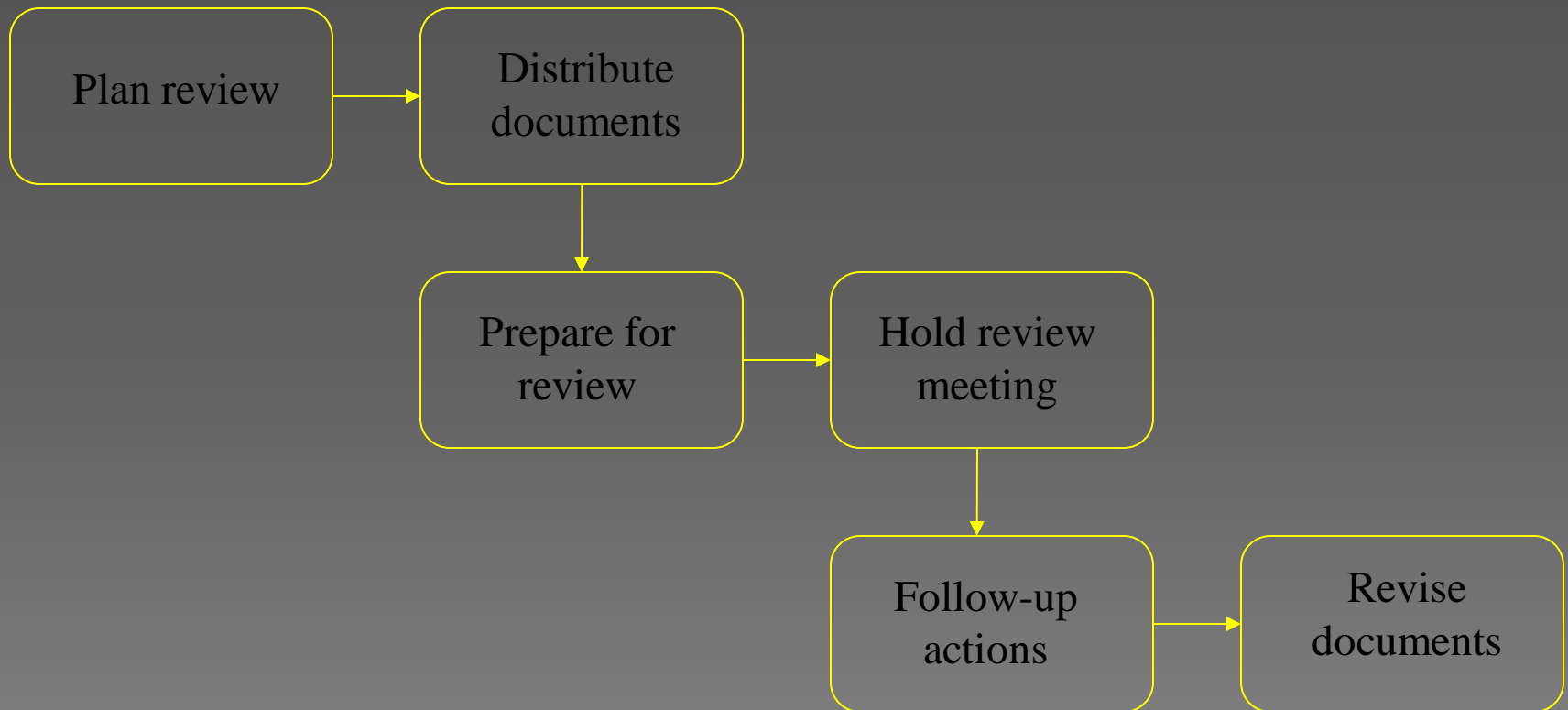
# Agreed Actions

- List of agreed actions in response to requirements problems. Some problems may have several corrective actions; some problems may have no associated actions

# Requirements Reviews

- A group of people read and analyze the requirements, look for problems, meet and discuss the problems and agree on actions to address these problems

# Requirements Review Process



# Review Activities - 1

- ◉ Plan review
  - > The review team is selected and a time and place for the review meeting is chosen
- ◉ Distribute documents
  - > The requirements document is distributed to the review team members

# Review Activities - 2

- ◎ 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

# Review Activities - 3

- ◉ 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

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

# Requirements Clarification

- The requirement may be badly expressed or may have accidentally omitted information which has been collected during requirements elicitation

# 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

# Requirements Conflict

- ⦿ 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 implement-able with the technology available or given other constraints on the system. Stakeholders must be consulted to decide how to make the requirement more realistic

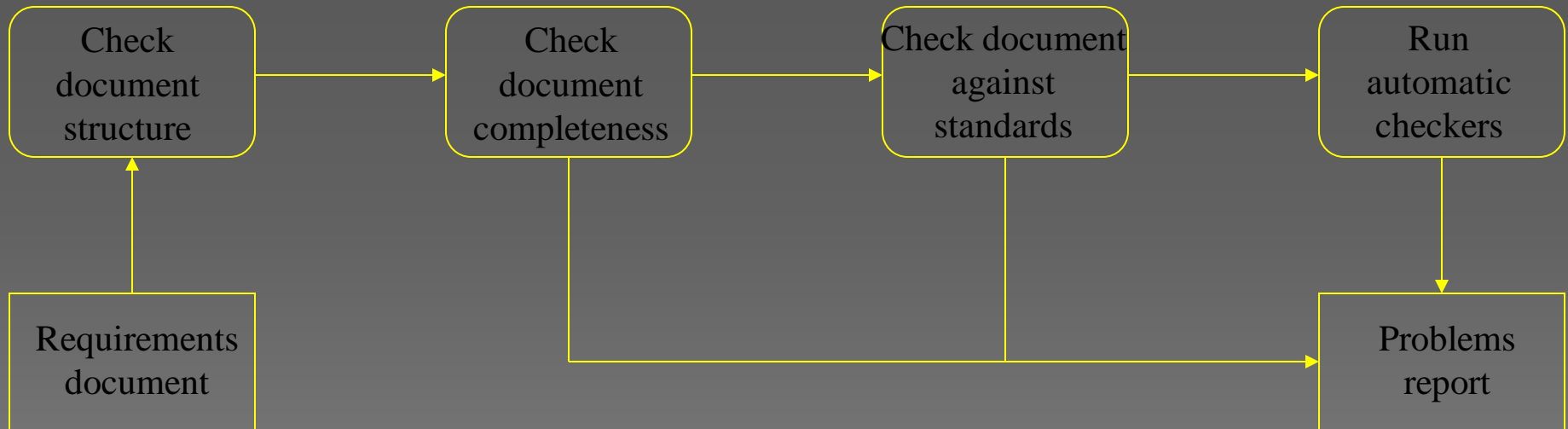
# Pre-review Checking - 1

- Reviews are expensive because they involve a number of people spending time reading and checking the requirements document

# Pre-review Checking - 2

- 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





# Review Team Membership

- 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-

# Summary - 1

- Requirements validation should focus on checking the final draft of the requirements document for conflicts, omissions and deviations from standards
- Inputs to the validation process are the requirements document, organizational standards and implicit organizational knowledge. The outputs are a list of requirements problems and agreed actions to

# Summary - 2

- Reviews involve a group of people making a detailed analysis of the requirements
- Review costs can be reduced by checking the requirements before the review for deviations from organizational standards. These may result from more serious requirements problems

# References

- 'Requirements Engineering: Processes and Techniques' by G. Kotonya and I. Sommerville, John Wiley & Sons, 1998