

Lecture: 7
Requirements Validation and Management
(Part-I)

Requirements validation is the process of checking that requirements actually define the system that the customer really wants.

It overlaps with analysis as it is concerned with finding problems with the requirements.

- Requirements validation is important because errors in a requirements document can lead to extensive rework costs when these problems are discovered during development or after the system is in service.
- The cost of fixing a requirements problem by making a system change is usually much greater than repairing design or coding errors.
 - The reason for this is that a change to the requirements usually means that the system design and implementation must also be changes. Furthermore, the system must then be re-tested.

During the requirements validation process, different types of checks should be carried out on the requirements in the requirements documents:

- **Validity Checks:**
 - A user may think that a system is needed to perform certain functions. However, further thought and analysis may identify additional or different functions that are required.
 - Systems have diverse stakeholders with different needs and any set of requirements is inevitably a compromise across the stakeholder community.
- **Consistency Checks:**
 - Requirements in the document should not conflict i.e. there should not be contradictory constraints or different descriptions of the same system function.
- **Completeness Checks:**
 - The requirements document should include requirements that define all functions and the constraints intended by the system user.
- **Realism Checks:**
 - Using knowledge of existing technology, the requirements should be checked to ensure that they can actually be implemented. These

checks should also take account of the budget and schedule for the system development.

- **Verifiability:**
 - To reduce the potential for dispute between customer and contractor, system requirements should always be written so that they are verifiable.
 - i.e. that you should be able to write a set of tests that can demonstrate that the delivered system meets each specified requirement.

Some validation techniques that can be used individually or in conjunction with one another are:

- **Requirements reviews:** The requirements are analyzed systematically by a team of reviewers who check for errors and inconsistencies.
- **Prototyping:** In this approach to validation, an executable model of the system in question is demonstrated to end-users and customers. They can experiment with this model to see if it meets their real needs.
- **Test-case generation:** Requirements should be testable.
 - If the tests for the requirements are devised as part of the validation process, this often reveals requirements problems.
 - If a test is difficult or impossible to design, this usually means that the requirements will be difficult to implement and should be reconsidered.
 - Developing tests from the user requirements before any code is written is an integral part of extreme programming.