



Methodology for Requirements Definition and Management

Audience

- Functional and business analysts
- Project managers
- Systems engineers
- Development engineers
- Quality managers (QA managers)
- Methodology managers
- Responsible for outsourcing

Course Delivery Method

An interactive and highly practical format is used, encouraging student participation, so that they reflect on the theoretical concepts and learn to apply them effectively in their daily work.

Theory and practice alternate, combining theoretical concepts with a large number of practical exercises developed individually and in groups. The teacher will review the various solutions proposed by the students to identify errors and areas for improvement. Active audience participation is encouraged.

Pre-requisites

Intermediate knowledge of software engineering and practical experience in Requirements Definition and Management.

Description

This course deals with all basic aspects related to Requirements Engineering: what requirements are, why they are important, their role in the various stages of a system life cycle, how to formulate, classify and manage them, and a description of all the activities of the requirement process that should be implemented in an organization.

The ever-increasing complexity of systems to be developed and the increasing awareness of the impact of the requirements on cost, quality and development time of projects require us to use every possible technique for the improvement of development processes. This need applies to both software and systems projects. In order to obtain the highest quality of products, customers demand higher quality development processes, often based on standards such as ISO, CMMI, etc.

This Requirements Engineering course offers a tool-independent approach focused on understanding the key role of requirements in the context of system development processes. The course uses an interactive format, encouraging students to examine their existing methods of developing requirements specifications and to investigate more effective approaches. The role of Requirements Engineering throughout the entire life cycle is examined, together with techniques to capture initial needs, the separation of actual requirements from what are not real requirements, the relationships between requirements and other project data, and techniques for efficient management of the requirements that allow keeping them updated and monitored throughout the system life cycle. The difference between User Requirements and System Requirements are listed, and also between Functional Requirements and Non Functional Requirements. The course covers methods for the logical organization of requirements.

The course analyzes the practices to be undertaken during the full development life cycle, from the point of view of the customer and the supplier. Students will learn to understand and manage iterative cycles and the impact of change in the requirements.

Schedule and time

The course will be conducted in 2 sessions of 6 hours each.

Agenda

■ Introduction: Why Requirements Engineering is required

As an introduction to the course, an overall view of course objectives and contents is given and the reasons why it is important to manage requirements throughout the system life cycle are explained, emphasizing the need to keep them updated in order to be able to properly define the system's acceptance conditions.

■ Requirements in the system life cycle

In this section, students analyze the role of requirements in each stage of a system's life cycle. The need to determine traceability between the outputs of each stage in the life cycle, from requirements to implementation, including the tests associated with each stage, is explained.

Furthermore, the activities that make up the requirement process: elicitation, modeling, specification and validation, are described.

■ Requirements elicitation: tasks and techniques

In this section it is provided a detailed description of the activities involved in the first stage of the requirements process: requirements capture and identification, and the techniques used for such purpose, such as meetings, analysis of documentation, questionnaires, interviews, market studies, prototypes, etc. The importance of correctly identifying all stakeholders in the requirement process is emphasized.

■ Requirements modeling

The objectives of requirements modeling are analyzed and available modeling techniques are proposed, emphasizing their use in the context of the requirement process for defining the system scope. Insofar as software, the techniques used for requirements modeling are taken from Software Engineering methodologies (functional and object-oriented): context diagrams, dataflow diagrams, use cases, scenarios, state diagrams, sequence diagrams, etc.

■ Requirements specification

In this section students are taught how to formulate requirements and how to characterize them using attributes. Among such attributes we have priority and status, which define the life cycle of requirements throughout the project. Classification of requirements as functional and non functional is also studied.

■ Requirements Management: traceability and change management

This section of the course describes the principles of requirements management, and stresses the need to manage versions and to maintain traceability among requirements and other project artifacts, especially regarding change management. The relationship between requirements and tests is also analyzed, together with the relevance of tests in system development.

Objectives

- Understand the difference between user requirements and system requirements.
- Learn how to identify all stakeholders and other sources of requirements.
- Learn how to use diagrams in order to represent the system scope.
- Know available techniques for requirement elicitation.
- Learn how to apply the most common requirement elicitation techniques, such as interviews and prototypes.
- Understand the use of attributes to characterize and classify requirements.
- Understand the relevance of traceability and change management in requirements.

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