

# The Reuse Company (TRC) World (Quality Management and Systems Engineering)



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## Introducción a la Ingeniería de sistemas (in Spanish)

### Goals/Objetivos

- Entender los conceptos propios de la disciplina de Ingeniería de sistemas
- Entender los procesos involucrados en los proyectos de ingeniería de sistemas
- Familiarizarse con técnicas y herramientas
- Entender cómo se orchestra un proyecto de ingeniería de sistemas: procesos, roles y herramientas

### Description/Descripción

A través de un caso práctico se presentarán los conceptos básicos empleados en un proyecto de ingeniería de sistemas. Asimismo, se definirán los procesos involucrados, y cómo los diferentes roles interactúan y ejecutan técnicas que permitan la correcta consecución del proyecto.

### Pre-Requirements / Who should attend/ Quién debería atender

Este curso está orientado a:

- Jefes de proyecto
- Jefes de producto
- Ingenieros de sistemas junior
- Otros ingenieros involucrados en el desarrollo de sistemas
- Analistas de sistemas
- Arquitectos de sistemas
- Ingenieros de software

El único prerrequisito es haber participado en alguna ocasión en un proyecto de desarrollo de sistemas o desarrollo de software.

### Outline/Contenidos

1. Conceptos básicos y estándares
2. El ciclo de vida en V
3. Revisión a los procesos principales y sus técnicas asociadas
4. Requisitos, modelado y verificación&validación

### Schedule/Planificación

**Duración:** 1 Jornada

**Día:** Lunes 3 de octubre

**Horario:** de 9 a 18 horas (con una pausa para la comida y 2 pausas más para café)

### Teachers/Profesores

**Dr. Juan Llorens.** Catedrático de Ingeniería de Software en la Universidad Carlos III de Madrid, Miembro del consejo del capítulo español de INCOSE (AEIS) y CEO-A en The REUSE Company.

## Introducción a la Ingeniería de requisitos (in Spanish)

### Goals/Objetivos

- Entender la importancia del requisito en los grandes proyectos
- Conceptos básicos
- Revisión de los procesos principales
- Técnicas de elicitación y captura de requisitos
- Técnicas de redacción de requisitos y medición de su calidad
- Técnicas de gestión de requisitos

### Description/Descripción

A través de un caso práctico guiado por el profesor, el alumno se familiarizará con los conceptos, procesos y tareas relacionados con esta disciplina. Cada alumno deberá realizar un pequeño caso práctico donde llegará a redactar documentos de requisitos y a revisar la calidad de los mismos mediante las técnicas explicadas en el curso.

### Pre-Requirements / Who should attend/ Quién debería atender

Este curso está orientado a:

- Jefes de proyecto/programa
- Jefes de producto
- Ingenieros de sistemas
- Analistas de negocio
- Analistas funcionales
- Responsables de calidad
- Responsables de contratación
- Ingenieros de software

El único prerrequisito es haber participado en alguna ocasión en un proyecto de desarrollo de sistemas o desarrollo de software.

### Outline/Contenidos

1. Introducción y conceptos básicos
2. Identificación y gestión de los interesados
3. Captación de requisitos
4. Documentación de requisitos
5. Análisis de requisitos
6. Validación y negociación de requisitos
7. Gestión de requisitos
8. Características de las herramientas para la ingeniería de requisitos

### Schedule/Planificación

**Duración:** 1 Jornada

**Día:** Martes 4 de octubre

**Horario:** de 9 a 18 horas (con una pausa para la comida y 2 pausas más para café)

### Teachers/Profesores

**José Fuentes.** Responsable de operaciones en The REUSE Company y Miembro del consejo del capítulo español de INCOSE (AEIS).

# How to improve the quality of your requirements specifications

## Goals

- Understand the impact of low quality in a requirements specification
- How different standards describe quality characteristics for requirements, and why it's not sufficient
- How different guidelines cope with the identification of rules
- The different dimensions: Correctness, Consistency and Completeness
- Templates and patterns
- Tools to automate the requirements verification process

## Description

After the revision of different standards that try to address the enormous impact of low quality in requirements specifications, a hands-on session will identify the most common rules followed in the industry to write high quality specifications. The attendees will write their own specification, ensuring the conformance to the quality rules described during the course.

## Pre-Requirements / Who should attend

- Business analysts
- Functional analysts
- Project managers
- Quality managers
- Procurement manager

## Outline

1. The impact of poor quality in a requirements specification
2. Quality characteristics: for documents and for individual requirements
3. The 3 quality dimensions for requirements: Correctness, Consistency and Completeness
4. Revision of requirement quality rules
5. Requirements templates for requirements documents
6. Requirements patterns to write consistent requirements
7. Tools to automate the requirements verification process
8. Practice and hands-on case

## Schedule

**Duration:** 1 day

**When:** Wednesday, 5<sup>th</sup> of October

**Timetable:** from 9am to 6pm (a break for lunch and two more coffee breaks)

## Teachers

**José Fuentes.** Chief Operating Manager at The REUSE Company and Member of the board of AEIS (the Spanish chapter of INCOSE).

# How to ensure correctness in your requirements specifications using the Requirements Quality Analyzer (RQA)

## Goals

- Review of the common quality rules for individual requirements
- RQA Connectors
- Quality Analysis with RQA (correctness)
- Quality Reporting with RQA (correctness)
- RQA for collaborative tasks
- Quality configuration with RQA (correctness)
- Correctness parameterized metrics with RQA

## Description

The attendees will use the latest version of Requirements Quality Suite so that they can analyze the quality level for a provided specification, and customize a number of rules.

## Pre-Requirements / Who should attend

- Business analysts
- Functional analysts
- Project managers
- Quality managers
- Procurement manager

## Outline

1. Requirements quality guidelines
2. Connection screen and the connection to external requirements management tools
3. The analysis screen in RQA (correctness)
4. The reporting mechanisms in RQA (correctness)
5. Collaboration mechanisms in RQA
6. Configuration of correctness metrics in RQA
7. Configuration of parameterized correctness metrics in RQA

## Schedule

**Duration:** 1 day

**When:** Monday, 3<sup>rd</sup> of October

**Timetable:** from 9am to 6pm (a break for lunch and two more coffee breaks)

## Teachers

TBD

# How to ensure completeness and consistency in your requirements specifications using the Requirements Quality Analyzer (RQA)

## Goals

- Review of the common quality rules for set of requirements
- Quality Analysis with RQA (consistency & completeness)
- Quality Reporting with RQA (consistency & completeness)
- Quality configuration with RQA (consistency & completeness)

## Description

The attendees will use the latest version of Requirements Quality Suite so that they can analyze the quality level for a provided specification, and customize a number of rules.

## Pre-Requirements / Who should attend

- Business analysts
- Functional analysts
- Project managers
- Quality managers
- Procurement manager

Basic knowledge about RQA (correctness analysis) or the previous course: *How to ensure correctness in your requirements specifications using the Requirements Quality Analyzer (RQA)*.

## Outline

1. Quality guidelines for sets of requirements
2. The analysis screen in RQA (consistency & completeness)
3. The reporting mechanisms in RQA (consistency & completeness)
4. Configuration of consistency and completeness metrics in RQA

## Schedule

**Duration:** 1 day

**When:** Tuesday, 4<sup>th</sup> of October

**Timetable:** from 9am to 6pm (a break for lunch and two more coffee breaks)

## Teachers

TBD

## Converting the Requirements Quality Analyzer into a Customized Quality Management tool

Customize RQA to perform any quality analysis based on calculations or mechanisms not available in the existing metrics.

### Description

The course will focus on creating new metrics based on ideas that are not available on RQA. These ideas can be found on the three different dimensions: correctness, consistency and completeness. An example for each dimension will be implemented.

### Pre-Requirements / Who should attend

The attendee must have knowledge of the possibilities in regard to Correctness, Completeness and Consistency in RQS. See the previous two courses described above.

The attendee must have programming skills and be familiar with .NET technology.

### Outline

1. Custom-code correctness metric
  - a. Evaluation
2. Custom-code completeness metric
  - a. Configuration
  - b. Evaluation
  - c. Displaying the results
3. Custom-code consistency metric
  - a. Configuration
  - b. Evaluation
  - c. Displaying the results

### Schedule

**Duration:** 1 day

**When:** Wednesday, 5<sup>th</sup> of October

**Timetable:** from 9am to 6pm (a break for lunch and two more coffee breaks)

### Teachers

**Luis Alonso.** Chief Architect of the Requirements Quality Suite.

# Mastering the Requirements Authoring Tool – RAT

## Goals

- Understand the concept: on-the-fly quality analysis
- On-the-fly correctness checking
- On-the-fly consistency checking
- Other quality information
- Communication with other requirement quality roles
- Pattern-based requirements writing

## Description

Through the use of the tool RAT we'll cover the concept of *on-the-fly* quality analysis. By writing different requirements in RAT, the attendees will understand the relationship between RAT and the quality rules described in RQA, and proceed with the three dimensions (correctness, consistency and completeness) on-the-fly; including the collaboration with other roles and RQS tools. Finally, the use of patterns to improve the authoring process will also be demonstrated with several practical examples.

## Pre-Requirements / Who should attend

- Business analysts
- Functional analysts
- Project managers
- Quality managers
- Procurement manager

The attendee must have knowledge of Requirement Quality Management and be familiar with Requirements Quality Analyzer

## Outline

1. Connection of RAT with RQA metric baselines
2. RAT Client vs RAT plugin
3. RAT for Correctness
4. RAT for Consistency and Completeness
5. Collaboration mechanisms
6. Pattern-based authoring

## Schedule

**Duration:** 1 day

**When:** Three different editions of the same course on Monday the 3<sup>rd</sup>, Tuesday the 4<sup>th</sup> and Wednesday the 5<sup>th</sup> of October

**Timetable:** from 9am to 6pm (a break for lunch and two more coffee breaks)

## Teachers

**Luis Alonso.** Chief Architect of the Requirements Quality Suite.

**Borja López.** Requirements Authoring Tool architect.



# Generating ontologies: how to manage terminology and Conceptual Models

## Goals

- Understanding the NLP pipeline with Knowledge Manager
- Understanding and mastering the Terminology / Controlled Vocabulary layer in Knowledge Manager
- Understanding and mastering the Conceptual Model layer in Knowledge Manager

## Description

After the revision of the NLP pipeline, the hands-on session will focus on identifying all the possibilities available in the Terminology and Conceptual Model layers, and how the customization performed in these layers affects the requirement processing in the NLP pipeline.

The session will also focus on identifying the most common problems found in the requirement analysis and in which layer they can be solved in the smoothest way.

Finally, the session will work on the terminology integrity checks to assure that the changes performed in the ontology does not interfere with other functionalities of the ontology

## Pre-Requirements / Who should attend

- Business analysts
- Functional analysts
- Project managers
- Quality managers

The attendee must have knowledge of Requirement Quality Management and be familiar with Requirements Quality Analyzer and Requirements Authoring Tool.

## Outline

1. NLP pipeline with Knowledge Manager
  - a. Tokenization, Normalization, Disambiguation
  - b. Complex terms identification
  - c. Pattern matching
2. Terminology / Controlled Vocabulary layer
  - a. Customization mechanisms
  - b. Terminology integrity checks
3. Conceptual Model layer:
  - a. Customization mechanisms
  - b. Supported Standards for exchanging information with external tools
  - c. Import/export

## Schedule

**Duration:** 1 day

**When:** Monday, 3<sup>rd</sup> of October

**Timetable:** from 9am to 6pm (a break for lunch and two more coffee breaks)

## Teachers

TBD

# Generating ontologies: mastering requirements patterns and formalization

## Goals

- Understanding and mastering the Pattern layer in Knowledge Manager
- Understanding and mastering the Formalization layer in Knowledge Manager

## Description

The hands-on session will focus on identifying all the possibilities available in these layers, and how the customization performed in these layers affects the requirement processing in the NLP pipeline.

The session will also focus on identifying the most common problems found in the pattern and formalization analysis and how they can be solved in the smoothest way.

Finally, the session will work on the pattern integrity checks to assure that the changes performed in the ontology does not interfere with other functionalities of the ontology

## Pre-Requirements / Who should attend

- Quality managers
- Knowledge managers
- Ontology managers

The attendee must have knowledge of Requirement Quality Management and be familiar with Requirements Quality Analyzer and Requirements Authoring Tool.

The attendee must have knowledge of RQS NLP pipeline and control the Terminology and Conceptual Model layer (see the previous course: Generating ontologies: how to manage terminology and Conceptual Models)

## Outline

1. Pattern Vocabulary layer
  - a. Description
  - b. Functionality
  - c. Creation and Customization mechanisms: simple patterns and hierarchy of patterns
  - d. Pattern integrity checks
2. Formalization layer:
  - a. Properties
  - b. Relationships

## Schedule

**Duration:** 1 day

**When:** Tuesday, 4<sup>th</sup> of October

**Timetable:** from 9am to 6pm (a break for lunch and two more coffee breaks)

## Teachers

TBD

## Generating ontologies: hands-on work

### Goals

- Master the contents of the out-of-the-box ontology
- Transform the out-of-the-box ontology to your business ontology
- Improve each ontology layer with information included in your already existing documentation
- Master the testing technology to check the ontology integrity

### Description

Starting from the out-of-the-box ontology, the course will revise in depth its contents layer by layer. Then gathering information from a concrete business domain (imitating what it would be inside a company) this information will be split into pieces to improve each ontology layer. E.g.: the controlled vocabulary will be improved with the most meaningful frequent terms from some requirements specifications. The attendees will add these pieces of information to the ontology, checking at each stage the ontology integrity.

### Pre-Requirements / Who should attend

- Quality managers
- Knowledge managers
- Ontology managers

The attendees must have knowledge of Requirement Quality Management and Requirements Quality Analyzer and Knowledge Manager (see previous courses).

### Outline

1. Description of the out-of-the-box ontology contents

The following steps will be hands-on-work:

2. Including new vocabulary from existing resources: dictionaries, glossaries, Protégé files, SKOS/RDF documents ...
3. Including new vocabulary from sample requirements specifications
4. Including new tokenization rules to match entities found in sample requirements specifications
5. Revision of the disambiguation rules if needed for a sample use case
6. Creation of patterns based of most common structures in sample requirements specifications
7. Creation of properties and relationships based of the patterns built in the previous step.

### Schedule

**Duration:** 1 day

**When:** Wednesday, 5<sup>th</sup> of October

**Timetable:** from 9am to 6pm (a break for lunch and two more coffee breaks)

### Teachers

**Elena Gallego.** Consultant at The REUSE Company