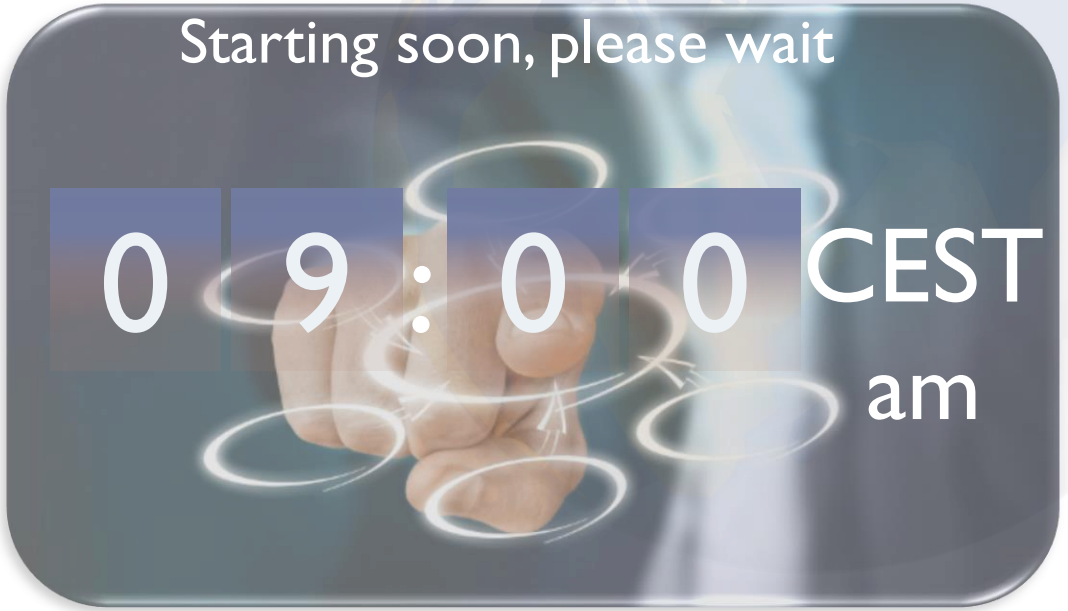
TRC WEBINARS 2020

Introduction: Webinar rules

RAT for Capella



- Webinar rules:
  - You'll be muted all along the Webinar
  - There's a chatting box to ask your questions or send your comments when you want
  - Please address these comments and questions to the user "The REUSE Company" and not to the presenter directly
  - If you have any technical issue please use this chatting box, or mail us at: support@reusecompany.com
  - The Webinar will be recorded. A link to the recording will be sent to you in few days

TRC

WEBINARS 2020

RAT for Capella

Tuesday, 16 June, 2020

Presenters

José M. Fuentes

- Chief Operating Manager
- jose.fuentes@reusecompany.com

Cecilia Karlsson

- Marketing & Communication manager
- cecilia.karlsson@reusecompany.com

Table of Contents

01 The company was created in **1999**

As a spin-off of a University in Europe

02 **System + Software Engineers**

Smart combination between Company staff and R&D from Academia

03 **Headquarters:**
Madrid (Spain)

International offices:
Stockholm (Sweden)
Tokyo (Japan) Delegation

2021:
USA
Chicago/Detroit/Miami

04 To promote a **reusable**, **scalable** and global solution to a **smart** and **interoperable** Systems Engineering environment, by offering a **semantic knowledge centric** approach.

Research and Innovation in our DNA

Spin-off of Carlos III University of Madrid
TRC's headquarter is in the Legatec Technology Park of the University
≈10% of revenues are devoted to R&D
TRC is actively involved in several large EU research projects

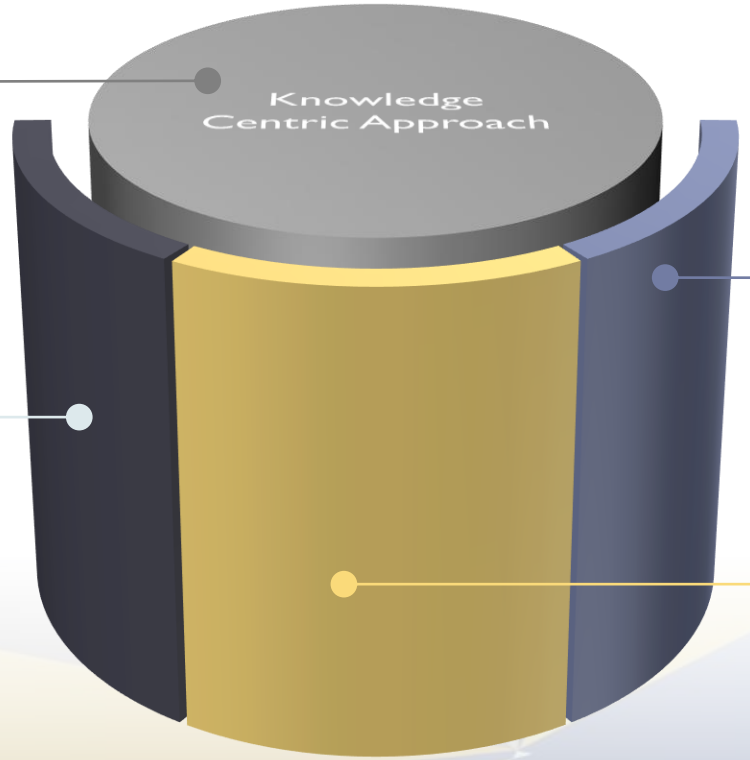
T (he) R (euse) Q (ompany)

Knowledge Centric Systems Engineering (KCSE)

Global Repositories –
Archiving –
Configuration Management –

TRACEABILITY

Links and Interoperability –
Transformations –
Change management –

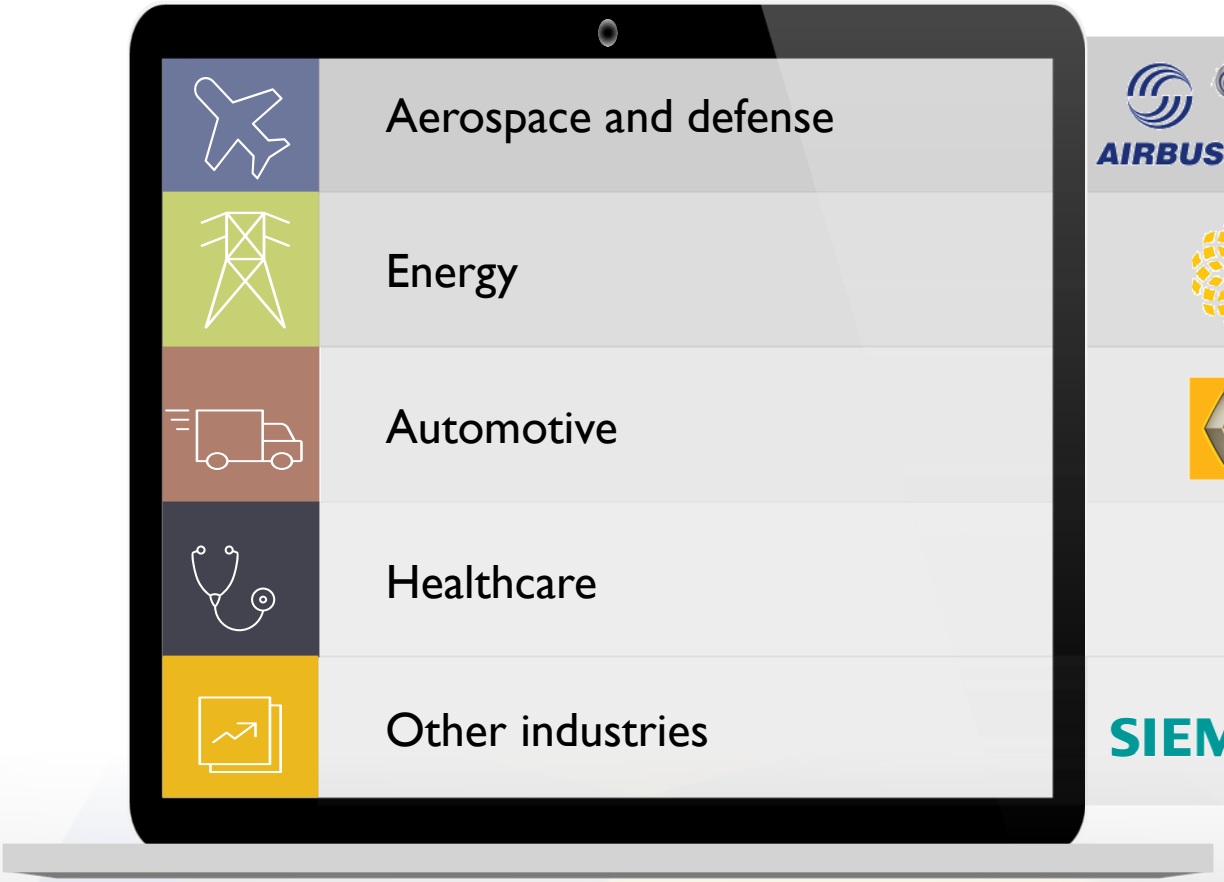


QUALITY (ies)

- Quality Management
- Verification & Validation management
- Risks Management
- Smart Authoring

REUSABILITY

- Interoperability
- Retrieval & Archiving
- Adaptability to Existing Toolsets



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AIRBUS DEFENCE & SPACE
AIRBUS GROUP INNOVATIONS
SAFRAN AIRCRAFT ENGINES
THALES
HENSOLDT
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THINK SURGICAL
Health Net
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ELRA European Land Registry Association
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José Fuentes

- **Current position:** Chief Operating Officer at The REUSE Company
- Product manager of the Systems Engineering Suite tools during the last 5 years
- INCOSE CSEP Certified
- Graduated in the INCOSE Institute for Technical Leadership
- Member of the board of AEIS – the Spanish chapter of INCOSE
- Active contributor to the INCOSE Guide for Writing Requirements

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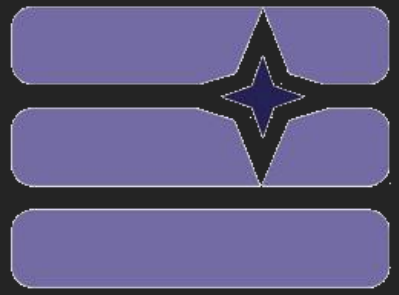


What is

Capella

What is Capella

- Open-Source solution for Model-based Systems Engineering
- Comprehensive, extensible and field-proven MBSE tool and method to successfully design systems architecture
- Main characteristics:
  - Understand the customer need
  - Define and share the solution
  - Ensure engineering-wide collaboration
  - Early evaluate and justify architectural choices
  - Prepare and master V&V
- +info: https://www.eclipse.org/capella/

Capella

Need model

helps formalize and consolidate customer and system requirements

Textual requirements

are at the heart of the current engineering practices

Solution model

helps validate feasibility, elicit/justify new requirements for the system/subsystems

Textual requirements and model requirements

Models add rigor to need expression / solution description

Models enable automated processing

A model requirement can formalize a textual requirement
and explicit its effects and ramifications

Some expectations (environmental, regulations, etc.)
are easier to express with textual descriptions

Some expectations on a model element at a given engineering level do not require a formal modeling (which is left to subsystem design)

Textual form of needs and requirements are not only useful, they are **fully necessary**

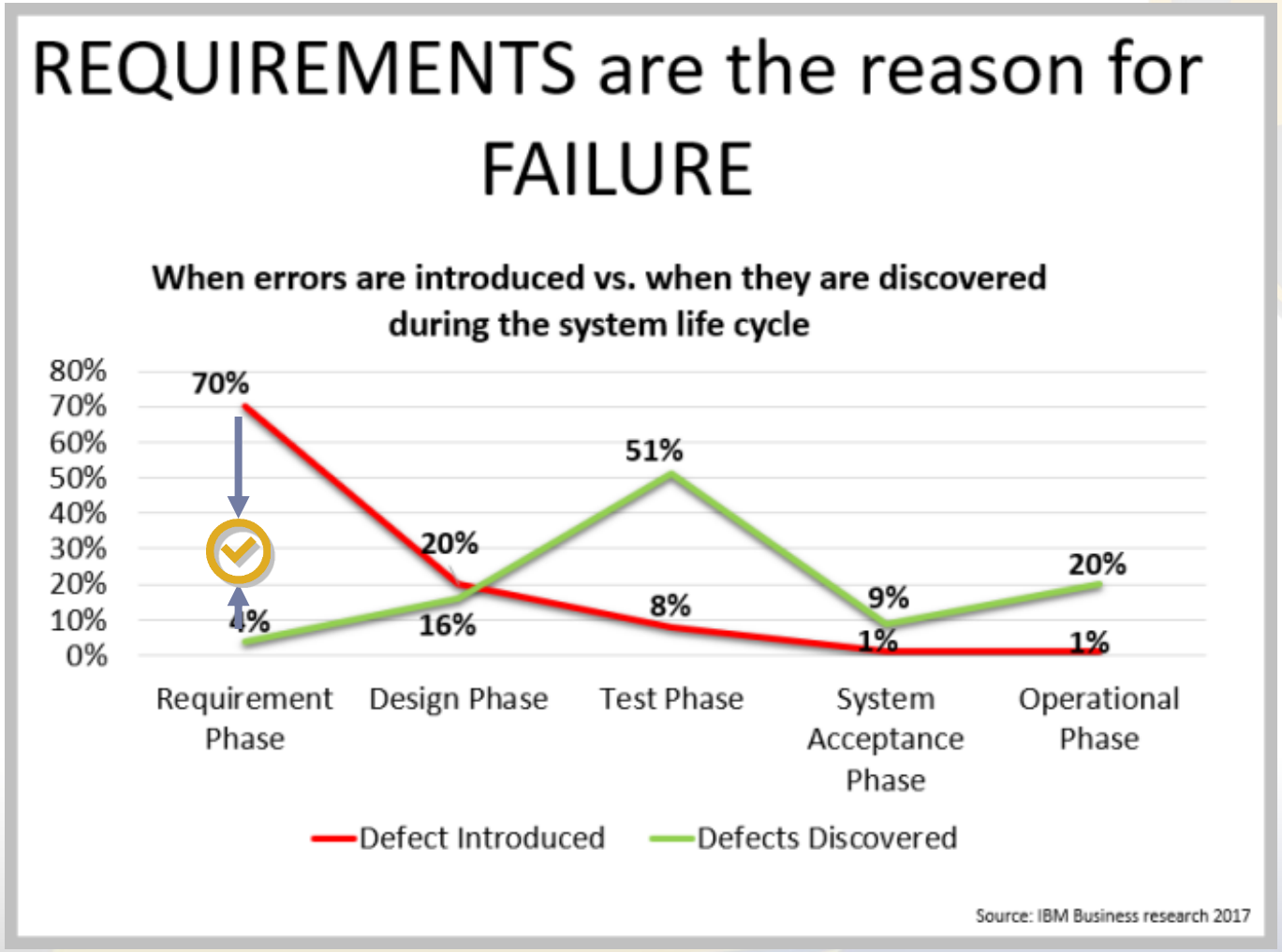
RAT for Capella

Main capabilities

Enhancing the Requirements and models collaboration

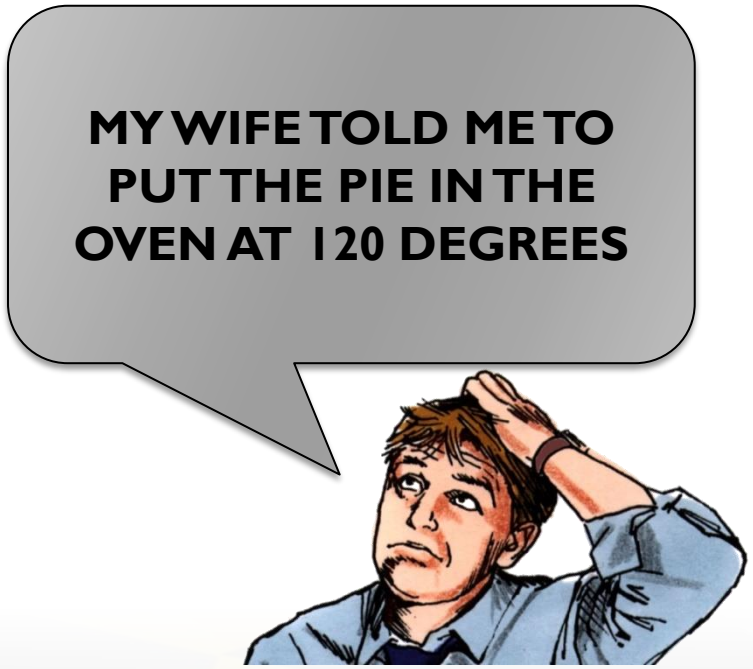
- All this looks great! But…
- … the connection between requirements and models has to be consistent and robust
- Quality must be guaranteed at both sides

Real-time quality analysis



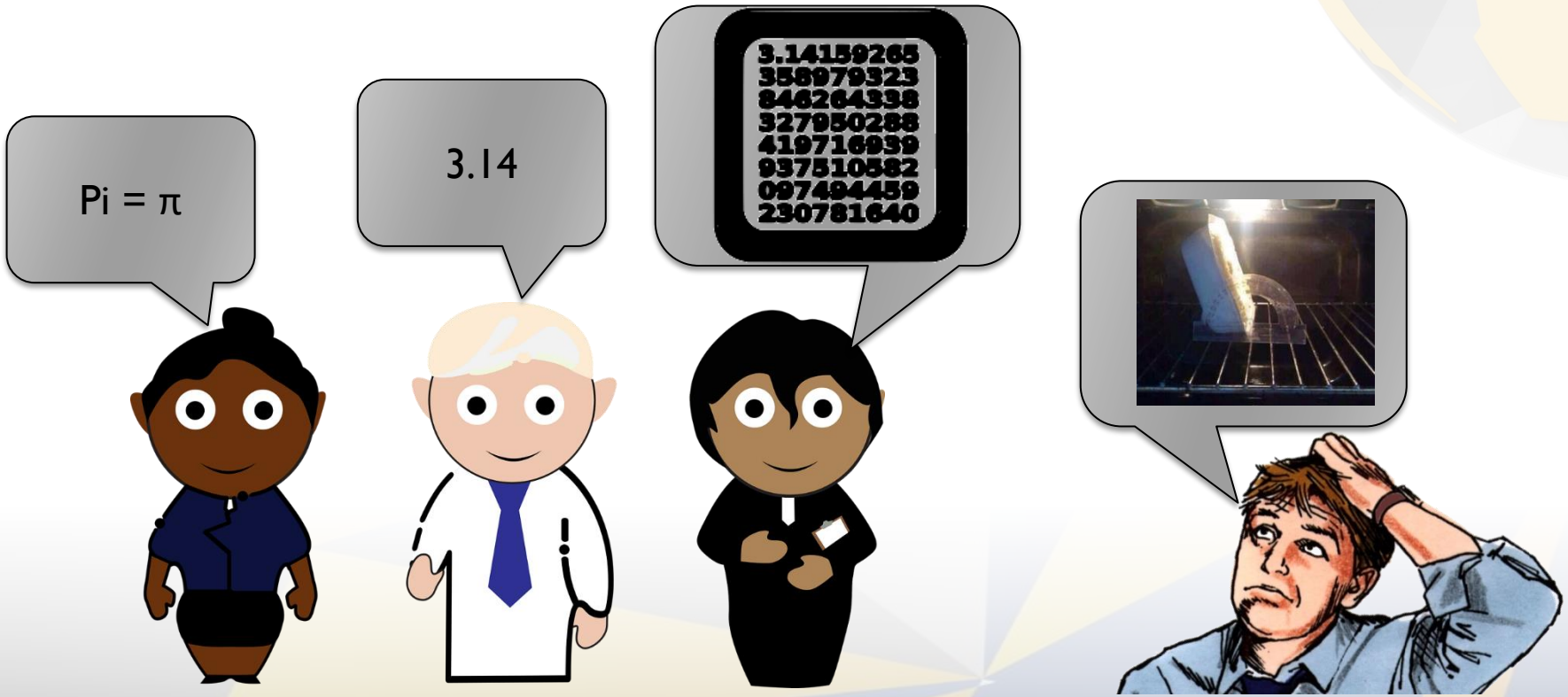
Enhancing the Requirements and Models Collaboration

- Because communication is not always that easy:



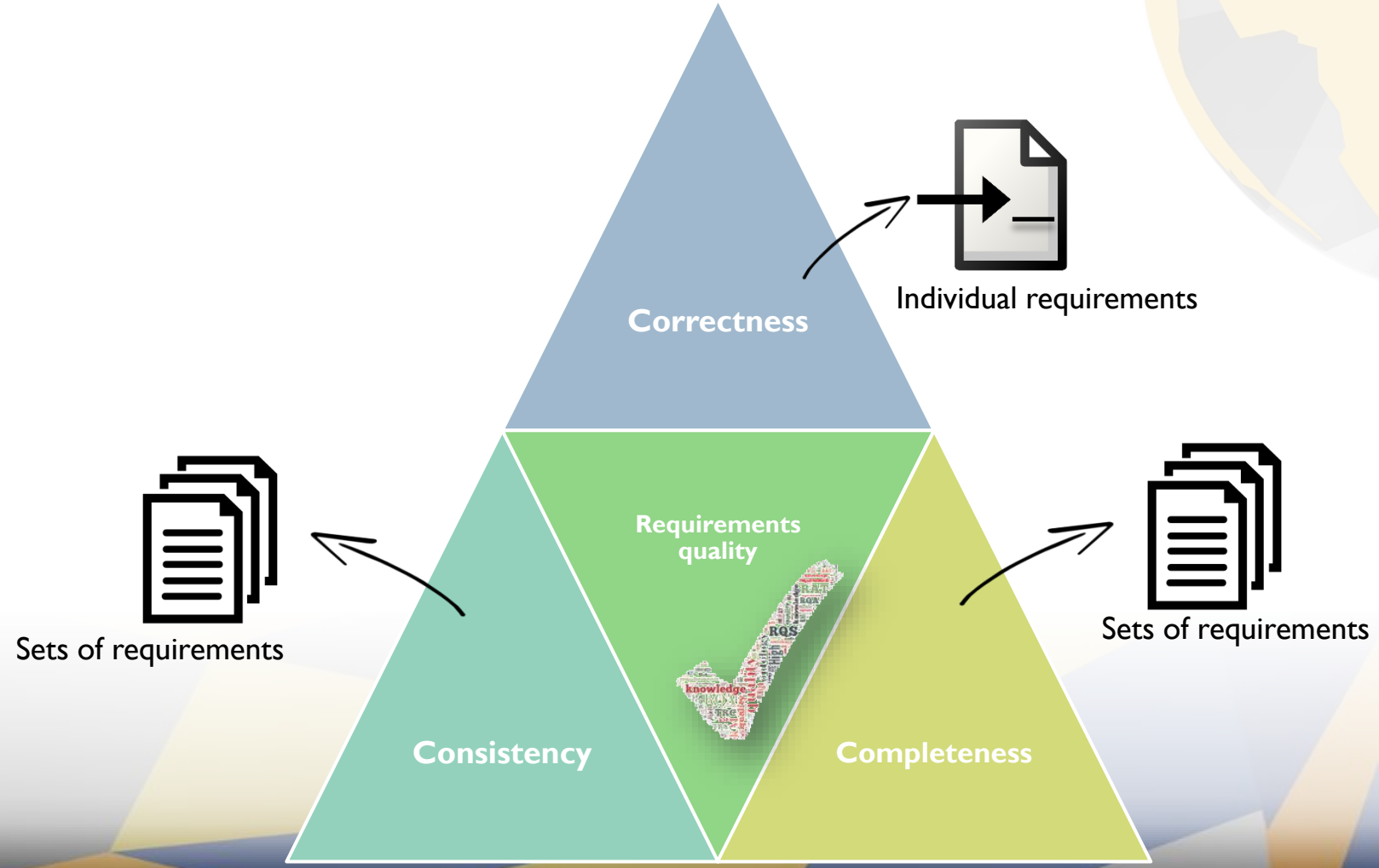
Why focusing on requirements quality

- Because communication is not always that easy:



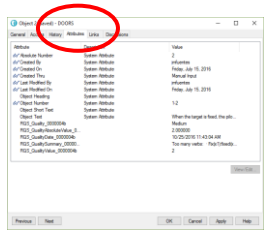
Real-time quality analysis: CCC Approach

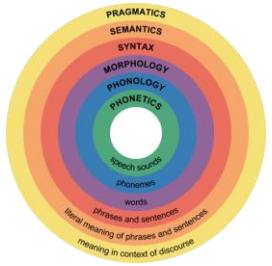
- CCC – Correctness, Consistency and Completeness

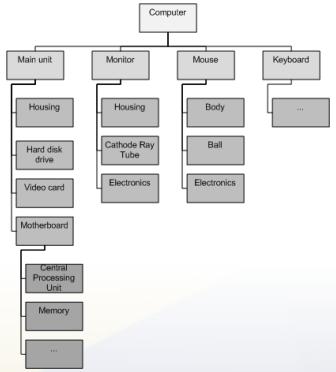


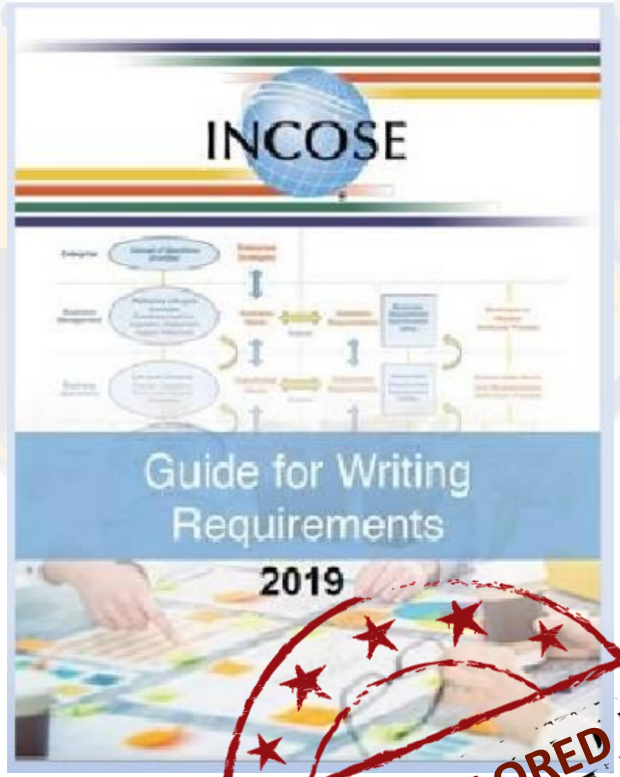
Real-time quality analysis: Correctness

- Metrics based on information coming from the RMS:
  - Attributes, links, versions…
- Metrics based on lists of terms:
  - Forbidden: ambiguous, pronouns…
  - Restricted: negations…
  - Mandatory: 'shall', 'will', 'should'…
- Metrics based on linguistic algorithms:
  - Text length, misspelling, readability….
  - Detection of passive voice, imperative tense…
- Metrics based on the conformance with models:
  - Concepts in your requirements coming from PBS, FBS…
- Metrics based on patterns:
  - Compliance with different types of requirements patterns
  - Detection of specific structures within the requirements

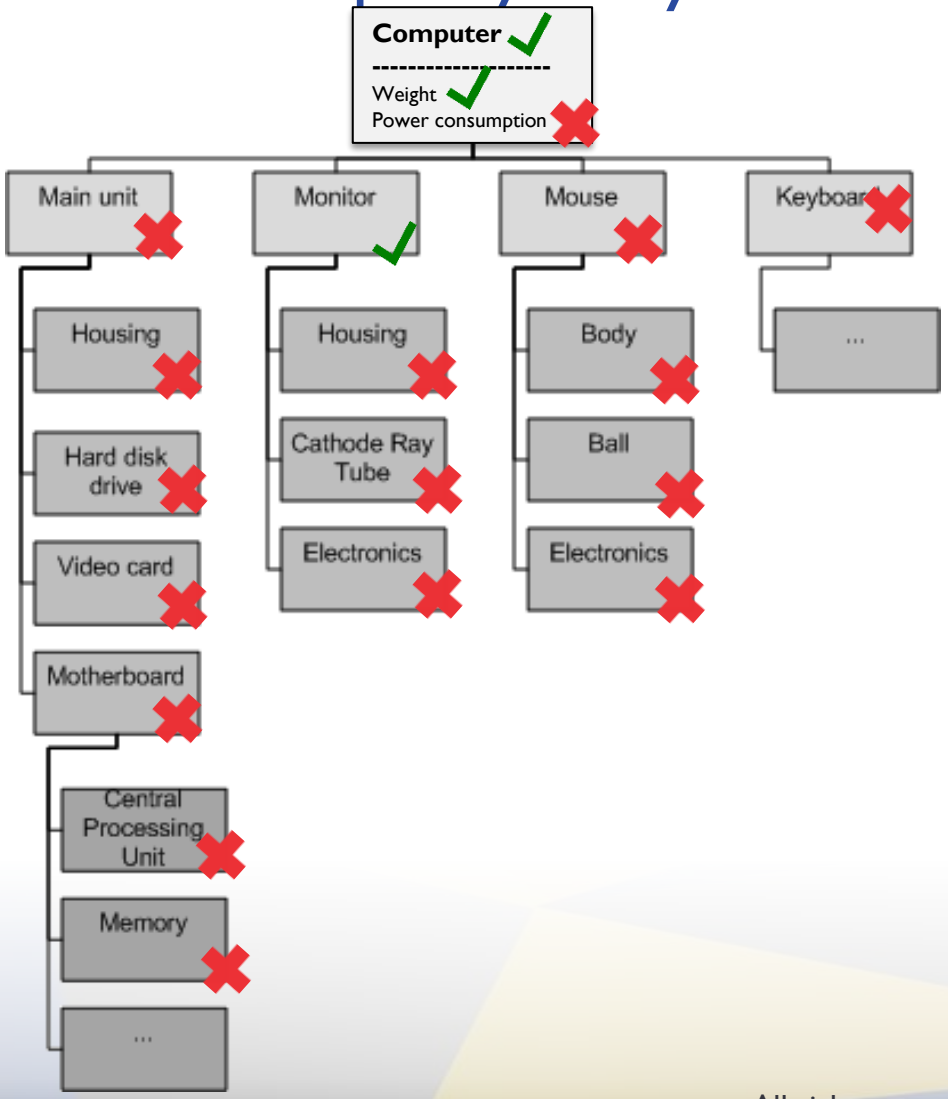


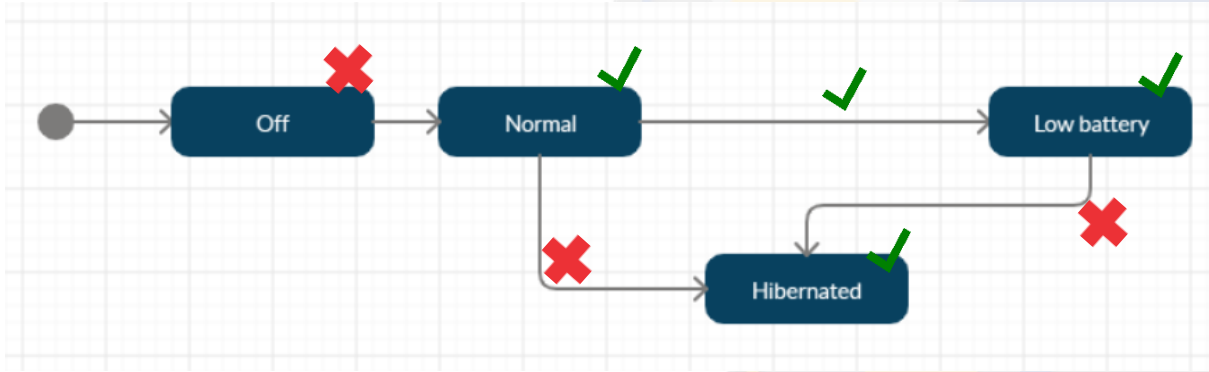






Real-time quality analysis: Completeness





The computer shall have 2 monitors

The computer shall have 2 engines

When the Computer is not plugged in, and the computer is in Normal state and the level of battery drops below 10%, the computer shall transit to Low battery mode

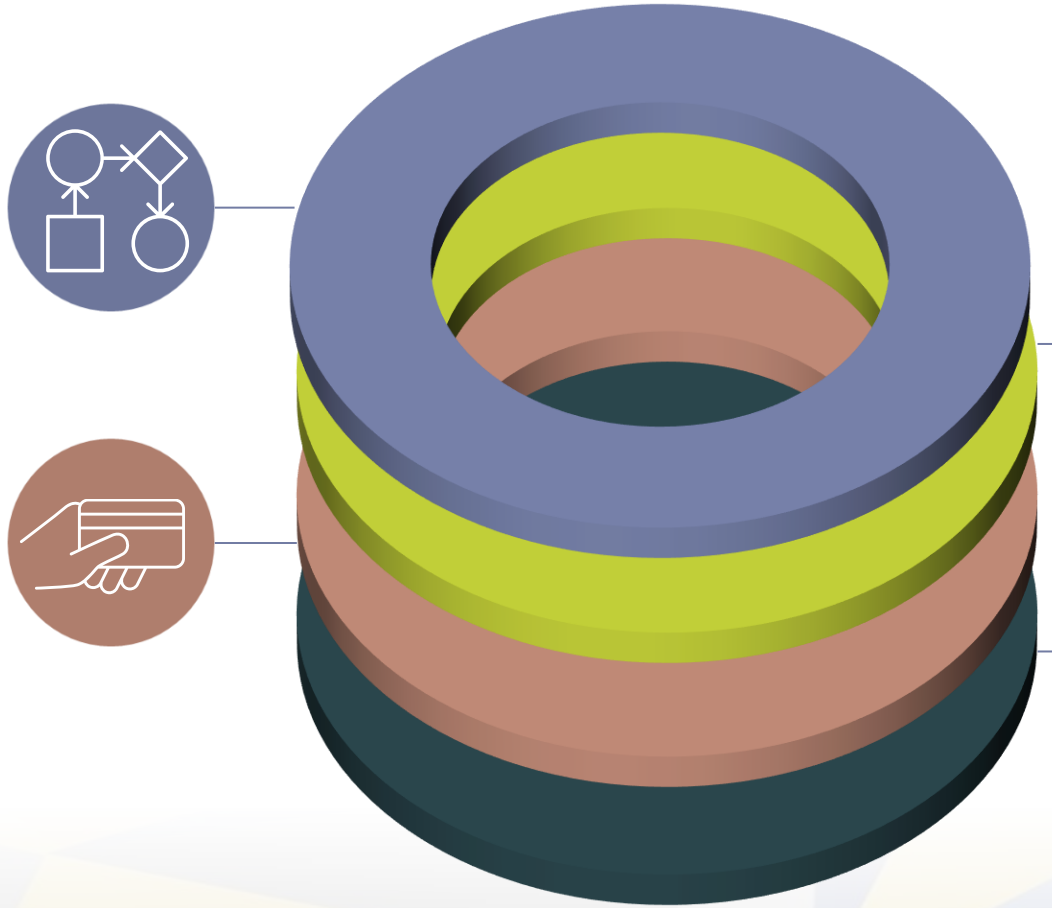
When the Computer is in Hibernated mode, the monitor shall turn black

The weight of the computer shall be 1.2 kg +- 10%

Real-time quality analysis: Consistency

Requirements-models Consistency
e.g. allocation of properties

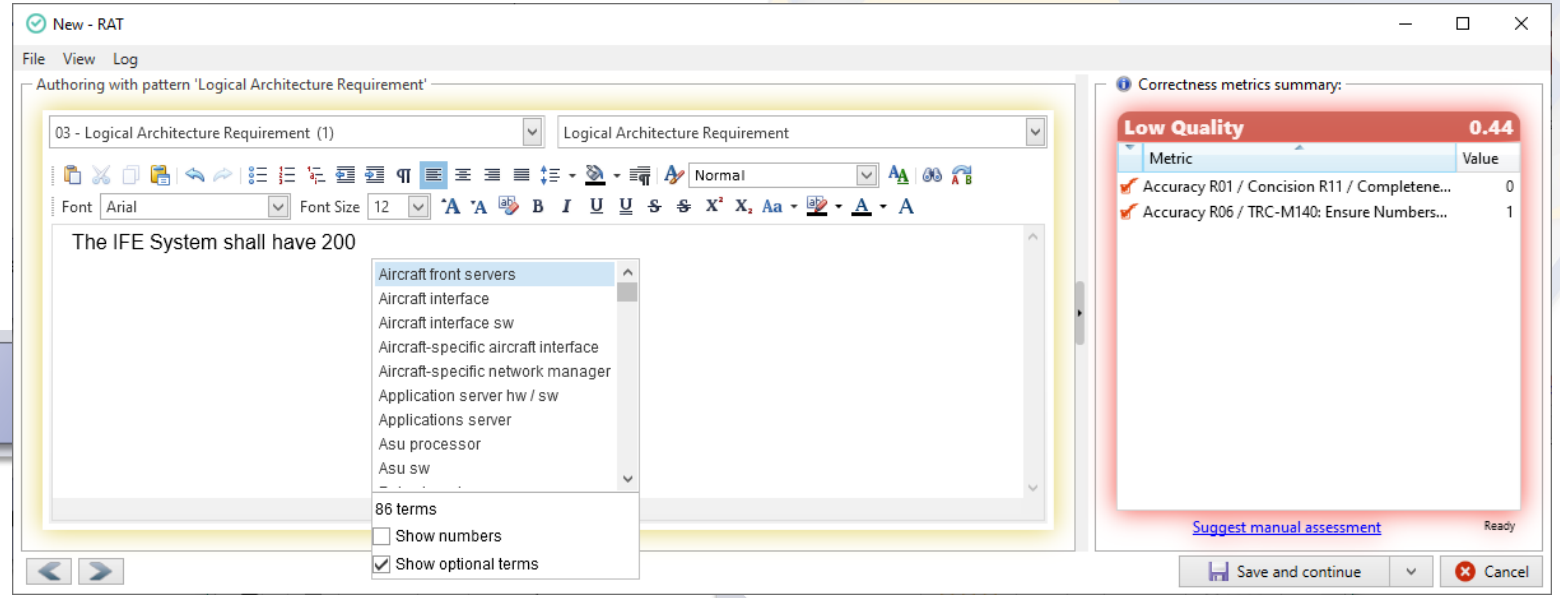
Naming consistency
Among models elements and elements in textual requirements



Consistency Among requirements:
e.g. overlapping

Pattern-based writing

Real-time quality analysis: Patterns

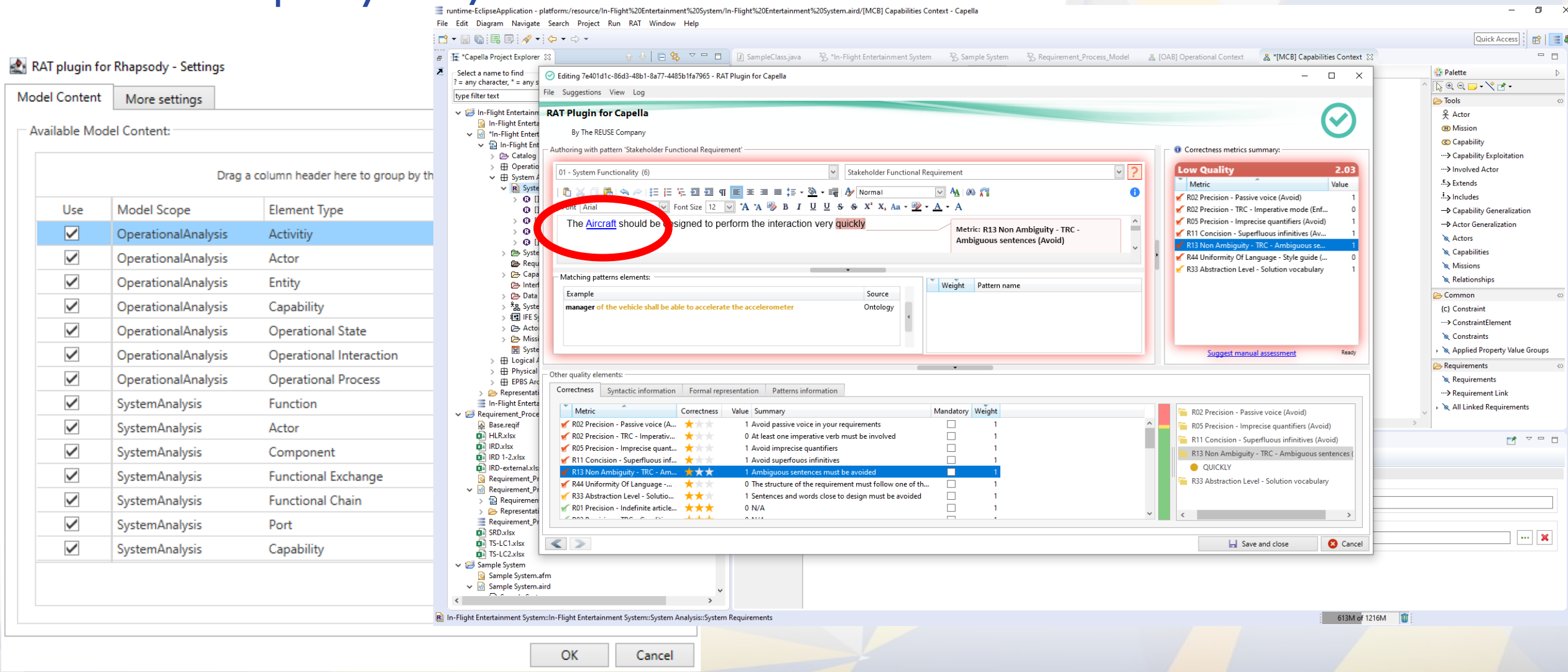


When / After / If … | **[Condition]** | **<Subject>**

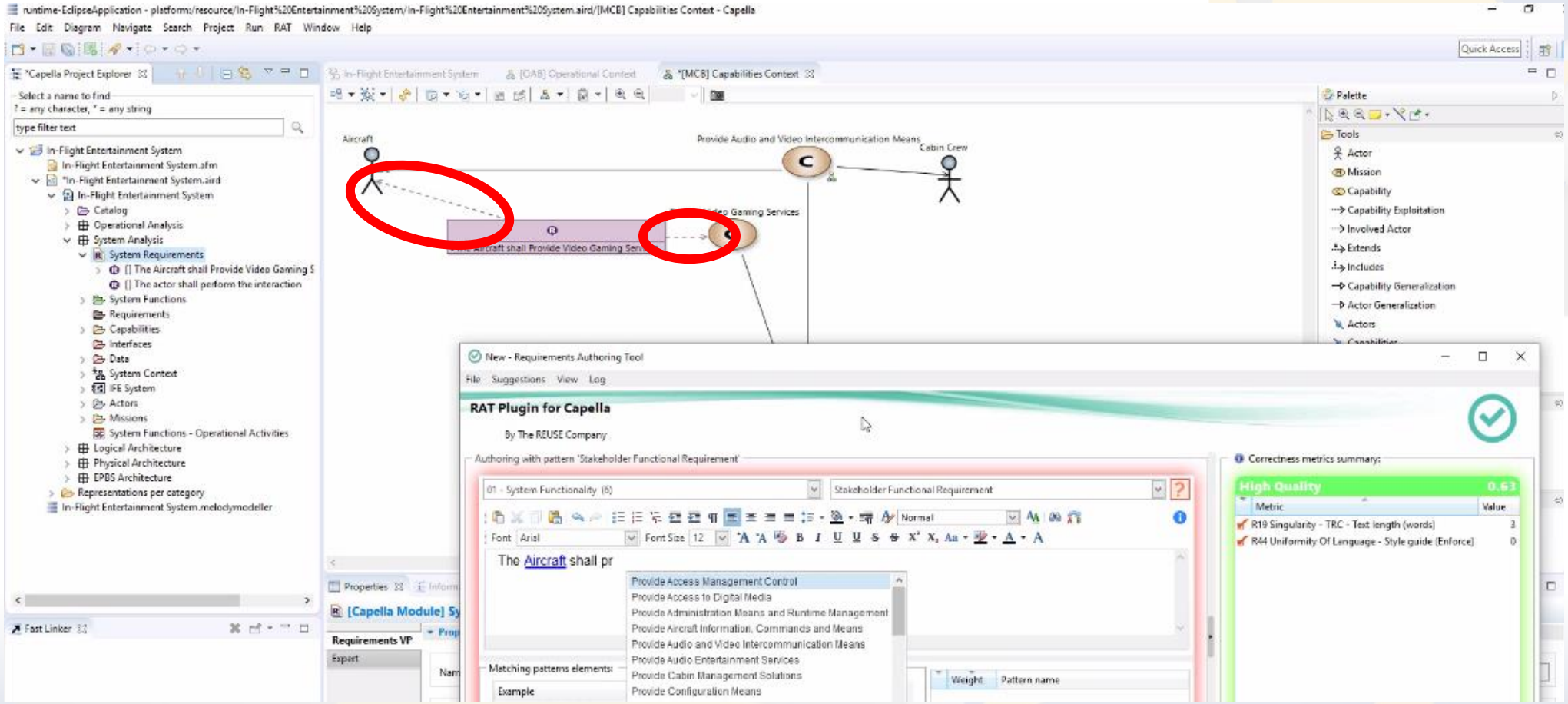
<Entity> | **Shall** | **Have** | **a/NUMBER** | **<Entity>**

The | **<Property>** | **Of** | **<Entity>** | **Shall be** | **<Value>**

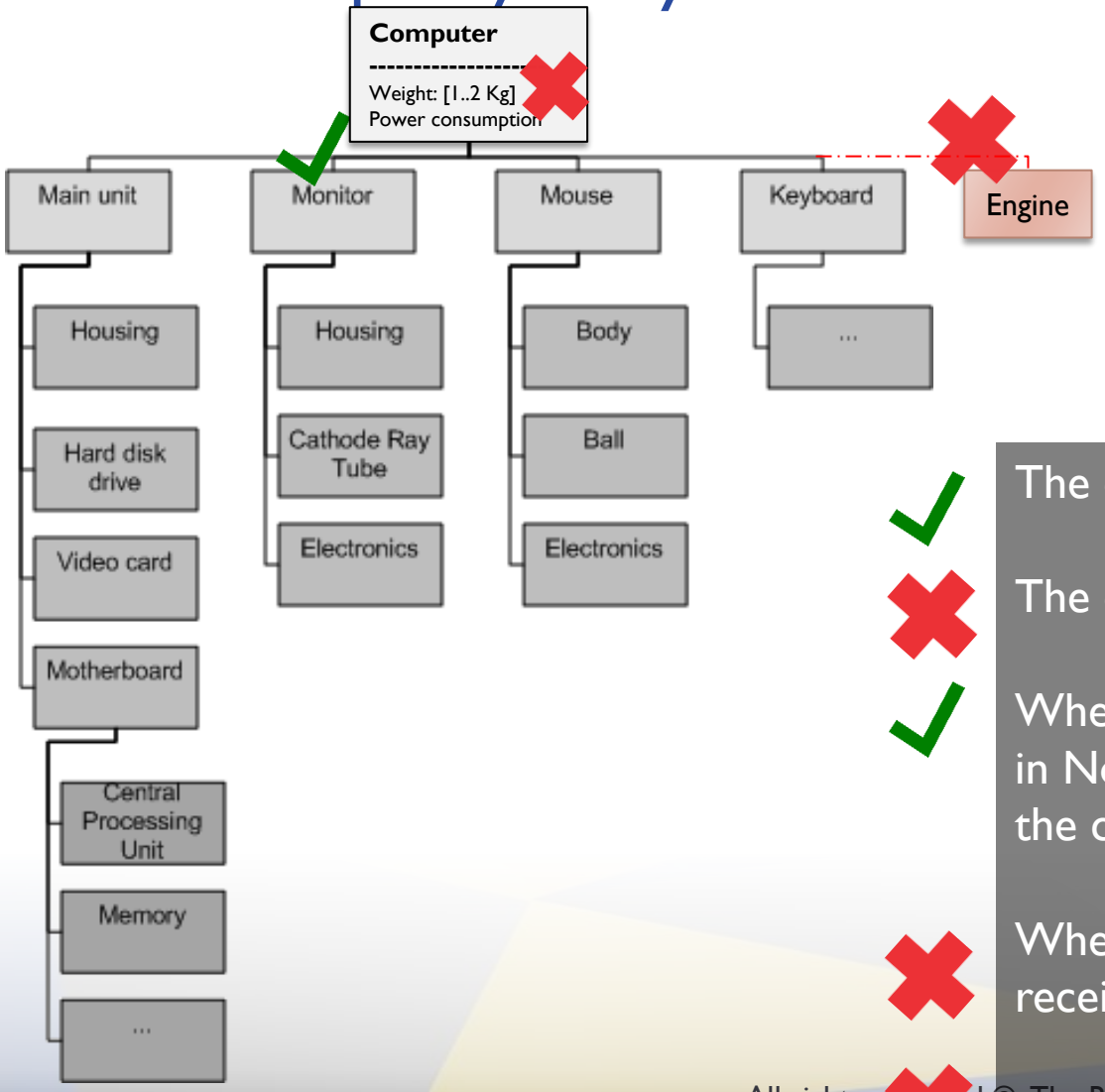
Real-time quality analysis: dictionaries

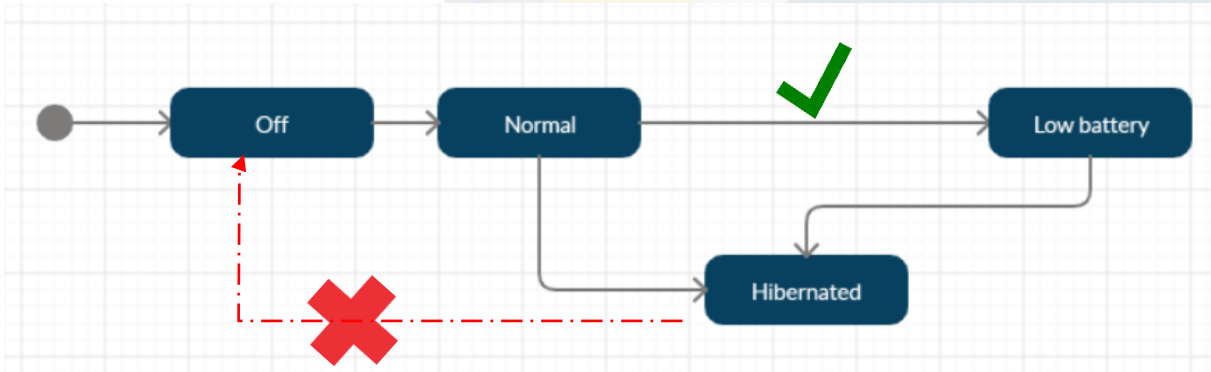


Real-time quality analysis: dictionaries



Real-time quality analysis: Consistency





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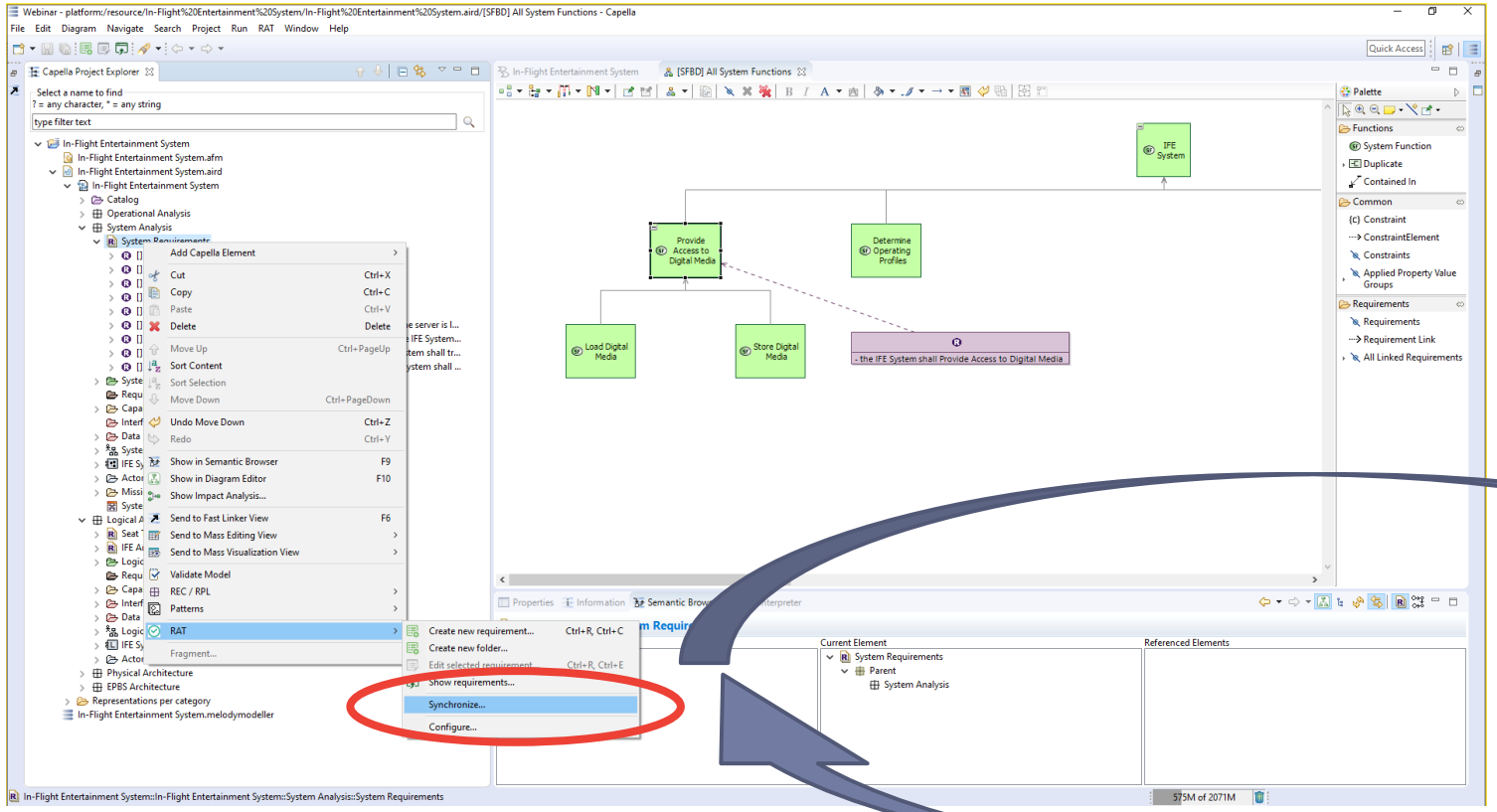
The computer shall have 2 engines

When the Computer is not plugged in, and the computer is in Normal state and the level of battery drops below 10%, the computer shall transit to Low battery mode

When the Computer is in Hibernated state and EventX is received, the computer shall transit to Off mode

The weight of the computer shall be 3.5 kg +- 10%

Requirements roundtrip



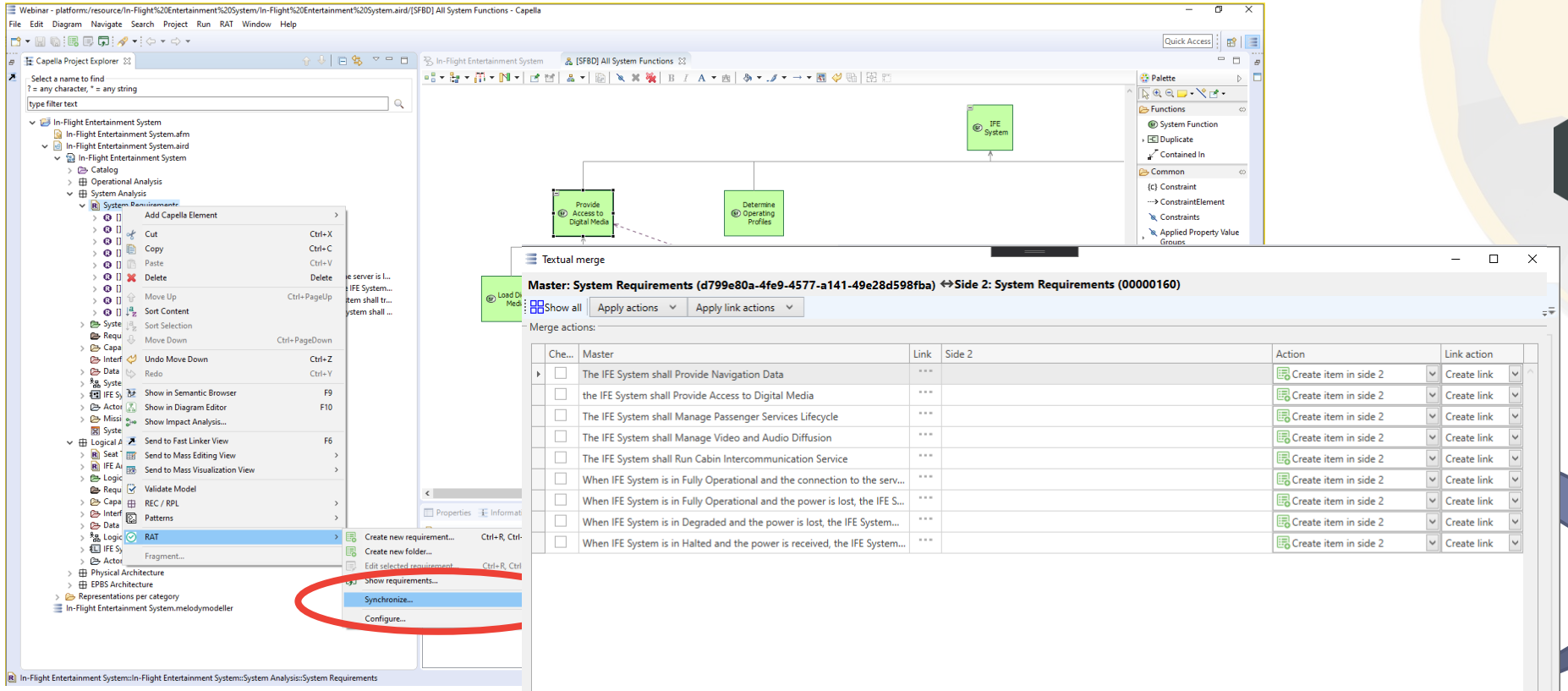
integrity™

OSLC
Inspired by the web

ReqIF
Requirements Interchange Format

… and more

Requirements roundtrip



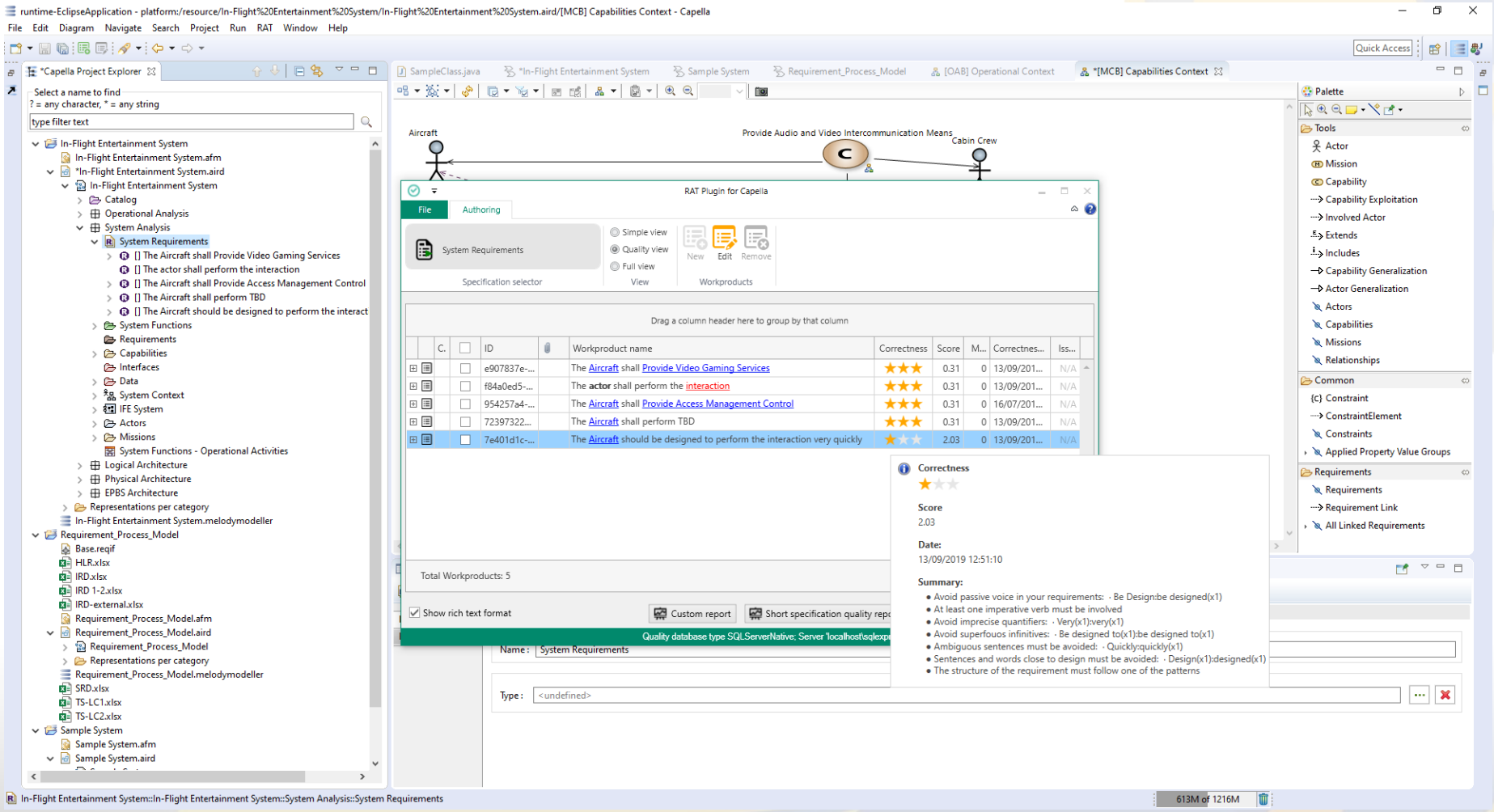
integrity™

OSLC
Inspired by the web

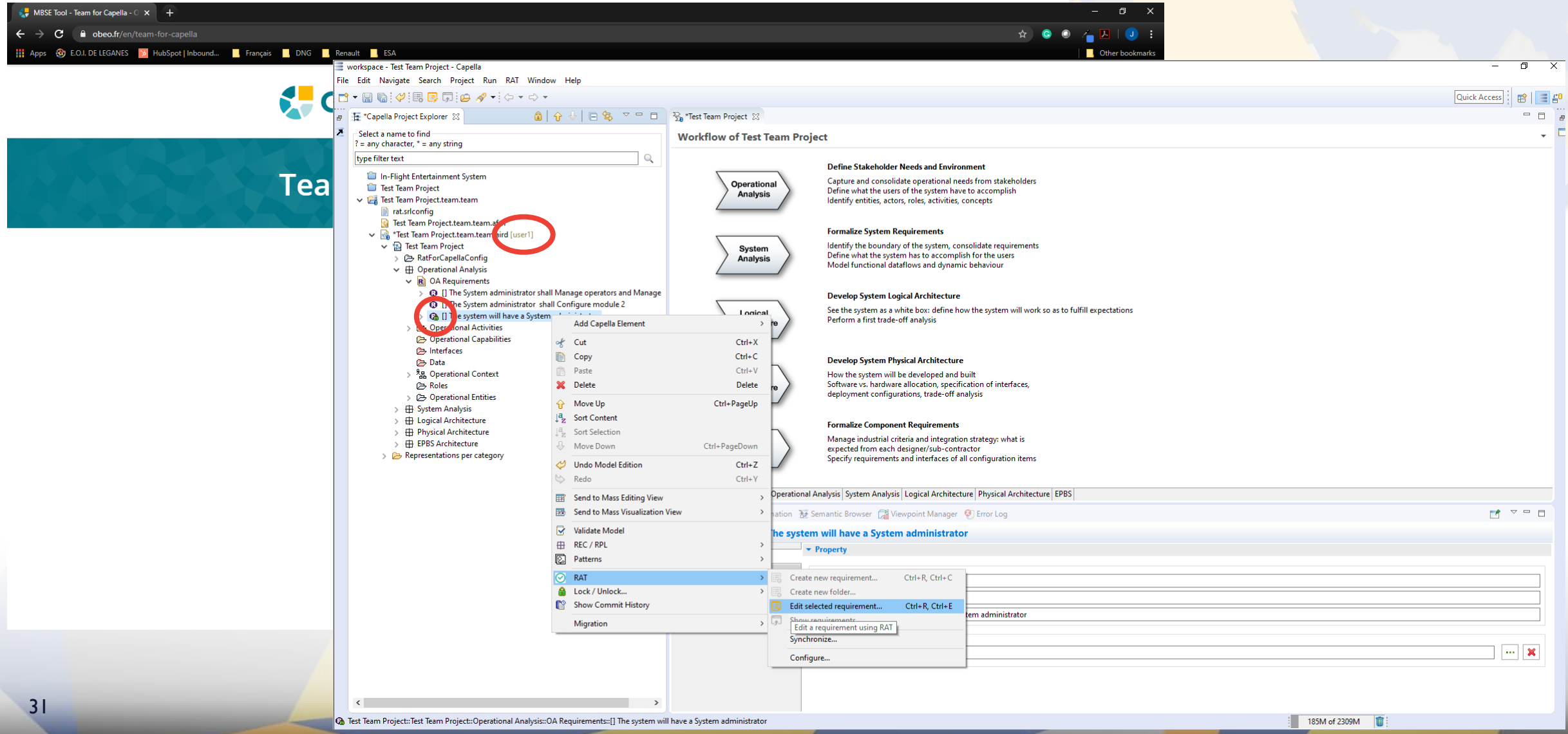
ReqIF
Requirements Interchange Format

… and more

Usability



Accesibility



Capella and

Knowledge manager

Knowledge-based requirements writing

01 Vocabulary

Controlled Organizational and Project Vocabulary for a common understanding among stakeholders

02 SCM/Architectures

Recreate and capture the system architectures represented in views and models. Stablish relationships among system and system elements

03 Patterns

Represent requirements similarities and enable formal representation, automatic recognition and aid authors

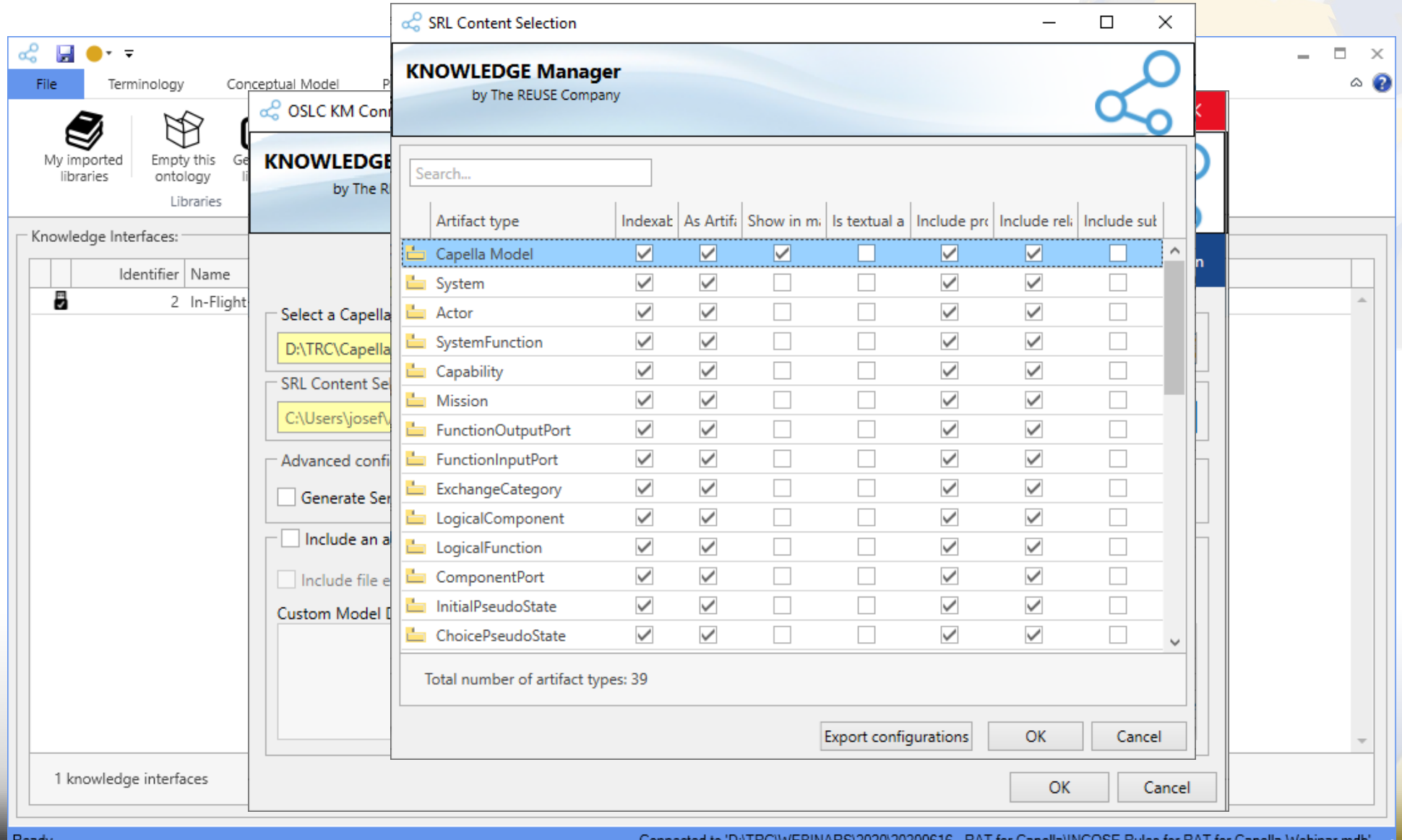
04 Formalization

Representation of assets semantic through SRL – System Representation Language

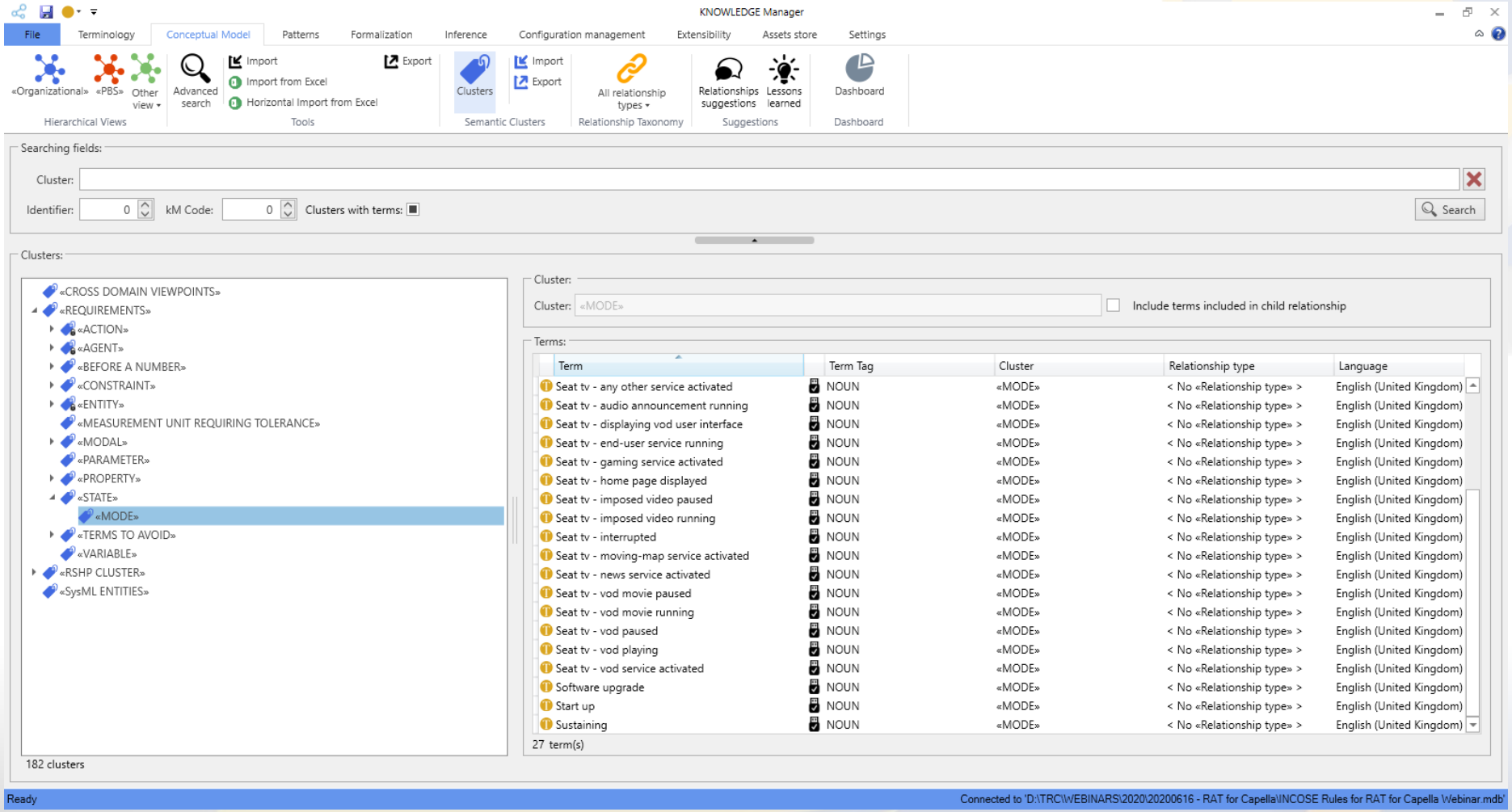
05 Reasoning

A combination of rules, tasks and groups to infer information from valuable assets

Capella models as Knowledge Base



Capella models as Knowledge Base

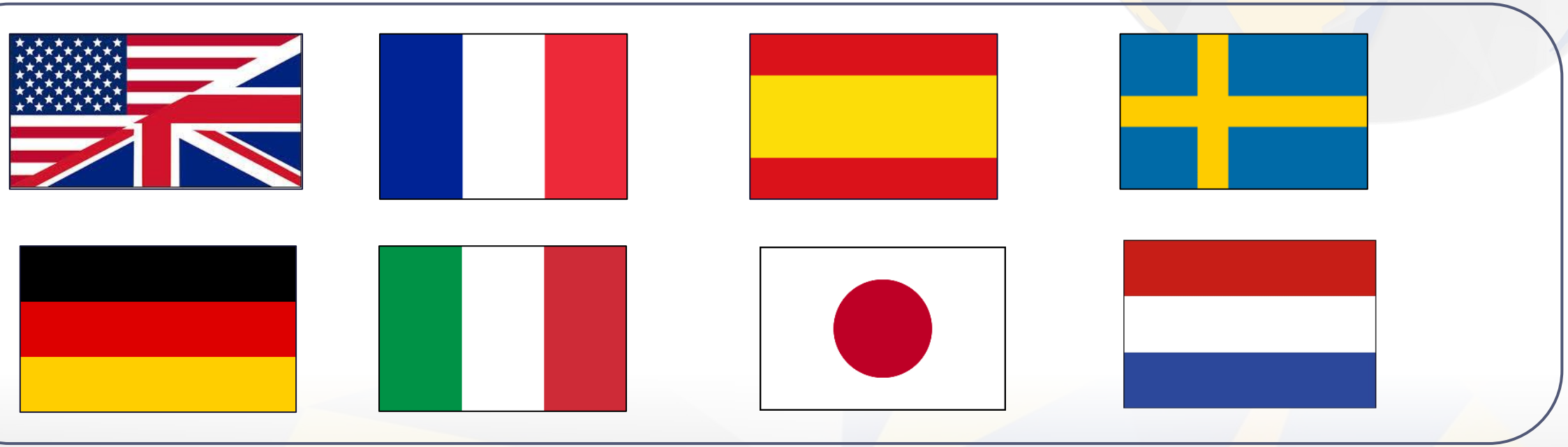


RAT for Capella

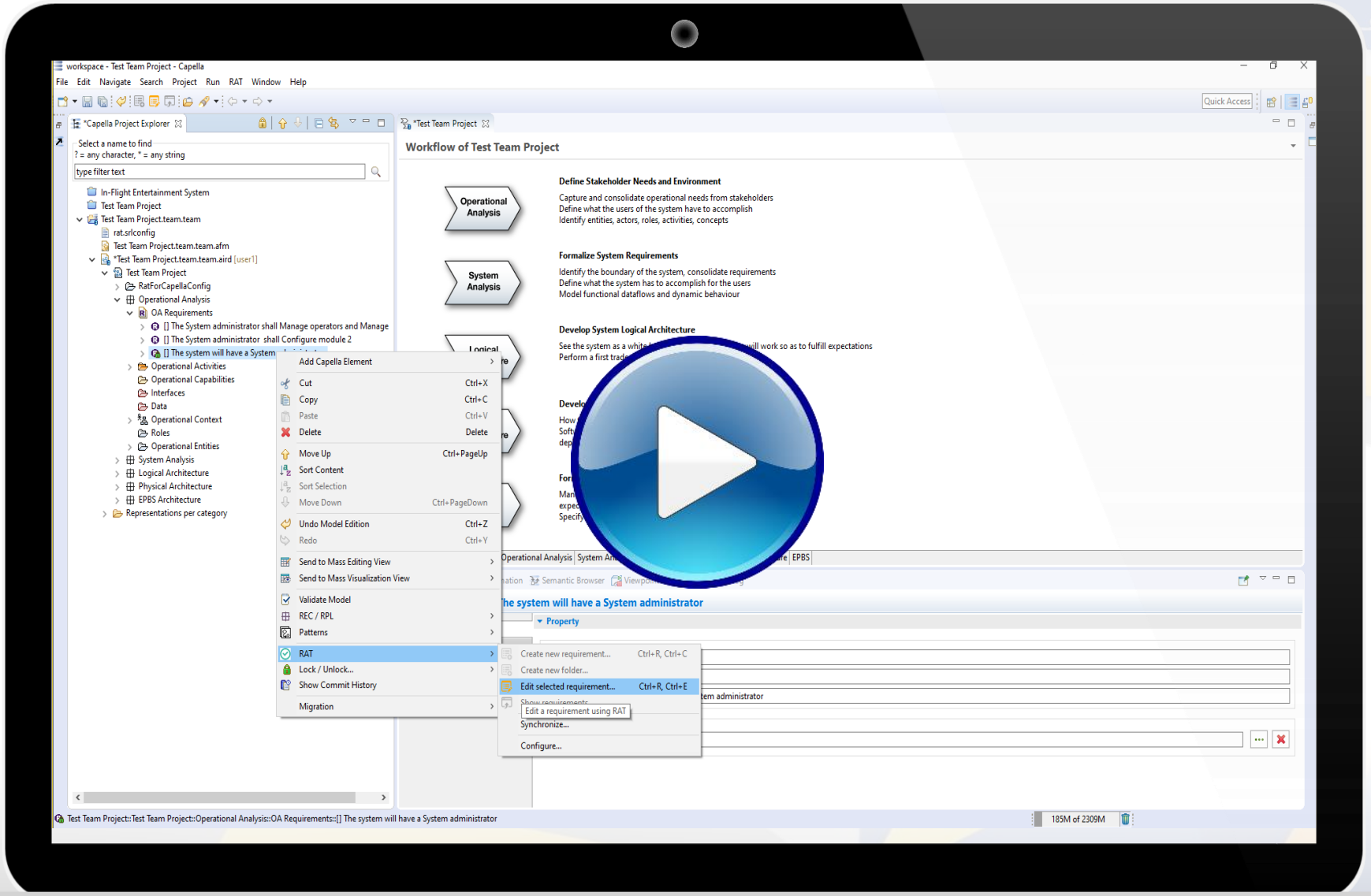
Live demo

The TRC Quality Suite: supported languages

- The TRC Quality Suite is highly dependent of the language of the requirements
- Languages supported so far:



RAT for Capella: Demo




Q&A

Next webinar

- **A comprehensive guide on tailoring the INCOSE GfWR** (Guide for Writing Requirements)
  - While the guide is a worldwide broadly used and recognized reference for requirement engineers, its implementation still poses many challenges. For example, the fact that requirements can be expressed at different levels of abstraction, the components addressed by those requirements are not equally critical and a requirement document might contain requirements of different types or levels. Additionally, because the guide is extremely complete, the implementation of these rules in a single step turns out to be very complex, especially when considering the different skills of different team members, not to mention the amount of effort for the manual inspection of such a large number of quality rules.
  - This webinar describes a solution for all these challenges, including, among others, the use of a set of tools to automatize some of the most tedious tasks

Dates:

- June 25th 2020

- **Where:**
  - Only for INCOSE members


Q&A

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the
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