
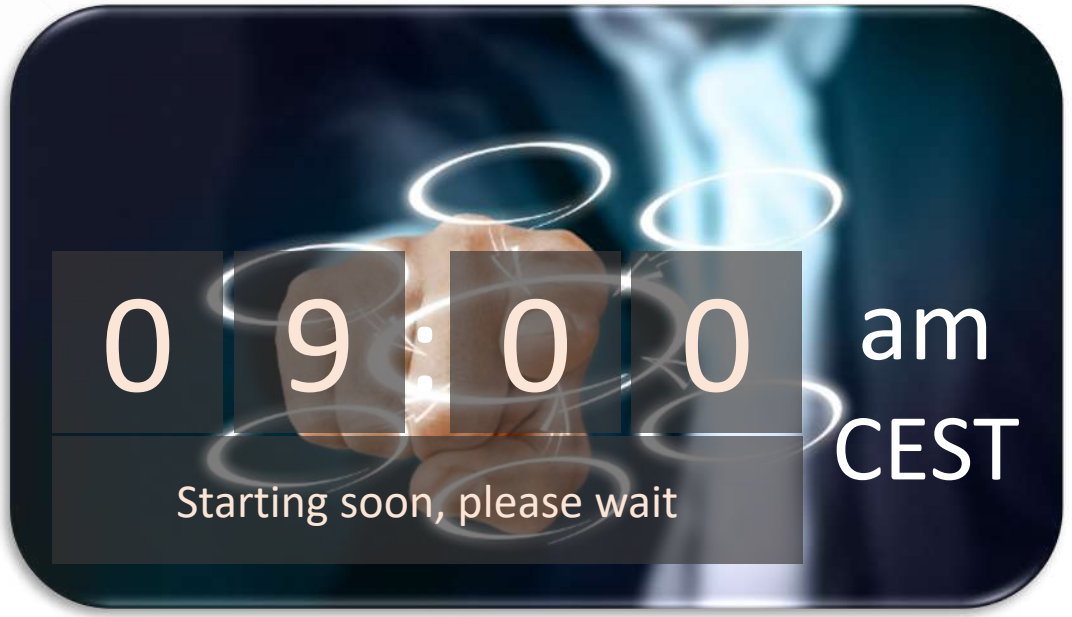


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  - You'll be muted all along the Webinar
  - There's a *Question* section to ask your questions or send your comments whenever you want
  - If you have any technical issue, please use the chat box (not the *Question*)
  - The Webinar will be recorded. A link to the recording will be sent to you in few days

Chief Software Architect

# How to Boost your Requirements Engineering Process on top of Polarion

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THE REUSE COMPANY

# Contents

- Introduction to The REUSE Company and the speaker
- Siemens Polarion
- AI and Classic semantic features:
  - Requirements quality and writing assistant
  - Traceability assistant
  - Interoperating Requirements
  - Ontology population
- Live demos
- Q&A

# About The REUSE Company (TRC)


**01** The company was established in **1999**

As a spin-off of a University in Madrid

**02** **System + Software Engineers**

Smart combination between Company staff and R&D from Academia

**03** **Headquarters:**
Madrid (Spain)

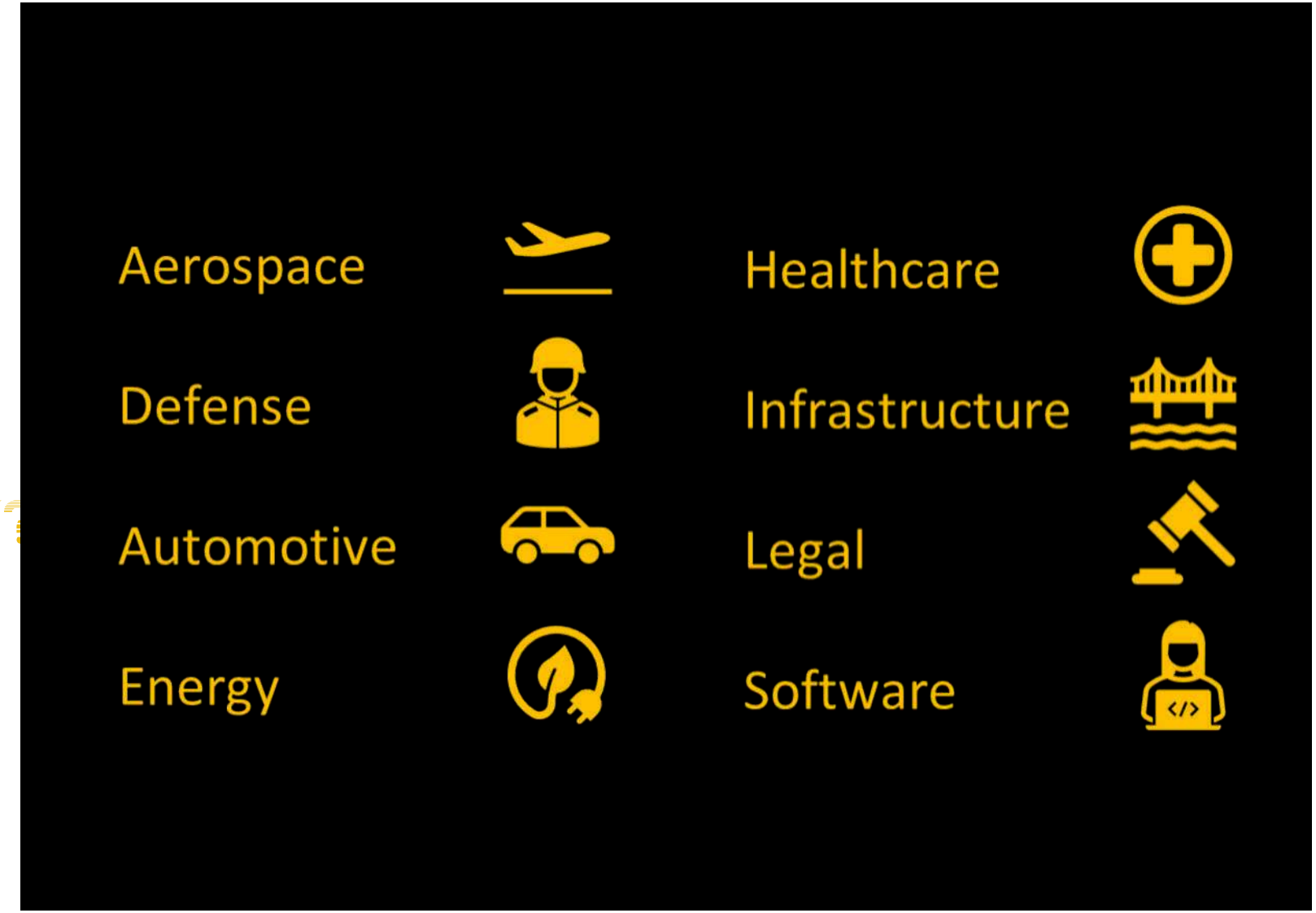
**International offices:**
Miami (USA)
Stockholm (Sweden)
Tokyo (Japan) Delegation

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

# THE REUSE COMPANY

a solution provider specialized in the application of **SEMANTIC TECHNOLOGIES** and **ARTIFICIAL INTELLIGENCE** to improve the digitalization of the **Systems Engineering life cycle**.

# WHO IS USING OUR TECHNOLOGY?



# The presenters

Luis Alonso

- **Current Position:**

  Consultant Director of The REUSE Company

- **Former position:**

  Chief Software Architect of The REUSE Company

# The presenters

Iker Gonzalez

- **Current Position:**

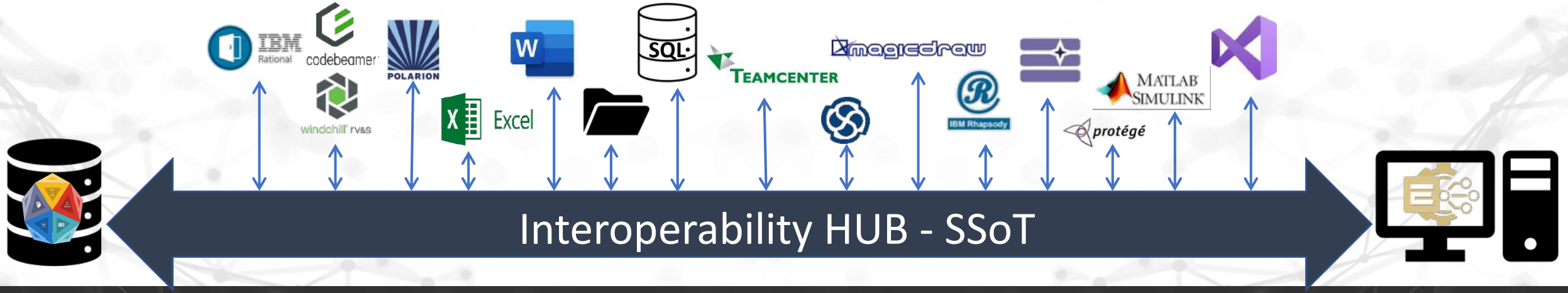
  Consultant of The REUSE Company

# INTRODUCING SIEMENS POLARION AND SES ENGINEERING STUDIO


- Polarion ALM is one of the references solutions in the field of Application Lifecycle Management (ALM) and Product Lifecycle Management (PLM).
- Offers a modern and collaborative web-based interface providing Integral Requirements, Risks and Test management. Granting end-to-end traceability of these artifacts.

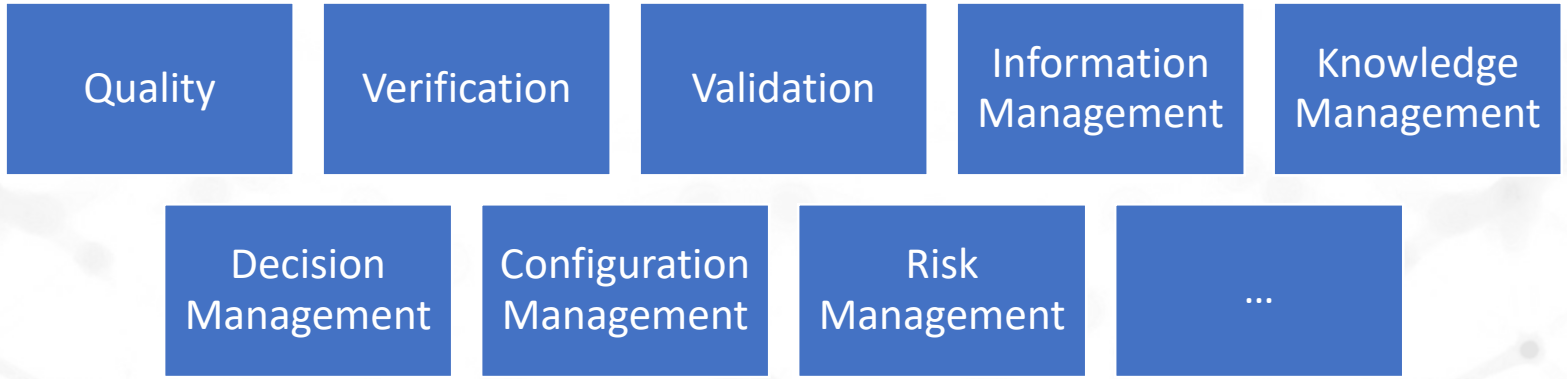
SES ENGINEERING Studio

- A modern tool to leverage activities developed on other tools
- Not aiming at replacing the concept of SoT
- But including connectivity to Polarion and +50 tools:
  - RM, MBSE, ALM, PLM, MS Office, PDF…
- Featuring traceability and interoperability among all these tools:
  - Thus, allowing the seamless definition of your *Digital Thread*



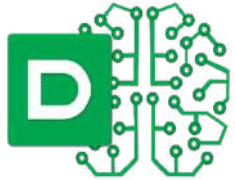
SES ENGINEERING Studio

- A modern tool to leverage activities developed on other tools
- …
- And implementing a series of Technical and Technical Management Processes on top of all those tools:



SES ENGINEERING Studio

- Semantic knowledge-centric approach on top of an ontology
  - Featuring classic Natural Language Programming techniques
- Now implementing plenty of AI methods
  - Including LLM/SLM



- All this leads to **Neuro-symbolic AI**
- Providing an outstanding treatment of textual artifacts
- And **Requirements** is a great candidate for enhancement

# STRONGER TOGETHER

# Stronger together


- 100% of the ENGINEERING Studio capabilities have been integrated with Siemens Polarion.

- Resulting into an outstanding integration and mix of features

# ARTIFICIAL INTELLIGENCE TECHNIQUES

SES ENGINEERING Studio includes a component called: **Decision Management**

This module is loaded with plenty of AI core techniques, ready to be used

Users create their *Decision Flows* to reach their goals, using as input the information in your Digital Thread, in this case, a Polarion project

**Examples of flows:**

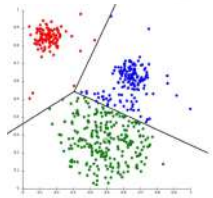
Automatic population of an ontology based on patterns

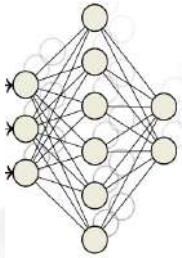
Implementation of AHP (Analytic Hierarchy Process) to assess pros and cons of a set of candidate architectures

Requirements classification

# DMS approach

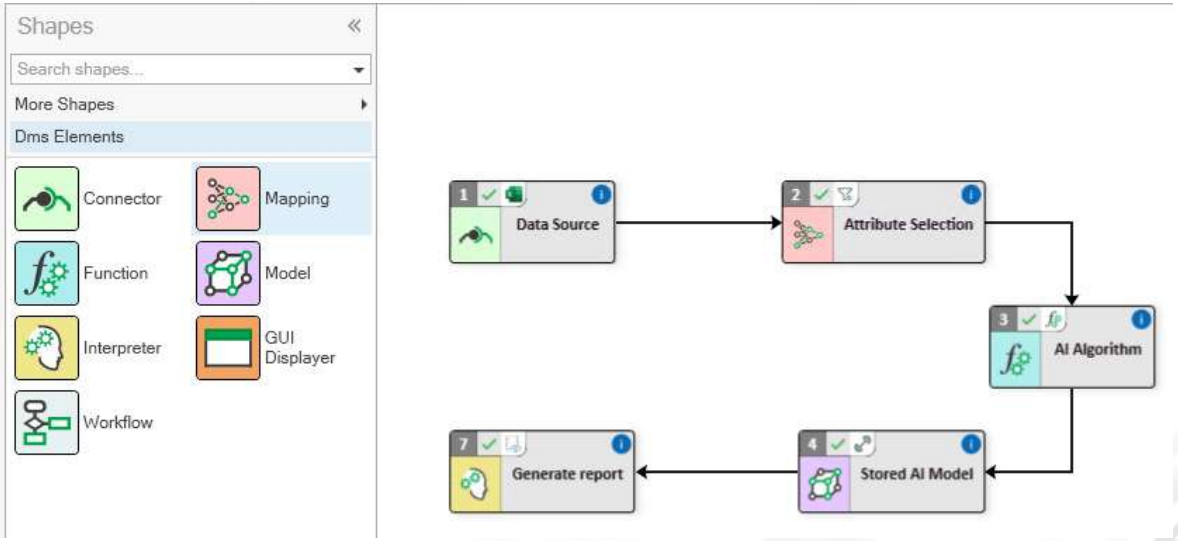




# Executing AI workflows

- The requirements in a Polarion project can be used to extract the main entities of the project:
  - Name of systems, entities, actions, states/modes…
  - Based on a series of pre-existing requirements patterns (EARS..)



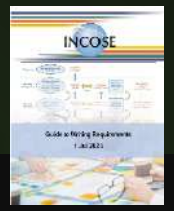
# REQUIREMENTS QUALITY

Tools and add-ins to **customize sets of requirements** quality rules, assist during the **authoring** process, and provide customizable **quality reports**.

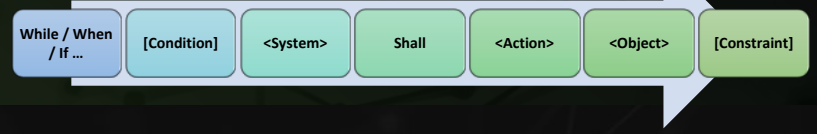
**Implements the notion of CCC: correctness** for individual requirements, and **consistency** and **completeness** among requirements and models.

Fully integrated with Polarion, including a web extension

Implementing the rules in the INCOSE GtWR and many other guidelines



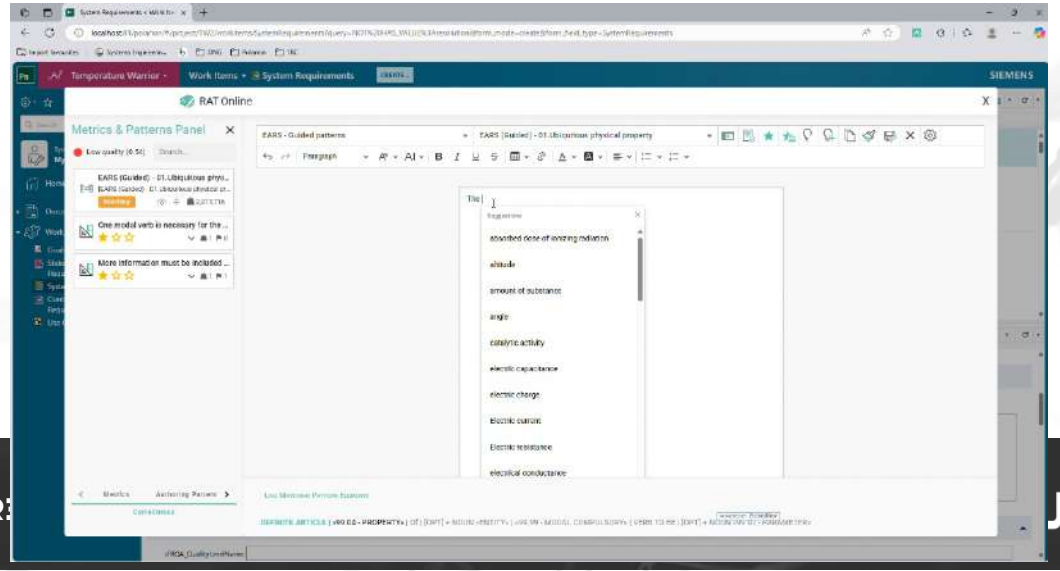

Implementing catalogues of patterns like EARS, INCOSE…



# With a Semantic Writing Assistant

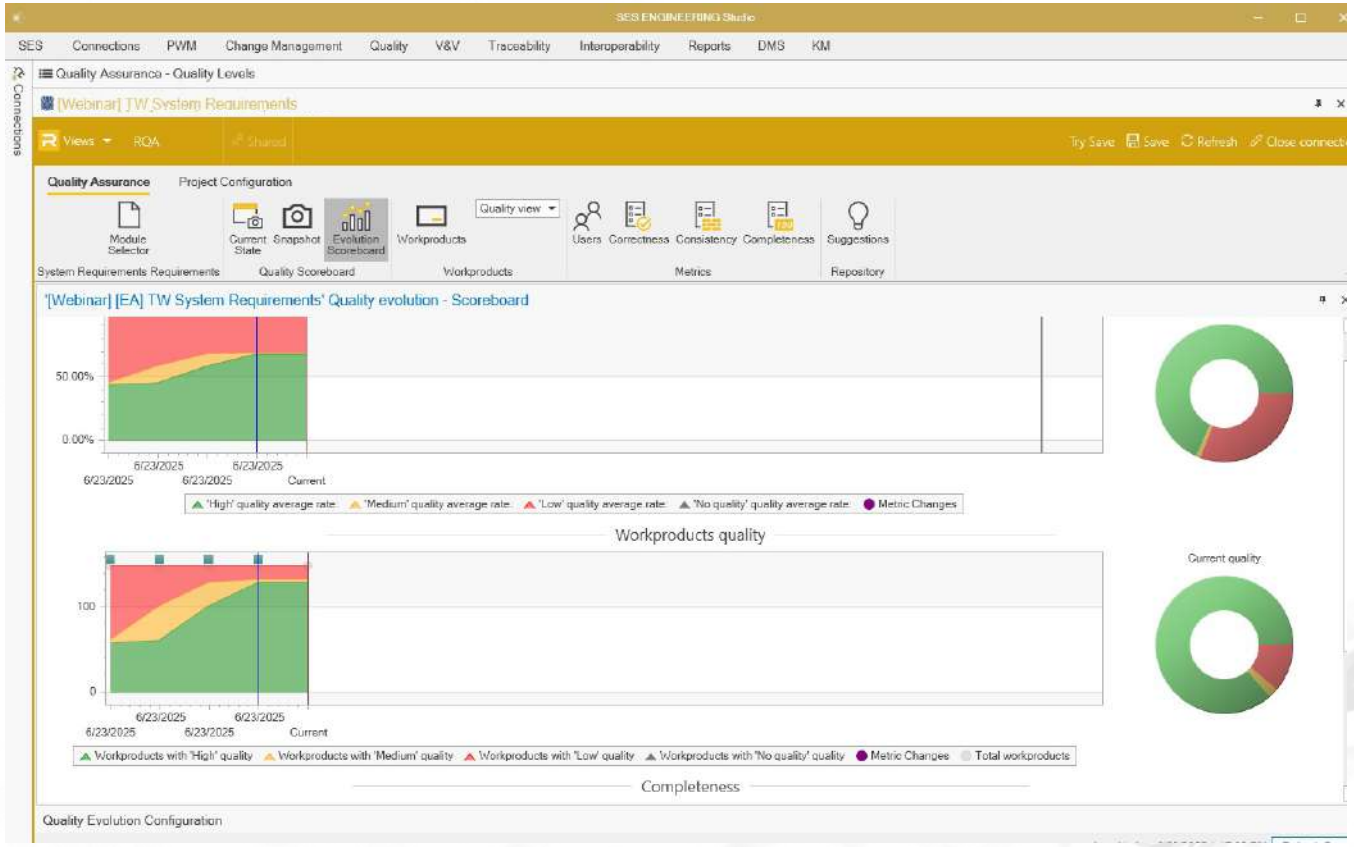
- A SMART assistant is helping authors, in real-time:
  - Follow a set of agreed patterns such as those defined by EARS, INCOSE, the MASTER …
  - Real-time checking of the agreed rules: INCOSE GtWR…
  - Search for duplicates

- EARS
- Ubiquitous
- State-driven
- Event-driven
- Optional feature
- Unwanted behavior
- Complex pattern



# Check of Consistency With your Models

- Complete quality report of Polarion work items, including:
  - Correctness of your requirements with regards to your writing rules: INCOSE GtWR or others
  - Completeness and consistency of your documents vs models and domain ontology
  - Detection of duplicates



# INTEROPERABILITY HUB

Connect and synchronize your documents in **Polarion** with any other tool in your systems engineering ecosystem.

**+50 different connectors available**

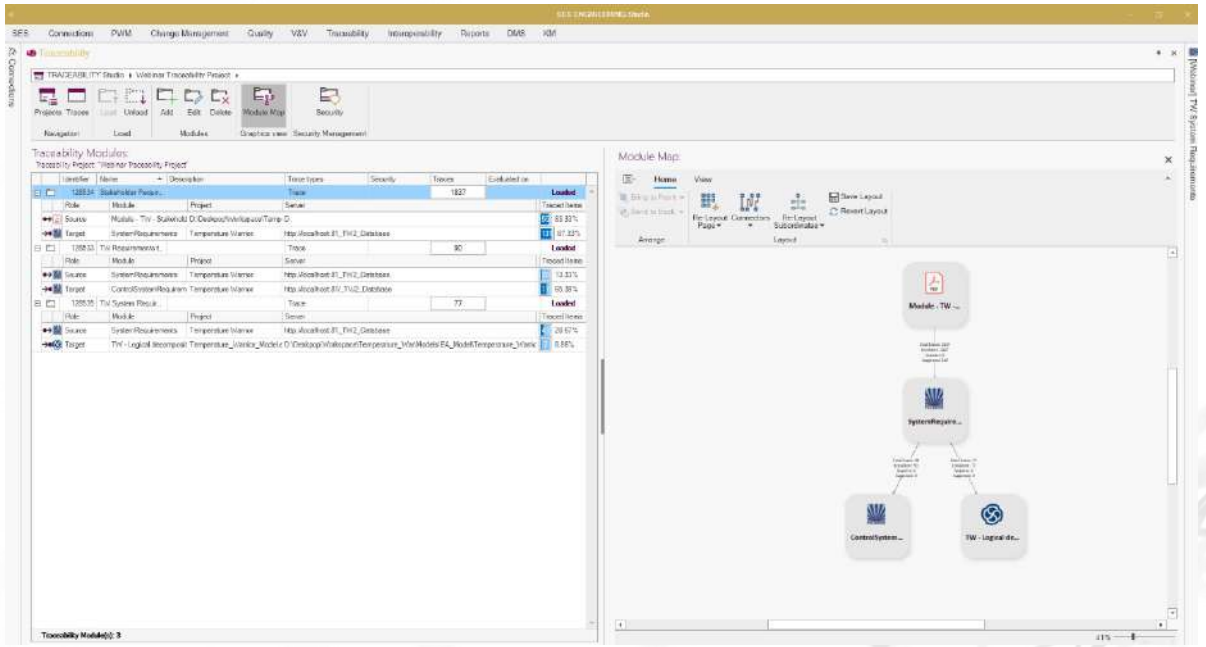
Traceability between Polarion and other SE tools: RMs, MBSEs, MS Office, PDF…

Exchange requirements between Polarion and other RM and MBSE tools

Collaborative development using different sets of tools, keeping your Sources of Truth always synchronized

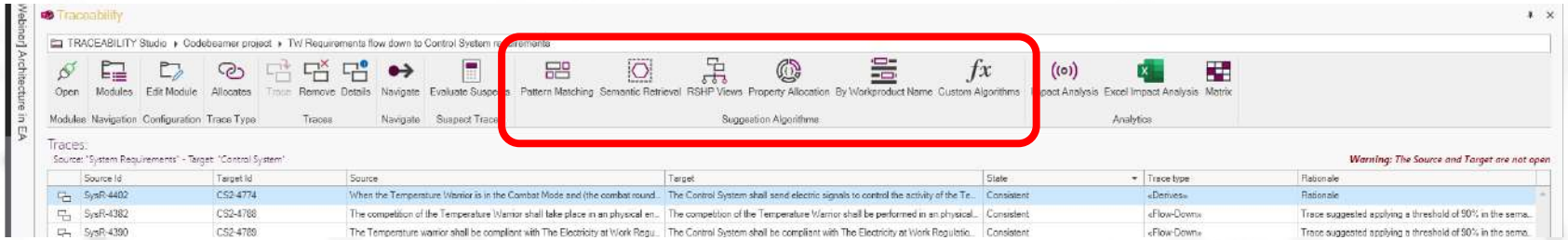
# Extending the end-to-end Traceability

- What about connecting your requirements in Polarion with:
  - Regulation that has been parsed in a PDF file
  - External requirements in MS Word, Excel, or other formats
  - Models in an MBSE tool
  - …



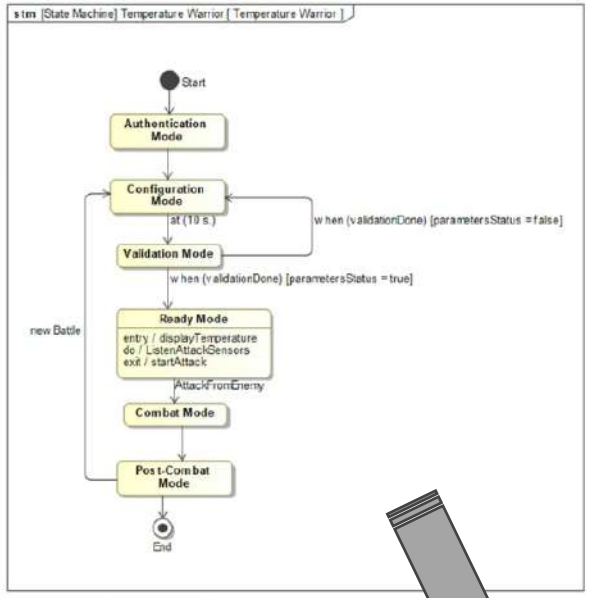
# Semantic traceability

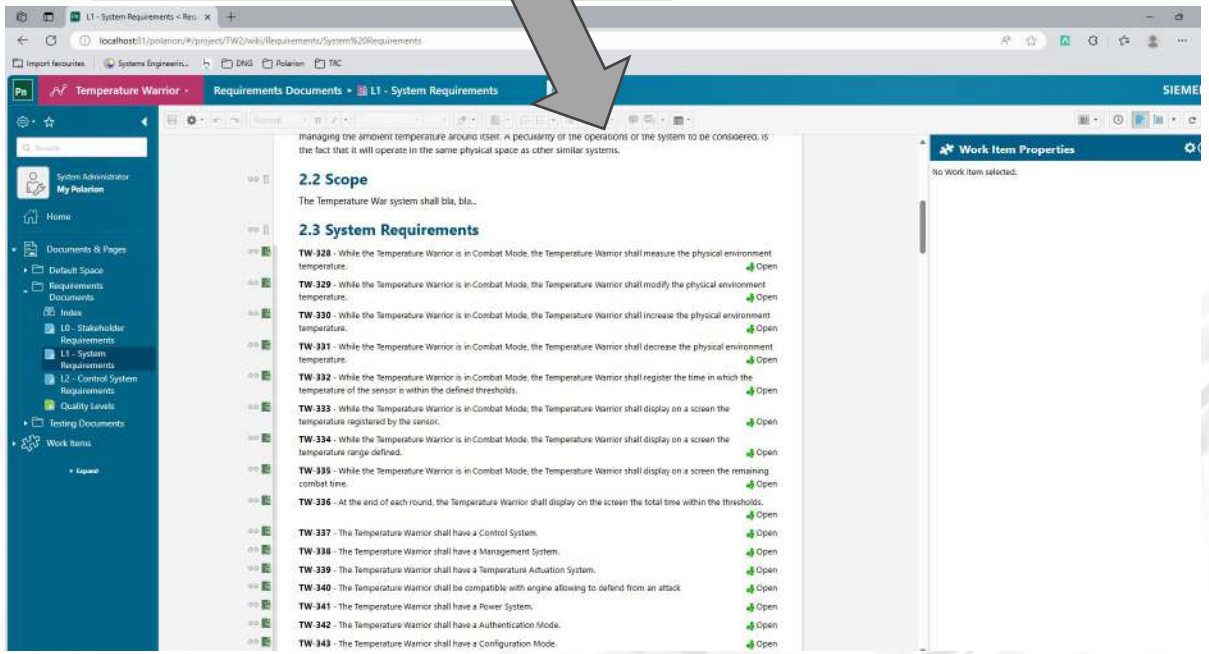
- But, if you consider traceability a tedious task…:
  - Ask your traceability assistant to identify traces for you
  - Different algorithms that consider the text in your requirements, and the information in the ontology and the connected models
  - Custom methods so that you can develop other means to identify traces
  - Sync the detected traces to your RMS



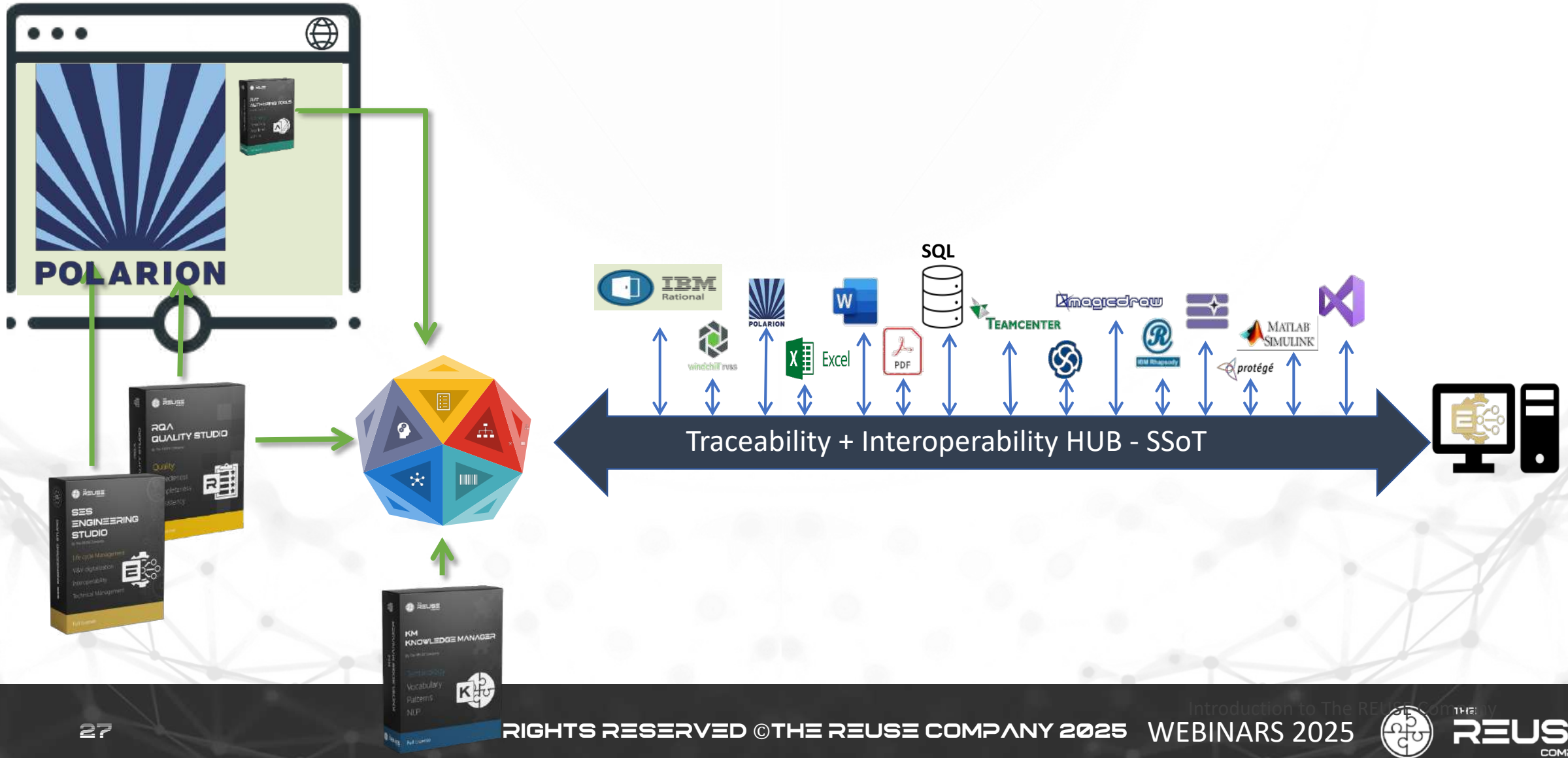
# Interoperating with other tools, within or without your IT infrastructure

- Synchronize, and roundtrip your artifacts and their traces in Polarion into:
  - Requirements in another RM tool
  - Requirements into a MBSE tool
- Generate models from requirements and vice-versa



# Deployment architecture

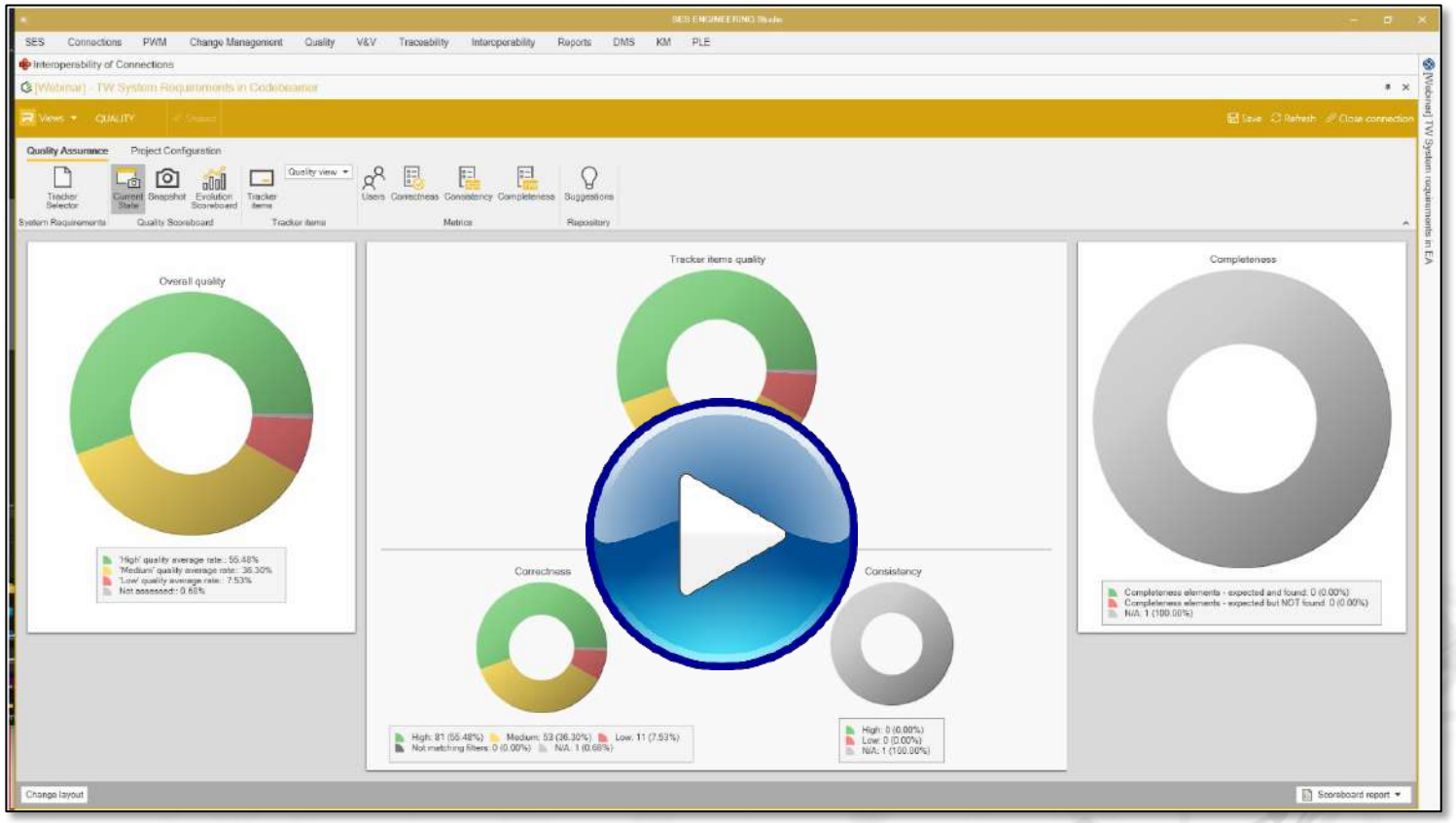


# DEMOS

# Demo: Requirements Quality

## Steps:

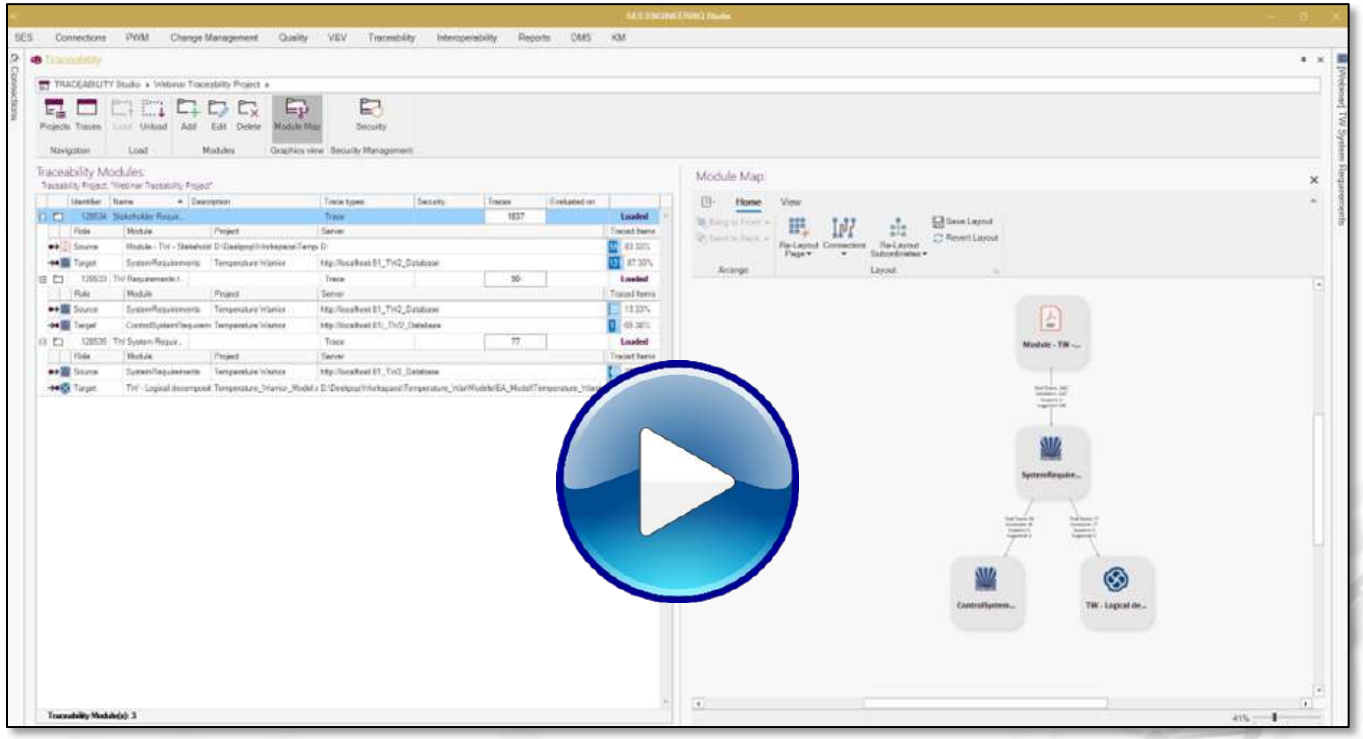
1. Create a connection to Polarion
2. Assign writing patterns and metrics
3. Write a new requirement with the Requirements Assistant (RAT)
4. Analyze quality in RQA



# Demo: Requirements Traceability

## Steps:

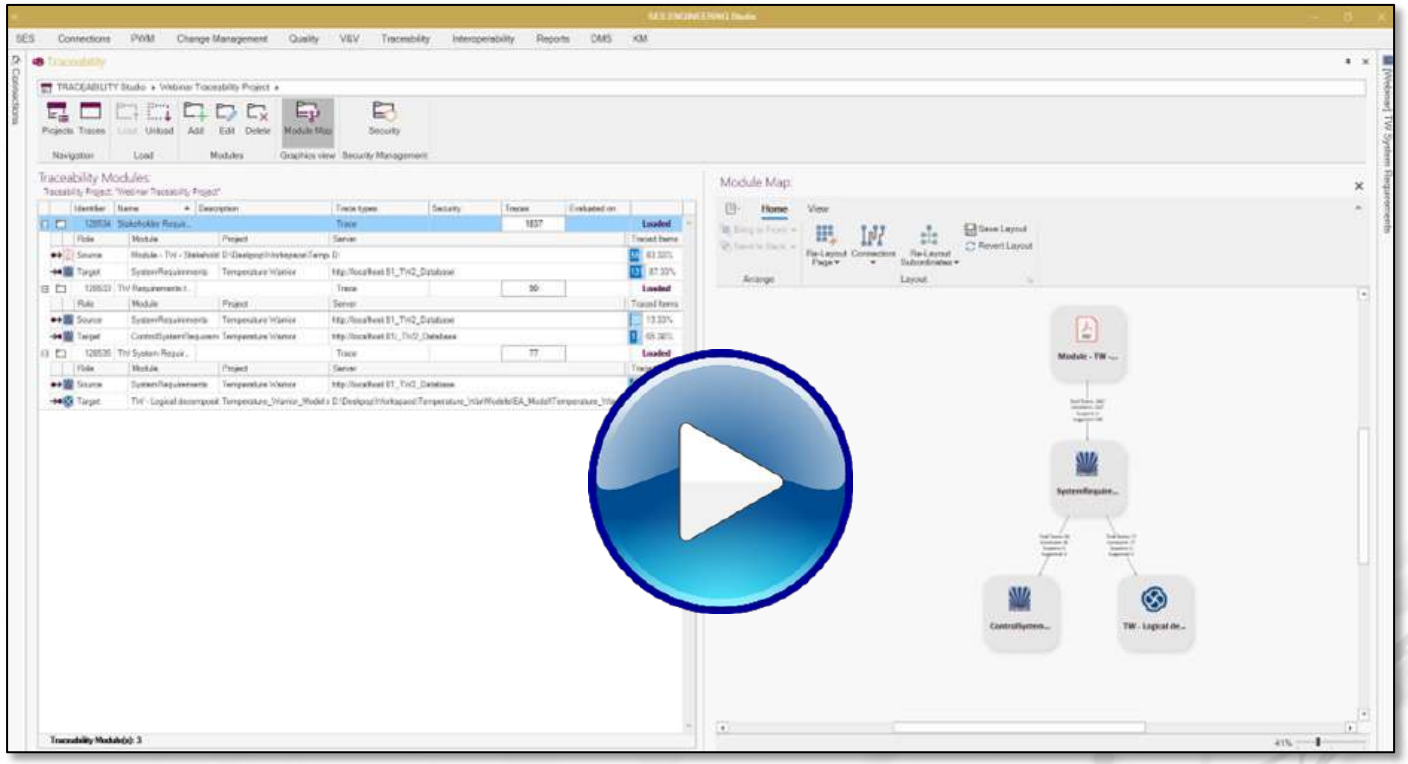
1. Suggest traces between 2 Polarion documents.
2. Connect to regulation in PDF and establish traces.
3. Show impact of PDF changes.



# Demo: Requirements Traceability

## Steps:

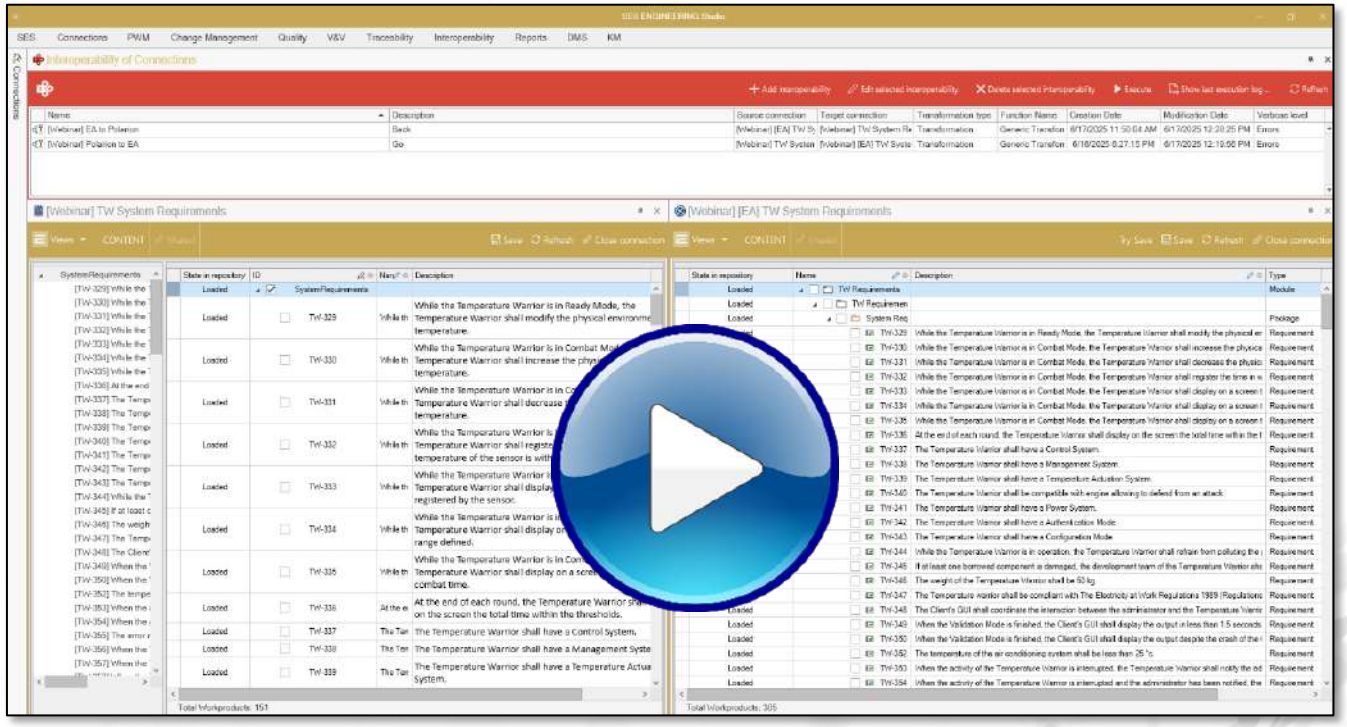
1. Connect to architecture in EA and generate traces
2. Show the global impact analysis.



# Demo: Requirements Interoperability

## Steps:

1. Open a Requirements connection to EA
2. Create the Interop operation
3. Execute the way Polarion → EA
4. Add, modify and delete requirements in EA
5. Execute the way back EA →Polarion



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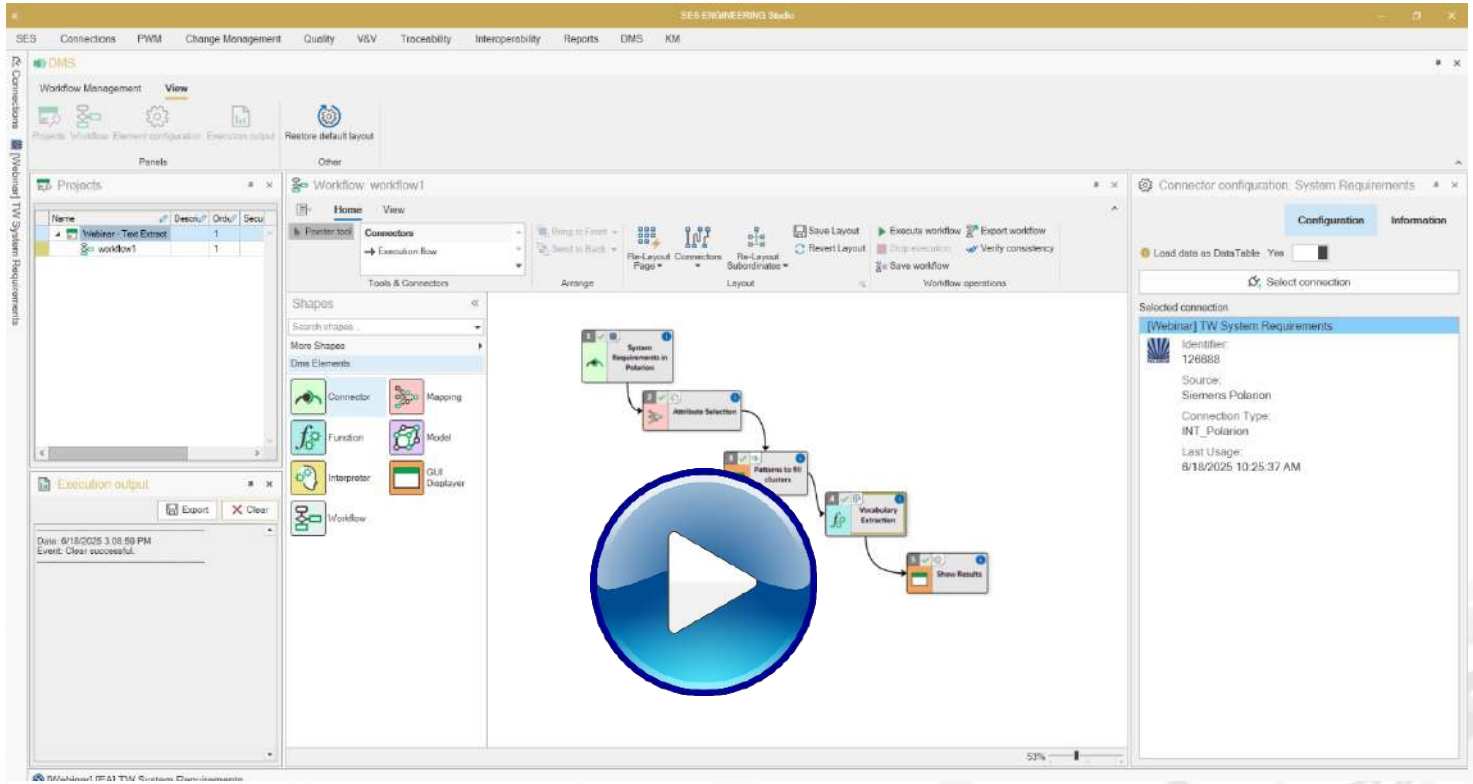
# Demo: Vocabulary Extraction

## Steps:

1. Open a Polarion document.
2. Select a pattern.
3. Find content for the vocabulary.
4. Save in the ontology.




Q&A

# Contact Information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