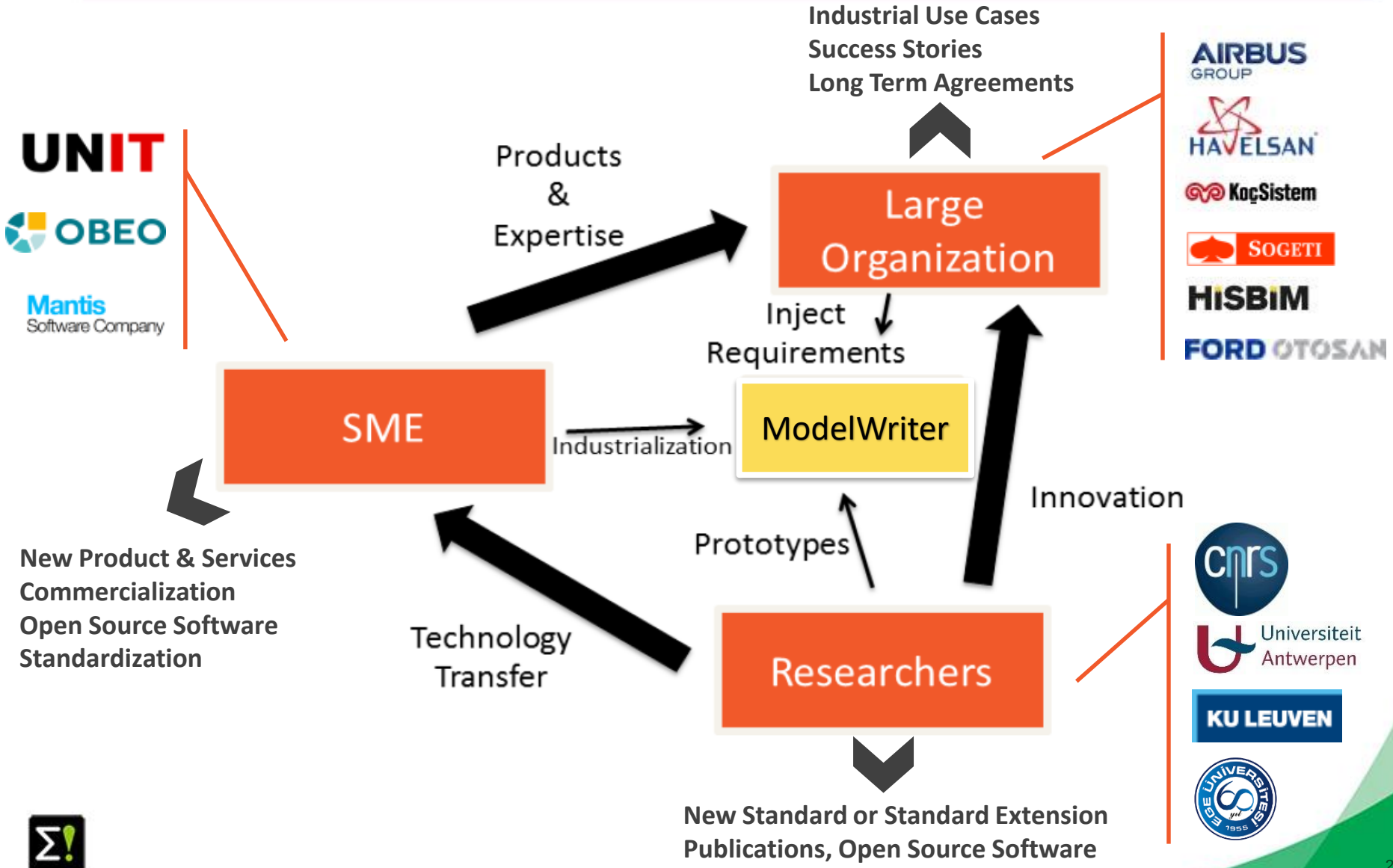
2 Overview of the Project

Ferhat Erata
UNIT, ModelWriter Project Leader

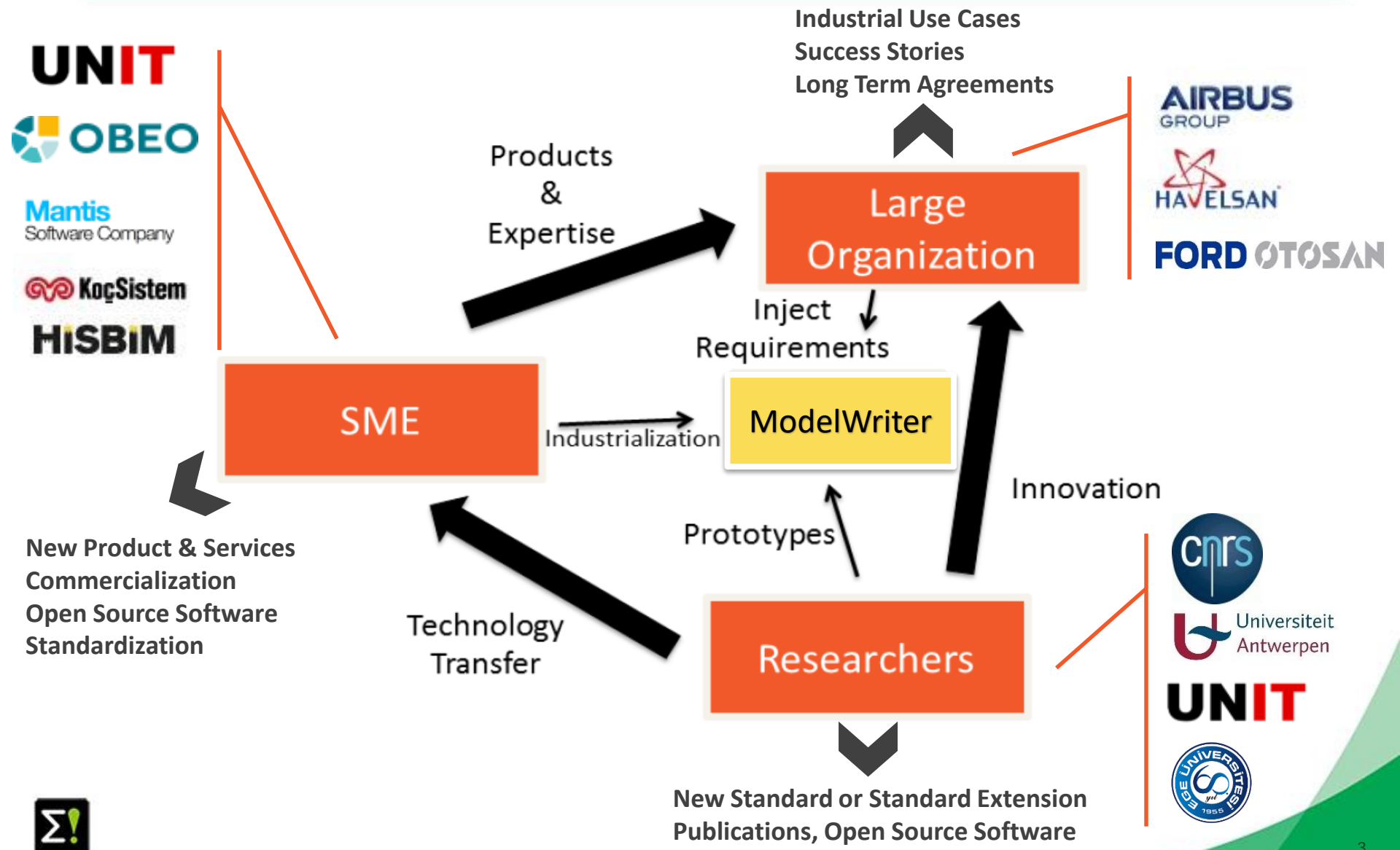
Industrialization Triangle in ModelWriter

Open Source Software (year #1)



Industrialization Triangle in ModelWriter

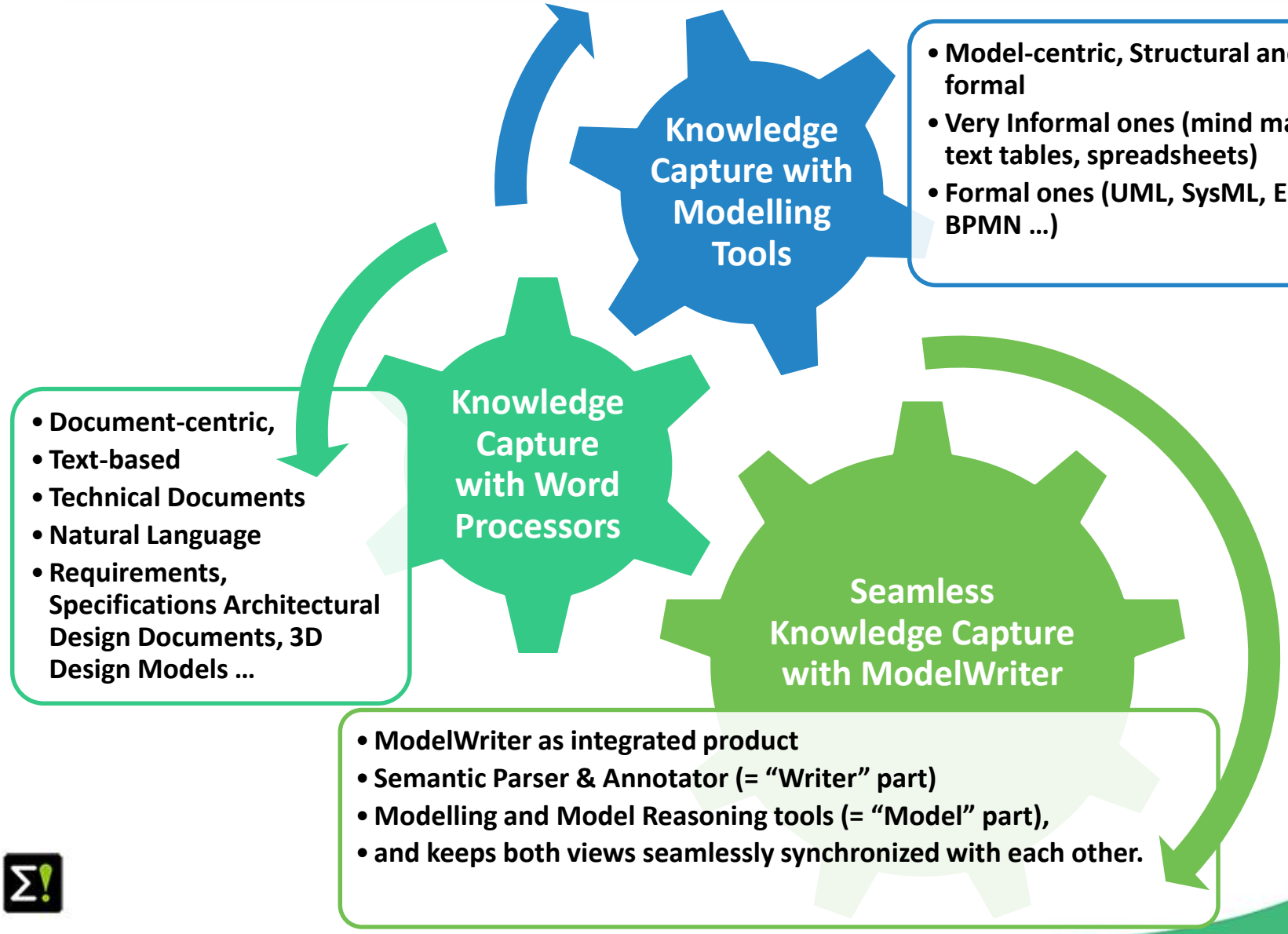
Open Source Software (year #2)



ModelWriter
Project Overview

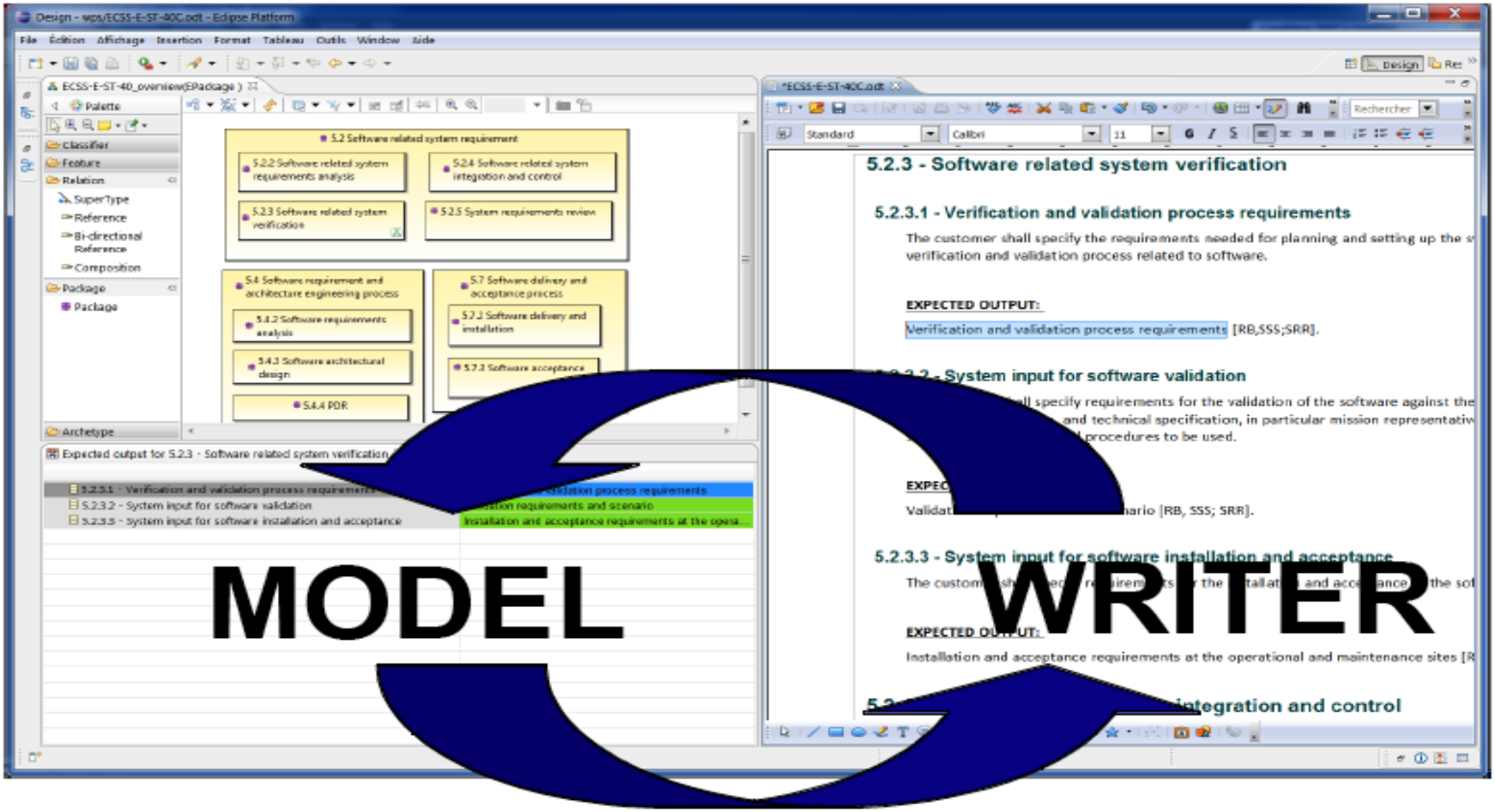
- Resource Allocation: 68,71 person year
- Project Duration: 36 months
- Planned Budget: 5,543,000 Euro
- Start and Finish Date: 01 Oct 2014 – 30 Sep 2017
- Open-Source Software Platform to be submitted to Eclipse Foundation

ModelWriter
Today's Knowledge Capture



ModelWriter

bi-directional Knowledge Capture tool



ModelWriter
Text-Based Knowledge Extraction

Semantic Word Processor
(Text-Based Knowledge Extractor)

Understands the various textual parts of a document expressed in Natural Language

Reveals concepts and relationships between them (“Model”-part)

Consistency & Completeness Checking

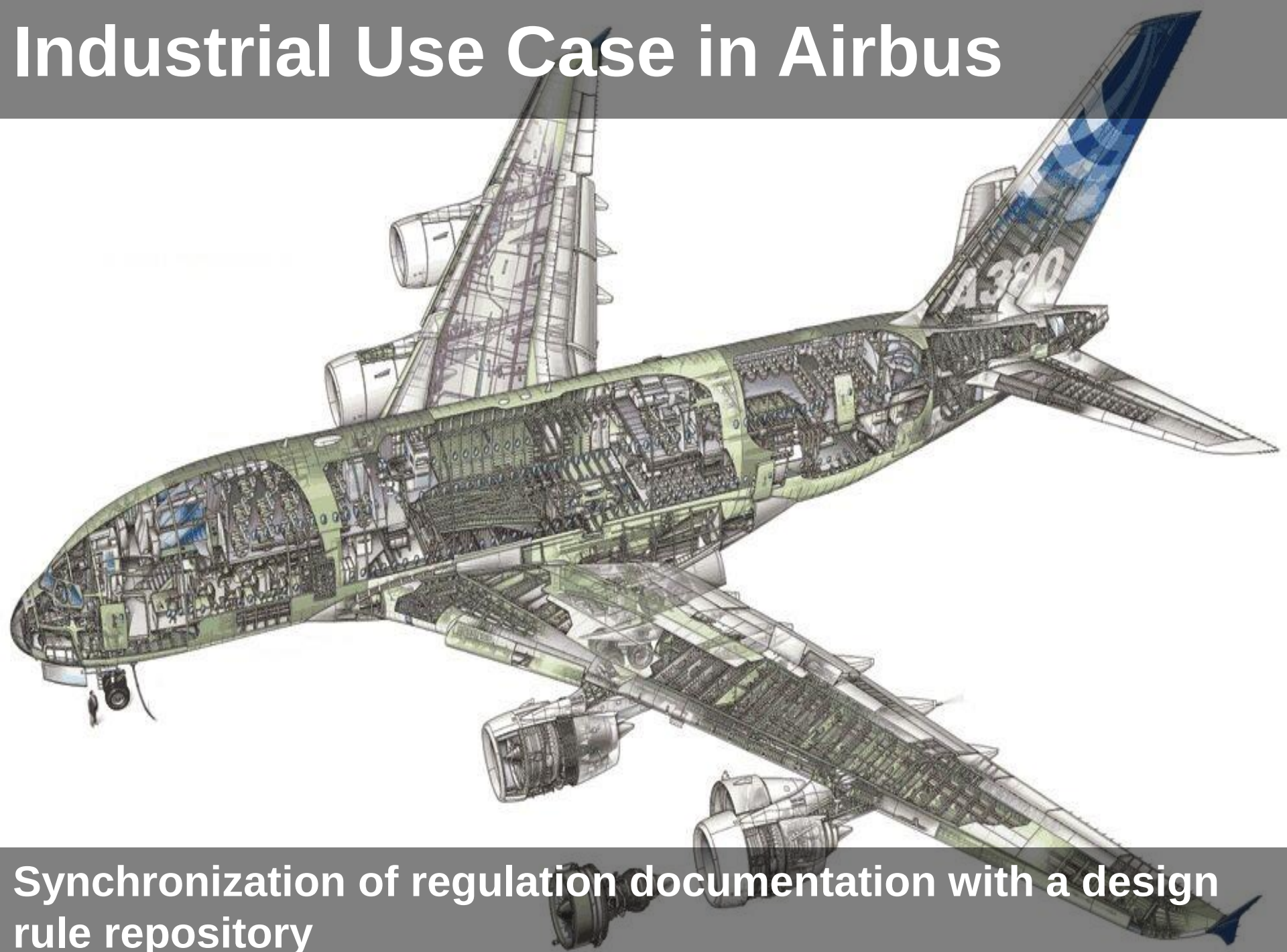
ModelWriter
Further Knowledge Valorizations

- “Everywhere” Document Regeneration: "tell once, show everywhere“: recycling knowledge from (1) the same document, or of (2) another related document
- Consistency Checking: the objective to provide a Consistency Checker that automates Quality Reviews of Requirements Engineering
- Open Source Software under Eclipse Foundation for Future Dissemination and Exploitation to further extend the Business Value Chain
- “MW” Knowledge Dissemination Standard (.mw ModelWriter exchange format)

What is the problem?

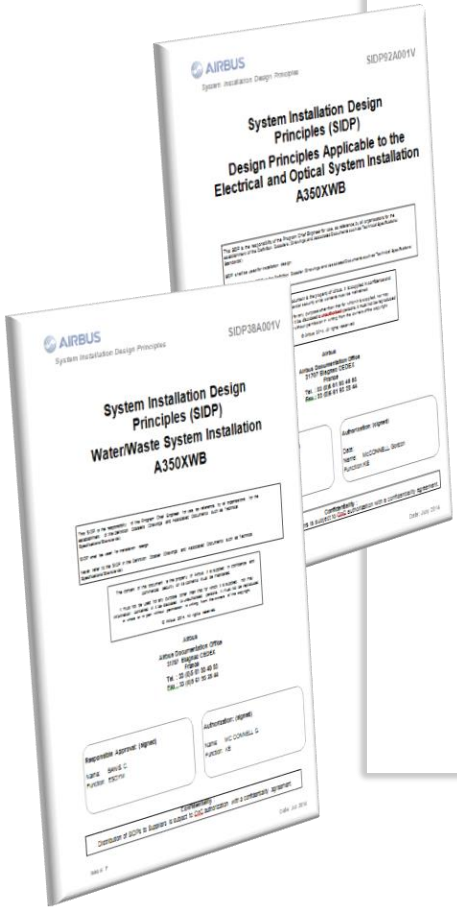
ITEA 3

Industrial Use Case in Airbus



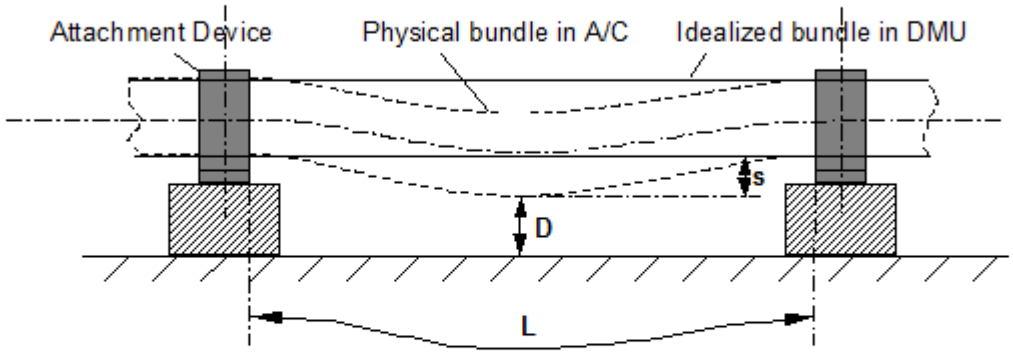
Synchronization of regulation documentation with a design rule repository

SIDP: System Installation Design Principles



SIDP92A001V-A-784

For installation of optical and electrical harnesses additional clearance for sagging (s) shall be provided as detailed below:



s...Sagging of bundle (real behavior of physical bundle in A/C due to gravity, ageing, etc.)
D...Required Distance
L...Actual length of a bundle segment between two Attachment Points (as designed in DMU)

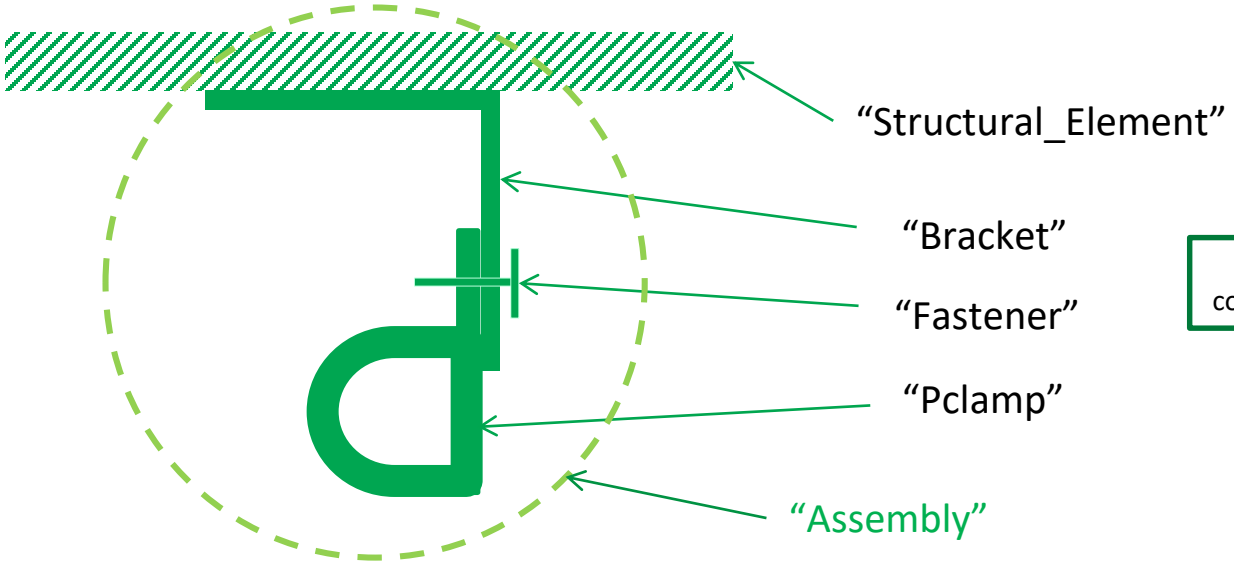
Figure 6: Sagging of bundles between attachment points

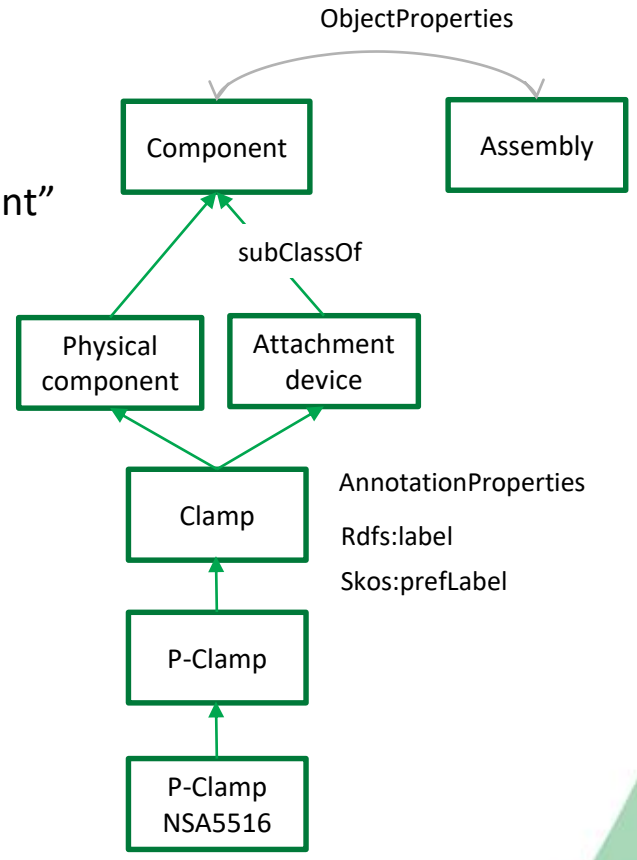
Note: Unless the bundle has a straight routing, L is bigger than the pitch between the Attachment Points.

Component Ontology and Rules

Objectives:

- Manage rules/design principles and improve traceability
- Automate identification of design conflicts against rules

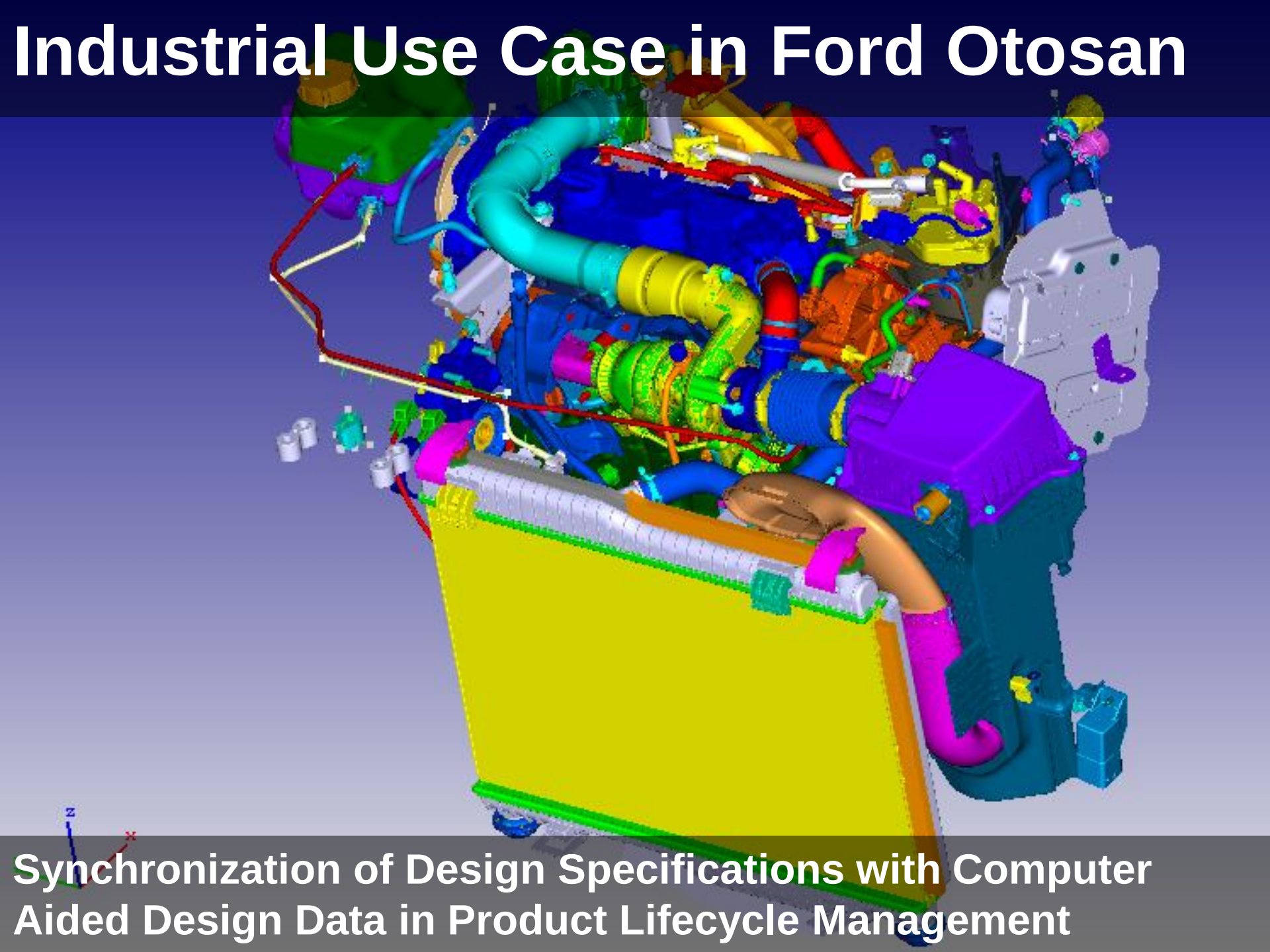




"P-clamp NSA5516 can be fixed on X with Y"

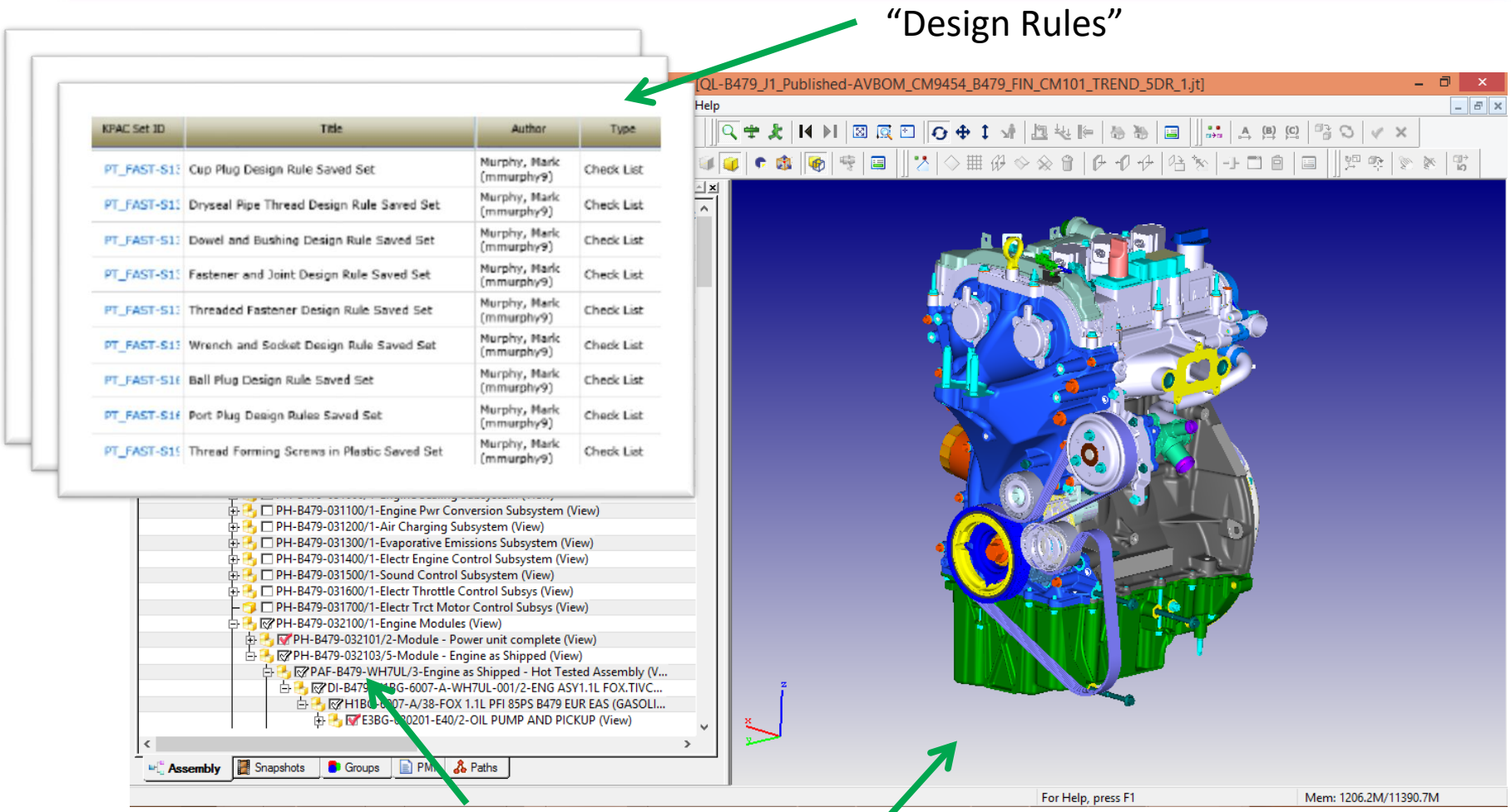
"Physical component" "Standard reference"

Industrial Use Case in Ford Otosan

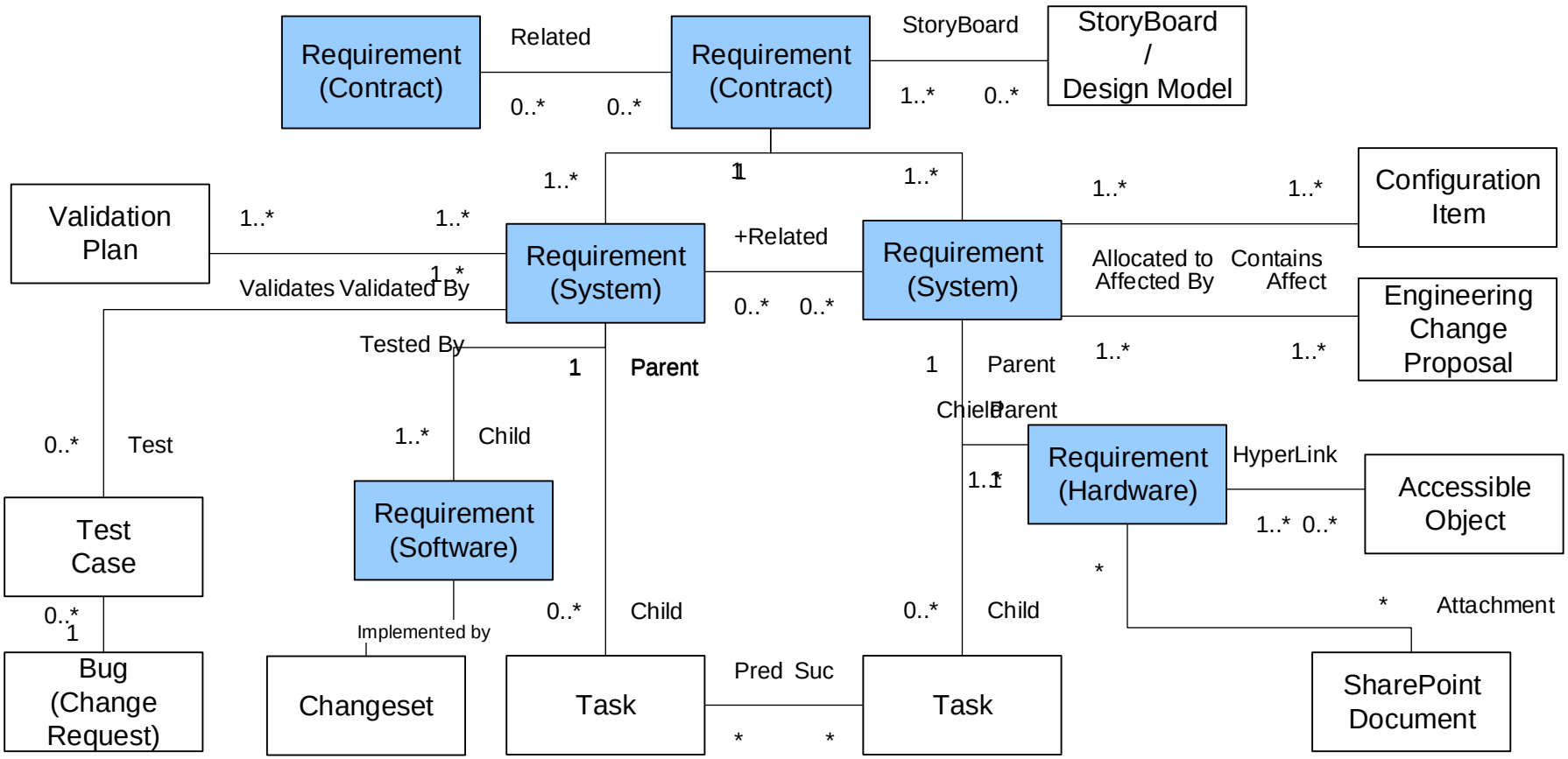


Synchronization of Design Specifications with Computer Aided Design Data in Product Lifecycle Management

BOM and Design Specifications



Industrial Use Case in Havelsan

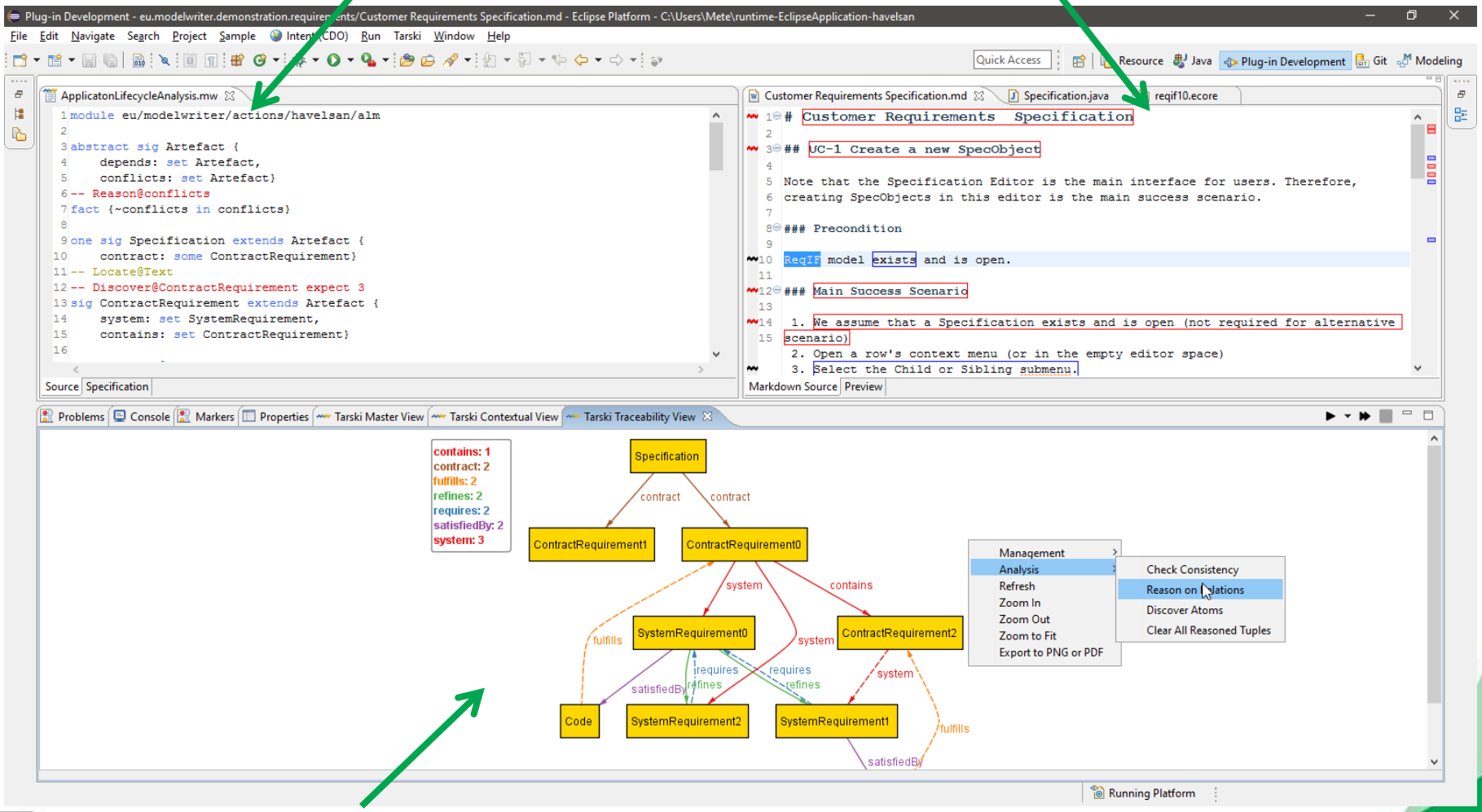


Integration with Application Lifecycle Management to ensure reliability and consistency in the system under development.

Automated Analysis of Dynamically Configured Traceability Semantics

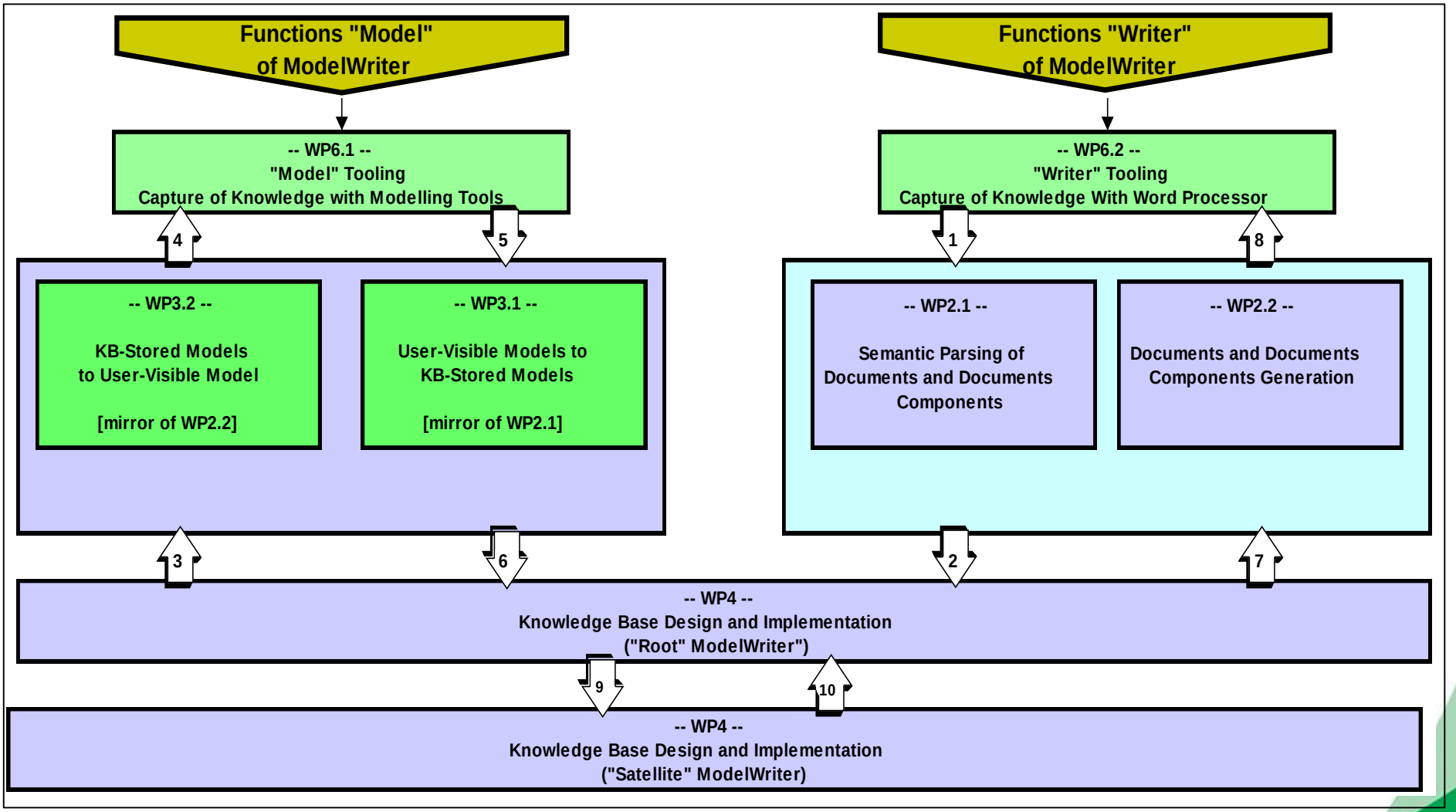
"Traceability Rules to define traceability semantics"

Artefacts or part of artefacts

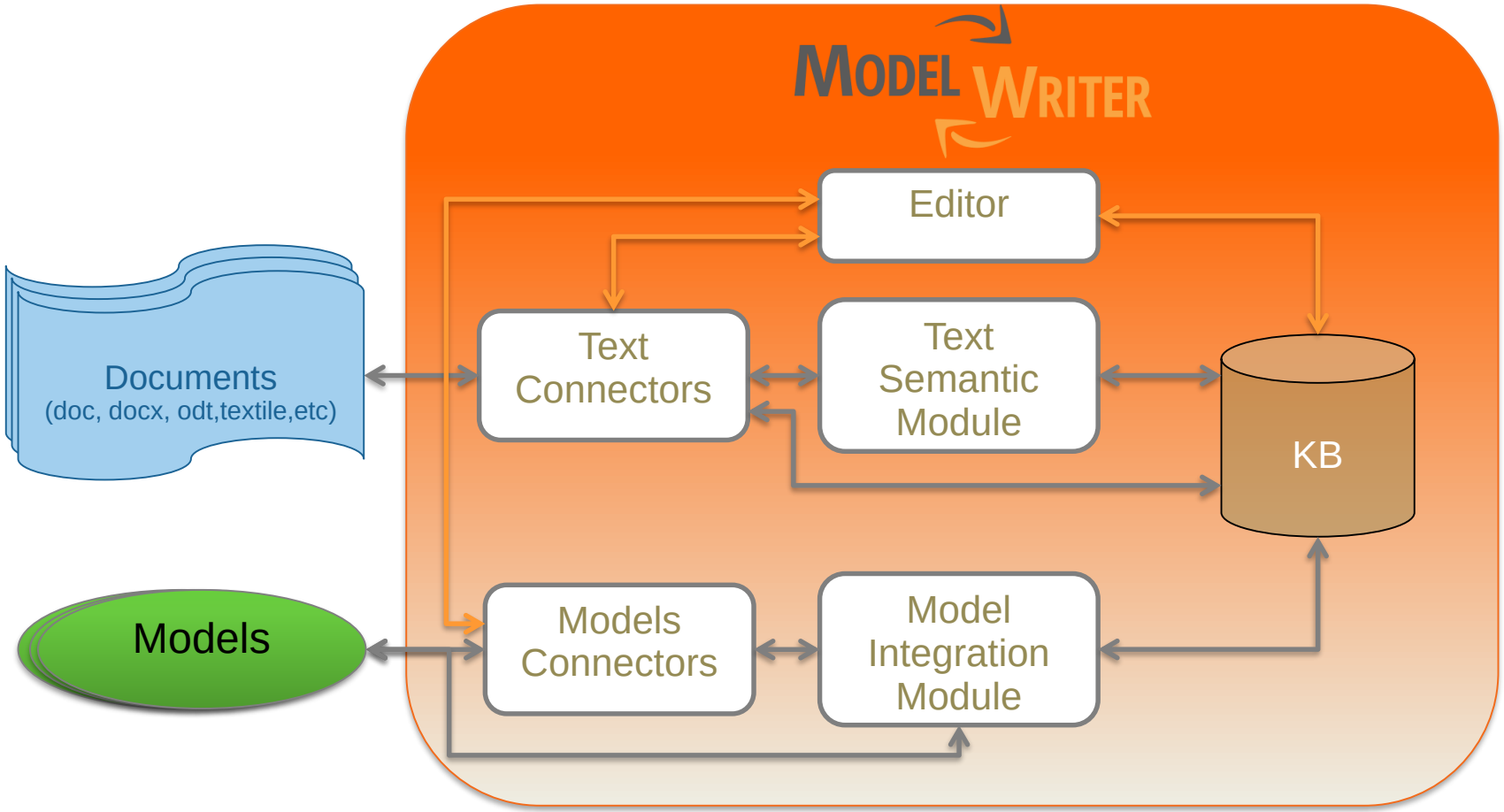


"Various Traceability Analysis might be performed"

ModelWriter
Technological components & interactions



ModelWriter
Conceptual Architecture



ModelWriter
Work Packages & Technical Innovations

WP1 Industrial Use Cases and Requirements (AIRBUS)

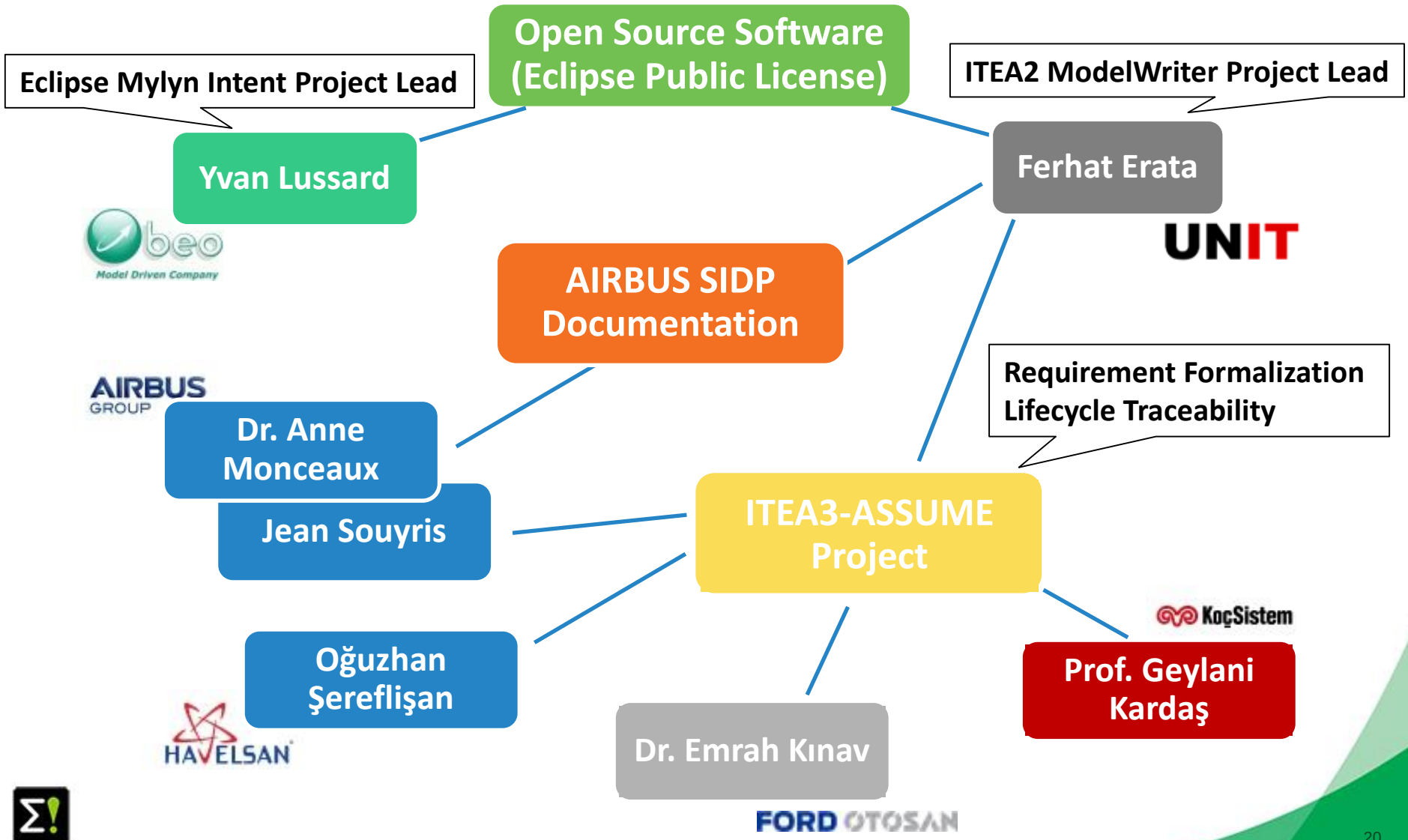
WP2 (LORIA)	WP3 (UNIT)	WP4 (MANTIS)	WP6 (OBEO)
• Semantic Parser • Document Generation • bi-directional transformation between text and formal knowledge representation	• Bi-directional synchronization mechanism between texts and models • Configuration & Traceability Components • Consistency checker plug-in for consistency	• A federated Knowledge Base and its API • Synchronization mechanism between texts/models & knowledge base	• A complete “ModelWriter” tool integrating of all these in a consistent way • User Interfaces

WP5 Project Management (UNIT)

WP7 Standardization, Dissemination and Exploitation (OBEO)

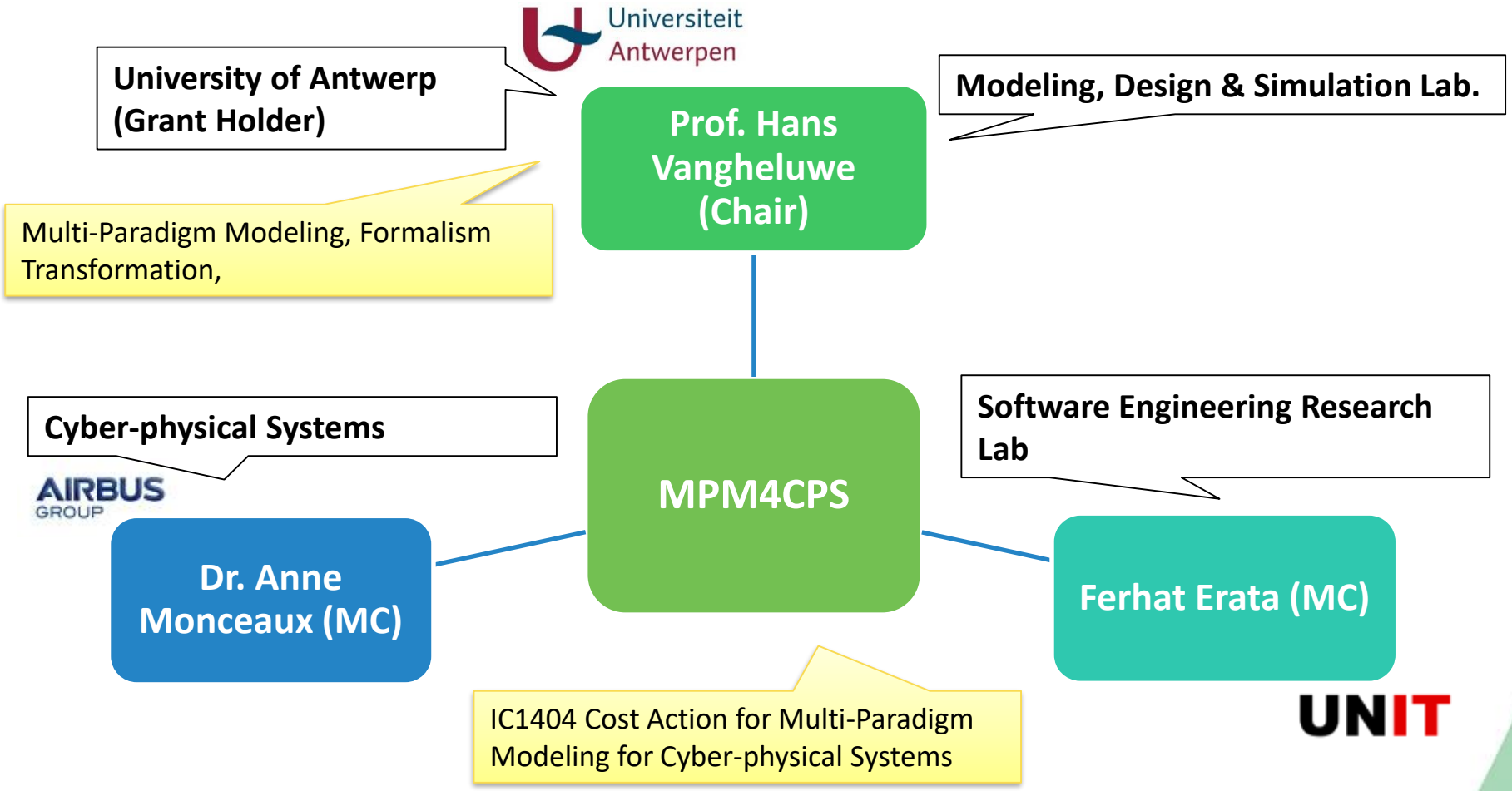
Level of Collaboration within ModelWriter

International Collaboration



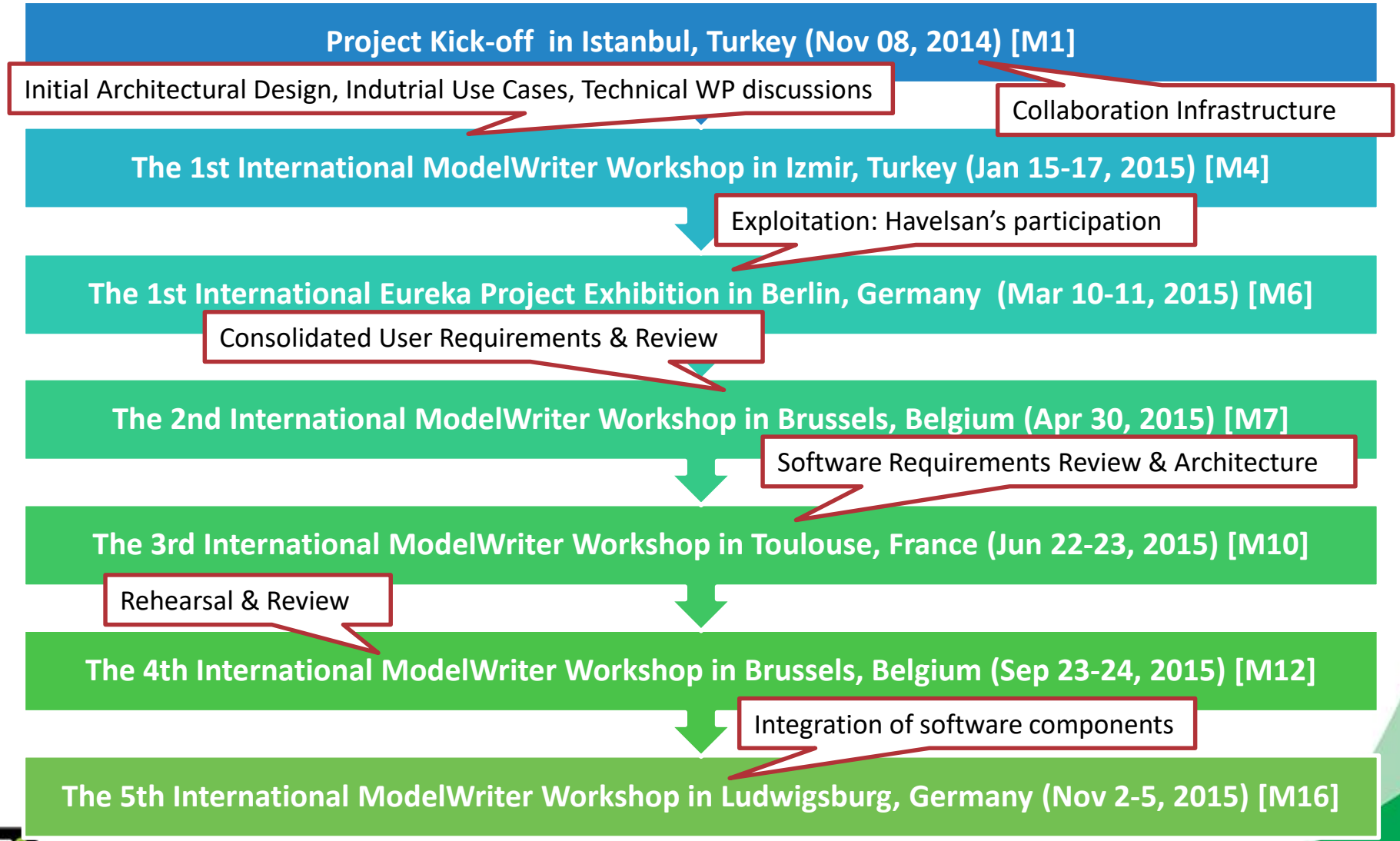
Level of Collaboration within ModelWriter

International Collaboration



ModelWriter Activities in the First Year

https://github.com/modelwriter/workshops



ModelWriter Activities in the Second Year

https://github.com/modelwriter/workshops

The 6th International ModelWriter Workshop in Paris, France (Feb 15-16, 2016)

ICT Cost Action - MPM4CPS WG meeting at Vienna, Austria, on the 15-16 April, 2016

The 7th International ModelWriter Technical Workshop in Toulouse, France (6 June 2016)

The 7th Int'l ModelWriter Brainstorming Session in Toulouse, France at Airbus (9 June 2016)

The 7th Int'l ModelWriter Coordination Meeting in Toulouse, France at Airbus (10 June 2016)

ModelWriter Poster Presentation SAT/SMT/AR Summer School 2016

Participation in International Joint Conference on Automated Reasoning (IJCAR) 2016

ModelWriter Workshops in the First Year

https://github.com/modelwriter/workshops

Verification Technology, Systems & Applications (VTSA) Summer School (Aug 29- Sept 02, 2016)

ICT Cost Action - MPM4CPS WG meeting at Gdansk, Poland (Sep 13-16, 2016)

A paper is submitted to ACM Applied Computing Symposium and under review.

Participation in Workshop on Software Correctness and Reliability (Oct 7-8 2016)

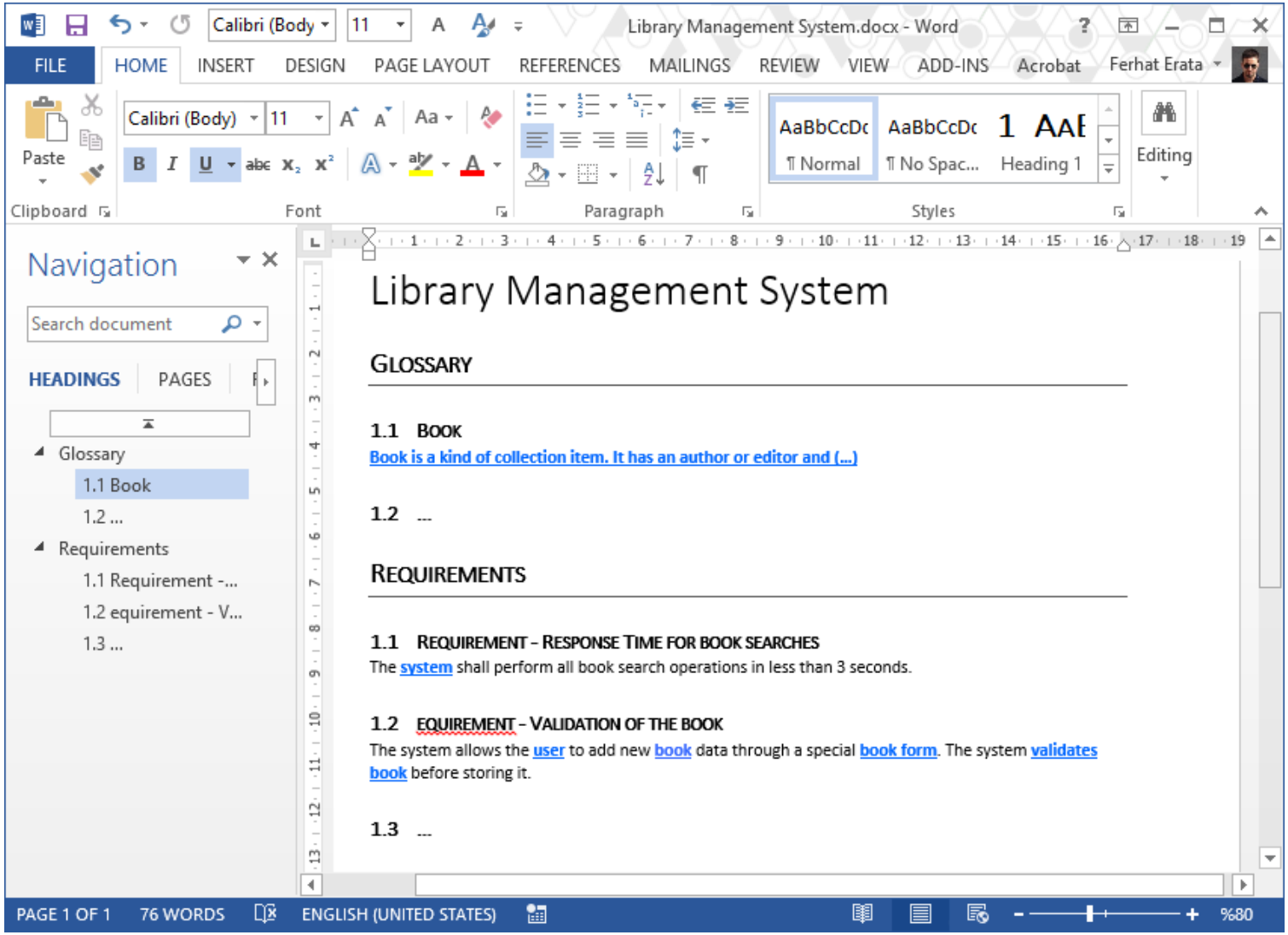
The 8th International ModelWriter Technical Workshop in Toulouse, France (13 June 2016)

ICT Cost Action - MPM4CPS WG meeting at Malaga, Spain (Nov 24-25, 2016)

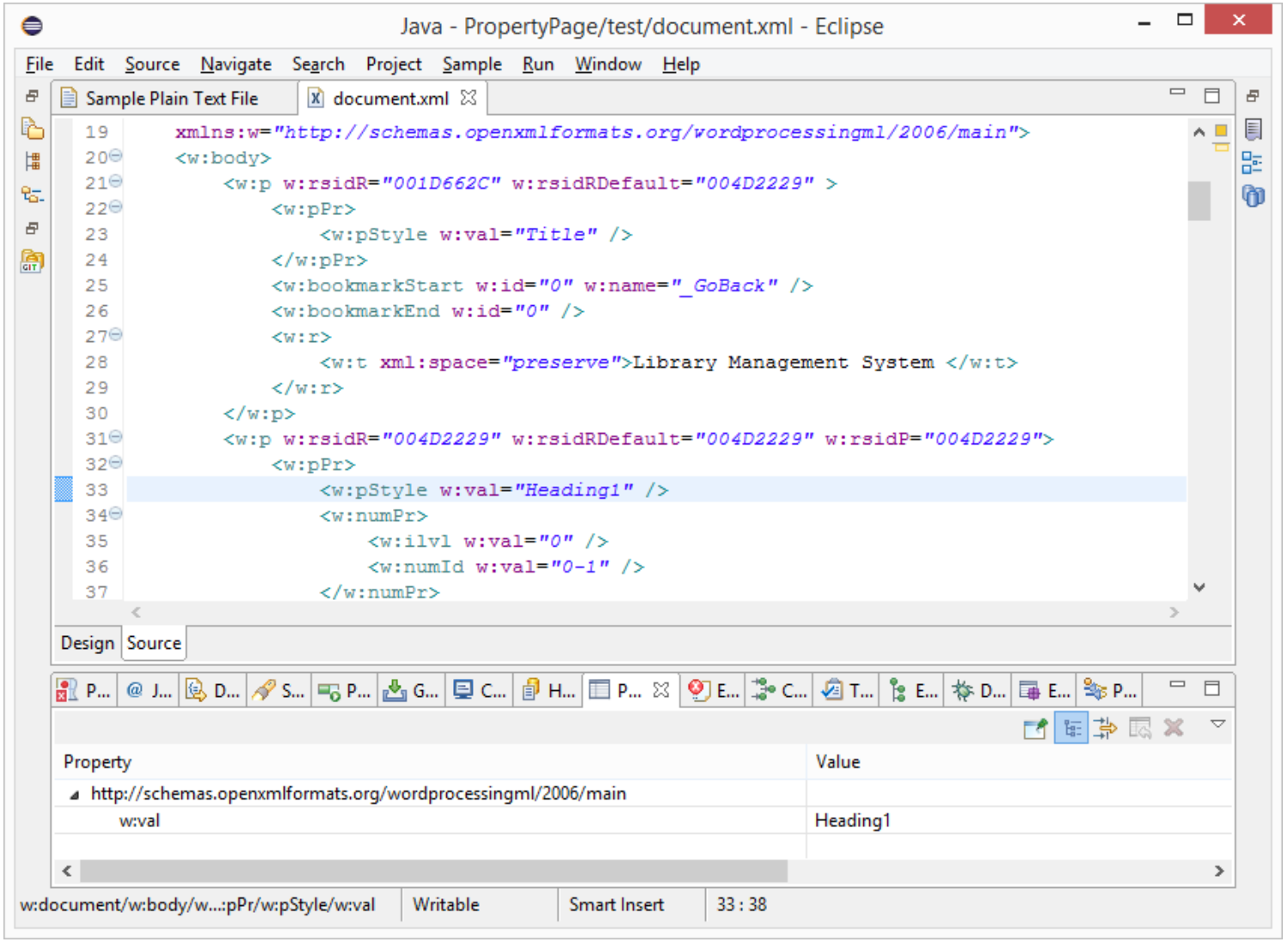
What is a text?

What is a text? (document file formats)

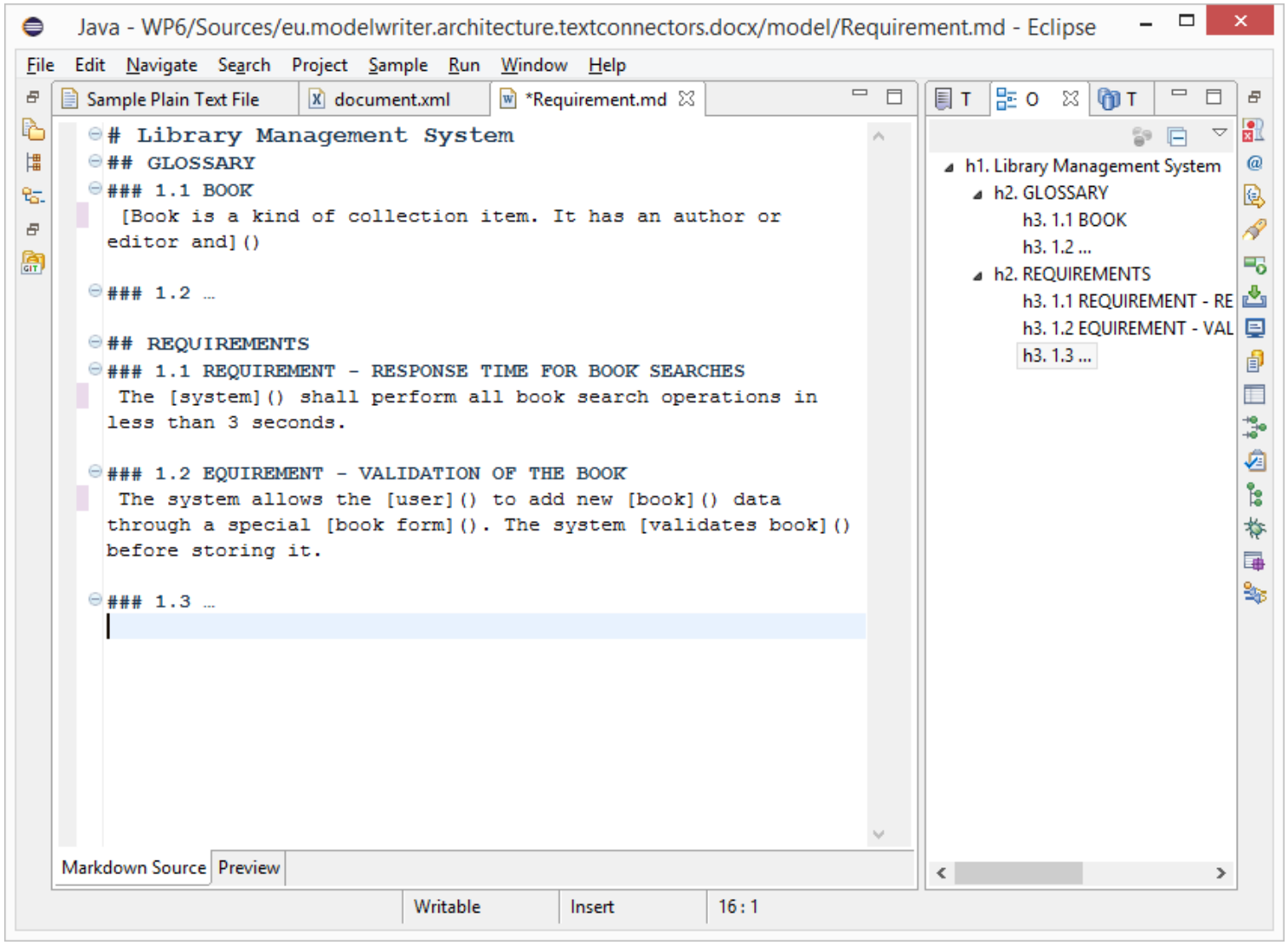
Office Open XML (.docx) (ISO/IEC 29500)



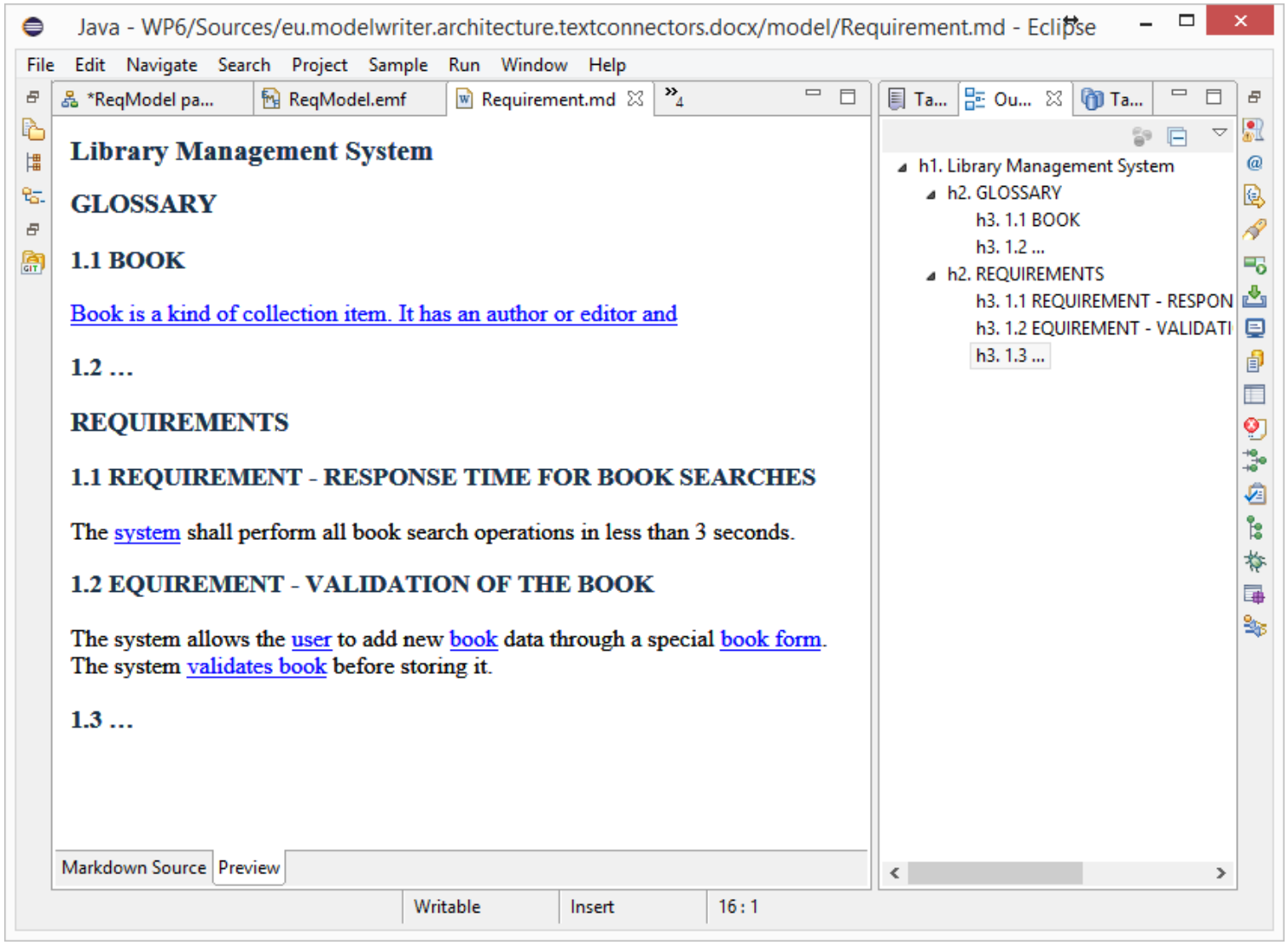
What is a text? (document file formats)
Office Open XML (.docx) (ISO/IEC 29500)



What is a text? (.md source file)
text/markdown (ICANN Standard)

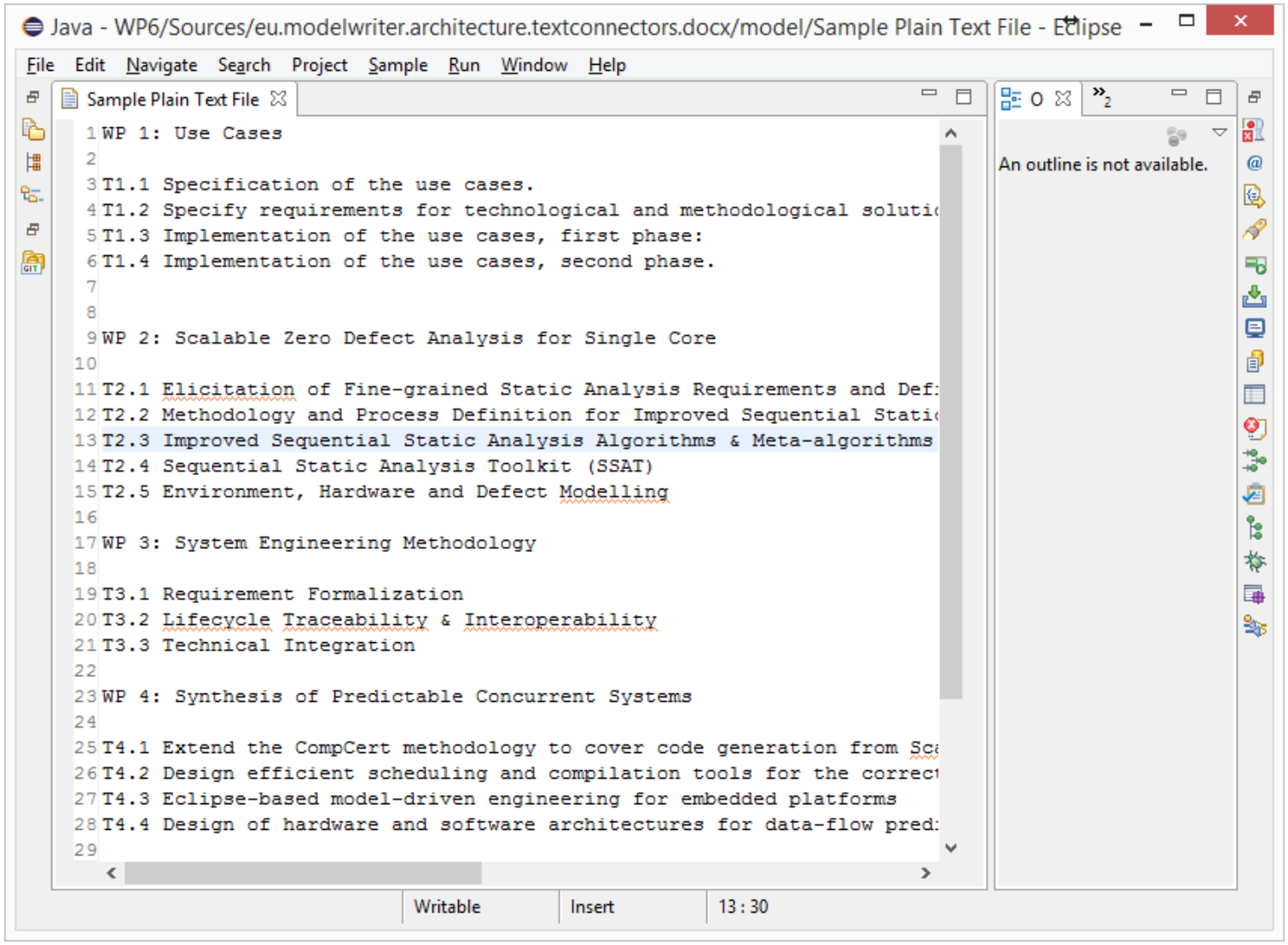


What is a text? (HTML Preview)
text/markdown (ICANN Standard)



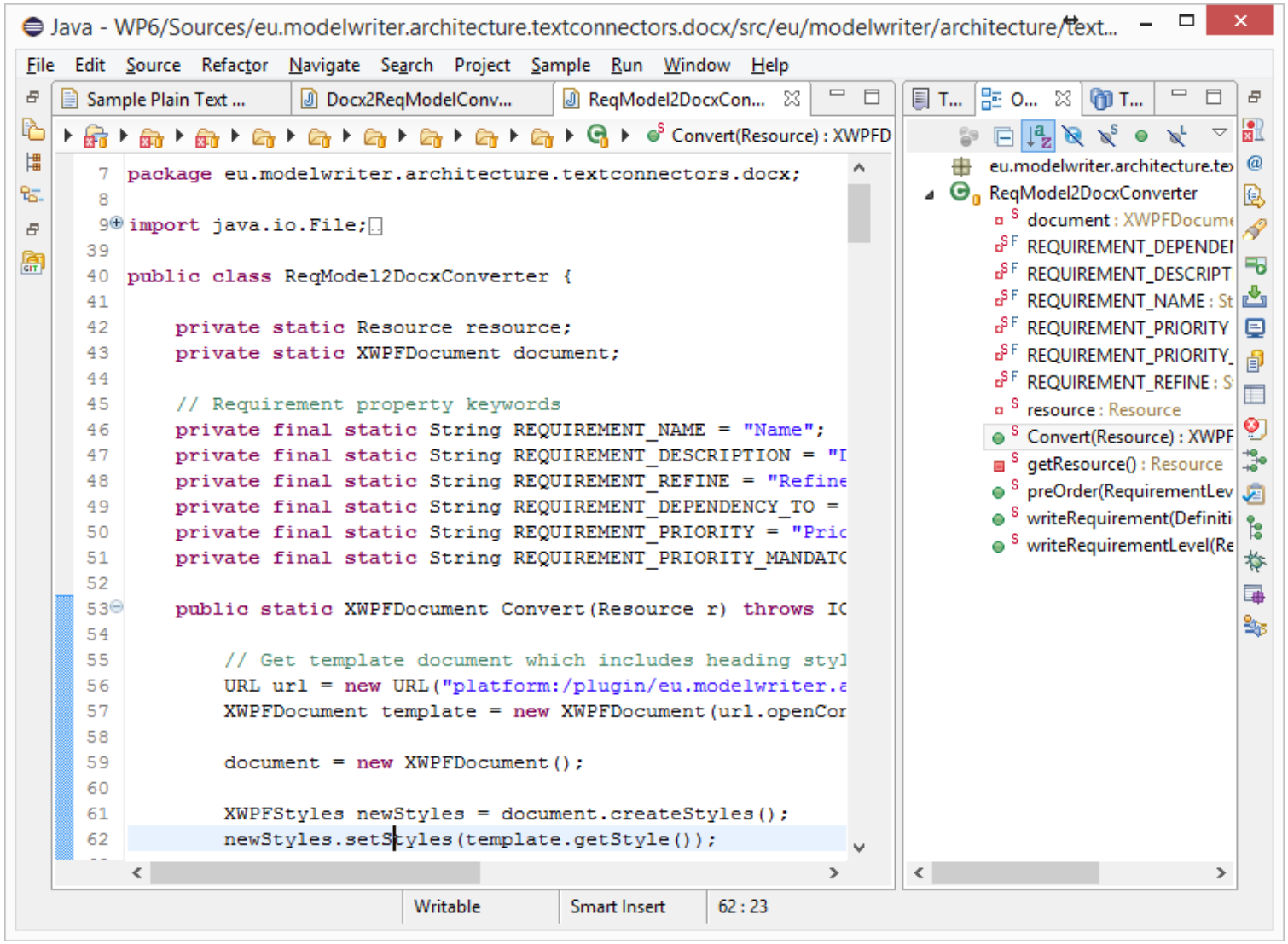
What is a text? (unformatted text)

text/plain (ICANN Standard)

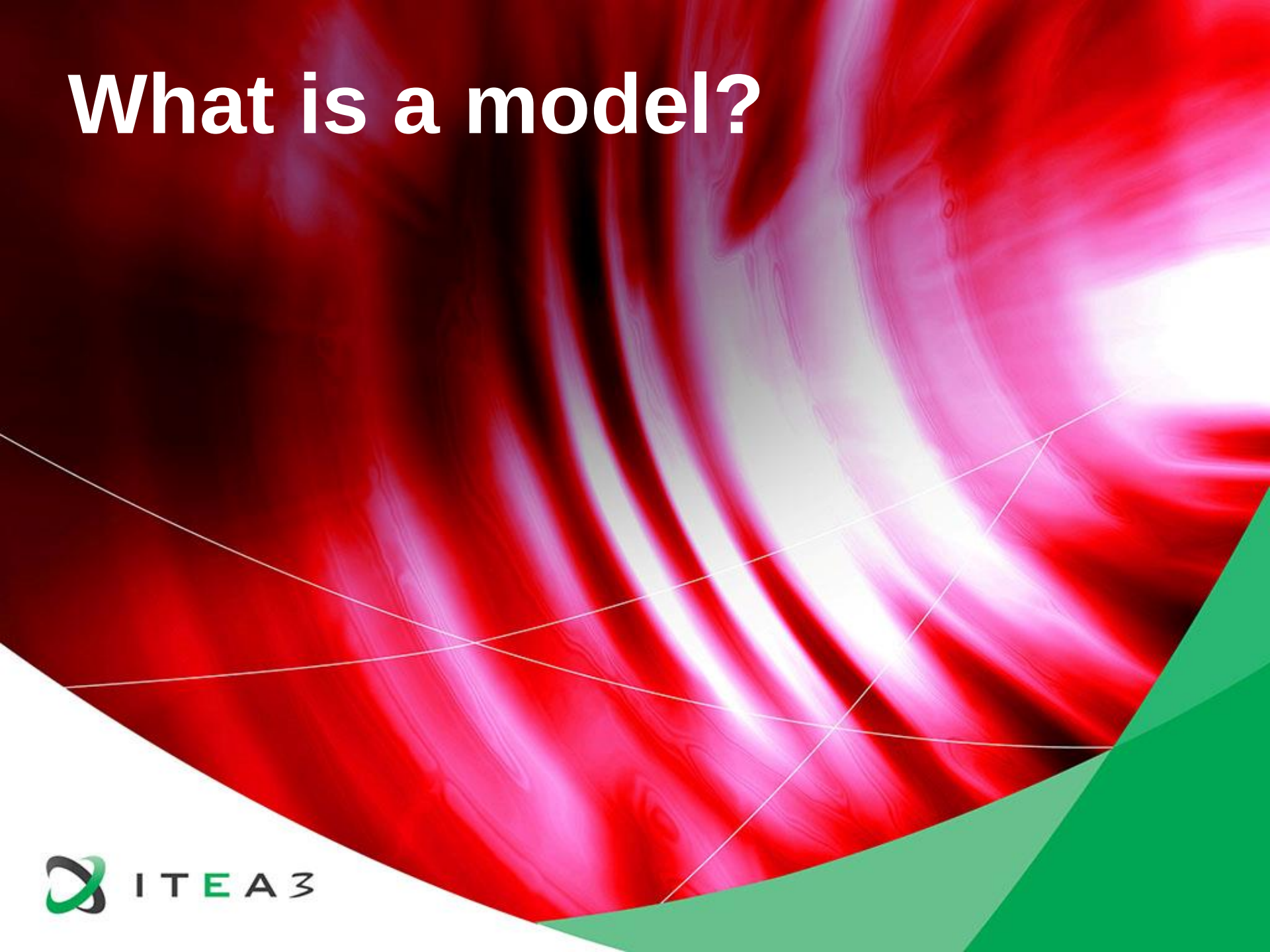


What is a text? (code files)

Java, C++ … Programing Languages

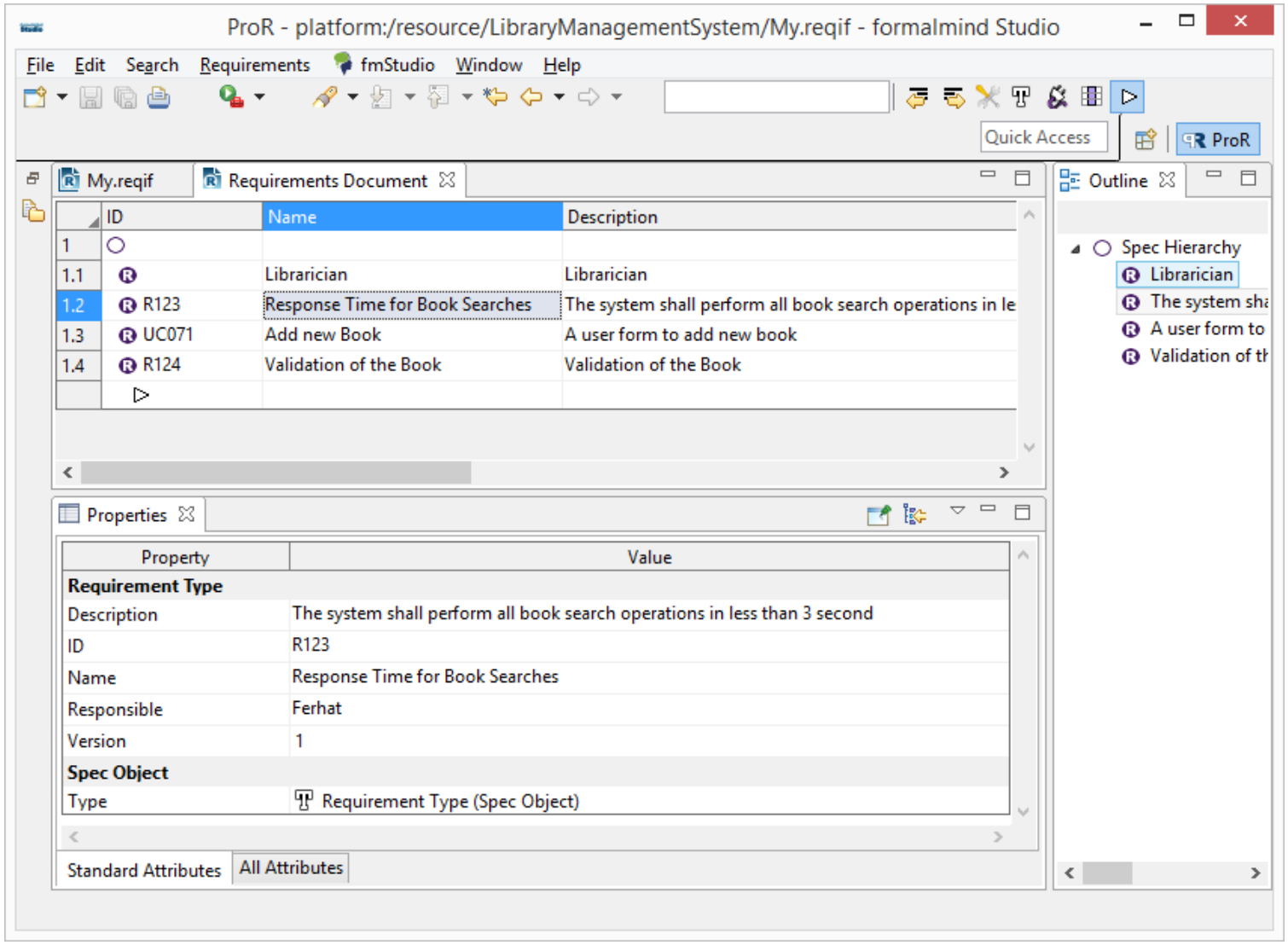


What is a model?



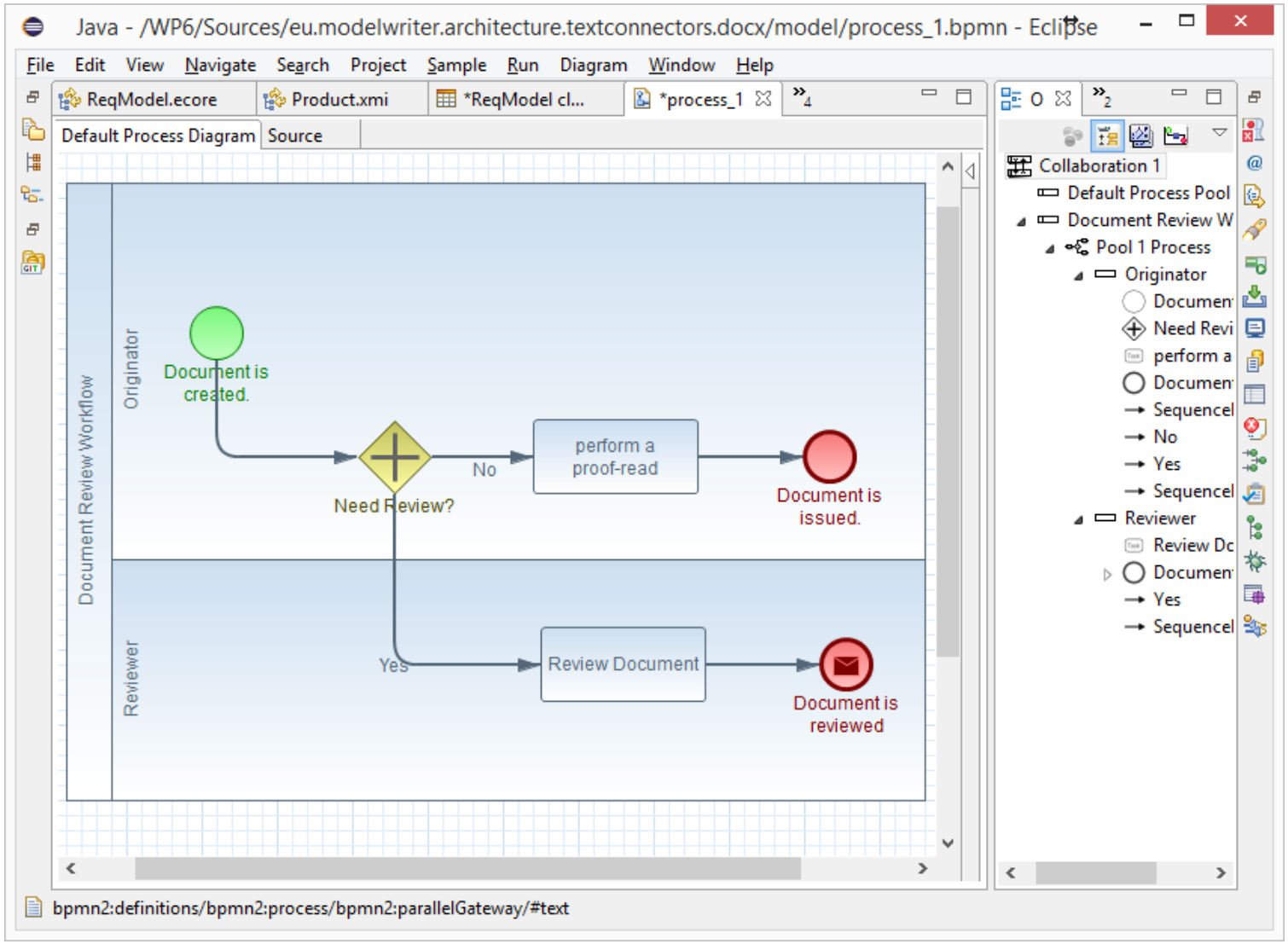
Everything is a model! (ReqIF Standard)

Requirements Interchange Format



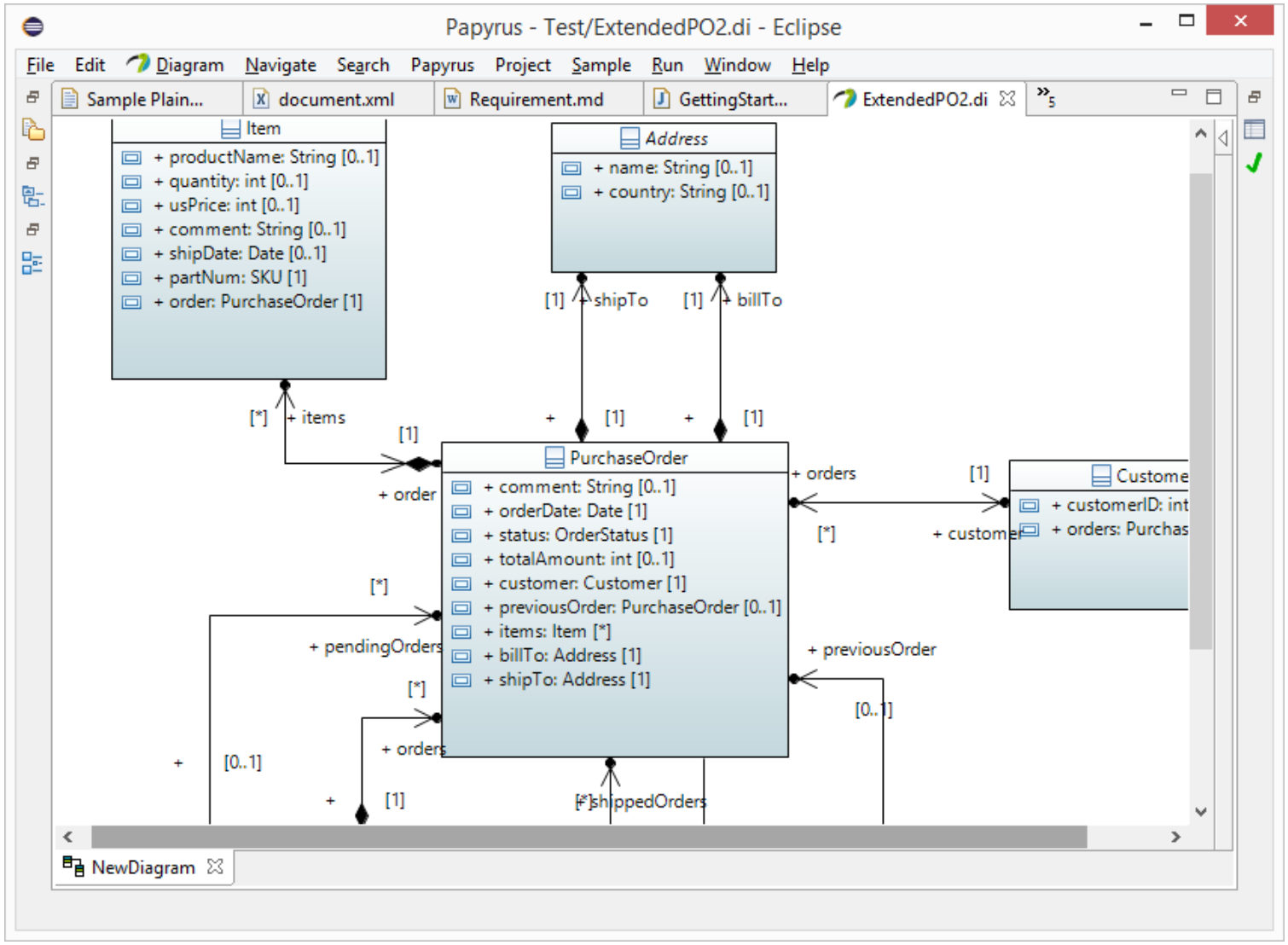
Everything is a model! (BPMN Standard)

Business Process Model & Notation

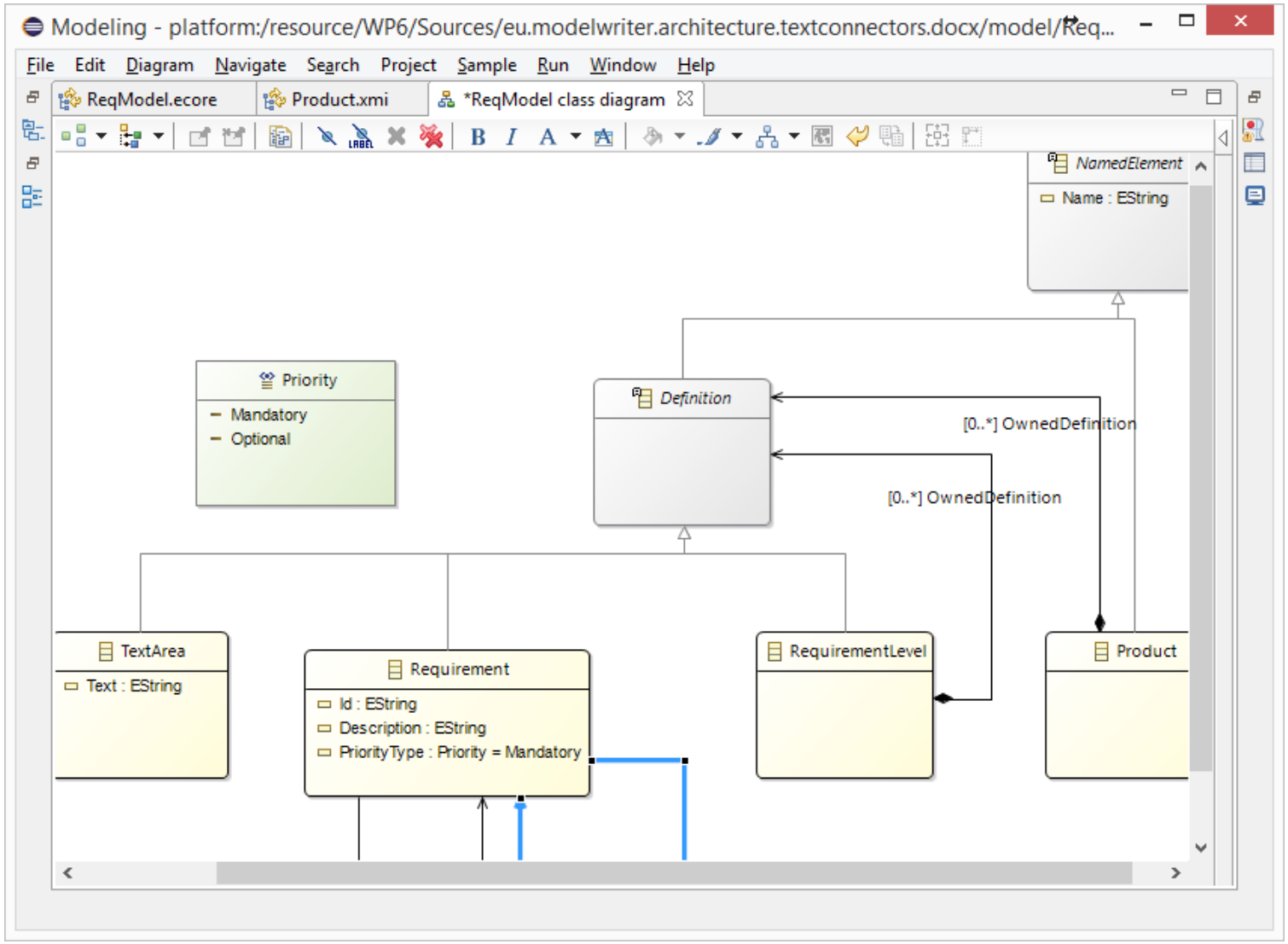


Everything is a model! (UML Standard)

UML Modeling Languages

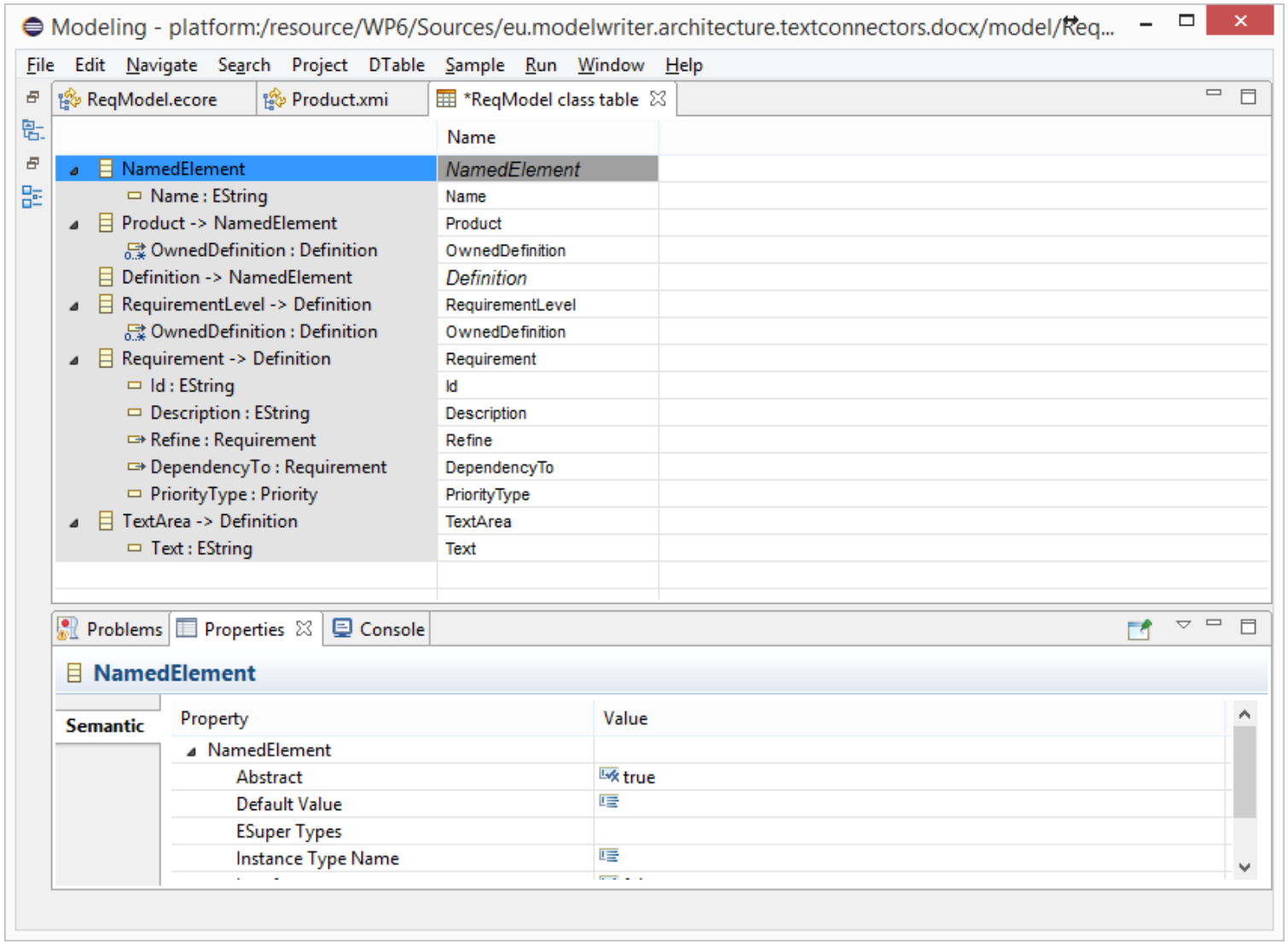


Everything is a model!
Eclipse Modeling Framework (EMF)

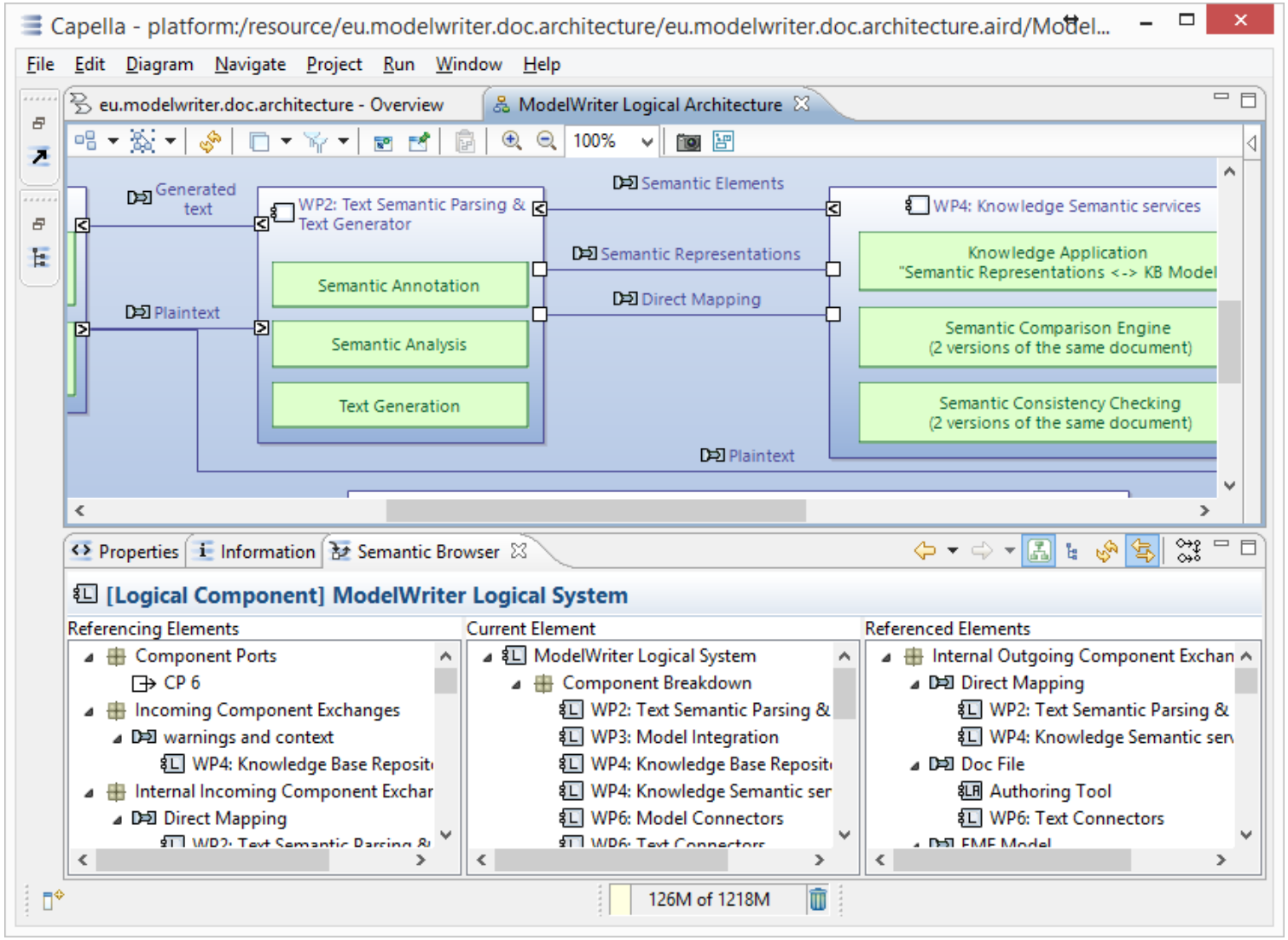


Everything is a model!

Tree-based or Tabular Representations

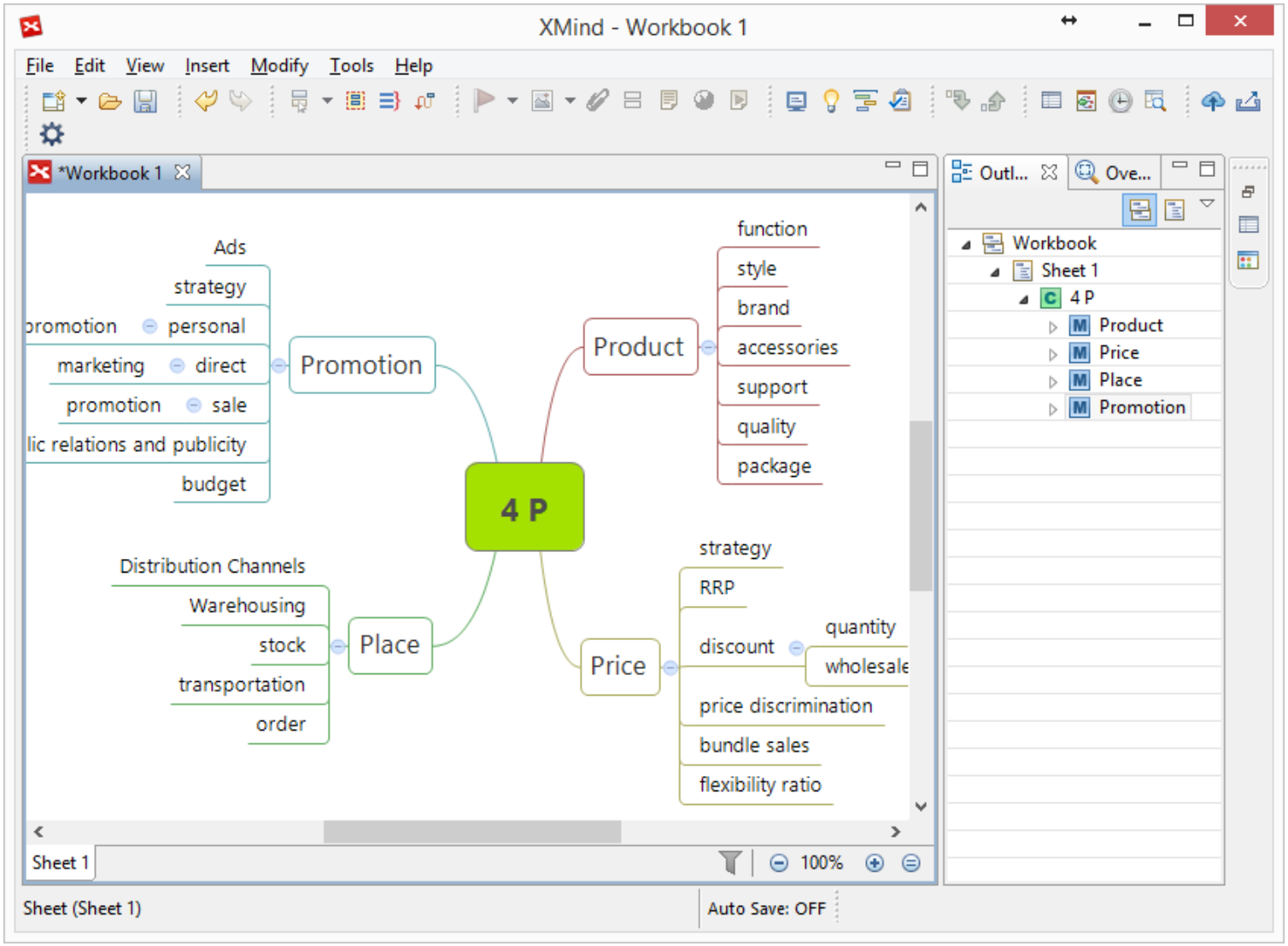


Everything is a model!
Software/System Architecture Design

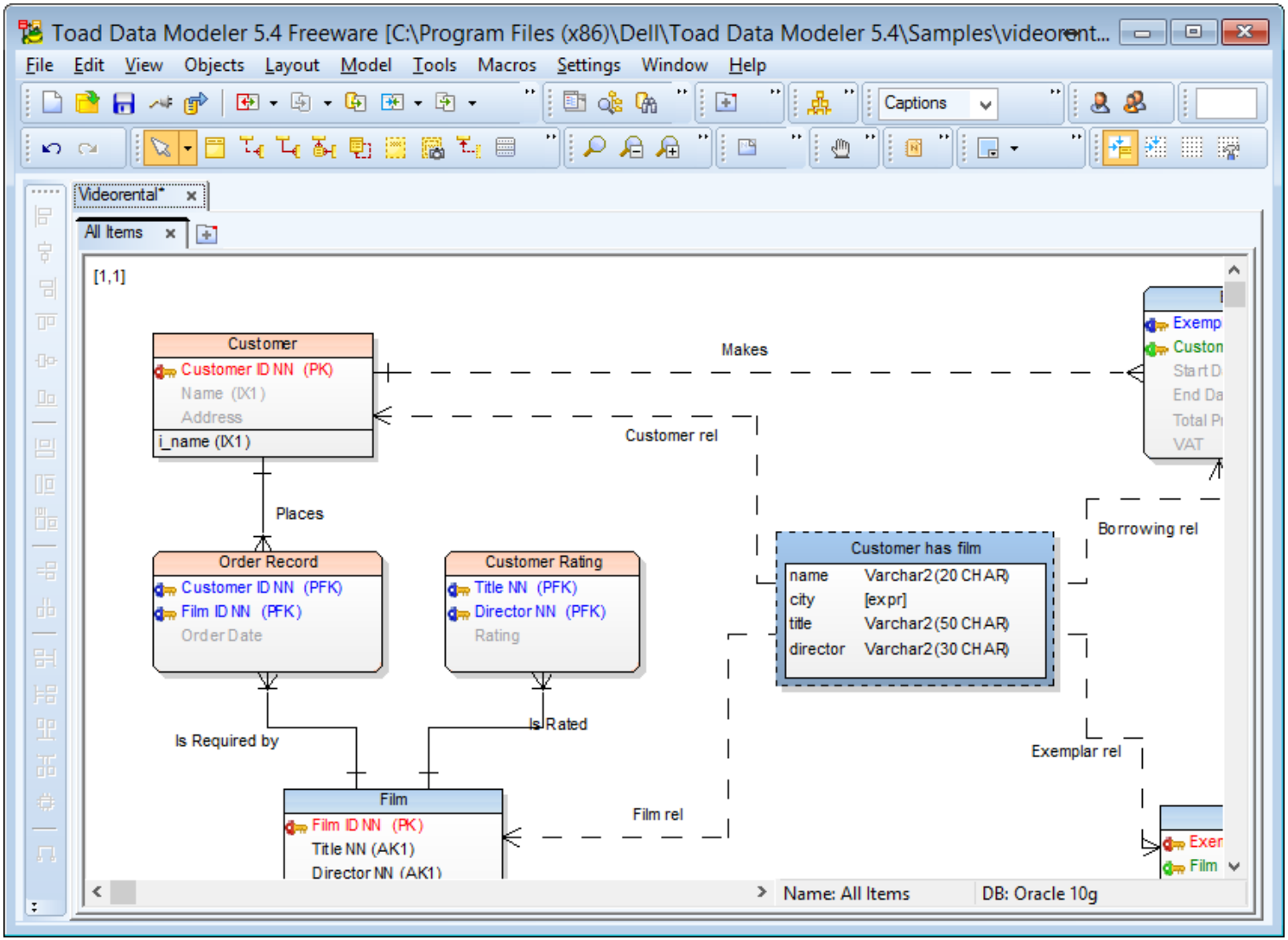


Everything is a model!

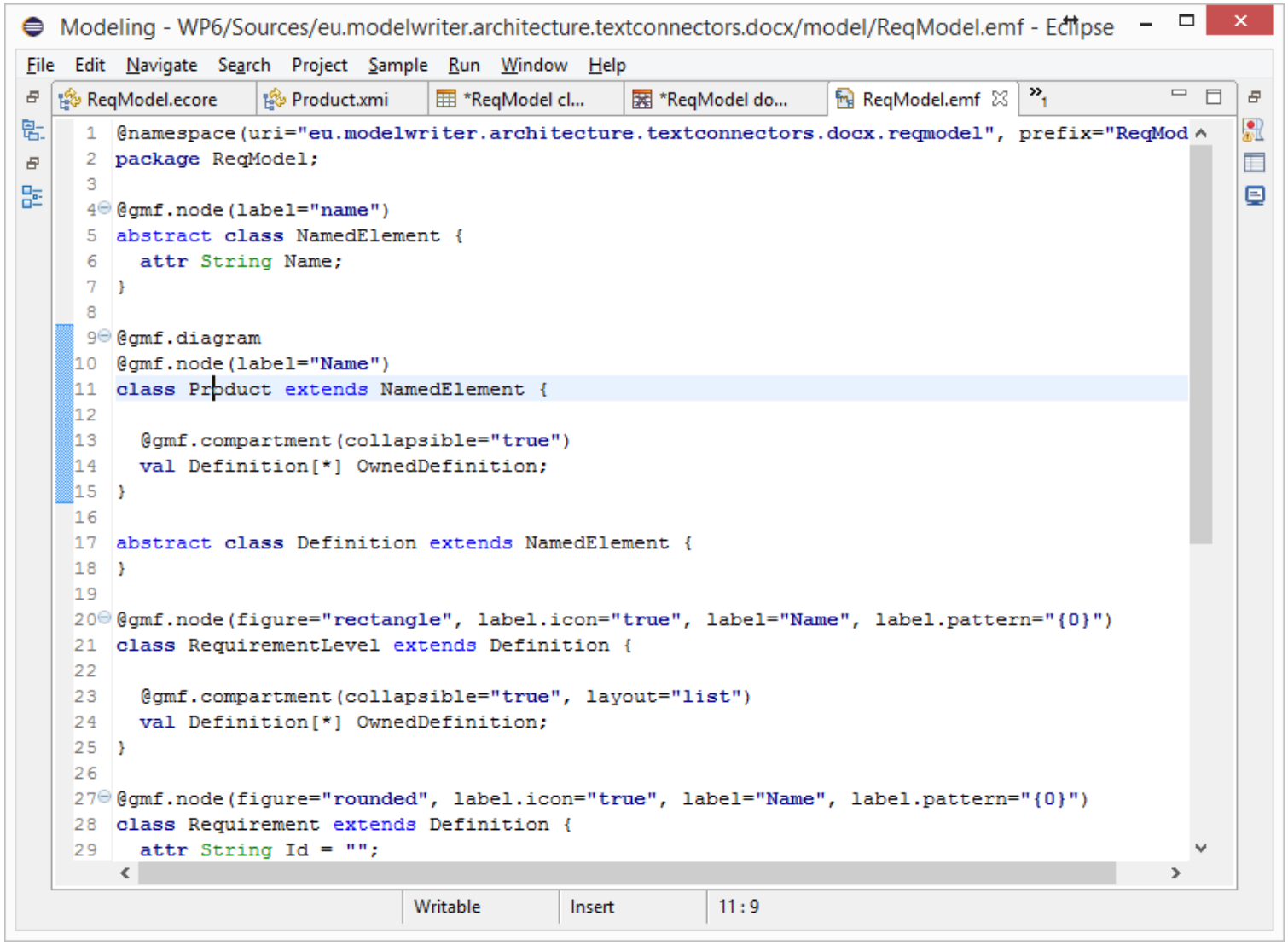
Topic Maps, Mind Maps, Vocabularies …



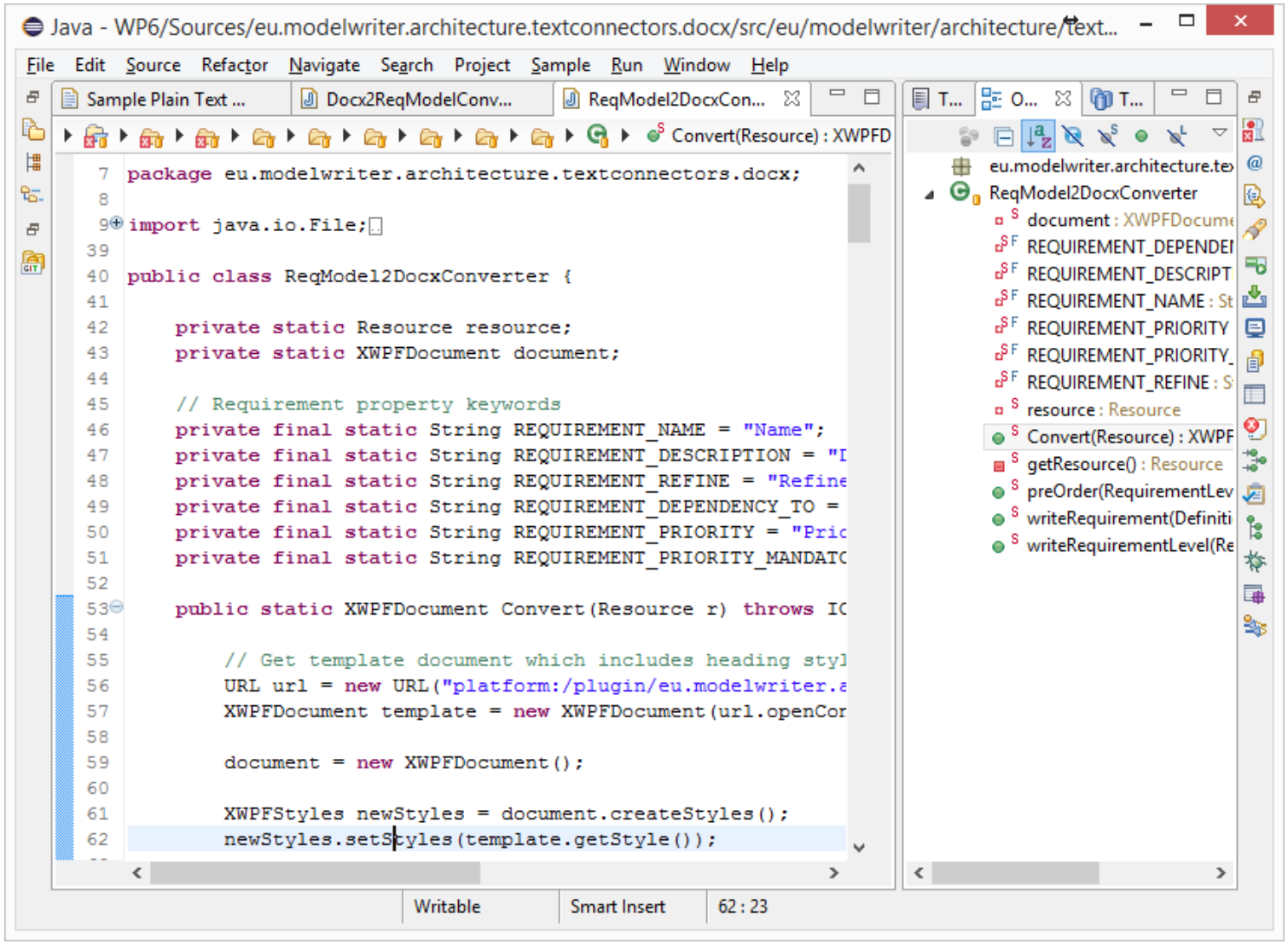
Everything is a model!
Databases (ER, IDEF1.x)



Everything is a model! (Textual Lang.)
Domain Specific Languages



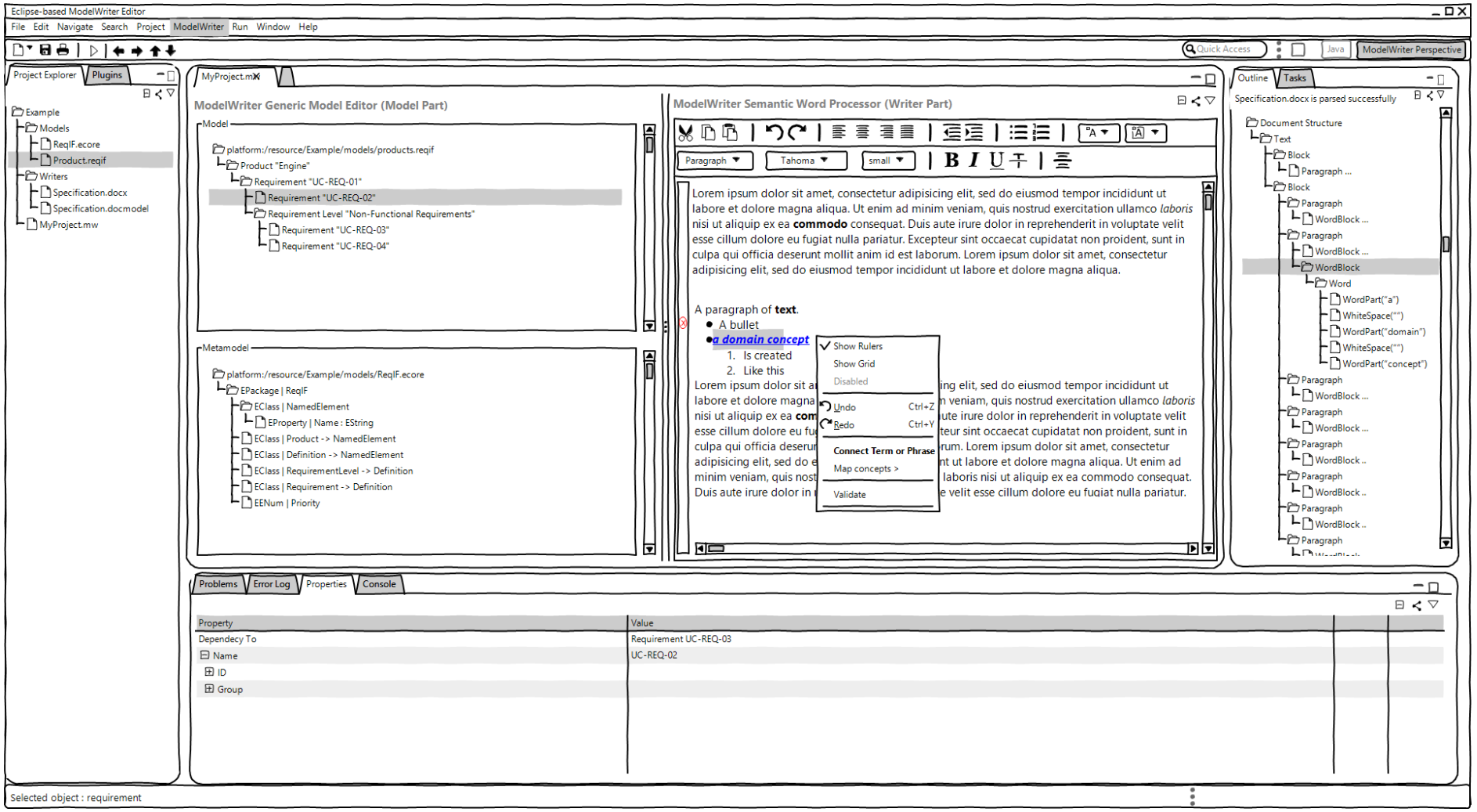
Everything is a model! (Java, C++, etc.)
Even Programing Languages (ASTs)



Is it possible to connect and keep arbitrary software/system engineering artifacts synchronized ?

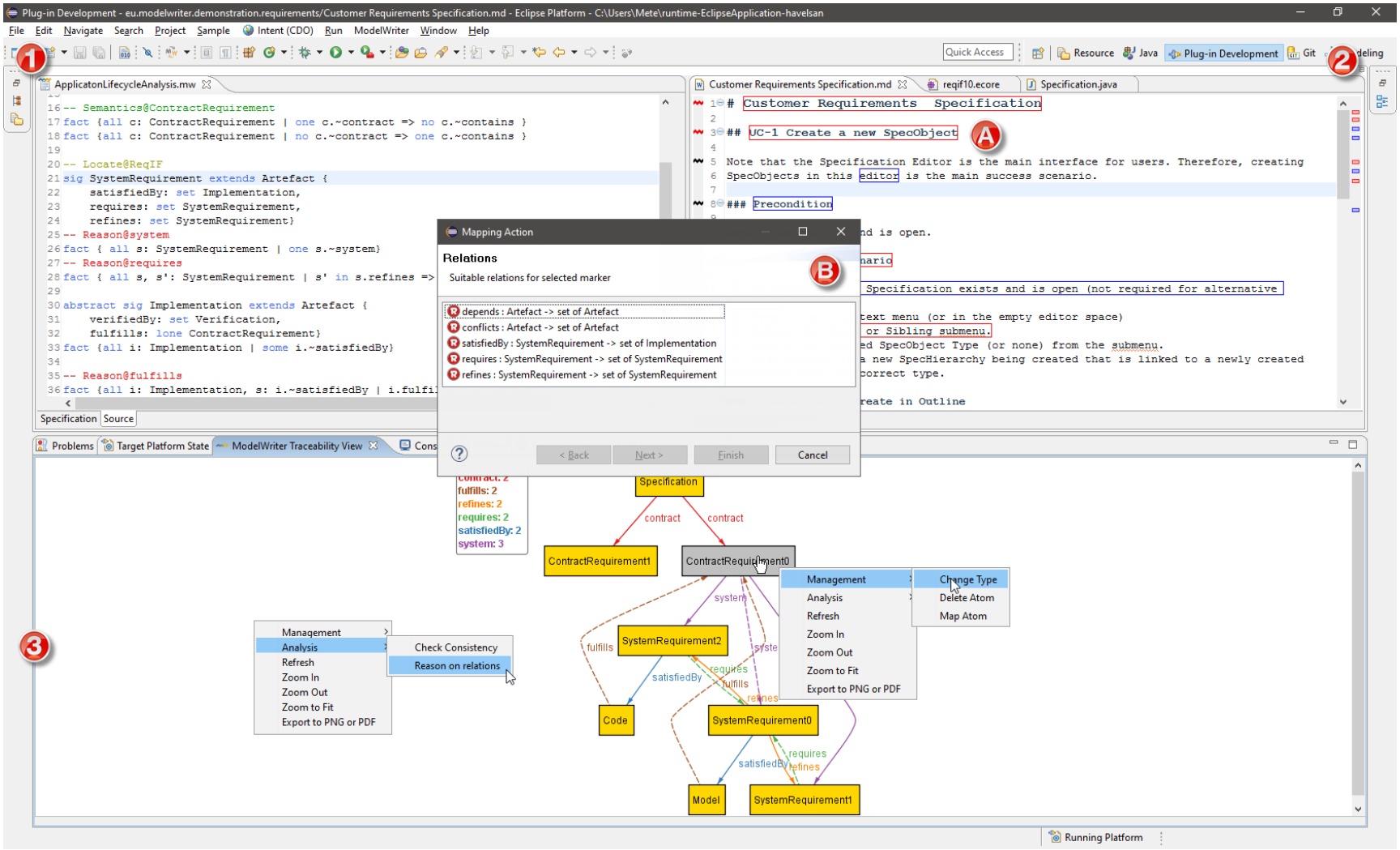
ITEA 3

ModelWriter – The Solution



Text & Model-Synchronized Document Engineering Platform

Solution – Knowledge Capture

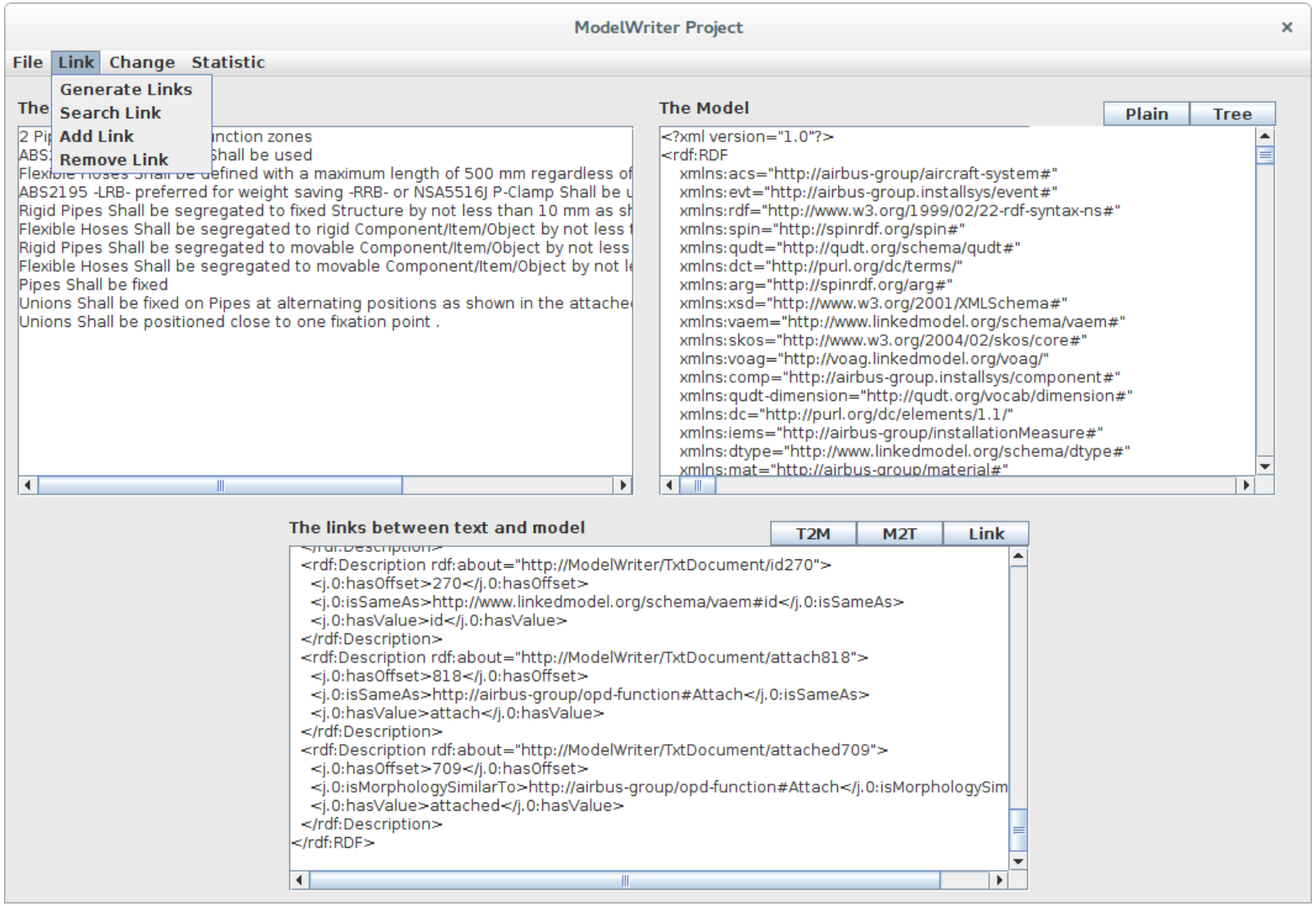


Text & Model-Synchronized Document Engineering Platform

Is it possible to extract knowledge from texts fragments based on a given ontology (model) ?

ITEA 3

Solution – Knowledge Extraction



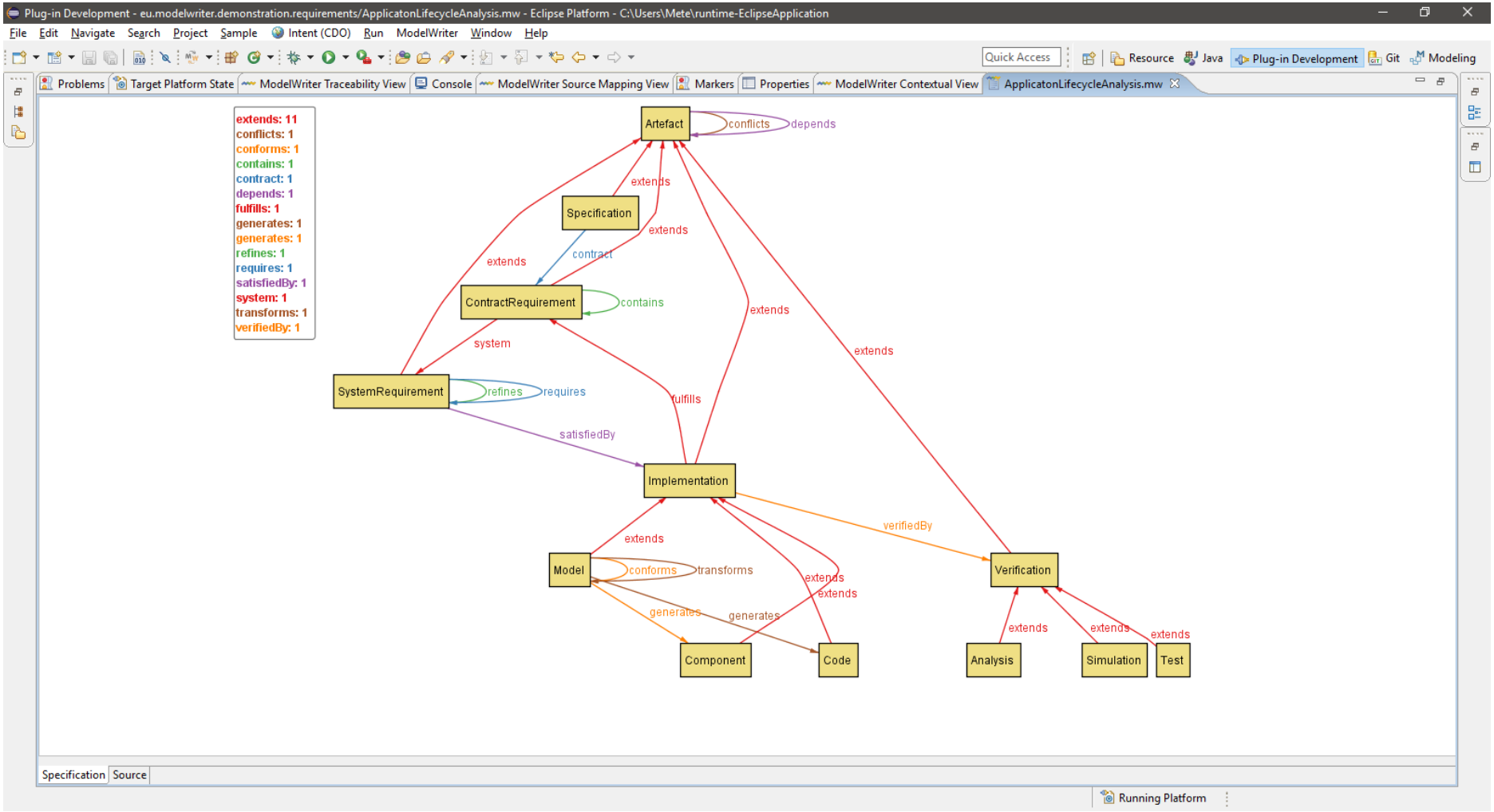
Text & Model-Synchronized Document Engineering Platform


Synchronization is maintained!

What about configuration/formalization of the platform?

ITEA 3

Configuration: Havelsan example

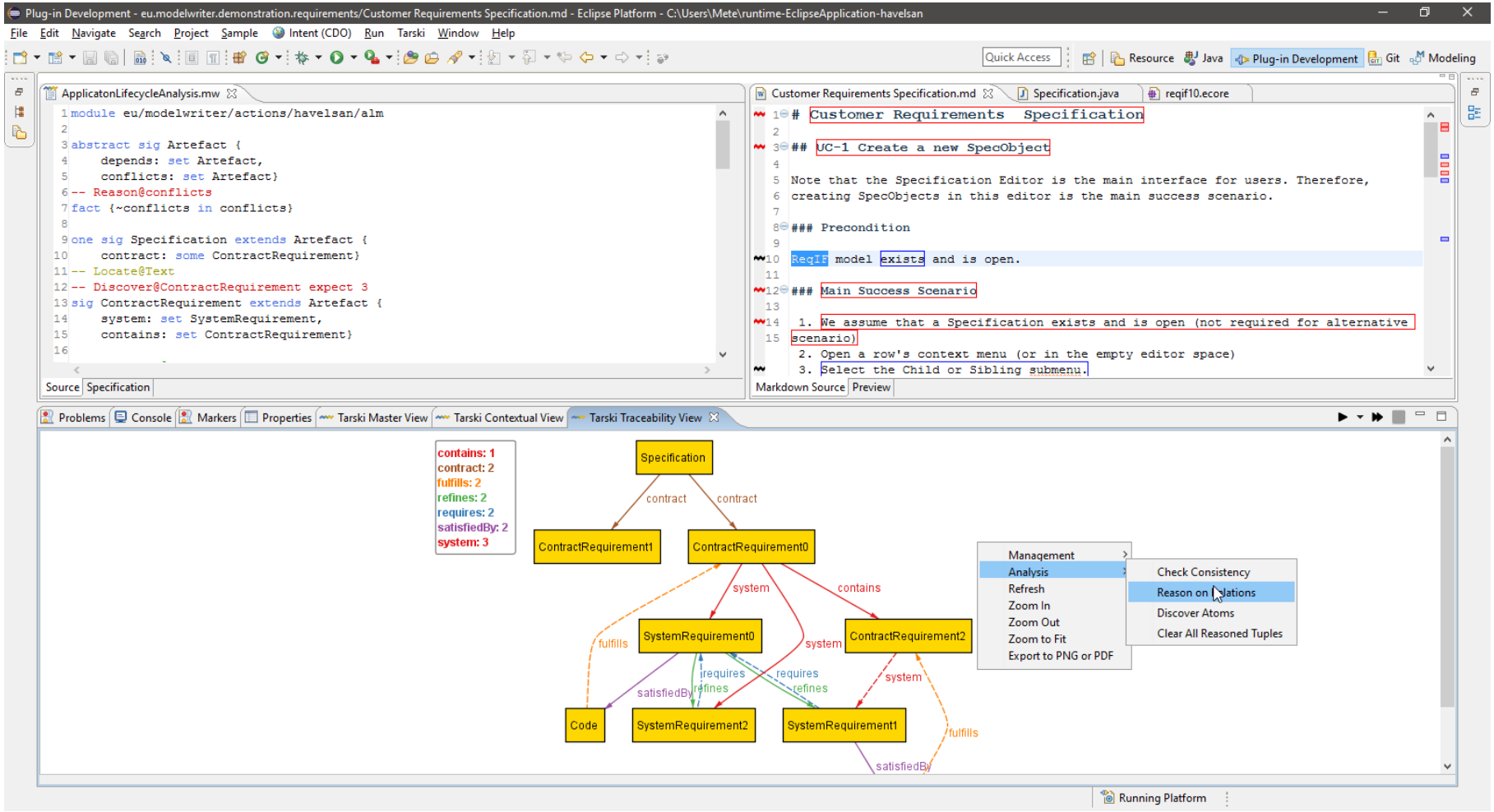


A Formal Specification Model to configure the ModelWriter

Is it possible to vizualize the trace links?

ITEA 3

Traceability: Havelsan example



A Formal Specification Model to configure the ModelWriter

Thank you for your attention
We value your opinion and questions.