

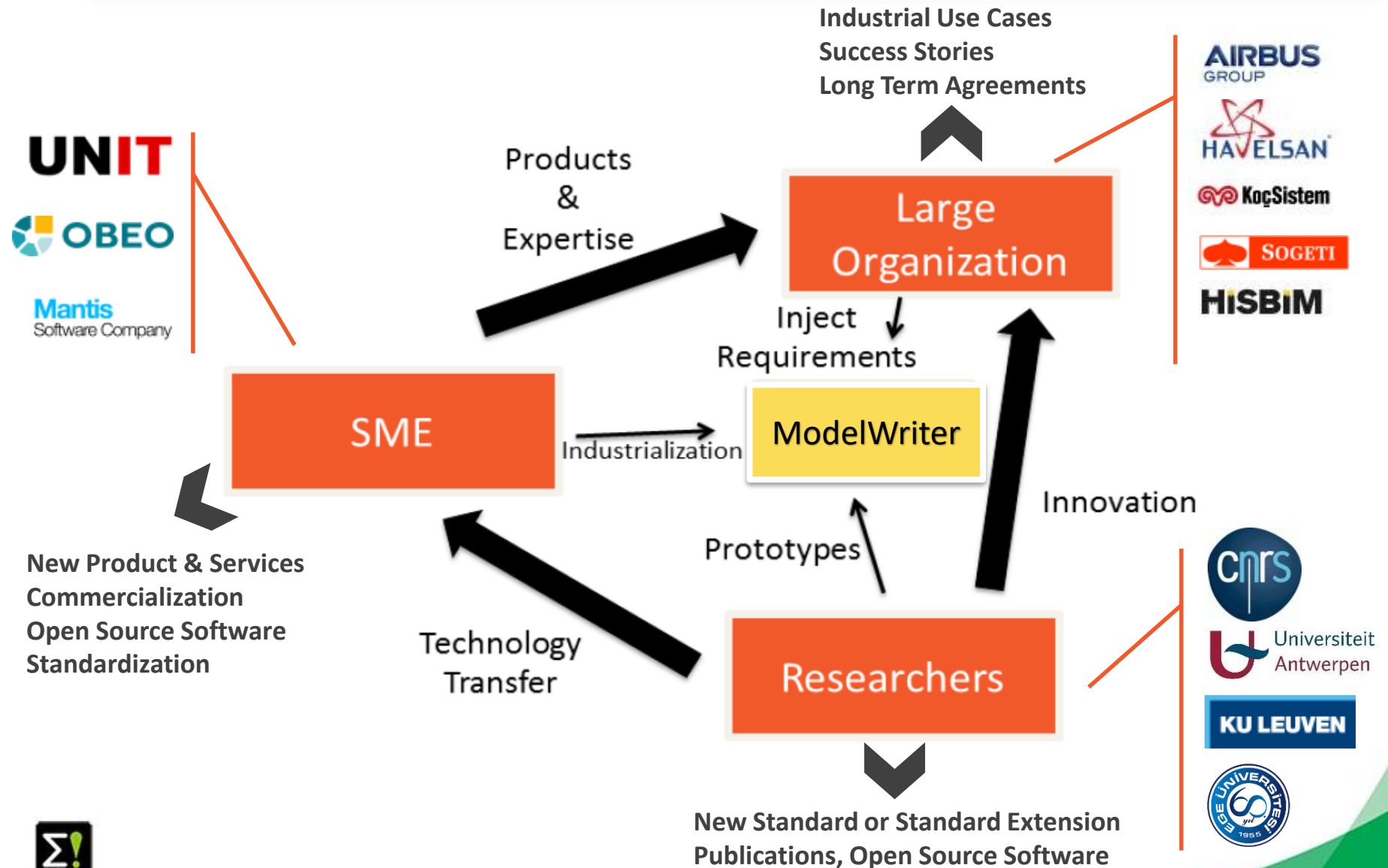
# 2 Overview of the Project

*Ferhat Erata*

*UNIT, ModelWriter Project Leader*

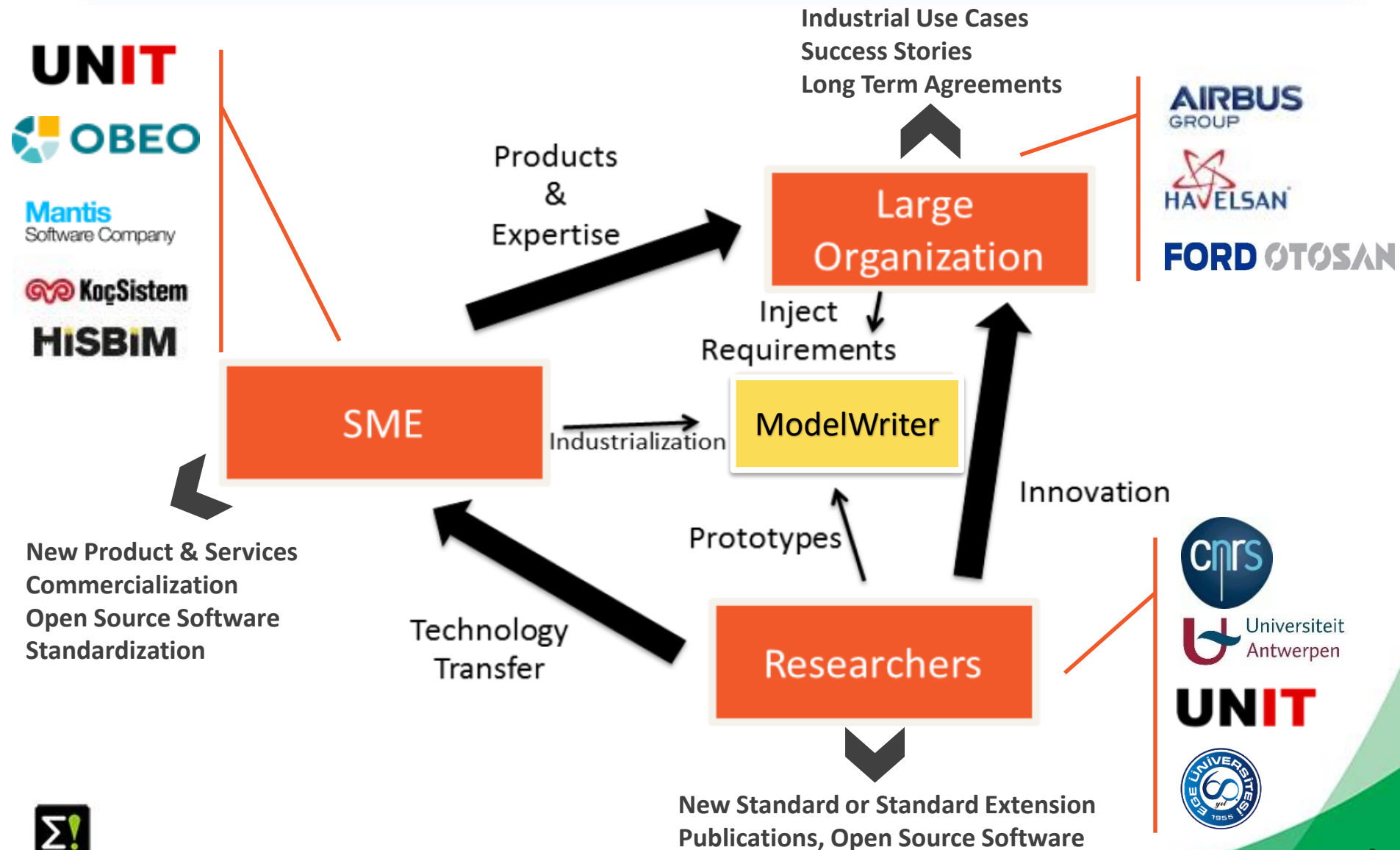
# Industrialization Triangle in ModelWriter

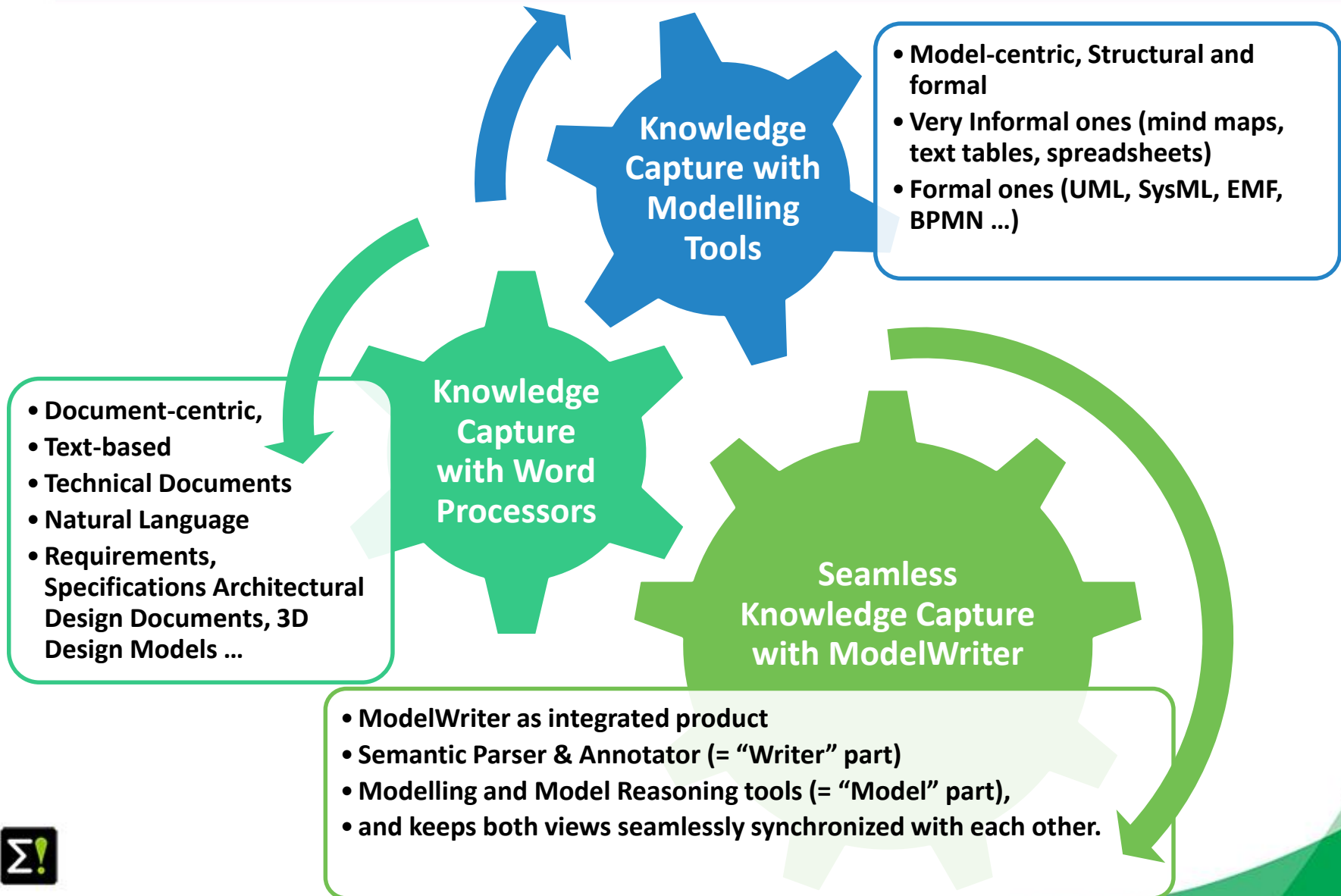
## Open Source Software (year #1)



# Industrialization Triangle in ModelWriter

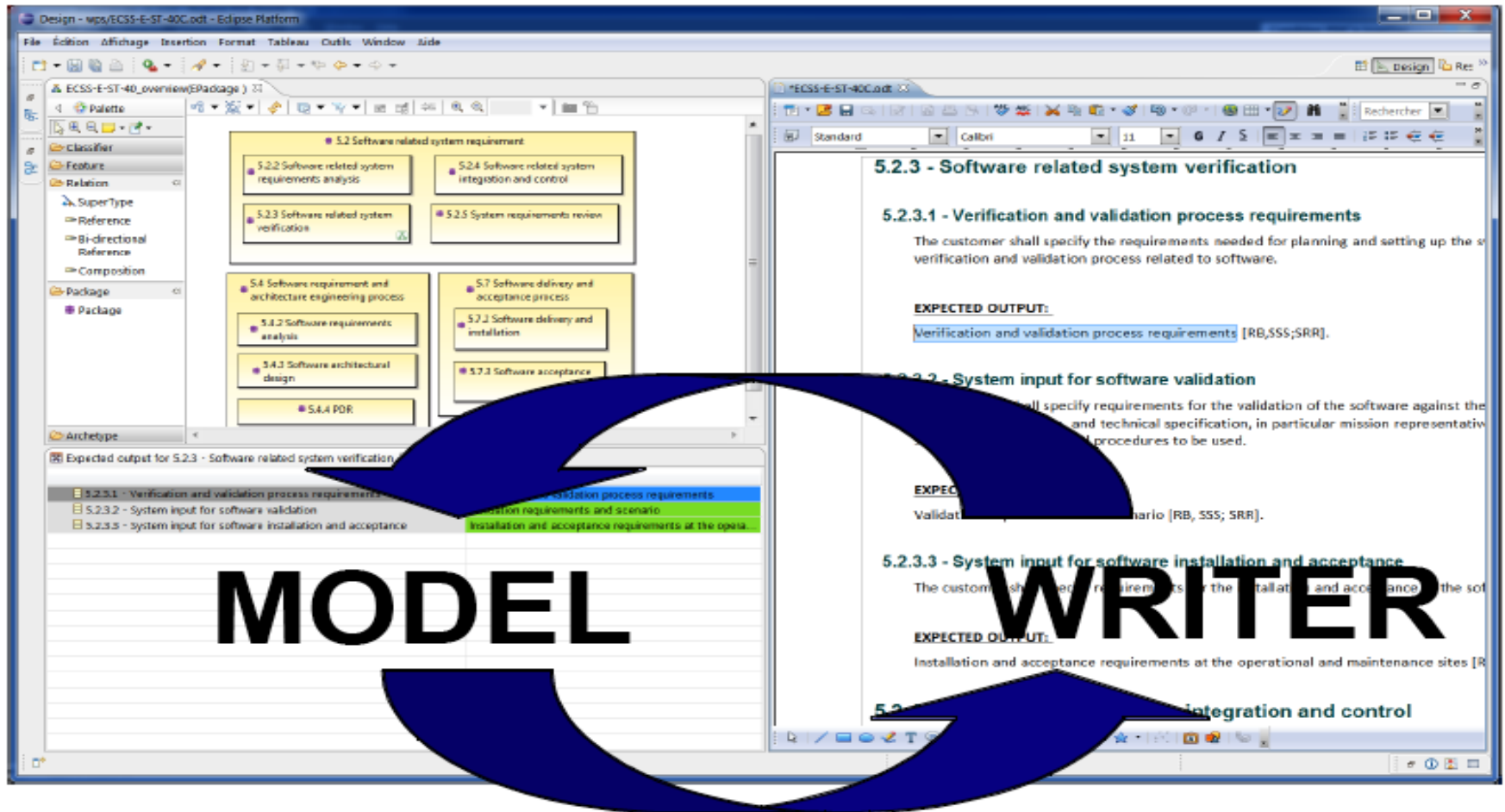
## Open Source Software (year #2)





# ModelWriter

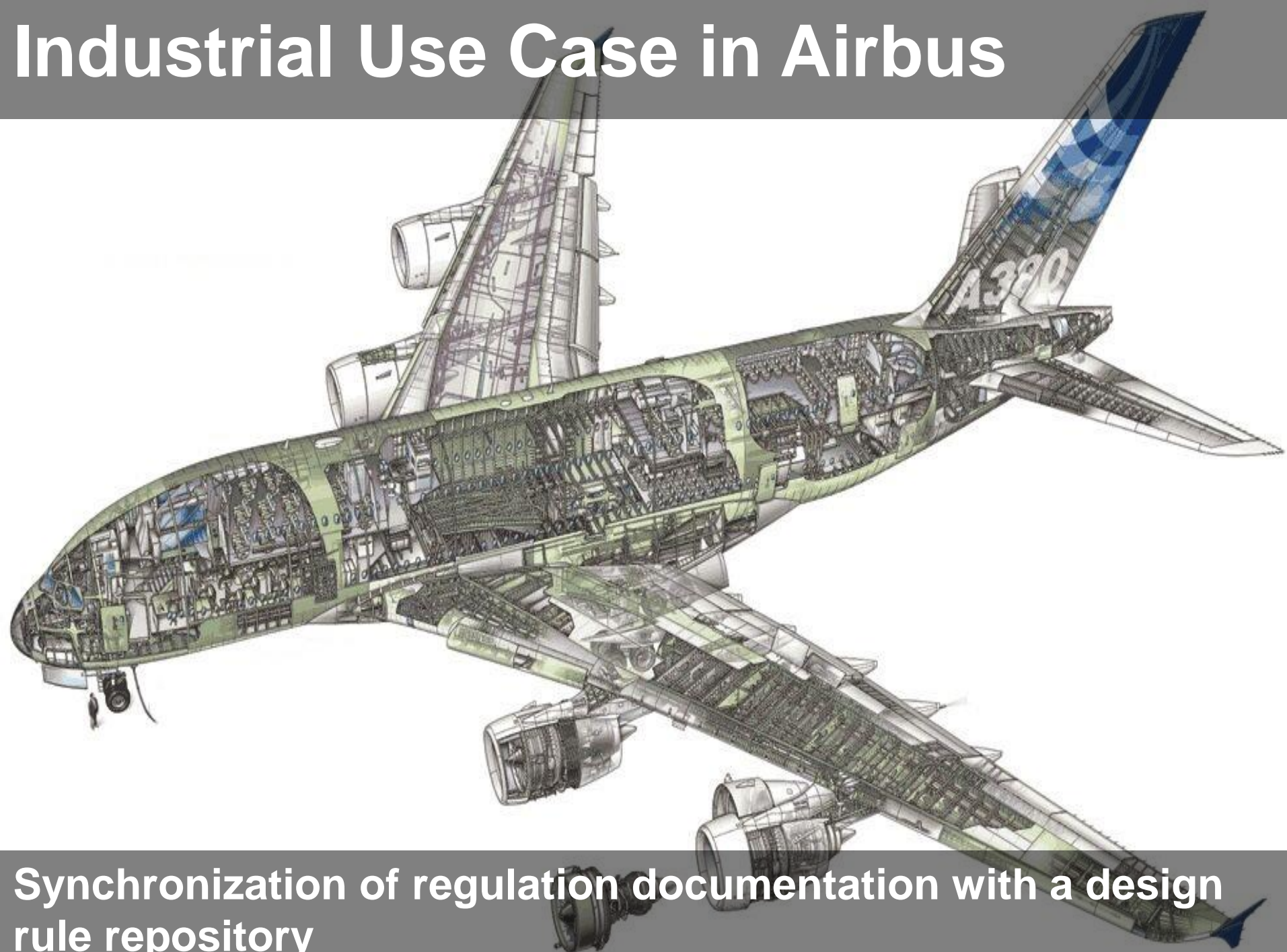
## bi-directional Knowledge Capture tool





# What is the problem?

# Industrial Use Case in Airbus

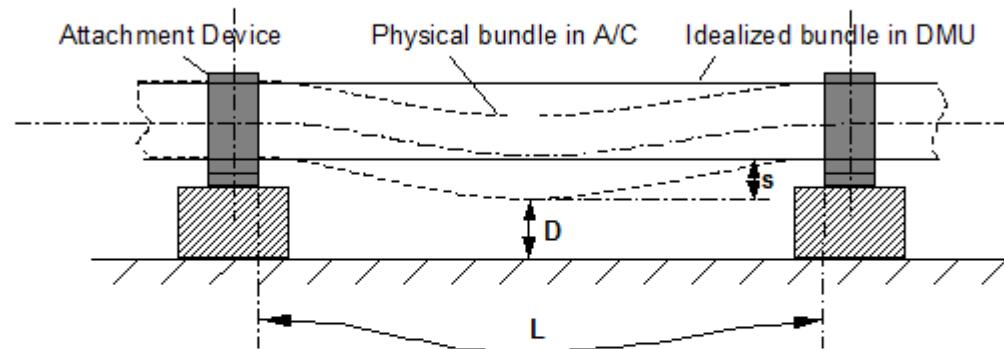


Synchronization of regulation documentation with a design rule repository

# SIDP: System Installation Design Principles

## SIDP92A001V-A-784

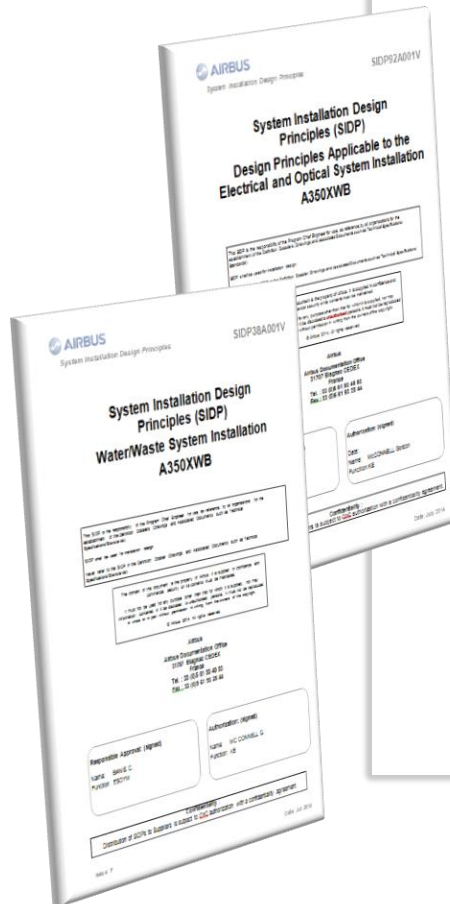
*For installation of optical and electrical harnesses additional clearance for sagging ( $s$ ) shall be provided as detailed below:*



$s$ ... 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.*

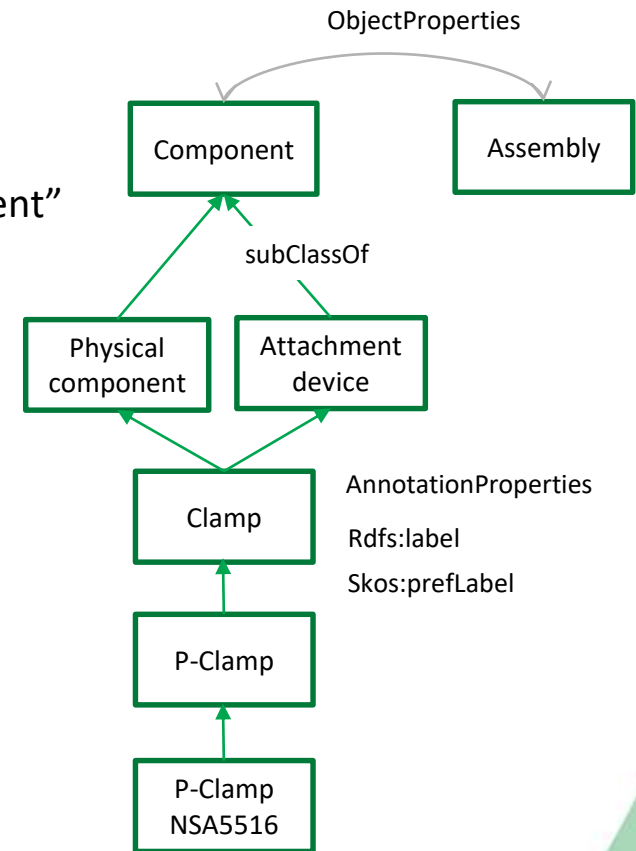
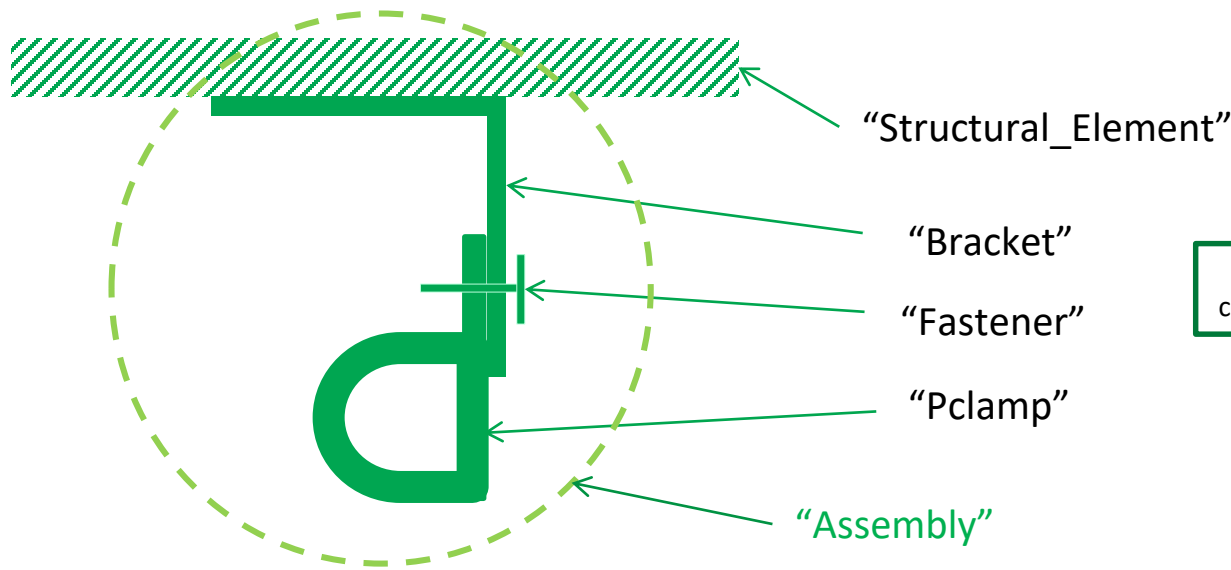




# Component Ontology and Rules

## Objectives:

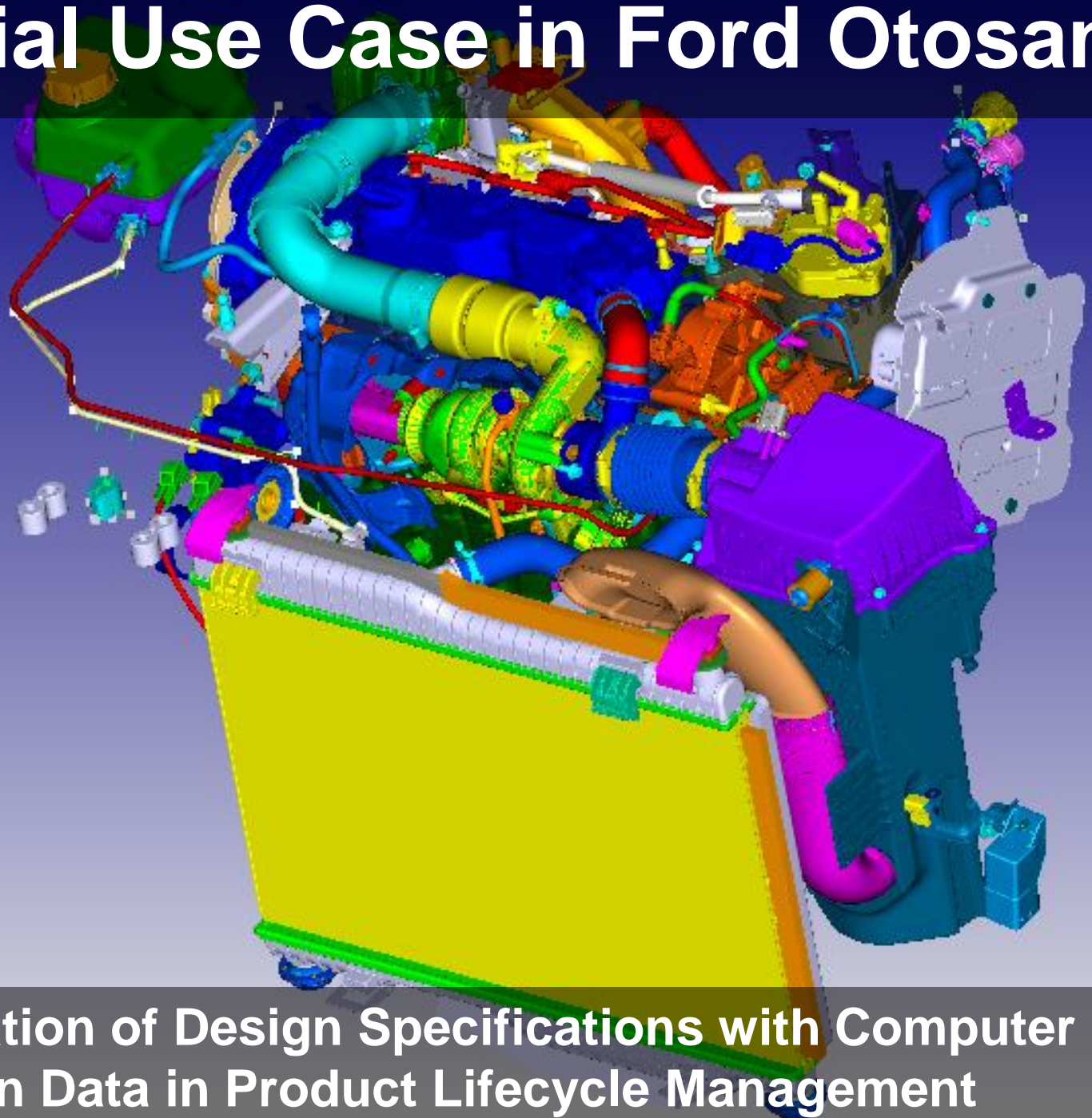
- Manage rules/design principles and improve traceability
- Automate identification of design conflicts against rules



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

"Physical component" "Standard reference"

# Industrial Use Case in Ford Otosan



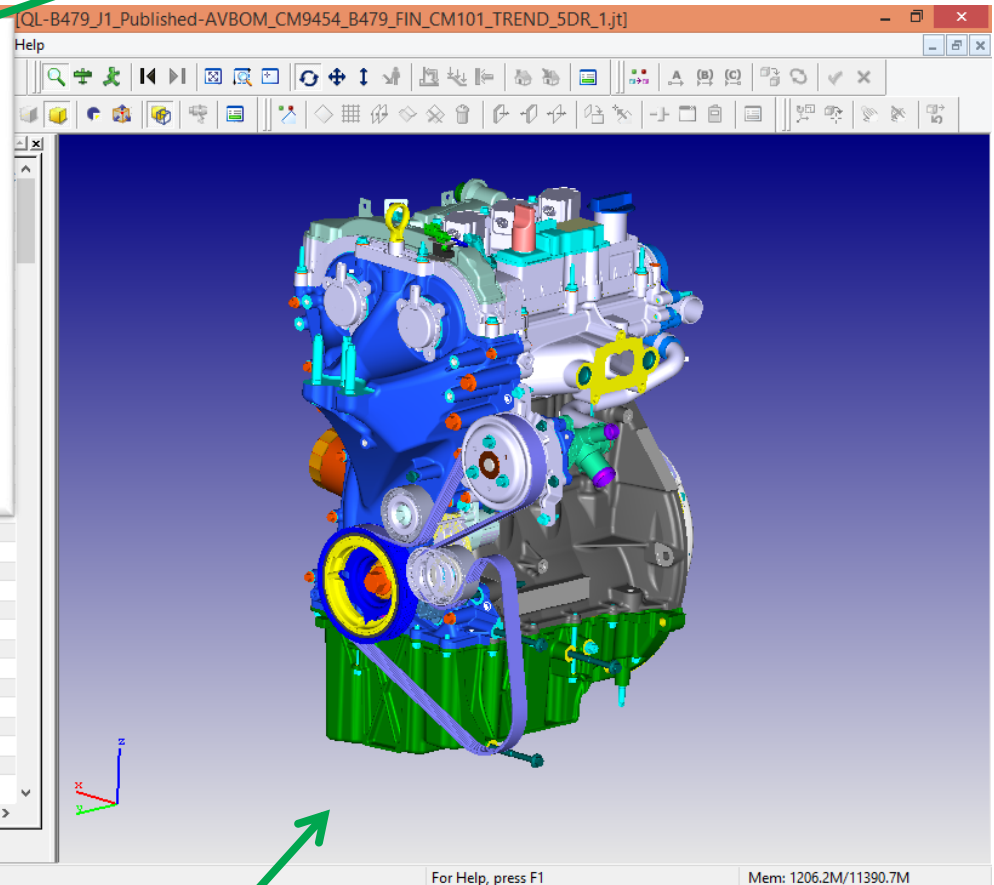
Synchronization of Design Specifications with Computer Aided Design Data in Product Lifecycle Management

# BOM and Design Specifications

“Design Rules”

KPAC Set ID	Title	Author	Type
PT_FAST-S12	Cup Plug Design Rule Saved Set	Murphy, Mark (mmurphy9)	Check List
PT_FAST-S12	Dryseal Pipe Thread Design Rule Saved Set	Murphy, Mark (mmurphy9)	Check List
PT_FAST-S12	Dowel and Bushing Design Rule Saved Set	Murphy, Mark (mmurphy9)	Check List
PT_FAST-S12	Fastener and Joint Design Rule Saved Set	Murphy, Mark (mmurphy9)	Check List
PT_FAST-S12	Threaded Fastener Design Rule Saved Set	Murphy, Mark (mmurphy9)	Check List
PT_FAST-S12	Wrench and Socket Design Rule Saved Set	Murphy, Mark (mmurphy9)	Check List
PT_FAST-S12	Ball Plug Design Rule Saved Set	Murphy, Mark (mmurphy9)	Check List
PT_FAST-S12	Port Plug Design Rule Saved Set	Murphy, Mark (mmurphy9)	Check List
PT_FAST-S12	Thread Forming Screws in Plastic Saved Set	Murphy, Mark (mmurphy9)	Check List

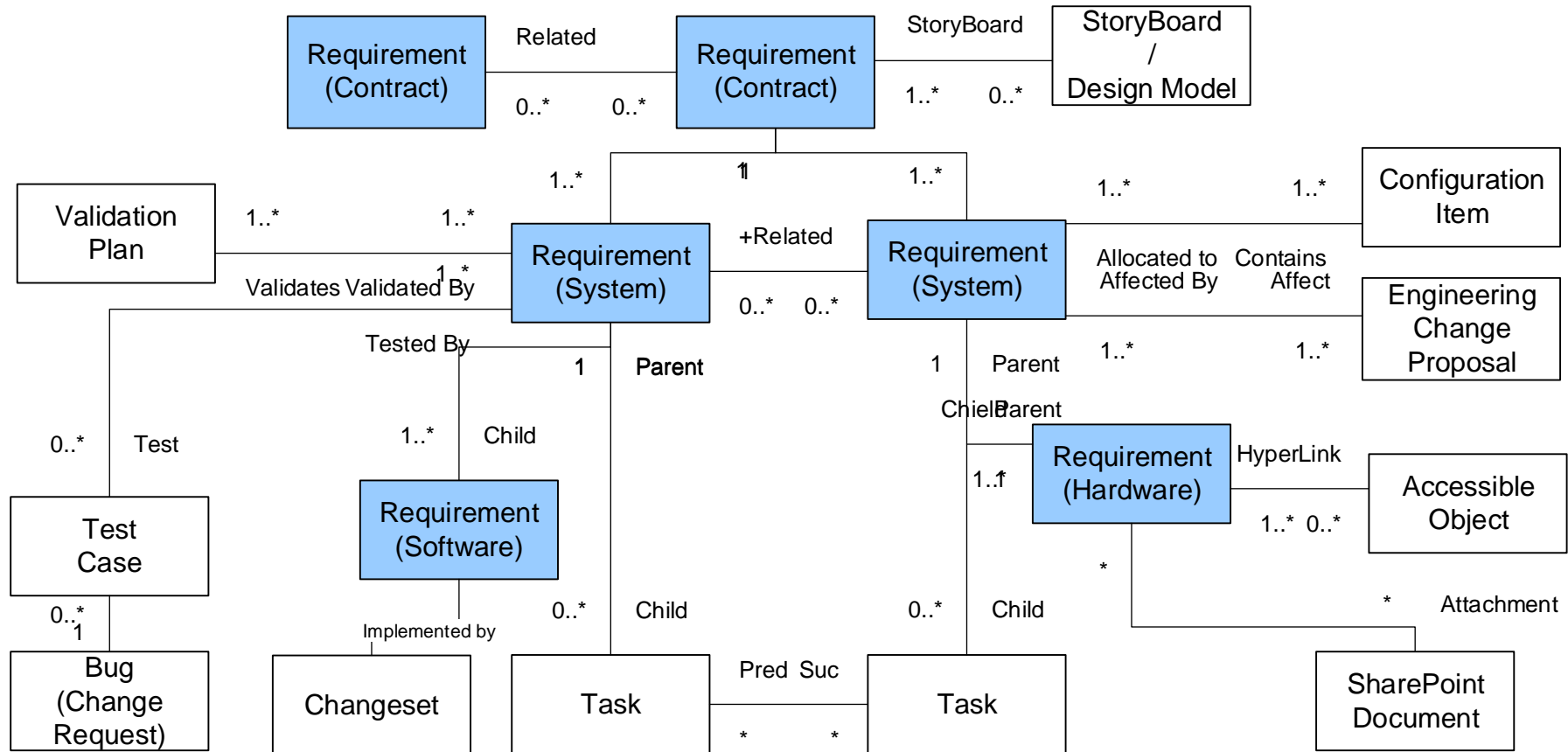
- ☐ PH-B479-031100/1-Engine Pwr Conversion Subsystem (View)
- ☐ PH-B479-031200/1-Air Charging Subsystem (View)
- ☐ PH-B479-031300/1-Evaporative Emissions Subsystem (View)
- ☐ PH-B479-031400/1-Electr Engine Control Subsystem (View)
- ☐ PH-B479-031500/1-Sound Control Subsystem (View)
- ☐ PH-B479-031600/1-Electr Throttle Control Subsys (View)
- ☐ PH-B479-031700/1-Electr Trct Motor Control Subsys (View)
- ☒ PH-B479-032100/1-Engine Modules (View)
- ☒ PH-B479-032101/2-Module - Power unit complete (View)
- ☒ PH-B479-032103/5-Module - Engine as Shipped (View)
- ☒ PAF-B479-WH7UL/3-Engine as Shipped - Hot Tested Assembly (V...
- ☒ DI-B479-18G-6007-A-WH7UL-001/2-ENG ASY1.1L FOX.TIVC...
- ☒ H18C-1007-A/38-FOX 1.1L PFI 85PS B479 EUR EAS (GASOLI...
- ☒ E3BG-020201-E40/2-OIL PUMP AND PICKUP (View)



“Bill of Material Data”

“Computer-aided Design Data”

# Industrial Use Case in Havel-san



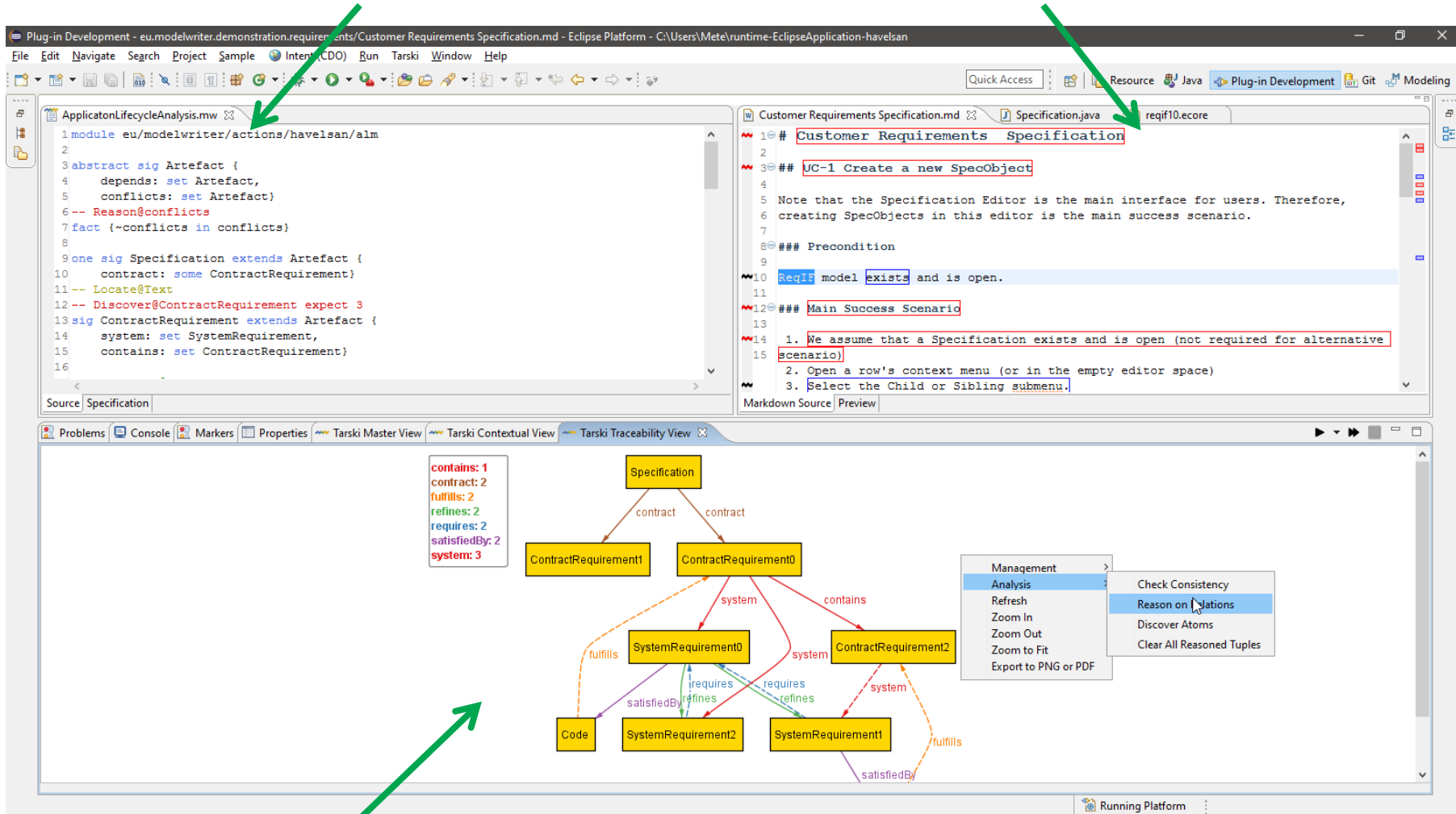
Integration with Application Lifecycle Management to ensure reliability and consistency in the system under development.



# Automated Analysis of Dynamically Configured Traceability Semantics

“Traceability Rules to define traceability semantics”

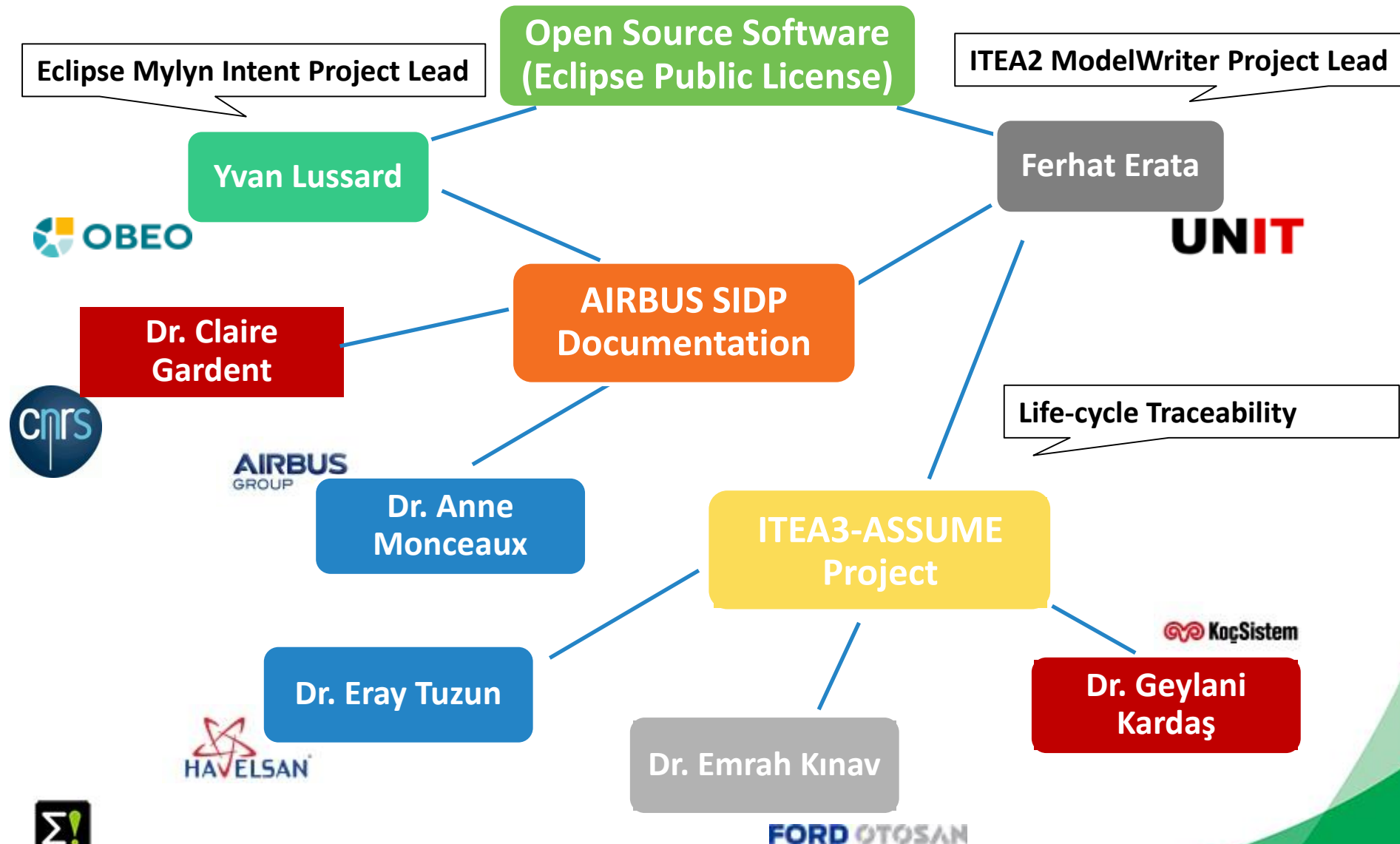
Artefacts or part of artefacts



“Various Traceability Analysis might be performed”

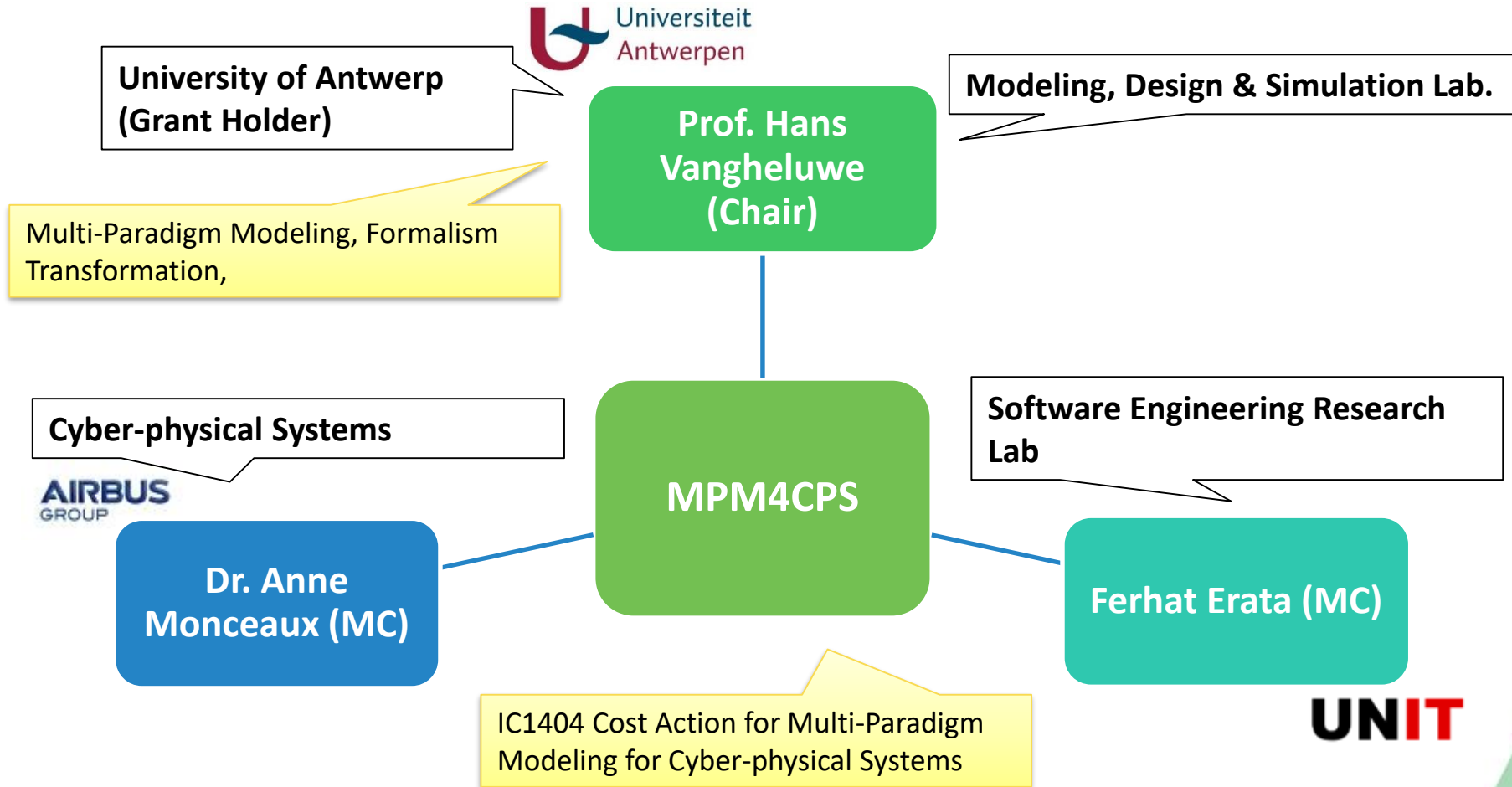
# Level of Collaboration within ModelWriter

## International Collaboration



# Level of Collaboration within ModelWriter

## International Collaboration



# ModelWriter Activities in the First Year

<https://github.com/modelwriter/workshops>

Project Kick-off in Istanbul, Turkey (Nov 08, 2014) [M1]

Initial Architectural Design, Industrial Use Cases, Technical WP discussions

Collaboration Infrastructure

The 1st International ModelWriter Workshop in Izmir, Turkey (Jan 15-17, 2015) [M4]

Exploitation: Havelsan's participation

The 1st International Eureka Project Exhibition in Berlin, Germany (Mar 10-11, 2015) [M6]

Consolidated User Requirements & Review

The 2nd International ModelWriter Workshop in Brussels, Belgium (Apr 30, 2015) [M7]

Software Requirements Review & Architecture

The 3rd International ModelWriter Workshop in Toulouse, France (Jun 22-23, 2015) [M10]

Rehearsal & Review

The 4th International ModelWriter Workshop in Brussels, Belgium (Sep 23-24, 2015) [M12]

Integration of software components

The 5th International ModelWriter Workshop in Ludwigsburg, Germany (Nov 2-5, 2015) [M16]



# ModelWriter Activities in the Second Year



<https://github.com/modelwriter/workshops>

Product Owner Review Meeting

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

ModelWriter is positioned on the Working Groups of this Cost Action

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)

Future of ModelWriter is discussed

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)

Poster Presentation

ModelWriter Poster Presentation SAT/SMT/AR Summer School 2016

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



# ModelWriter Activities in the Second 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)

## Work Packages & Technical Innovations

### WP1 Industrial Use Cases and Requirements (AIRBUS)

#### WP2 (LORIA)

- Semantic Parser
- Document Generation
- bi-directional transformation between text and formal knowledge representation

#### WP3 (UNIT)

- Bi-directional synchronization mechanism between texts and models
- Configuration & Traceability Components
- Consistency checker plug-in for consistency

#### WP4 (MANTIS)

- A federated Knowledge Base and its API
- Synchronization mechanism between texts/models & knowledge base

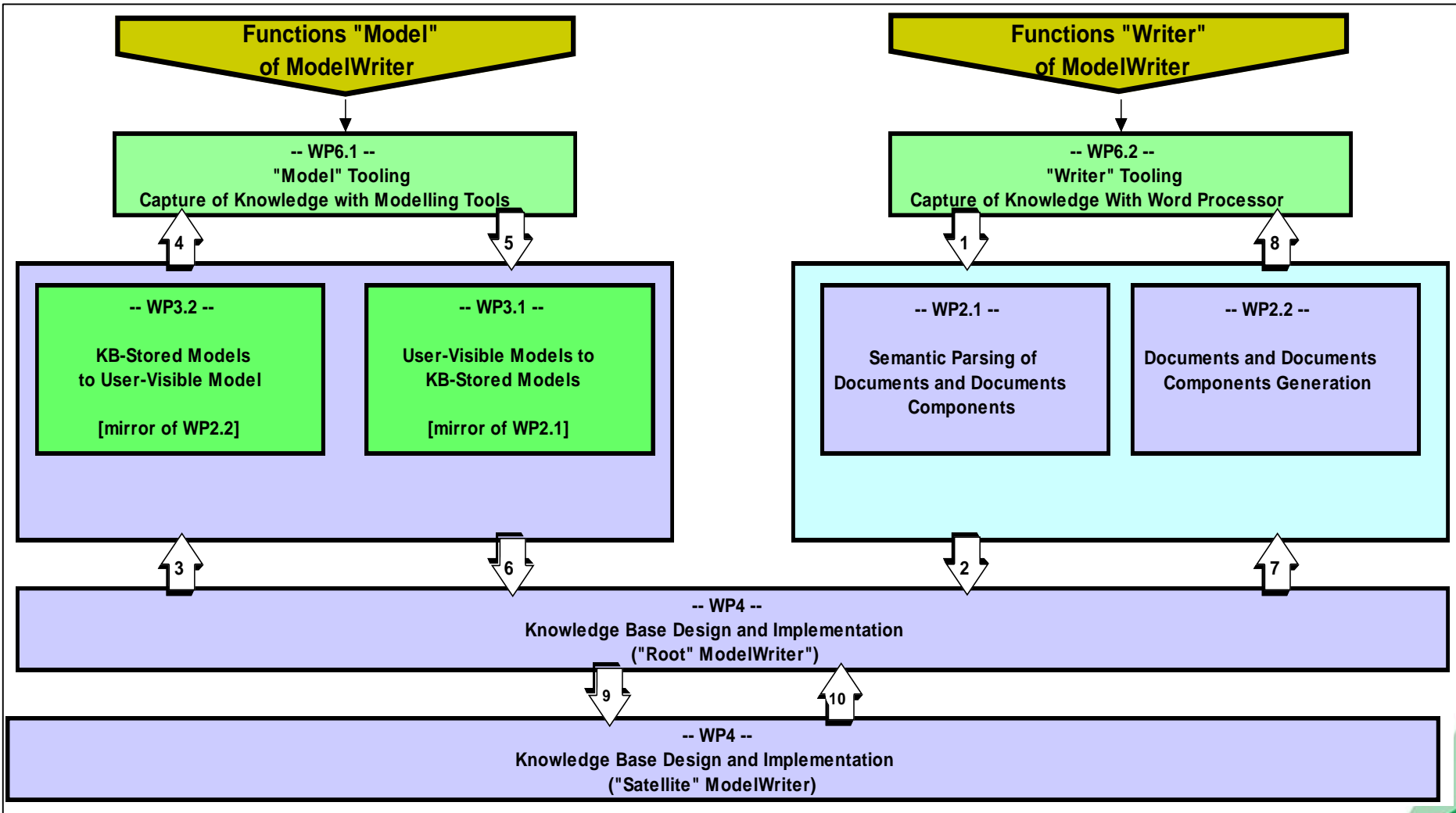
#### WP6 (OBEO)

- A complete “ModelWriter” tool integrating of all these in a consistent way
- User Interfaces

### WP5 Project Management (UNIT)

### WP7 Standardization, Dissemination and Exploitation (OBEO)

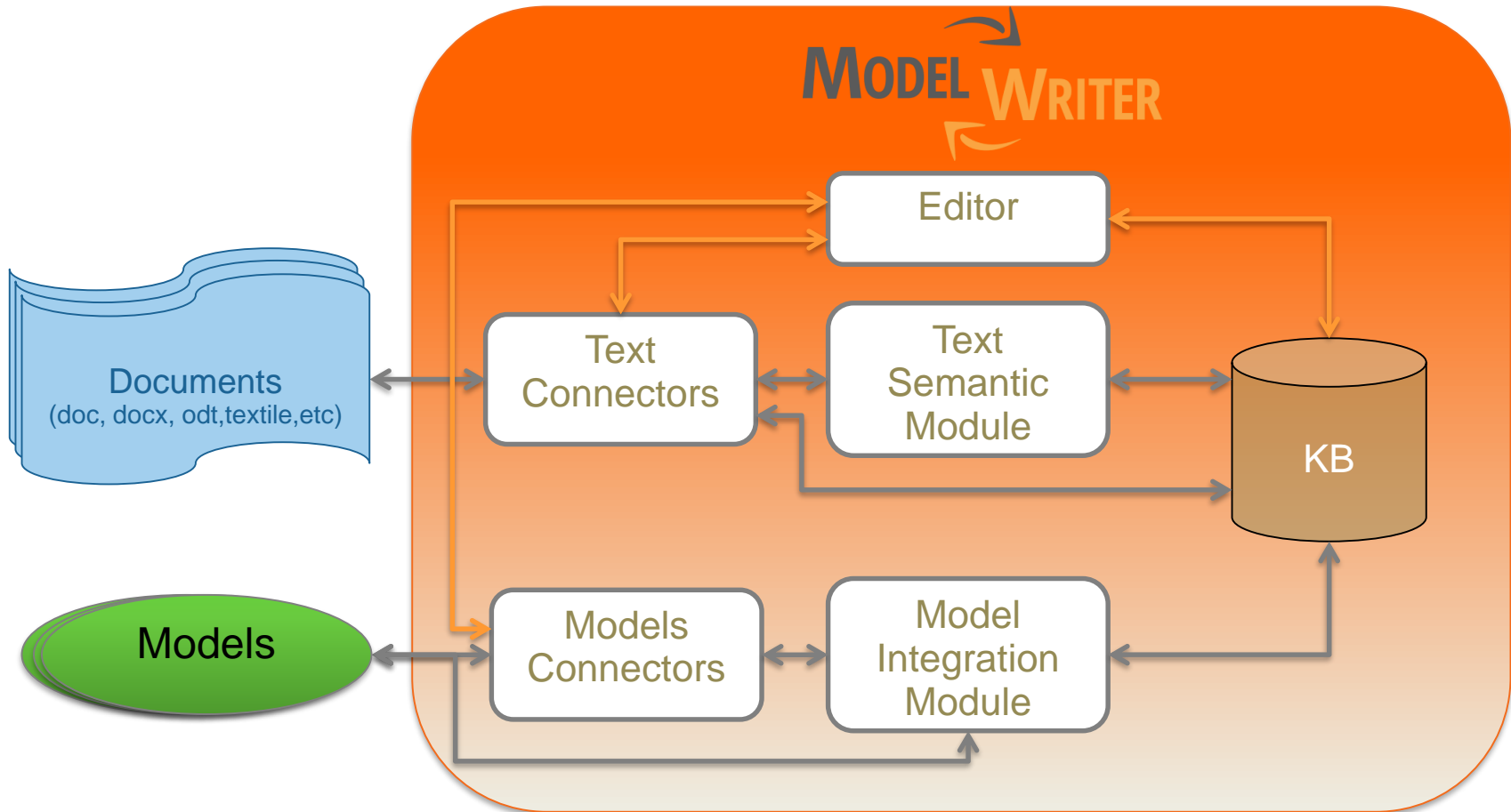
## Technological components & interactions





# ModelWriter

## Conceptual Architecture



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