



# IBM Technical Summit 2013

Démarquez-vous

17 octobre | IBM Client Center Paris

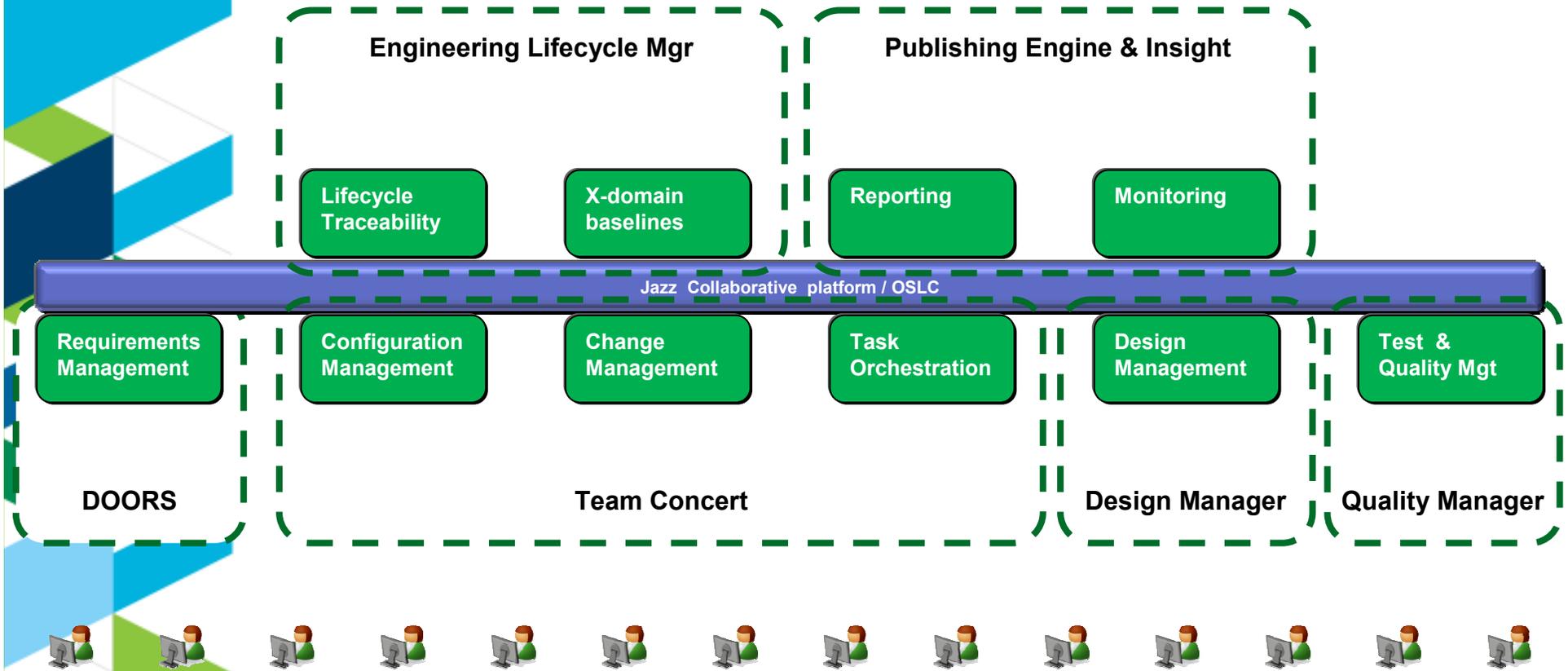
## L'atelier d'Ingénierie Système et Logiciel Embarqué, nouveautés 2013

Charles-Henry JURD

European Solution Architect



# SSE Jazz platform capabilities & tools



# Market-driven standard-based platform integration

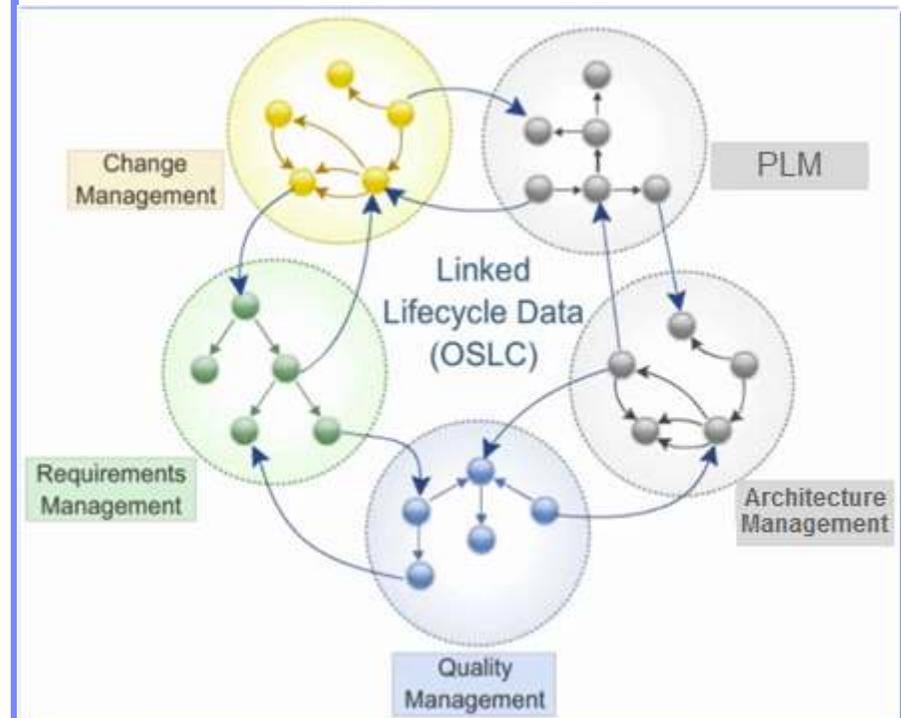


Open Services for Lifecycle Collaboration  
Lifecycle integration inspired by the web

- Open Community – @ [open-services.net](https://open-services.net)
- Driven by **OASIS** open-standards consortium
- Open specifications for numerous disciplines
  - Including ALM, PLM, and DevOps
- Defined by scenarios
  - Solution oriented
- Inspired by the web
- Open world assumption – vs. rigid APIs approach
  - Web **W3C** Linked-Data approach
  - Internet Architecture
  - HTTP based RESTful protocols
- Decouple data from container
  - Unlock data from silo tools
- “Just enough” integration
  - Consume/Provide the necessary services
- IBM and EADS are part of the 22 founding members



Linked Data Platform  
Working Group

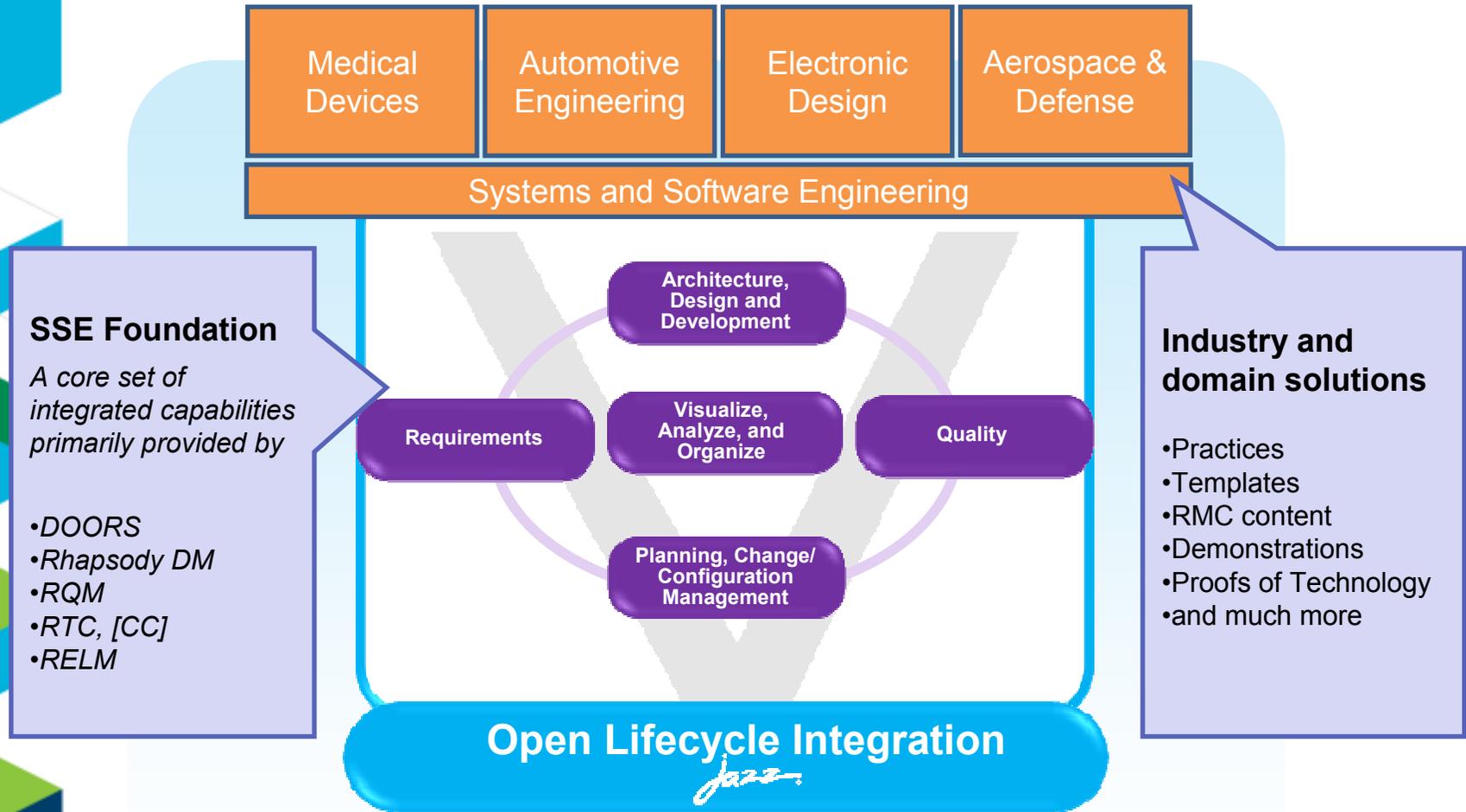


**OASIS**  
Advancing open standards for the information society

OSLC Member Section



# Systems & Software Engineering Accelerators



# Support for DO-178B/C

**Rational. Method Composer**

Search this Site: [Search Icon]

DO-178B

- Welcome to the DO178 Accelerator
- Getting Started
- Delivery Processes
  - ISDP - 178 Process
- DO-178B Objectives
  - DO-178B Software Planning Process
  - DO-178B Software Development Process
  - DO-178B Verification of Output of SW Requirements
  - DO-178B Verification of Outputs of SW Design
  - DO-178B Verification of Outputs of Coding and Integration
  - DO-178B Testing of Outputs of Integration
  - DO-178B Verification of Verification Results
  - DO-178B SW Configuration Management Process
  - DO-178B SW Quality Assurance Process
  - DO-178B Certification Liaison Process
- DO-178B SW Certification Levels
  - SW Level A
  - SW Level B
  - SW Level C
  - SW Level D
- Guidance
- Practices

Welcome to the DO178 Accelerator

The DO-178B mapping is a set of pages providing links between the objectives, plans, tasks, and work products specified in the RTCA DO-178B standard (particularly Appendix A) and the work tasks, work products, process roles and guidance provided by the Rational Practices. This mapping is meant to aid the development of software intended to be certified under this standard by providing links between the standard and the process assets represented within the Rational Practice library and processes.

This process content represents Best Practices for Embedded Software development in a variety of safety critical industries. It is our expectation that every deployment of this process will require customization in some form. Practices and work products may be inserted, deleted, or replaced as appropriate for your organization and your project.

**Main Description**

**About this configuration**

**Welcome to the DO178 Website!**

This configuration includes the practices, delivery process and the mapping to the DO-178 standard.

It also

**Navigation Links**

- Roles
- Work Products
- Tasks
- Processes
- Practices

Note that the DO-178B standard calls for a number of project plans as deliverables. It is anticipated that the process content in this configuration forms the base content for most of those plans (see the Artifact section). This entails customizing this content for each new project with project-specific information. This refers specifically to the Software Configuration Management Plan, Software Quality Assurance Plan, Software Development Plan, and Software Verification Plan, supplemented with additional project data in external documents. The Plan for Software Aspects of Certification is created within the DO-178B Certification Practice but results in an external document.

ISDP-178

Model

Testing

**IBM**

# Support for ISO 26262

**Rational. Method Composer**

Search this Site:

ISO 26262

- Welcome to ISO 26262
- Getting Started
- ISO 26262 Processes
  - Main Process Flows
    - Safety Lifecycle
    - Product development system level
    - 5 Hardware product development
    - 6 Software product development
  - ISO 26262, Main Phases of the Safety Lifecycle
    - 2 Management of functional safety
    - 3 Concept Phase
    - 4. Systems Engineering for product development
    - 5 Hardware product development
    - 6 Software product development
    - 4. Systems Integration and testing
    - 7 Production and Operation
  - Supporting Processes
    - 8.11 Qualification of software tools
    - 8.13 Qualification of HW components
    - 8.5 Manage supplier interface
    - 8.8 Change Management
    - 8.9 Verification Planning
    - Test Environment Setup

Welcome to ISO 26262

This web site details the Tasks, Work Products, Roles and workflows required for the development of safety related work item for a vehicle to be compliant to ISO 26262.

**Relationships**

Categories: ISO 26262

[Back to top](#)

**Main Description**

The diagram illustrates the structure of ISO 26262. It is organized into 10 numbered sections. Section 1 is 'Vocabulary'. Section 2 is 'Management of functional safety'. Section 3 is 'Concept phase'. Section 4 is 'Product development on system level'. Section 5 is 'Hardware development'. Section 6 is 'Software development'. Section 7 is 'Production and operation'. Section 8 is 'Supporting processes', which includes 'Practices for Requirements management', 'Configuration Management', and 'Change management'. Section 9 is 'ASIL-oriented and safety-oriented analysis'. Section 10 is 'Guideline on ISO 26262 (informative)'. A double-headed arrow is shown between sections 5 and 6, indicating interaction between hardware and software development.



# IBM Rational DOORS Next Generation

*DOORS concepts improved and much more....*



## Definition

- Rich-text documents
- Diagrams: Process, Use Case
- Storyboards, UI sketching & flow
- Project glossaries
- Templates



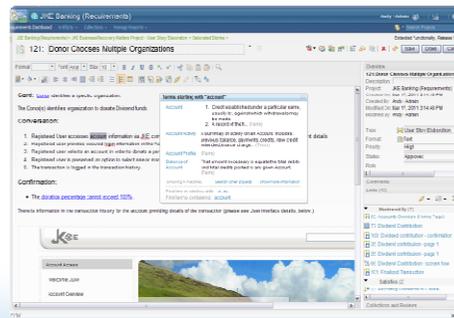
## Visibility

- Customizable dashboards
- Analysis views
- Collections
- Milestone tracking & status



## Collaboration

- Review & Approval
- Discussions
- Email Notification



## Management

- Structure, Attributes/Types
- Traceability, Filtering, Tags
- Baselines, Change History
- Reuse (reqs & types)
- Reporting Metrics & Doc.



## Lifecycle

- Central requirements, test, & development repository
- Common administration and role-based user licensing
- Warehouse reporting



## Planning

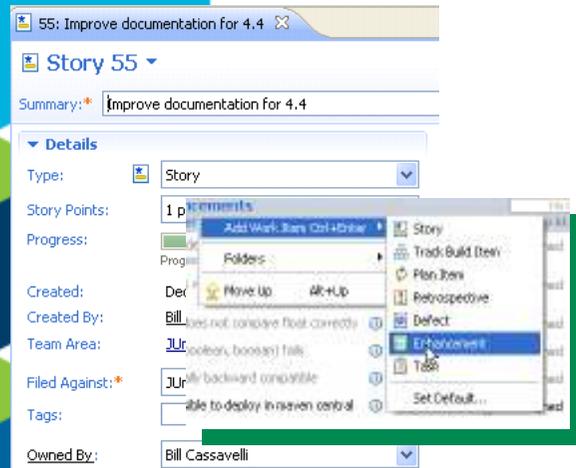
- Integrated planning
- Effort estimation
- Task Management





# Rational Team Concert

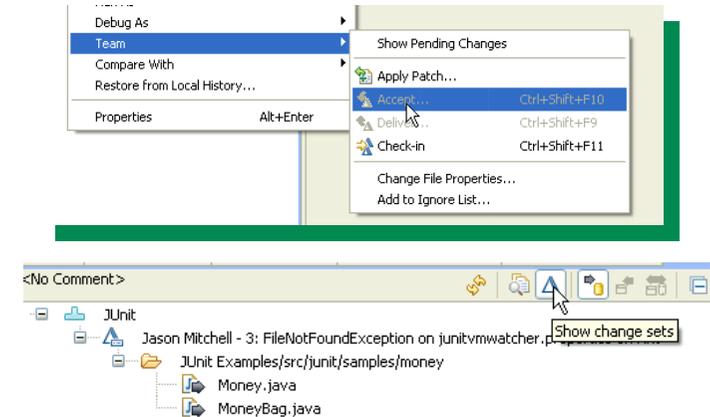
## Work Items



## Planning



## Source Control



## Builds – Continuous Integration



## Dashboards & Reporting



## Method Enforcement and Automation

### Problem

A work item must be associated with the change set or a comment must be set.

### Reason

All change sets should be associated with a work item which is planned for the iteration.

**Deliver (Failed)**

This makes it difficult to deliver through the IDE why your change set is not associated with a work item or comment.

### Solutions

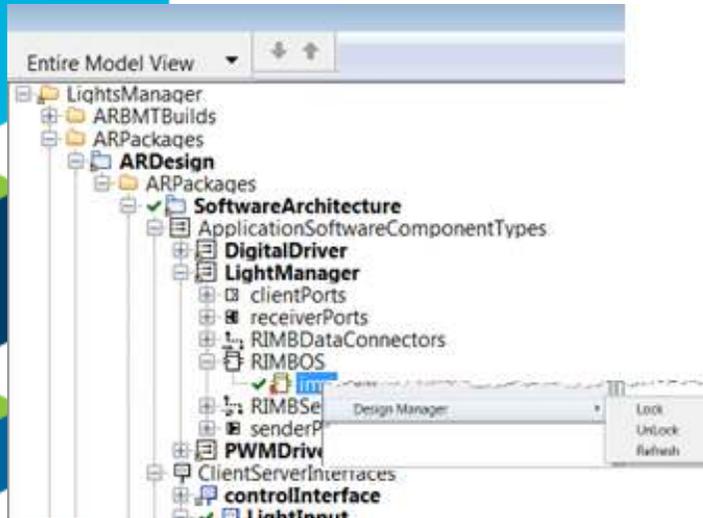
- Associate Existing Work Item
- Associate New Work Item
- Associate and Try Again (experimental)
- Override 'Descriptive Change Sets' Precondition



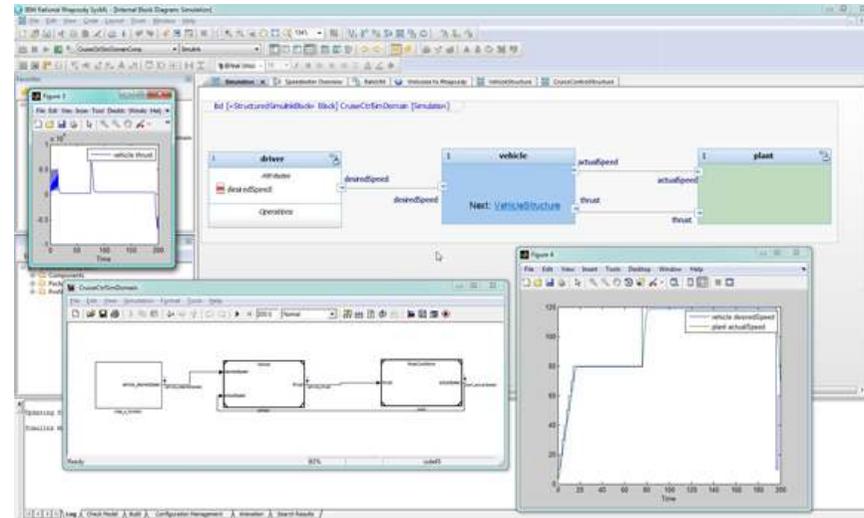


# Rational Design Manager

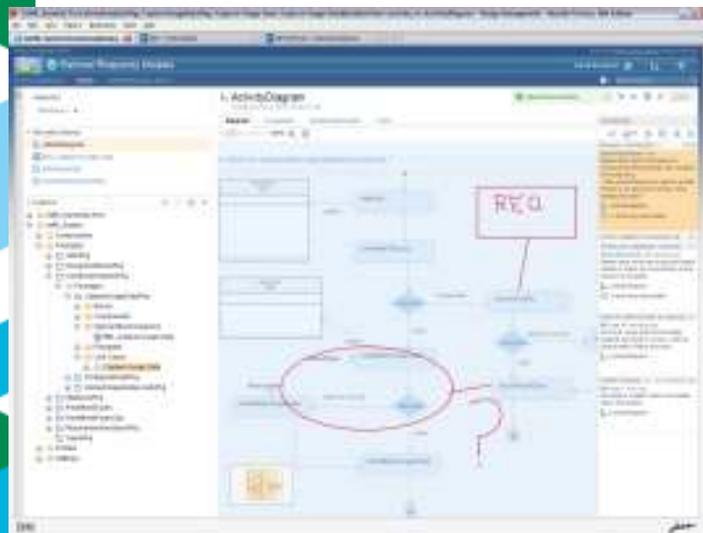
- Simplified Design Collaboration



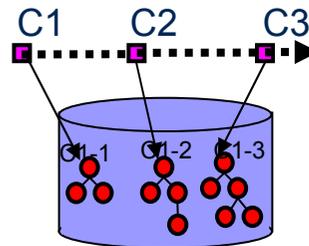
- Flexible Rhapsody & Simulink model management



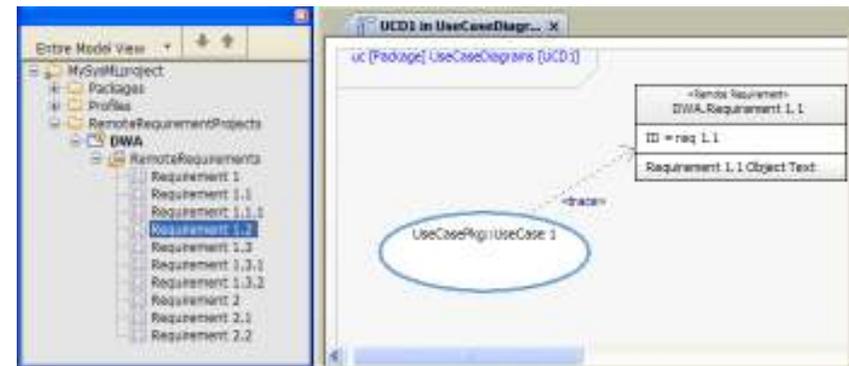
- Web-client for commenting & Reviewing



- Model Version & Variant Control



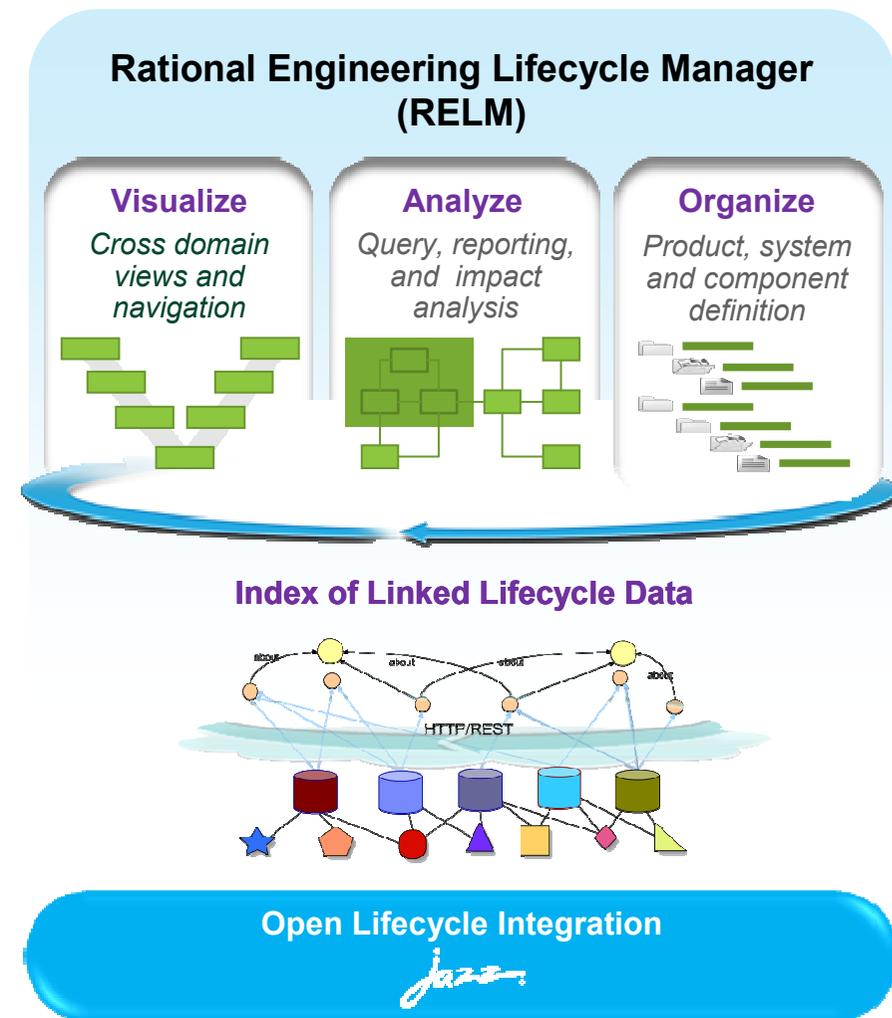
- Linking Designs to Requirements via OSLC





# Rational Engineering Lifecycle Manager

- **Leverages the Linked Data/Traceability to enable**
  - ✓ **Visibility** – cross-lifecycle queries & views
  - ✓ **Analysis** - answer questions using contextualized information
  - ✓ **Organization** – global configurations & product line engineering
- **Which allows engineering organizations to**
  - Manage growing data size and complexity
  - Find relevant information quickly
  - Determine and understand the impact of change
  - Make timely and correct engineering decisions
- **In order to**
  - Improve engineering agility
  - Increase innovative capacity
  - More easily achieve, maintain and demonstrate compliance to standards



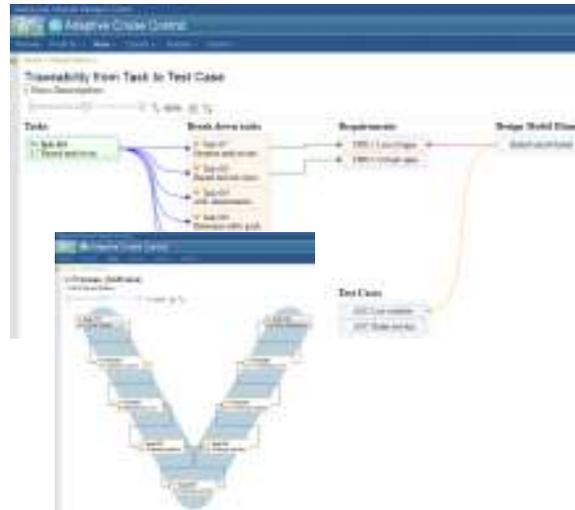
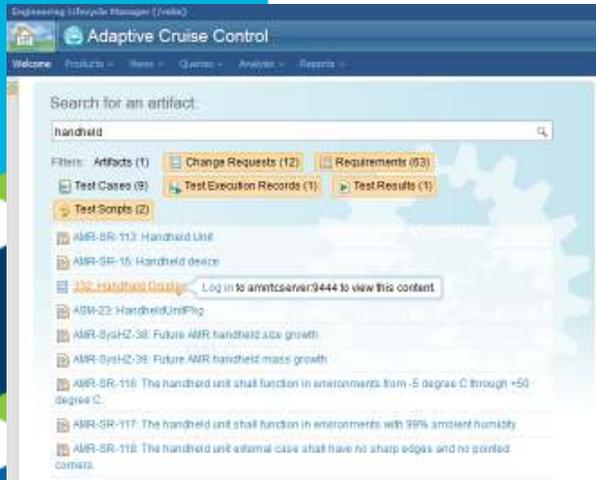


# Rational Engineering Lifecycle Manager

▪ Search & Query

▪ Views & Navigation

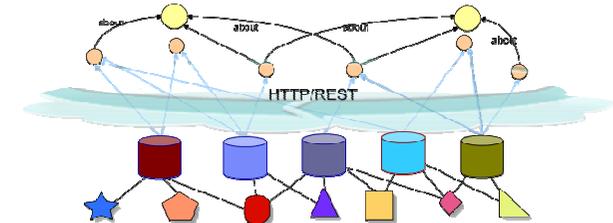
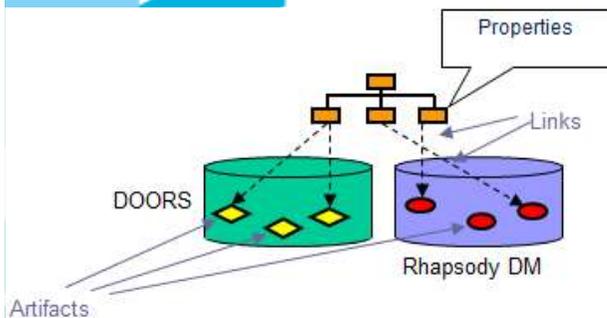
▪ Impact Analysis



▪ Global CM

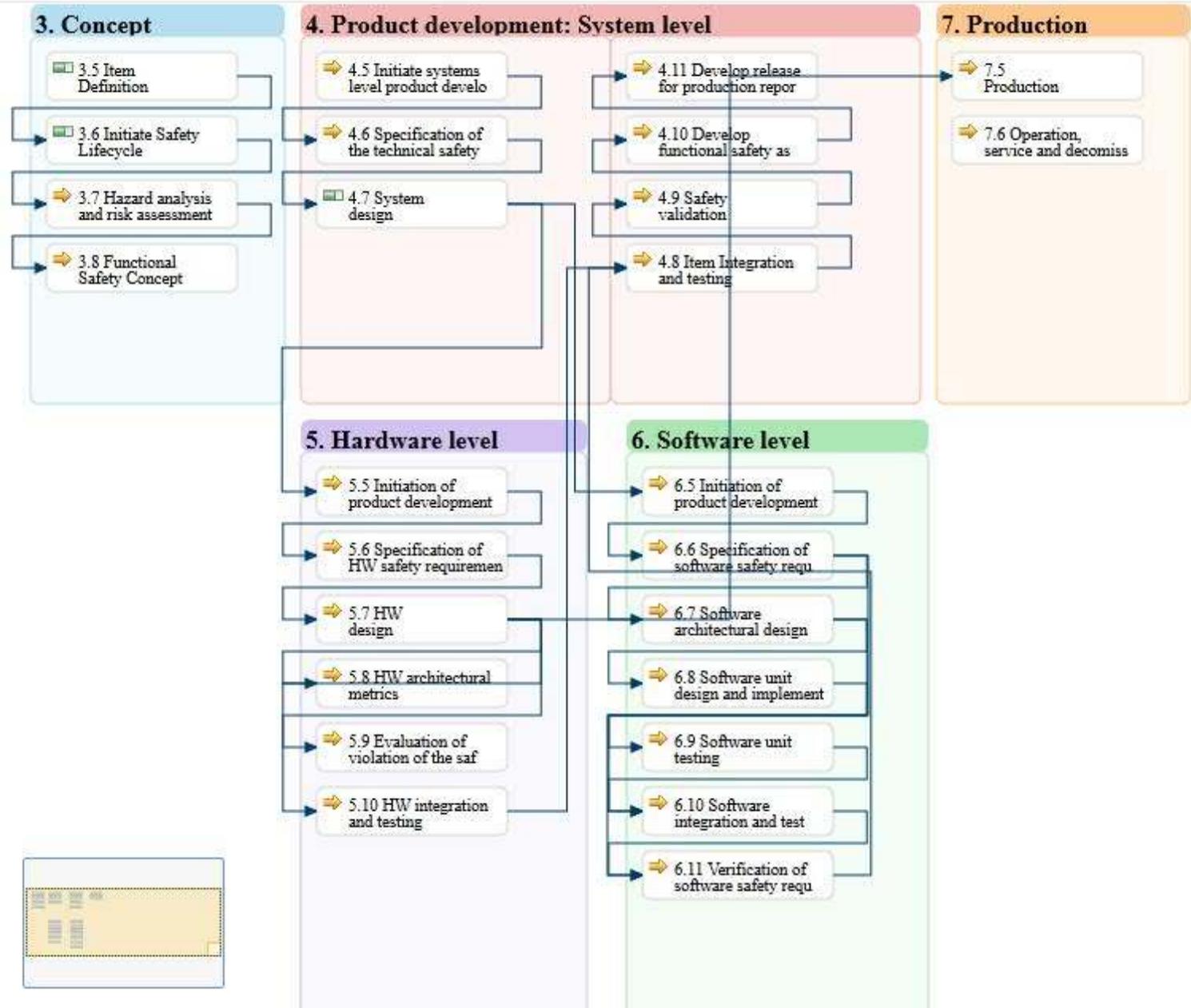
▪ Product Line Engineering

▪ Indexing of Lifecycle Data



# ISO-26262 Overview

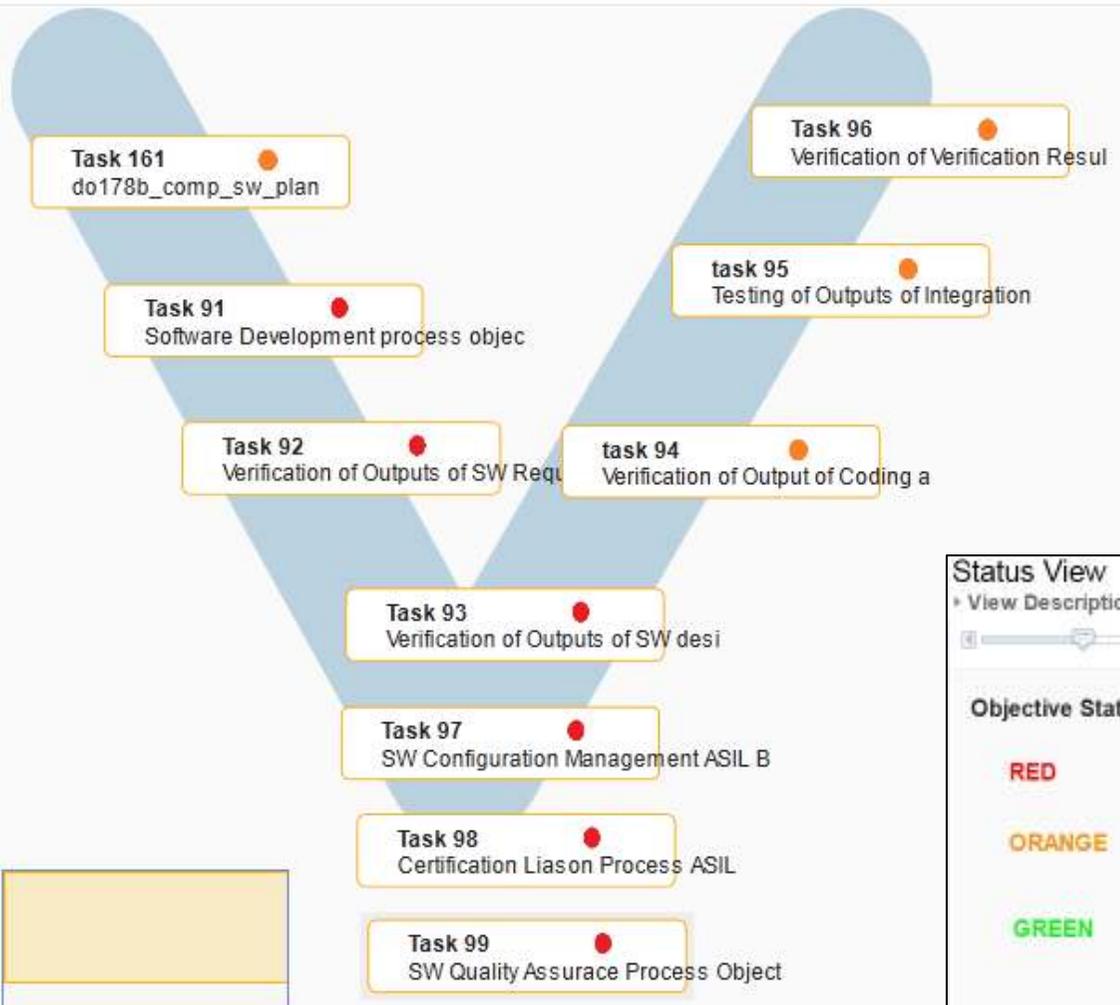
## View Description



# DO178B/C Overview

► View Description

70% Actions



## Top View of DO178B/C objectives



### Status View

► View Description

80% Actions

Objective Status	Percentage (%)	Objective Count
RED	80%	6
ORANGE	15%	1
GREEN	0%	0

Status Report !!!

# DO178B/C compliance views

## Objective Tree - Software Planning

View Description



### High Level Objective of DO178B/C

High Level Objective

Objective

Task 161  
do178b\_comp\_sw\_pla

Task 162  
Objective A.1.1

Task 171  
Objective A.1.2

Task 180  
Objective A.1.3

Task 192  
Objective A.1.4

Task 201  
Objective A.1.5

Task 206  
Objective A.1.6

Task 212  
Objective A.1.7

## Full Tree

View Description



### Complete Tree of DO178B/C Objectives

Low Level Objective

Objective

Task 161  
do178b\_comp\_sw\_pla

Task 162  
Objective A.1.1

Task 163  
Check compliance t

Task 164  
Tailor the Process

Task 165  
Check Configuratio

Task 166  
Check for complian

Task 167  
Check Plan for Sof

Task 168  
Check Quality Assur

Task 169  
Check Software Dev

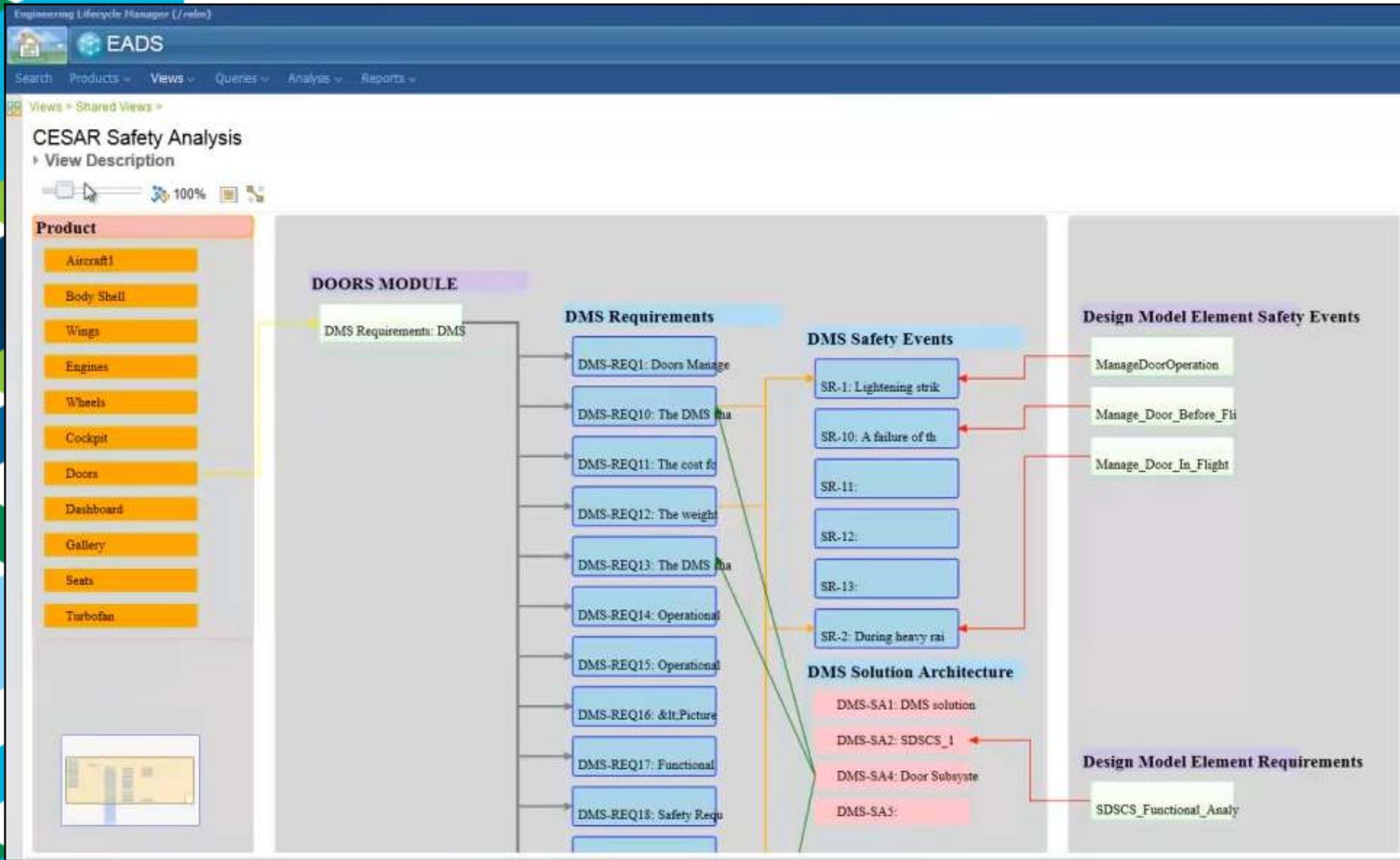
Task 170  
Check Software Ver

Task 171  
Objective A.1.2

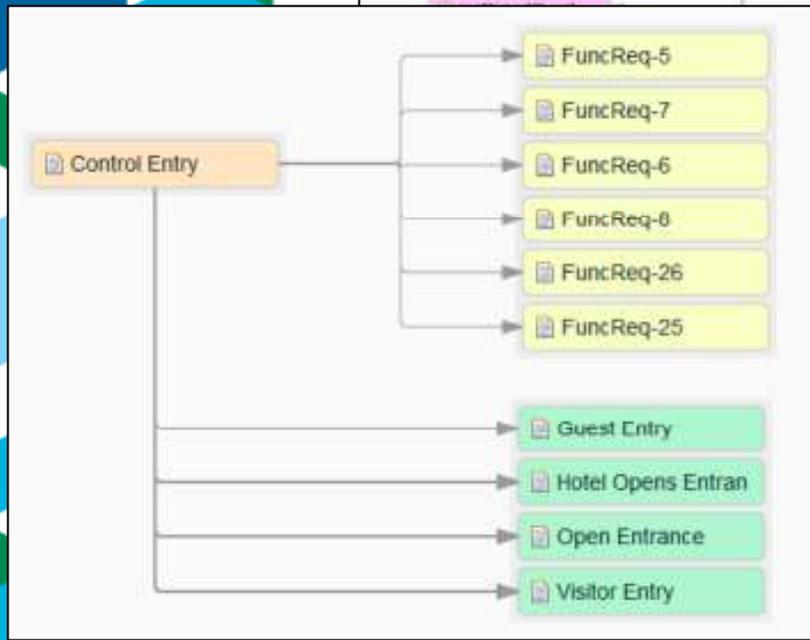
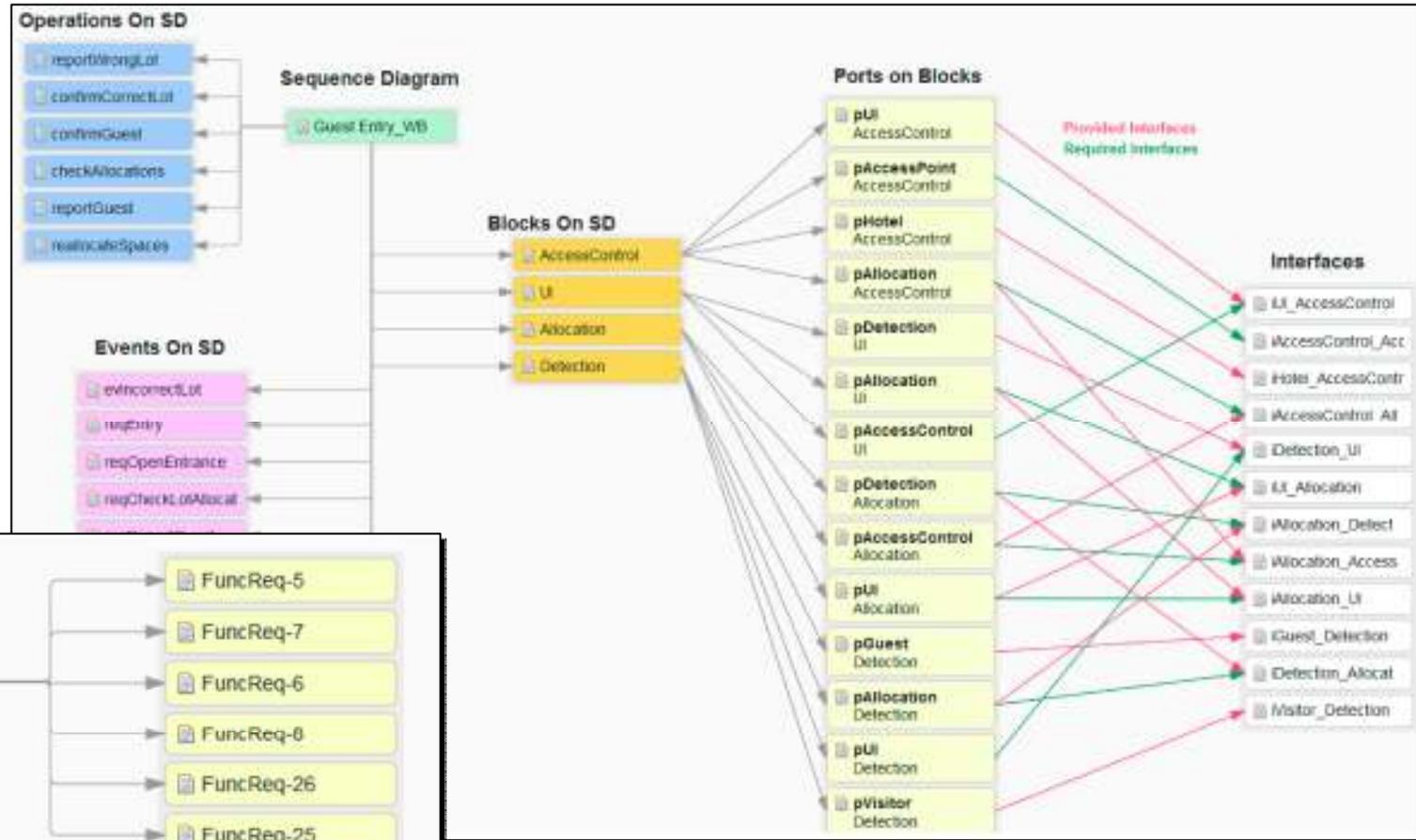
Task 172  
Check compliance t

Task 173  
Tailor the Process

# EADS Safety Critical Systems-Traceability



# RELM Views of a Rhapsody model





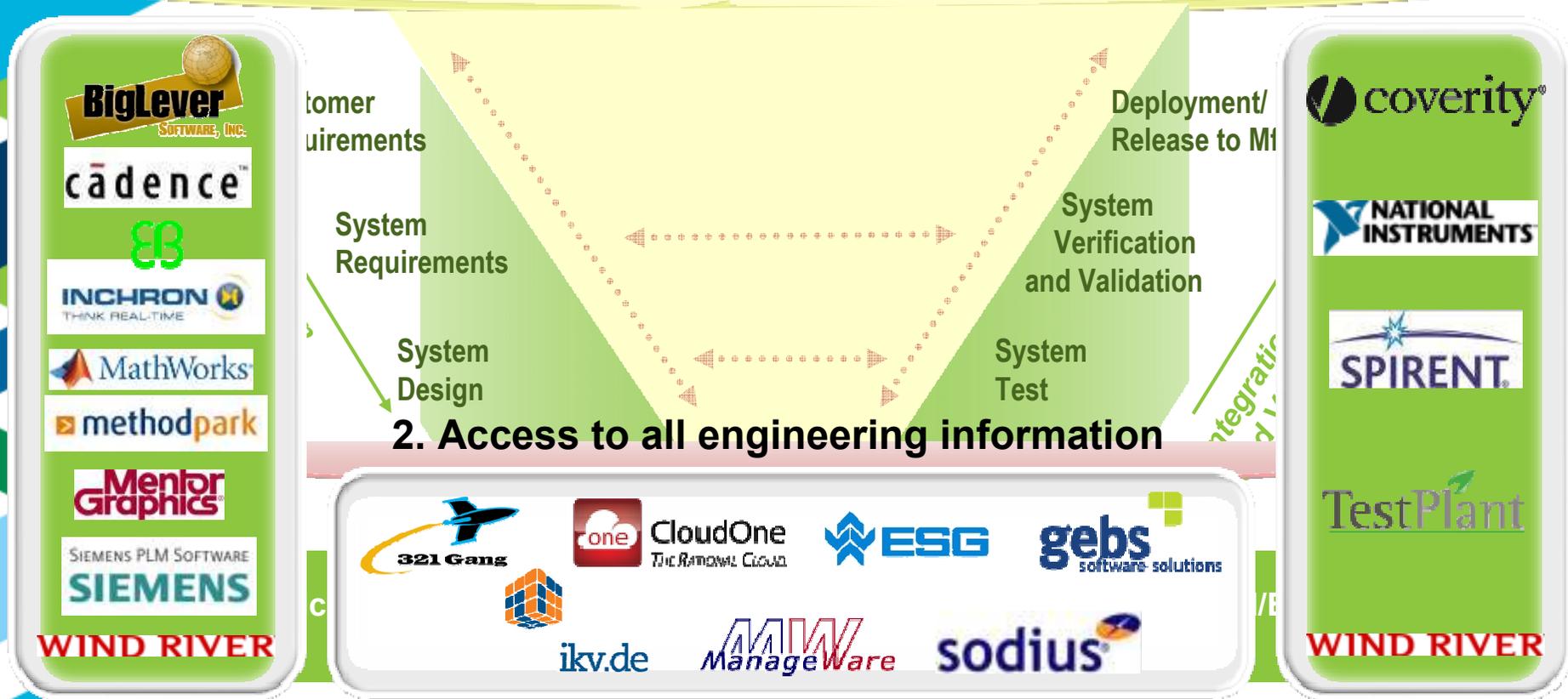
**DEMO**

***Requirement-driven design update & verification***

# Collaboration Across Engineering Disciplines

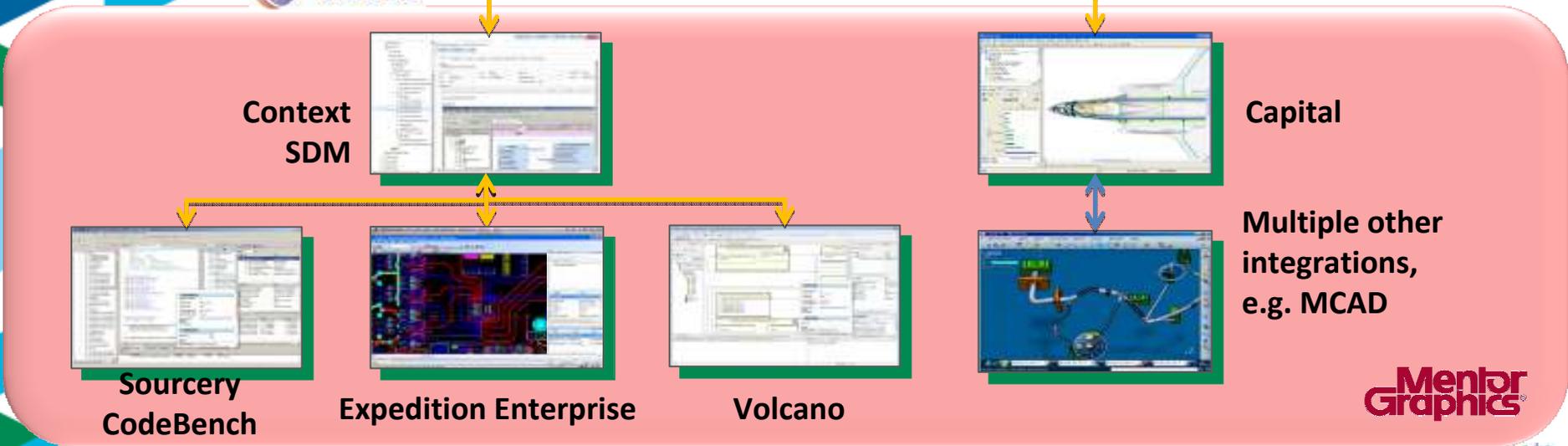
*Extend the collaboration ecosystem*

## 1. Traceability across the lifecycle

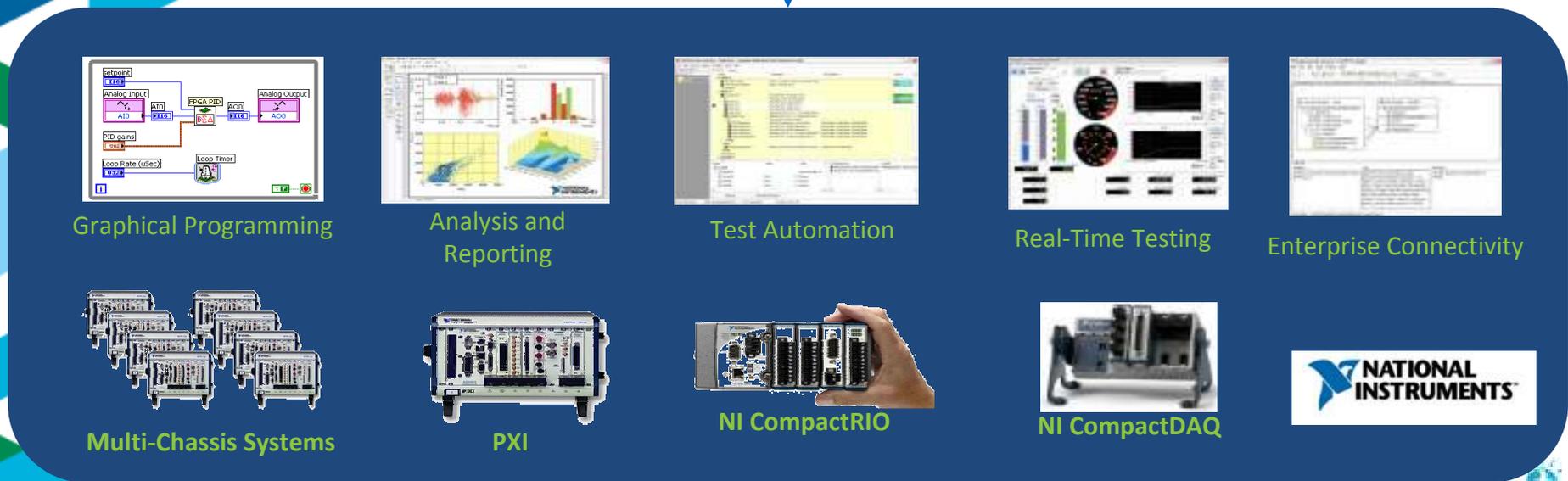


## 3. Collaboration across engineering disciplines

# Connect across systems, software and electrical/electronic engineering



# Connect across product development and test





<http://www.ibm.com/software/fr/rational/>

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