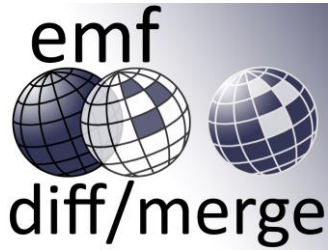


# THALES



## A MERGE ENGINE AND APPLICATIONS FOR MODEL-BASED ENGINEERING



## “Merge” as a primitive operation

■ “Merge” as a primitive operation

■ To realize features for model-based engineering

“Merge” as a primitive operation

To realize features for model-based engineering

Based on  emf  
© ECLIPSE MODELING FRAMEWORK

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## “Merge” as a primitive operation

### To realize features for model-based engineering

Based on  emf  
© ECLIPSE MODELING FRAMEWORK

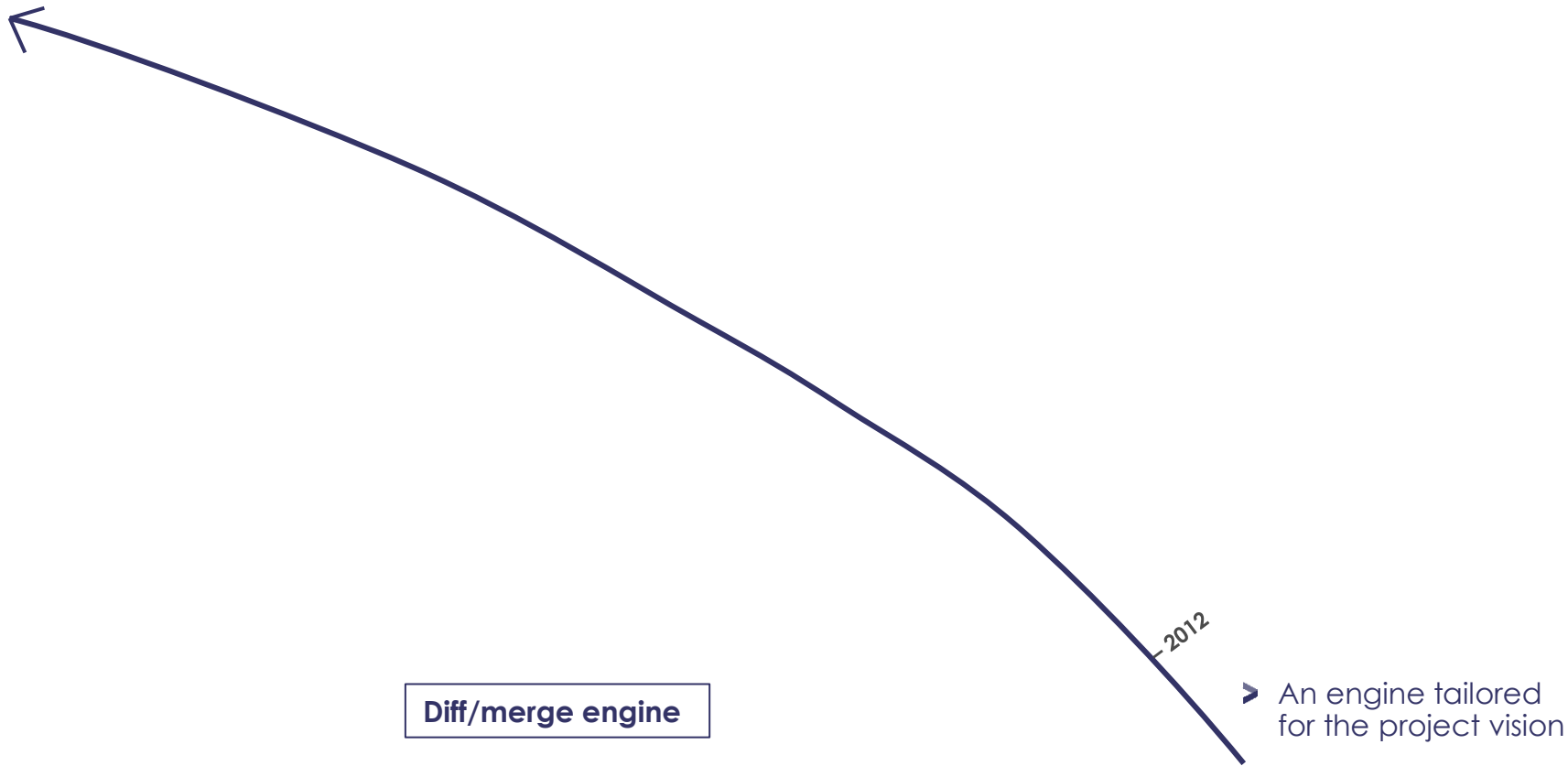
### Especially related to

- Collaboration
- Reuse

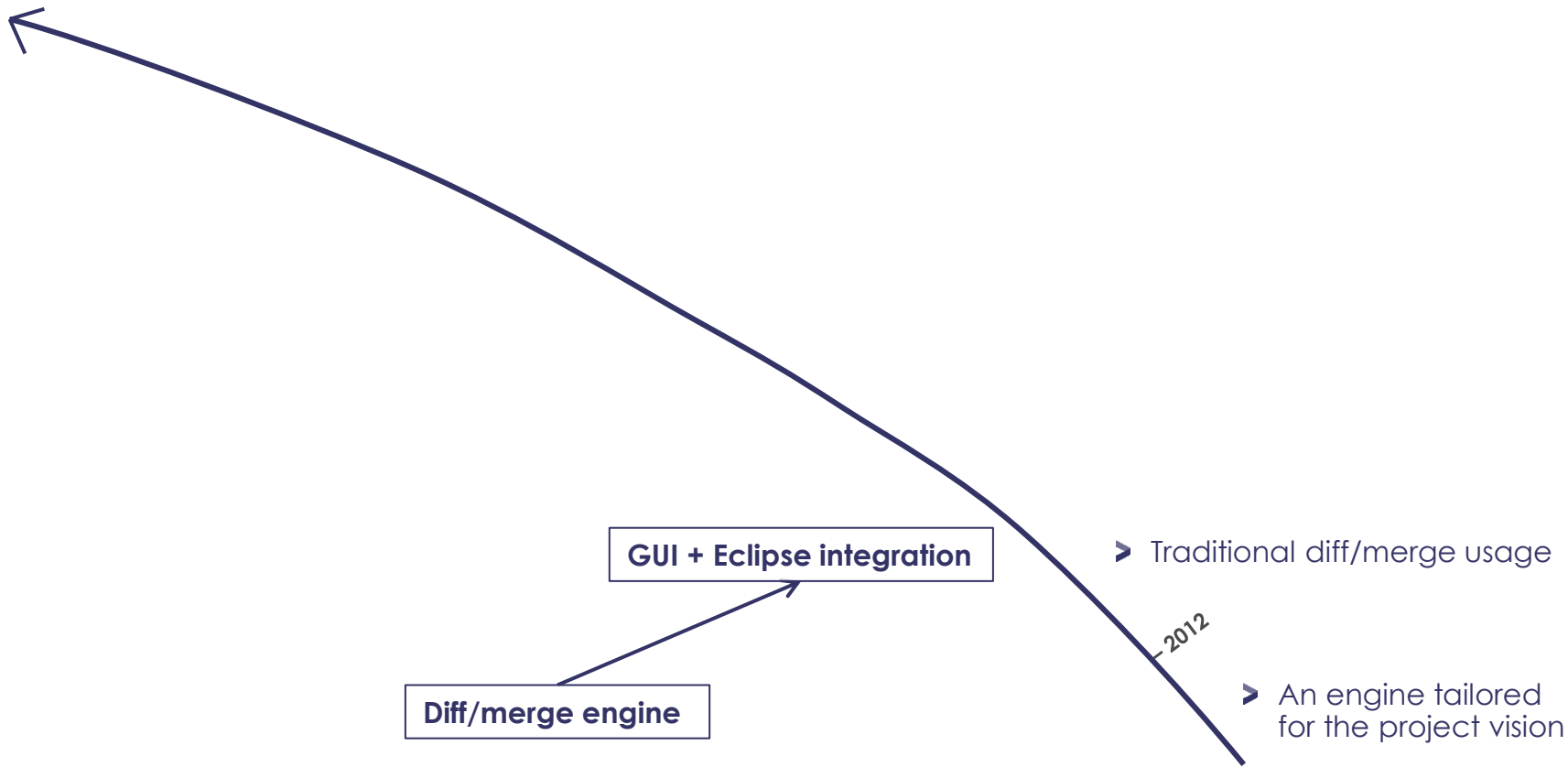
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# Project Contents

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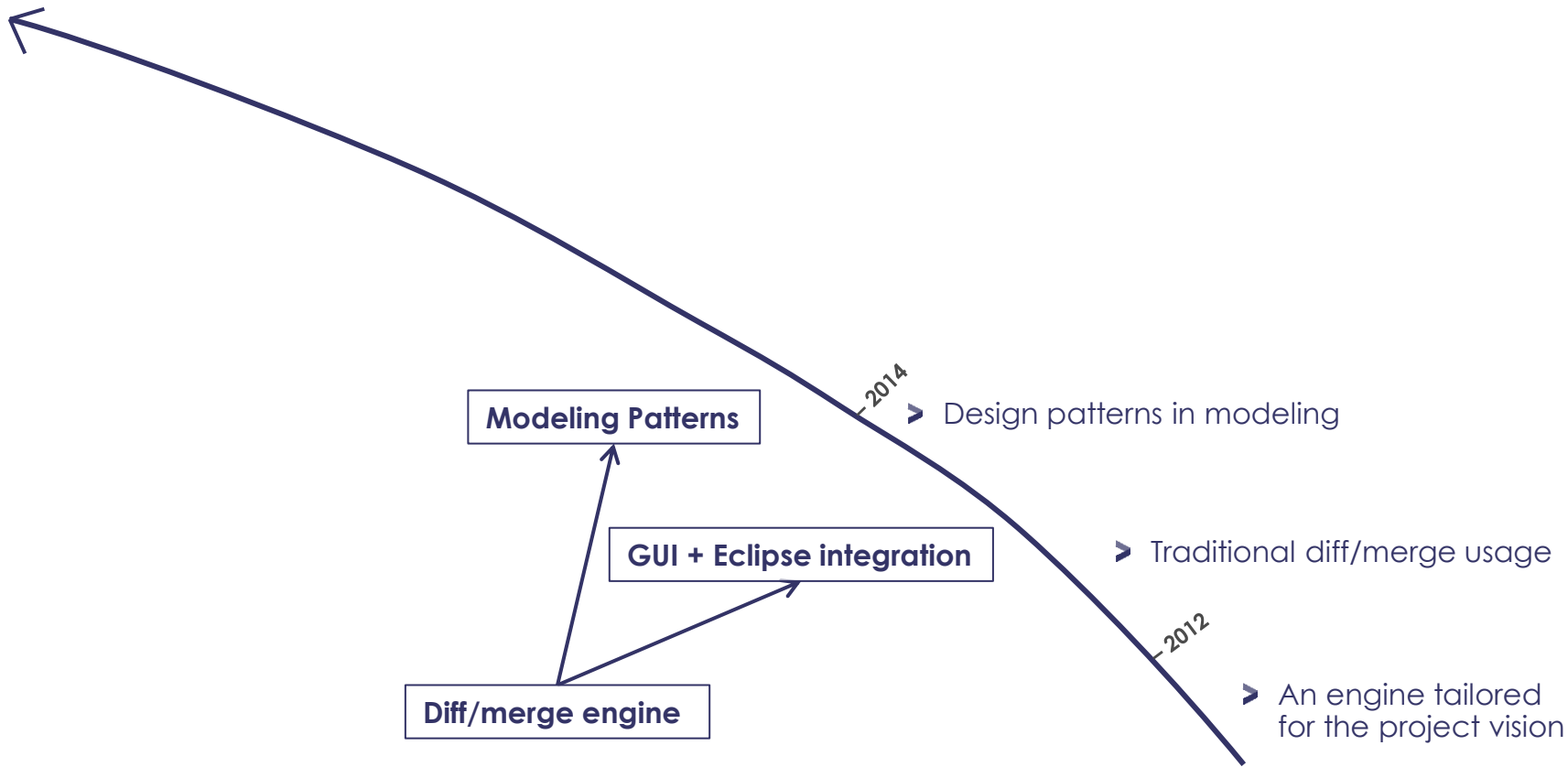


# Project Contents



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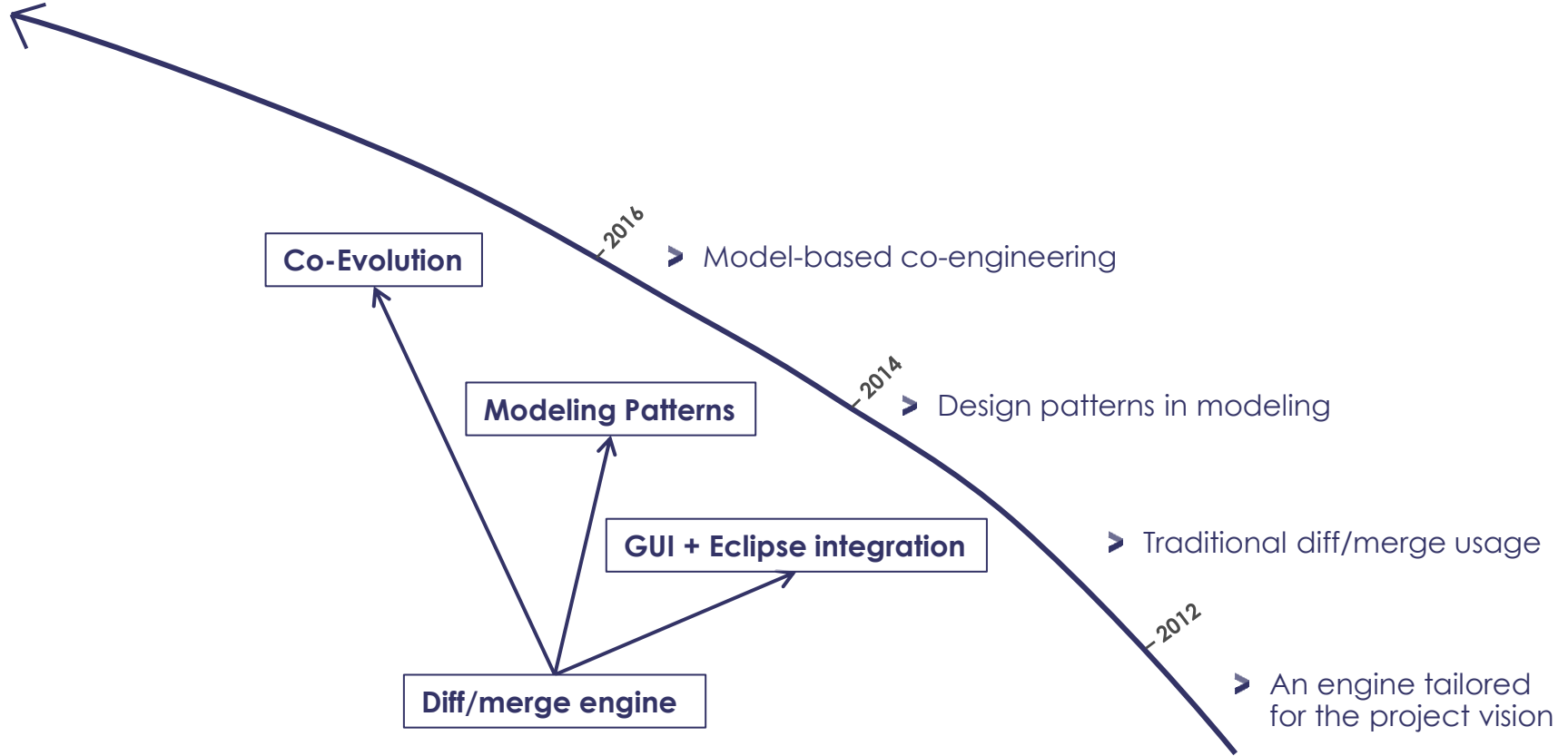
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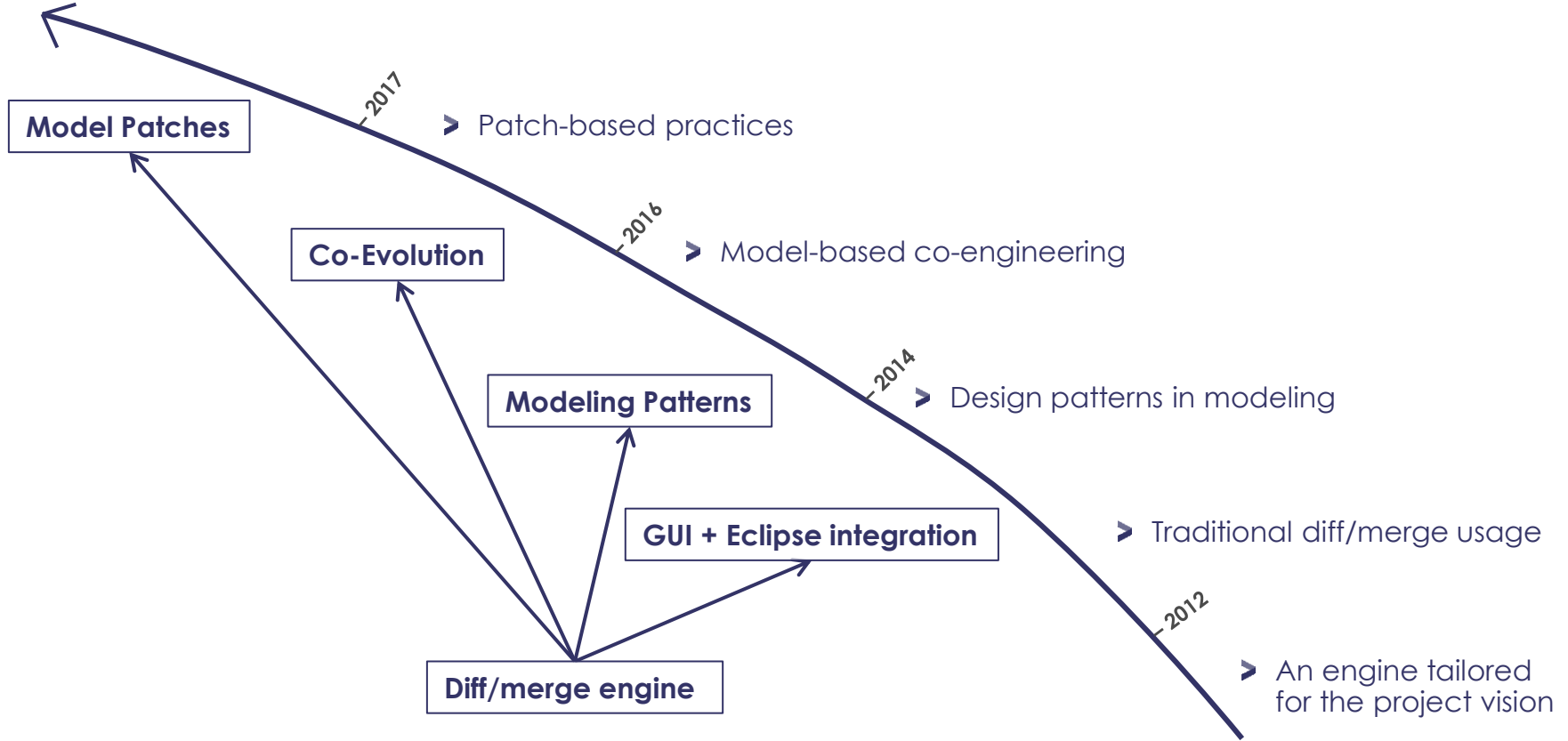


# Project Contents



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# Project Contents

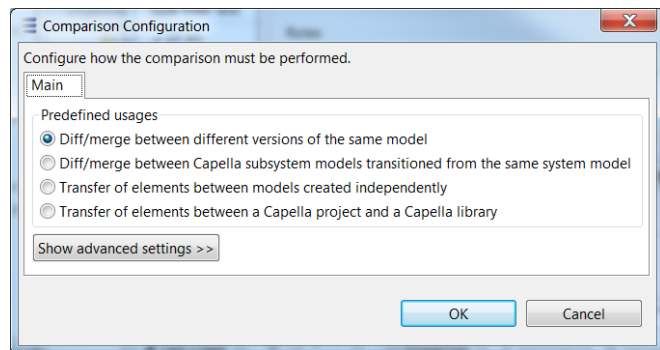


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# 1) GUI + Eclipse Integration

## Predefined use cases

- Version control
- Opportunistic reuse

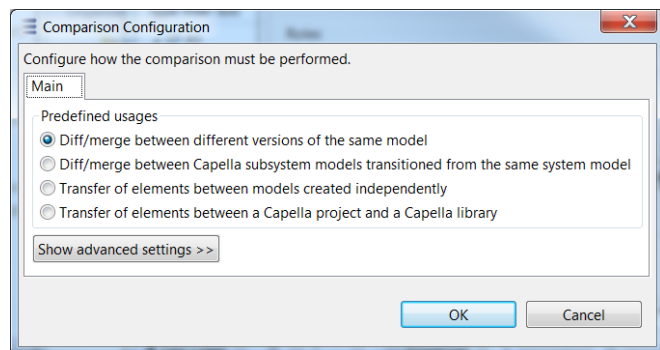


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# 1) GUI + Eclipse Integration

## Predefined use cases

- Version control
- Opportunistic reuse



## Other use cases

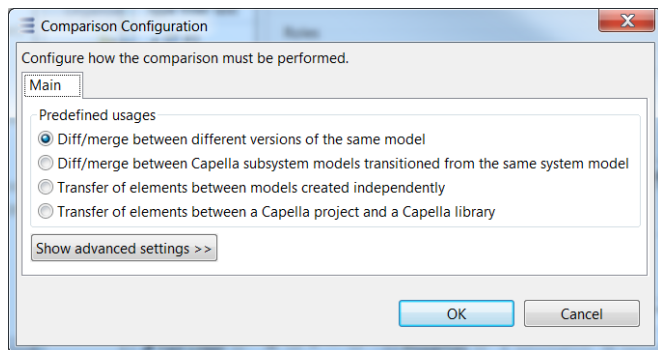
- Advanced configuration
- Extendible per modeling tool

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# 1) GUI + Eclipse Integration

## Predefined use cases

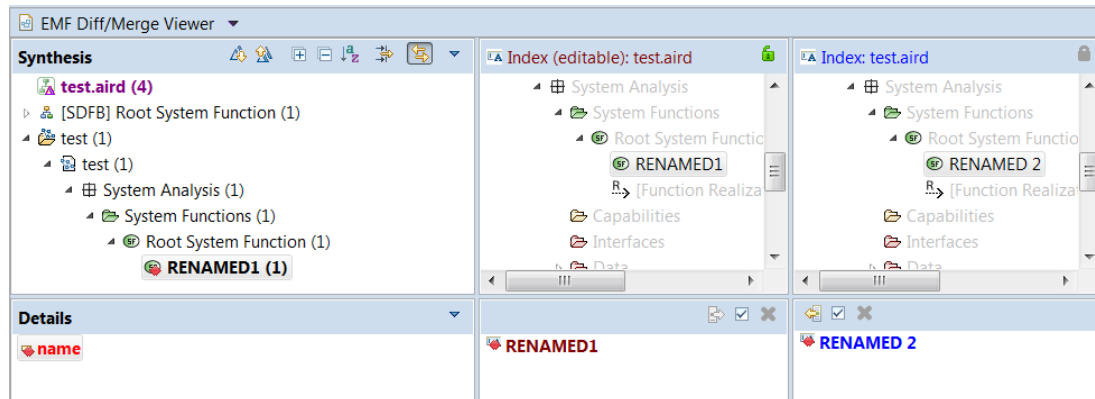
- Version control
- Opportunistic reuse



## Other use cases

- Advanced configuration
- Extendible per modeling tool

## Dedicated GUI

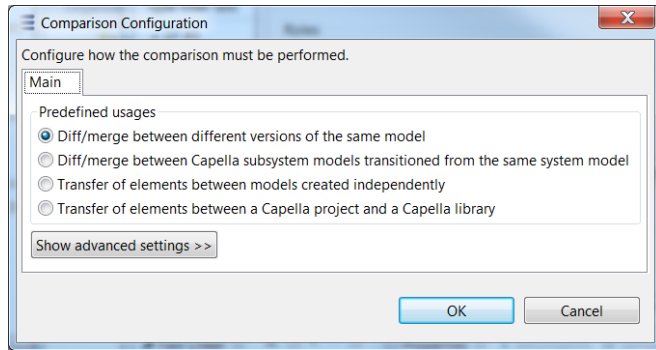


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# 1) GUI + Eclipse Integration

## Predefined use cases

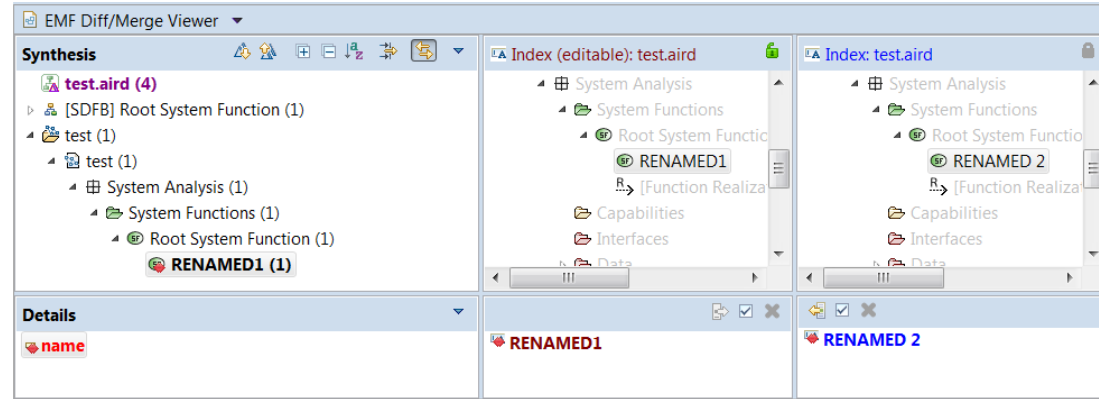
- Version control
- Opportunistic reuse



## Other use cases

- Advanced configuration
- Extendible per modeling tool

## Dedicated GUI



+ Integration with Local history, SVN, Git

Diagrams: extensions for GMF, Sirius

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## 2) Modeling Patterns

### Engineering Patterns

A general solution to a class of  
recurring problems

## 2) Modeling Patterns

### Engineering Patterns

A general solution to a class of  
recurring problems

- Enforce design principles
- Share and disseminate know-how
- ➔ Productivity and design quality

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## 2) Modeling Patterns

### Engineering Patterns

A general solution to a class of  
recurring problems

Model-based  
Engineering

### Modeling Patterns

- Enforce design principles
- Share and disseminate know-how
- ➔ Productivity and design quality

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## 2) Modeling Patterns

### Engineering Patterns

A general solution to a class of  
recurring problems

- Enforce design principles
- Share and disseminate know-how
- ➔ Productivity and design quality

Model-based  
Engineering

### Modeling Patterns

- Formally
- With tool support
- Through Pattern catalogs

# 2) Modeling Patterns

## Pattern creation

The screenshot displays a software interface for creating a pattern. On the left, a signal flow diagram shows the following components and connections:

- Convert Audio** block outputs a **Decoded Audio Stream**.
- The **Decoded Audio Stream** connects to a **Synchronize Audio Video** block.
- The **Synchronize Audio Video** block outputs **Sync Metadata**.
- The **Decoded Audio Stream** and **Sync Metadata** connect to a **Decode Audio Packets** block.
- The **Decode Audio Packets** block outputs **Audio Packets**.
- The **Audio Packets** connect to a **Receive and Bufferize Audio Packets** block.
- The **Receive and Bufferize Audio Packets** block outputs a **Packetized Audio Stream**.
- The **Packetized Audio Stream** connects to a **Play Audio on Seat TV** block.
- A **Split Audio Video Streams** block is also present, receiving input from the **Play Audio on Seat TV** block.

On the right, the **New Pattern** dialog box is open, showing the following details:

- Create new pattern** section: Specify the properties and contents of the new pattern, and how this pattern can be applied in models.
- Properties** tab: Includes fields for **Catalog** (In-Flight Entertainment System), **Name** (Audio Conversion), **Version** (1.0), **Environments** (Capella 1.2.x), and **Authors** (T0131040).
- Image** section: A preview of the signal flow diagram is shown, with the  **Image** checkbox selected.
- Include layout and style** section: The  **Include layout and style** checkbox is selected, with a **Use template...** button below it.
- Buttons**: **Finish** and **Cancel** buttons are located at the bottom right.

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# 2) Modeling Patterns

## Pattern creation

**Create new pattern**

Specify the properties and contents of the new pattern, and how this pattern can be applied in models.

Properties: Content | Advanced

Catalog: In-Flight Entertainment System [Open... Close New...]

Name: Audio Conversion

Version: 1.0

Environments: Capella 1.2.x

Authors: T0131040

Description:

Image:

Include layout and style

Use template...

Finish

**Pattern Instance Management**

Select a pattern instance and actions to perform on it. Element initially selected: 'Synchronize Audio Video'.

Instance of	Role played
Audio Conversion (v1.0)	PhysicalFunctions

Life-cycle

Fold  Show unfolded elements

Rename  Keep user names \$Name\$

Delete

Synchronization

Features to Exclude

Name  Description  Summary

Check Conformity:  Show details

Update instance  Show additions  Destructive

Update pattern

Representation

Show Status:

Reuse layout

Highlight  Nodes  Ports  Edges

Reset  Reuse style

Close

**Pattern application & reuse,  
Instance management,  
Conformance checking**

# 2) Modeling Patterns

Catalog browsing, Pattern/Instance update

## Pattern creation

The 'New Pattern' dialog is shown with the following details:

- Create new pattern**  
Specify the properties and contents of the new pattern, and how this pattern can be applied in models.
- Properties** (Content | Advanced)
  - Catalog: In-Flight Entertainment System
  - Name: Audio Conversion
  - Version: 1.0
  - Environments: Capella 1.2.x
  - Authors: T0131040
  - Description:
- Image:
- Include layout and style
- Use template...
- Finish

The background diagram shows a flow: Split Audio Video Streams -> Packetized Audio Stream -> Play Audio on Seat TV. Another path: Convert Audio -> Decoded Audio Stream -> Decode Audio Packets -> Receive and Bufferize Audio Packets -> Synchronize Audio Video -> Sync Metadata -> Decode Audio Packets.

Pattern Instance Explorer | Properties | Information | Semantic Browser

### Pattern Instances in In-FlightES.melodymodeller

- SharedCatalog [In-Flight Entertainment System/SharedCatalog.patterns]
  - Audio Conversion
    - Instance v1.0 (Convert Audio, ...)
    - Instance v1.0 (Play Audio, ...)
      - Audio Packets
        - Audio-Video Stream Header
        - Convert Audio
        - Decode Audio Packets
        - Decoded Audio Stream [Decode Audio Packets -> Convert Audio]
        - Play Audio

Pattern application & reuse,  
Instance management,  
Conformance checking

Pattern Instance Management

Select a pattern instance and actions to perform on it. Element initially selected: 'Synchronize Audio Video'.

Instance of	Role played
Audio Conversion (v1.0)	PhysicalFunctions

Life-cycle

- Fold  Show unfolded elements
- Rename  Keep user names \$name\$
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Synchronization

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- Name  Description  Summary

Check Conformity:  Show details

Update instance  Show additions  Destructive

Update pattern

Representation

Show Status:

Reuse layout

Highlight  Nodes  Ports  Edges

Reset  Reuse style

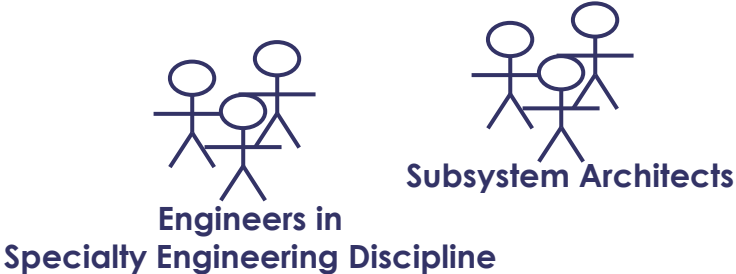
Close

The background diagram shows a pattern instance with nodes: Play Audio, Convert Audio, Synchronize Audio Video, Decode Audio Packets, and Provide Lower-Quality Audio Packets. Connections include: Convert Audio -> Decoded Audio Stream -> Decode Audio Packets; Synchronize Audio Video -> Sync Metadata -> Decode Audio Packets; Decode Audio Packets -> FunctionalExchange S -> Provide Lower-Quality Audio Packets.

# 3) Model-Based Co-Engineering

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System model(s)

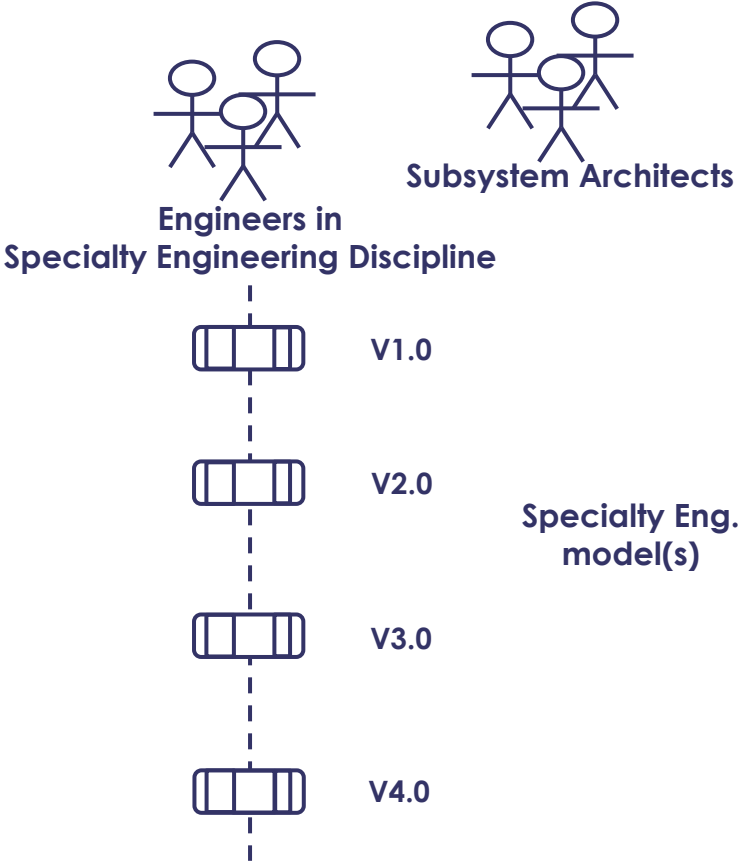
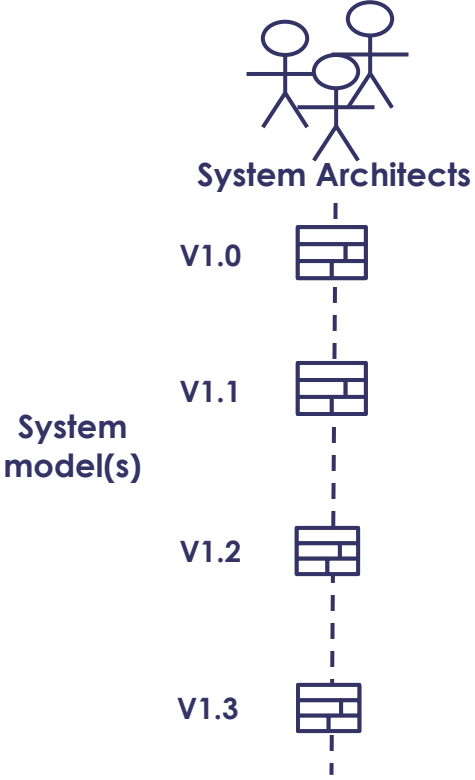


Specialty Eng. model(s)

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# 3) Model-Based Co-Engineering

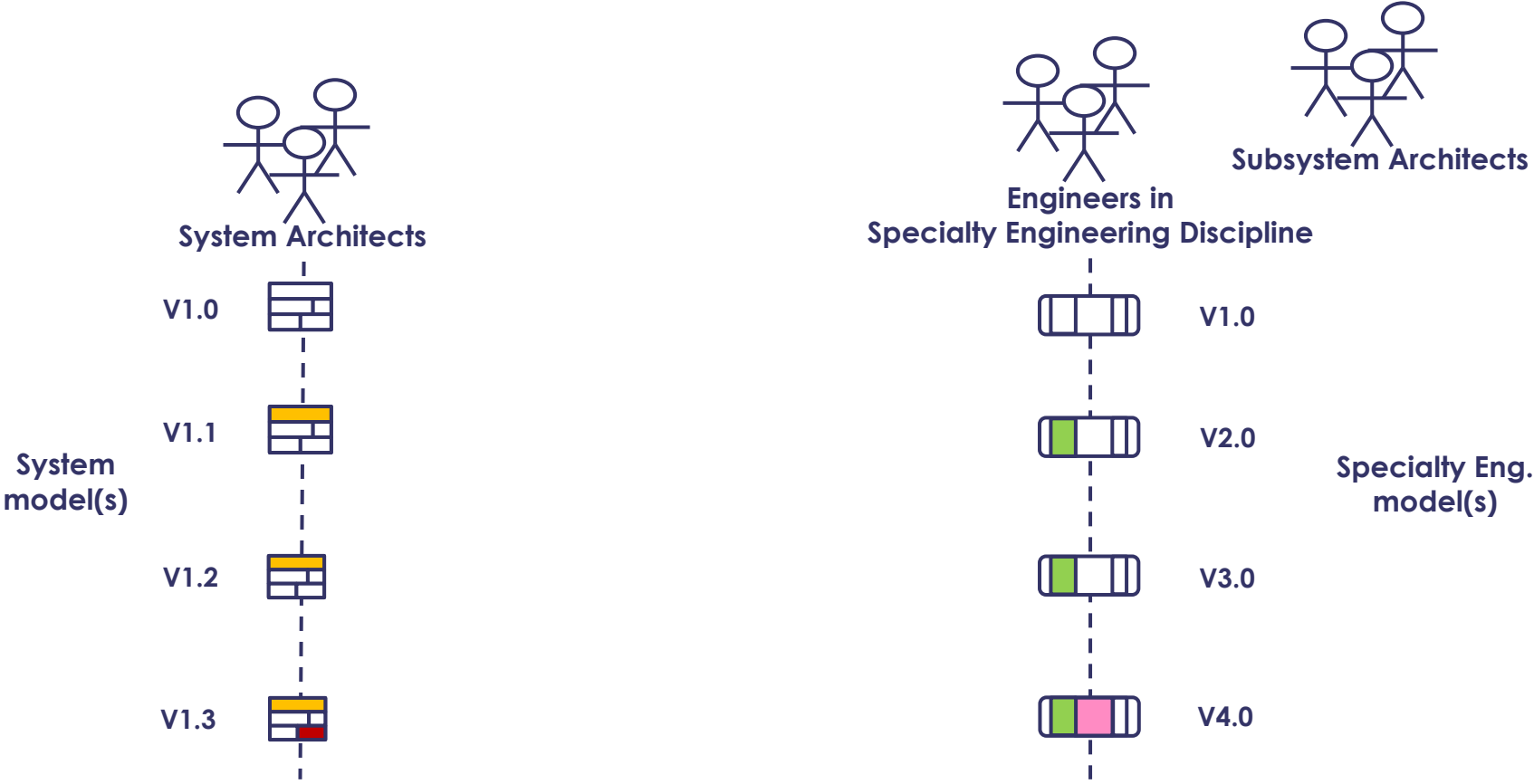
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# 3) Model-Based Co-Engineering

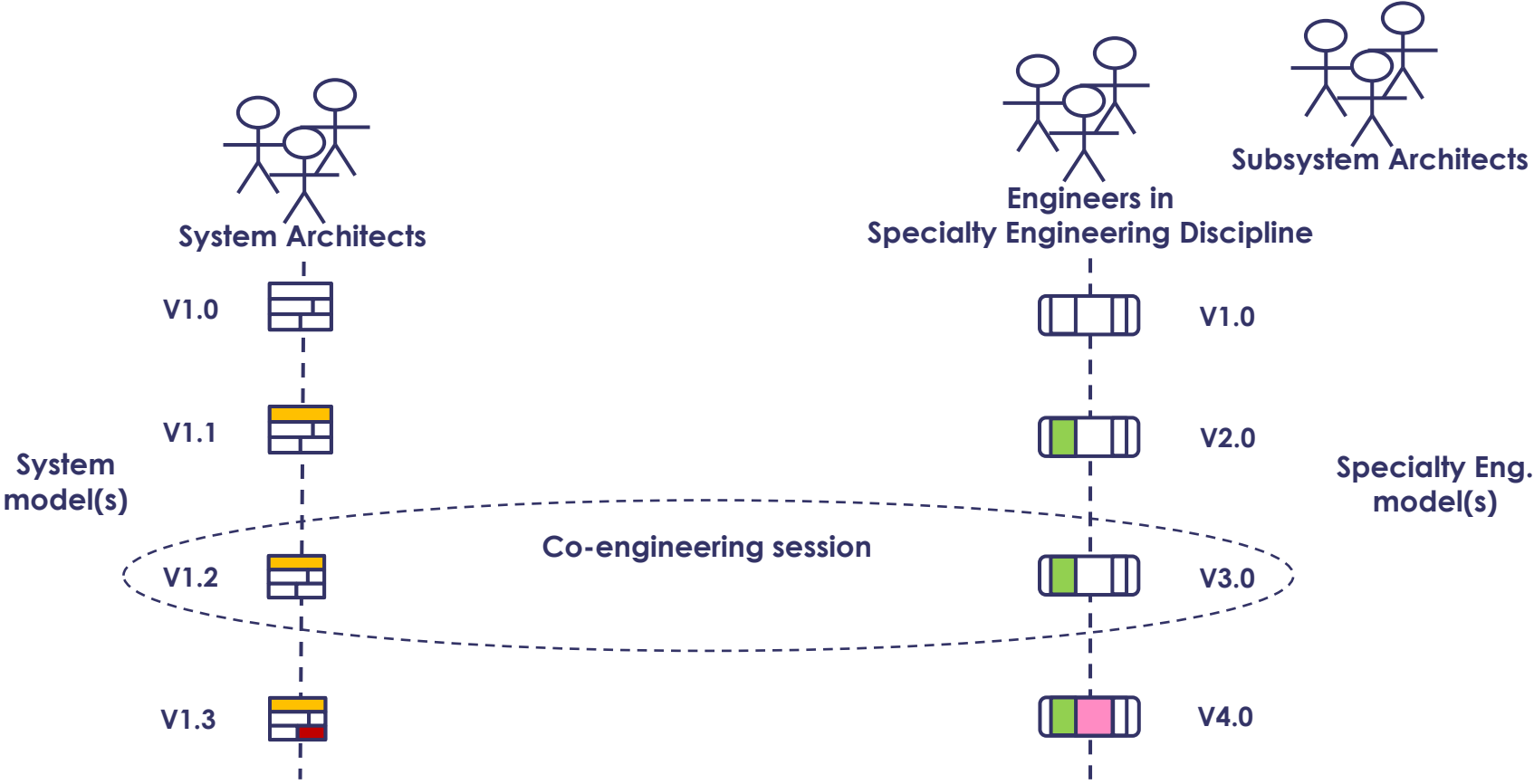
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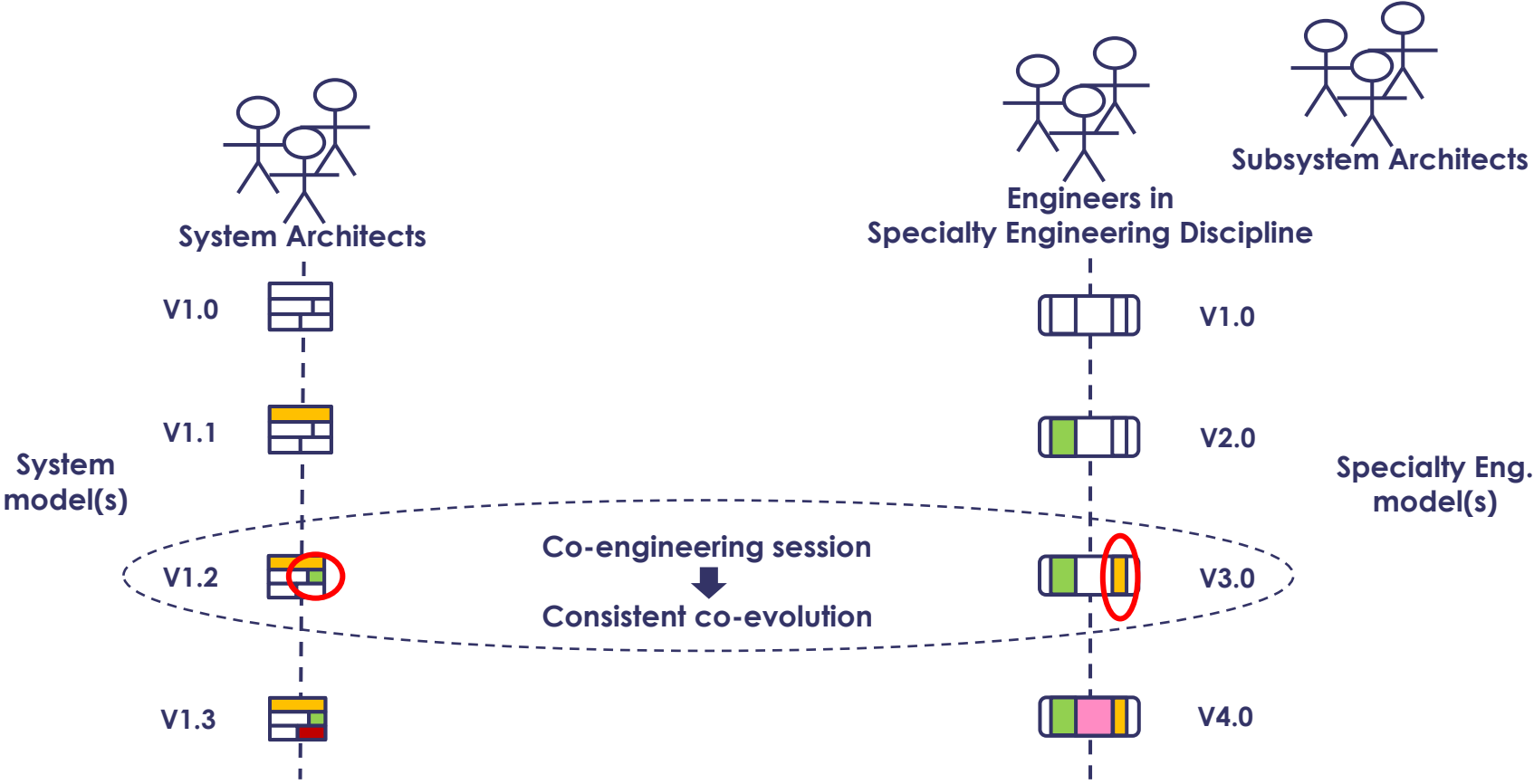


# 3) Model-Based Co-Engineering



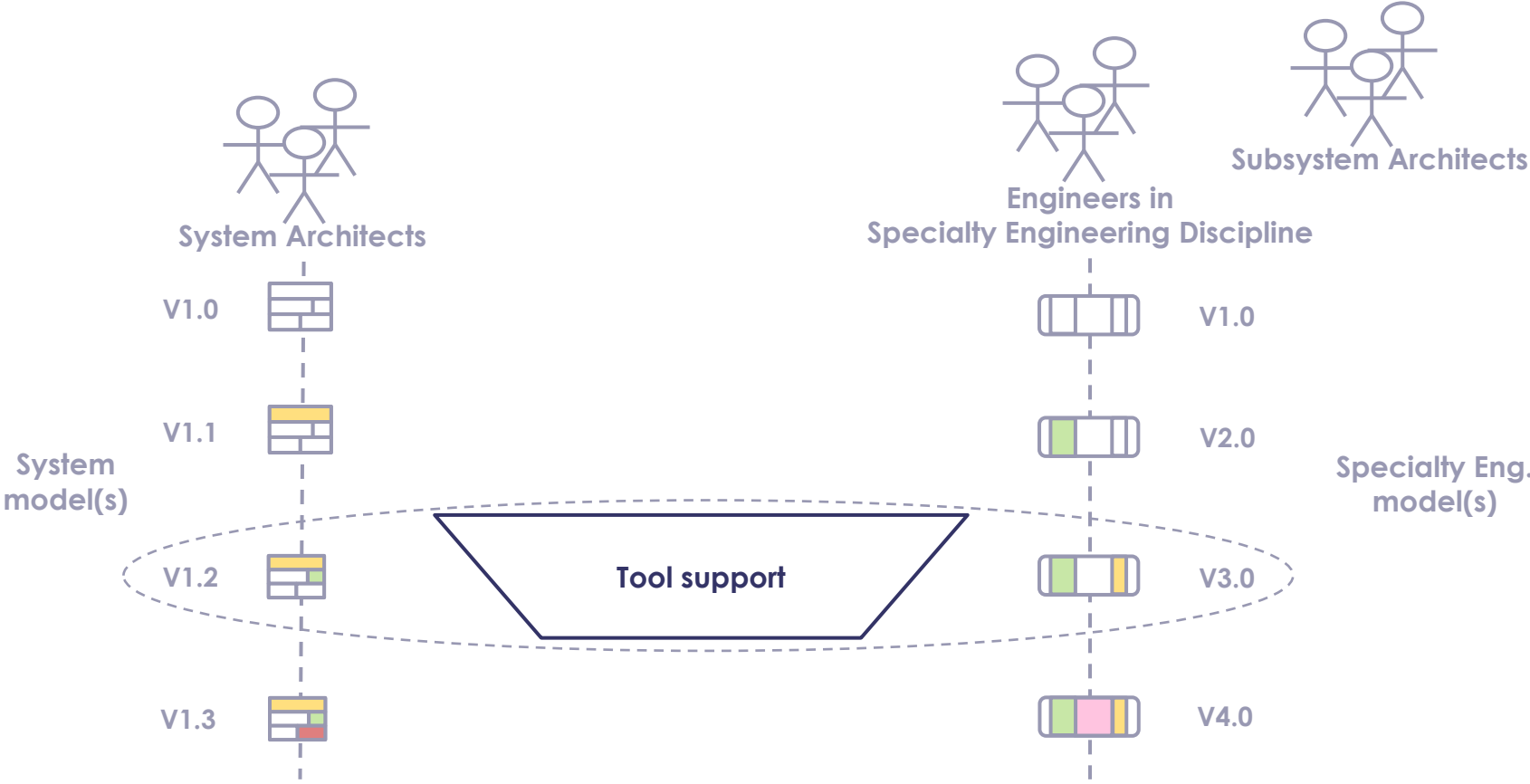
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# 3) Model-Based Co-Engineering



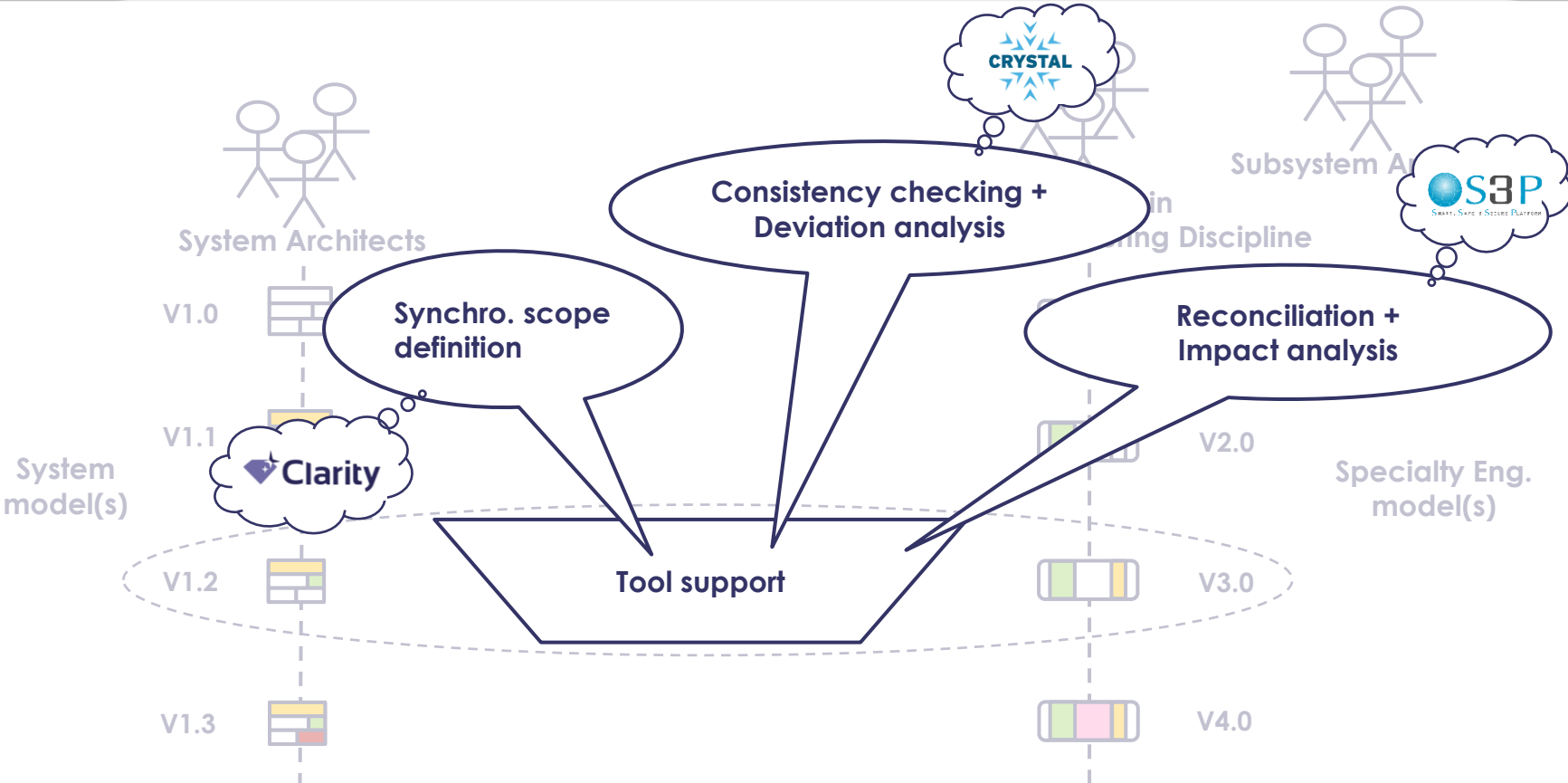
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# 3) Model-Based Co-Engineering



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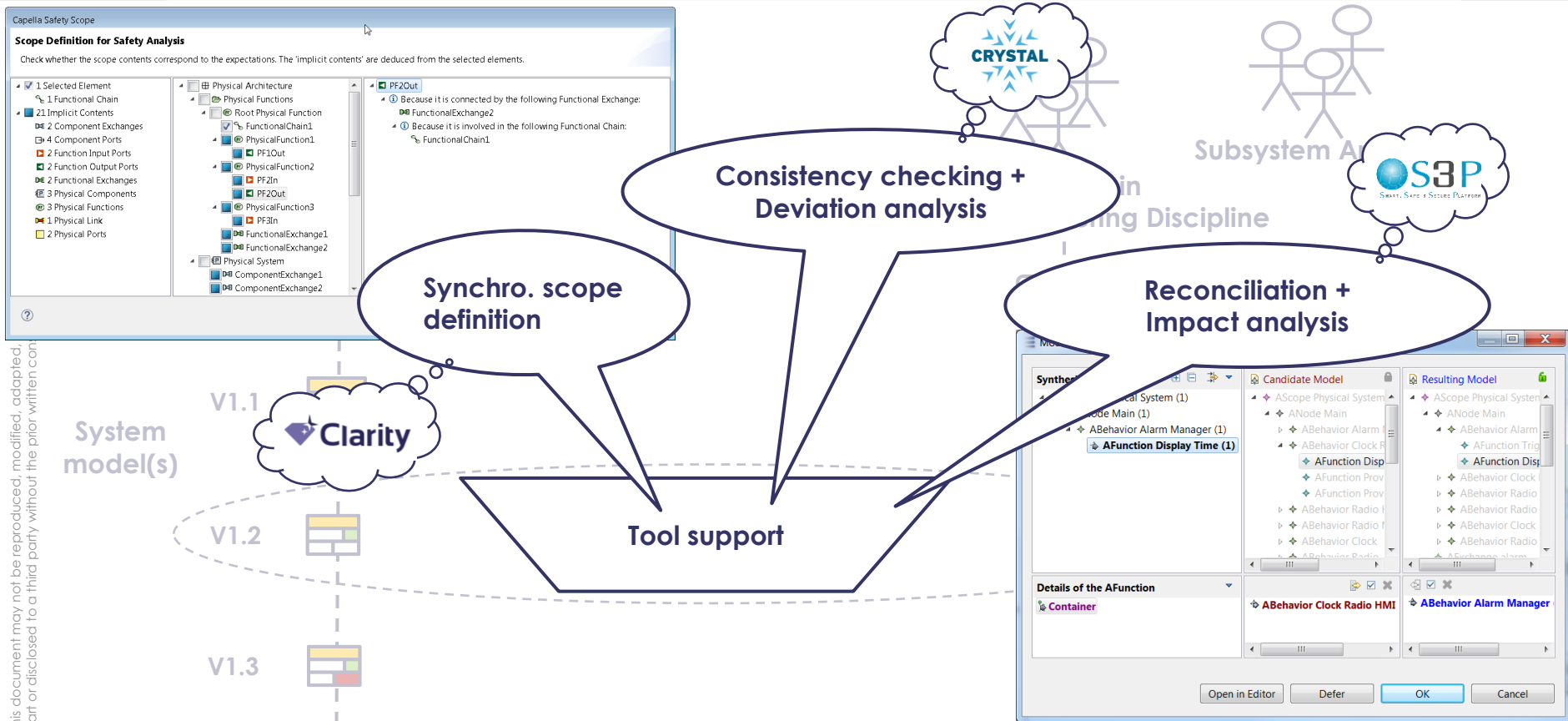
# 3) Model-Based Co-Engineering



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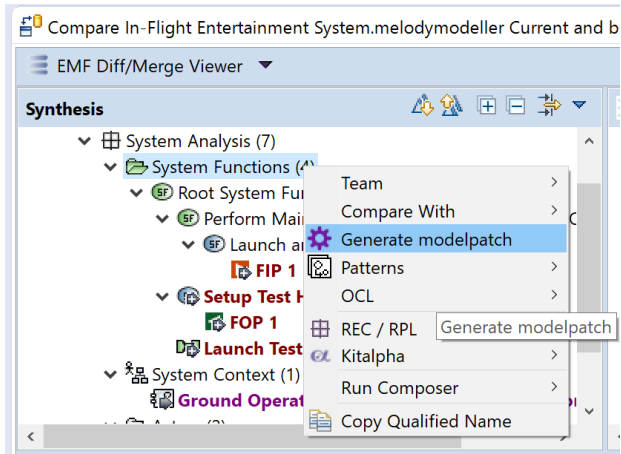
# 3) Model-Based Co-Engineering

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# 4) Model Patches

## Compare models → Generate patch

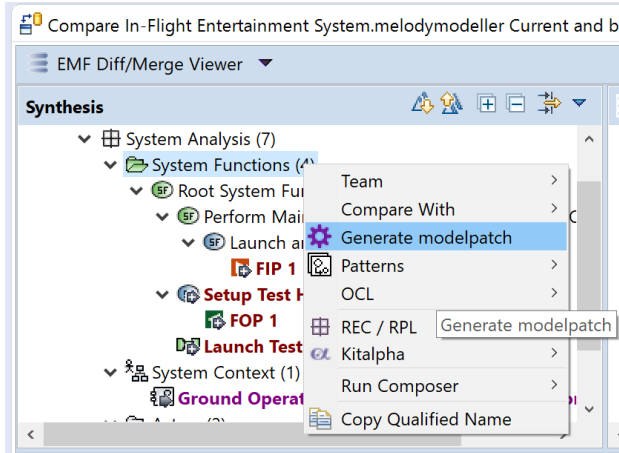


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# 4) Model Patches

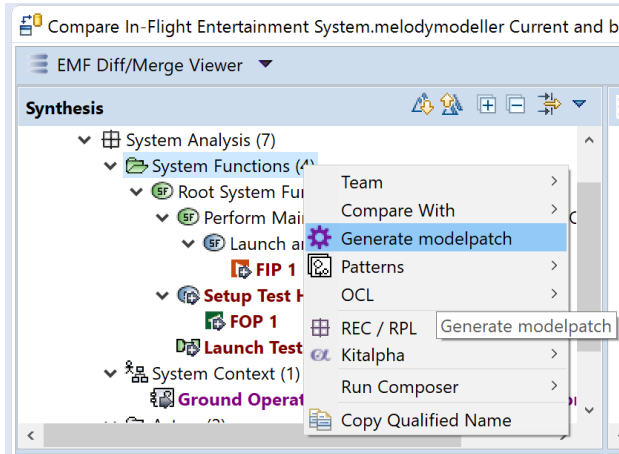
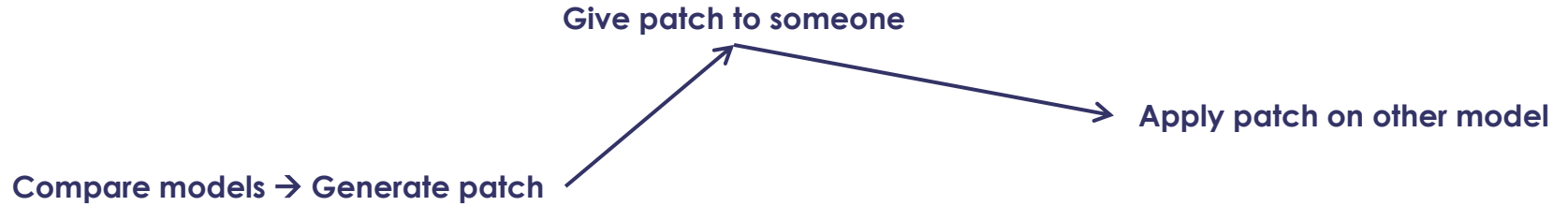
Give patch to someone

Compare models → Generate patch



# 4) Model Patches

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Ref number- date

Name of the company/ Template : 87204467-DOC-GRP-EN-002





# 4) Model Patches

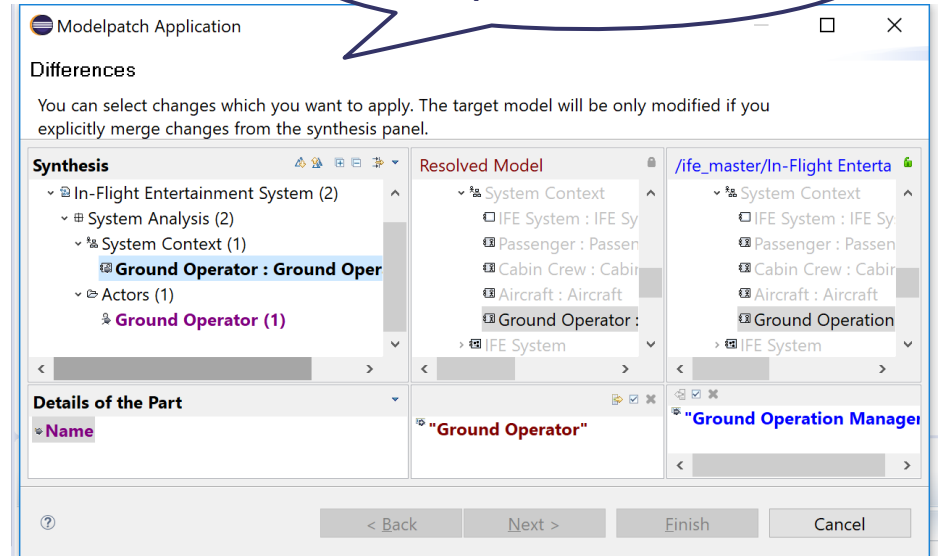
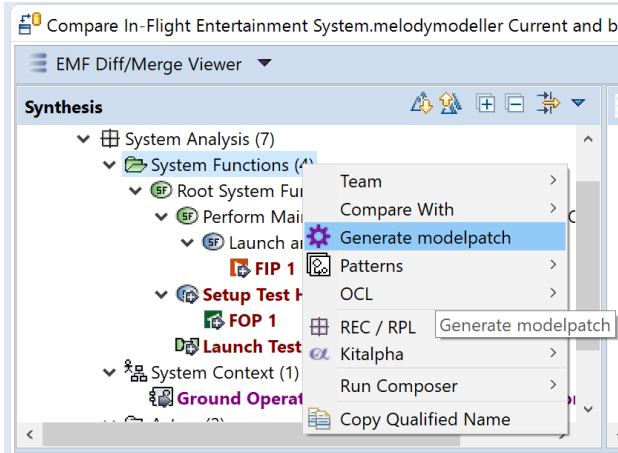
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Compare models → Generate patch

Give patch to someone

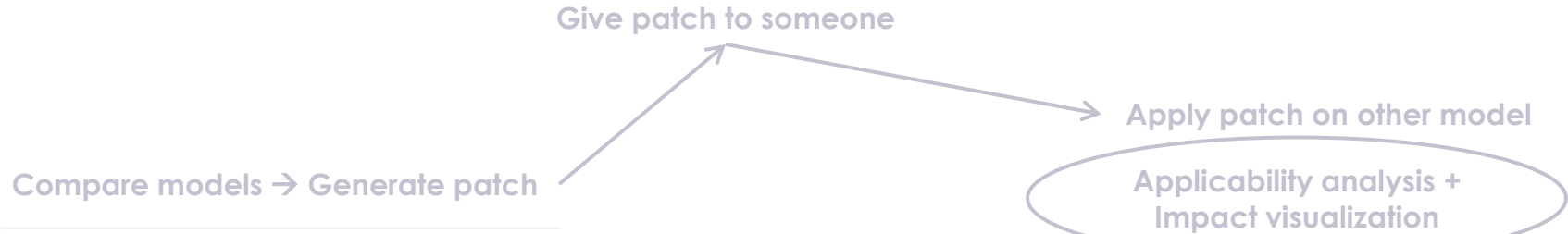
Apply patch on other model

Applicability analysis +  
Impact visualization



# 4) Model Patches

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**May happen in very different situations and contexts**

Resolved Model	/ife_master/In-Flight Enterta
System Context	System Context
IFE System : IFE Sy	IFE System : IFE Sy
Passenger : Passen	Passenger : Passen
Cabin Crew : Cabin	Cabin Crew : Cabin
Aircraft : Aircraft	Aircraft : Aircraft
Ground Operator :	Ground Operation
IFE System	IFE System

Details of the Part

Name
"Ground Operator"
"Ground Operation Manager"

Buttons: < Back, Next >, Finish, Cancel

# Known Ecosystem

CoFluent™ Studio

 **Capella**

 Safety Architect

 MaTeLo

## Products

## Organizations

 **intel**  
Software

**THALES**

**ALL4TEC**

**Atos**

  
Inc**Query**Labs<sup>Ltd</sup>

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**THALES**

# Known Ecosystem

CoFluent™ Studio

 **Capella**

 Safety Architect

 MaTeLo

## Products

## Organizations

  
Software

+ Eclipse community:  
“Most Innovative New Eclipse Project or Feature” award  
@EclipseCon World 2013

L4TEC

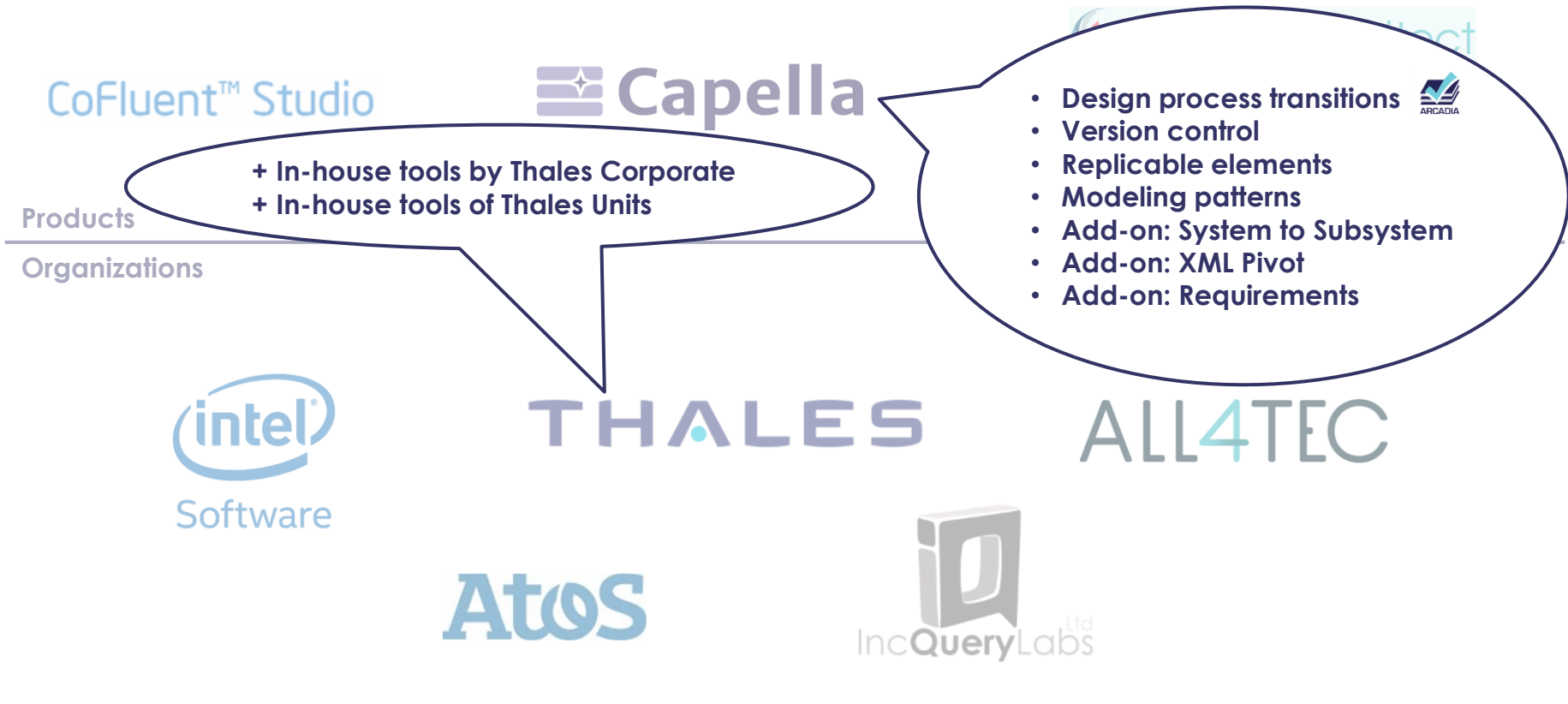
**Atos**

  
IncQuery Labs Ltd

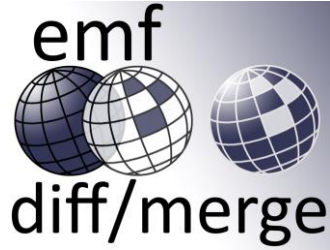
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# Known Ecosystem – Thales Perspective



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▶ [http://wiki.eclipse.org/EMF\\_DiffMerge](http://wiki.eclipse.org/EMF_DiffMerge)

- ▶ Forum
- ▶ Bug tracking
- ▶ Download
- ▶ Misc. information

▶ **Main contact:** olivier . constant @ thalesgroup . com

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# Log of changes and approval

## Log of changes

Revisions	Description	Date
001	Initial version	2017 10 19
002	Slightly updated version	2017 10 24

## Approval

Actors	Name and role	Signature	Date
Written by	Olivier CONSTANT, Thales Corporate Engineering		2017 10 19
Verified by			
Approved by			