MBSE-MBD Integration : Improving Efficiency for Co-creation

Panasonic AUTOMOTIVE

Benefits

Accelerate the Specification Agreements between the OEM and Supplier

- Identify and resolve requirement and specification issues early through simulation validation.

- Enhance estimate accuracy and reduce time by converting system specification into model assets.

- Enable agile feedback on the impact of requirement changes by improving traceability.

Before

Document review alone may lead to omissions.

Requirement spec

Alignment by Q&A

Misinterpretations emerge later.

Not utilizing design assets efficiently.

OEM

Supplier

After

Early simulation cuts feedback time.

Requirement spec

Simulation validation

Make model asset reduce review time.

OEM

PAS*

Quickly achieve specification confirmation and agreement.
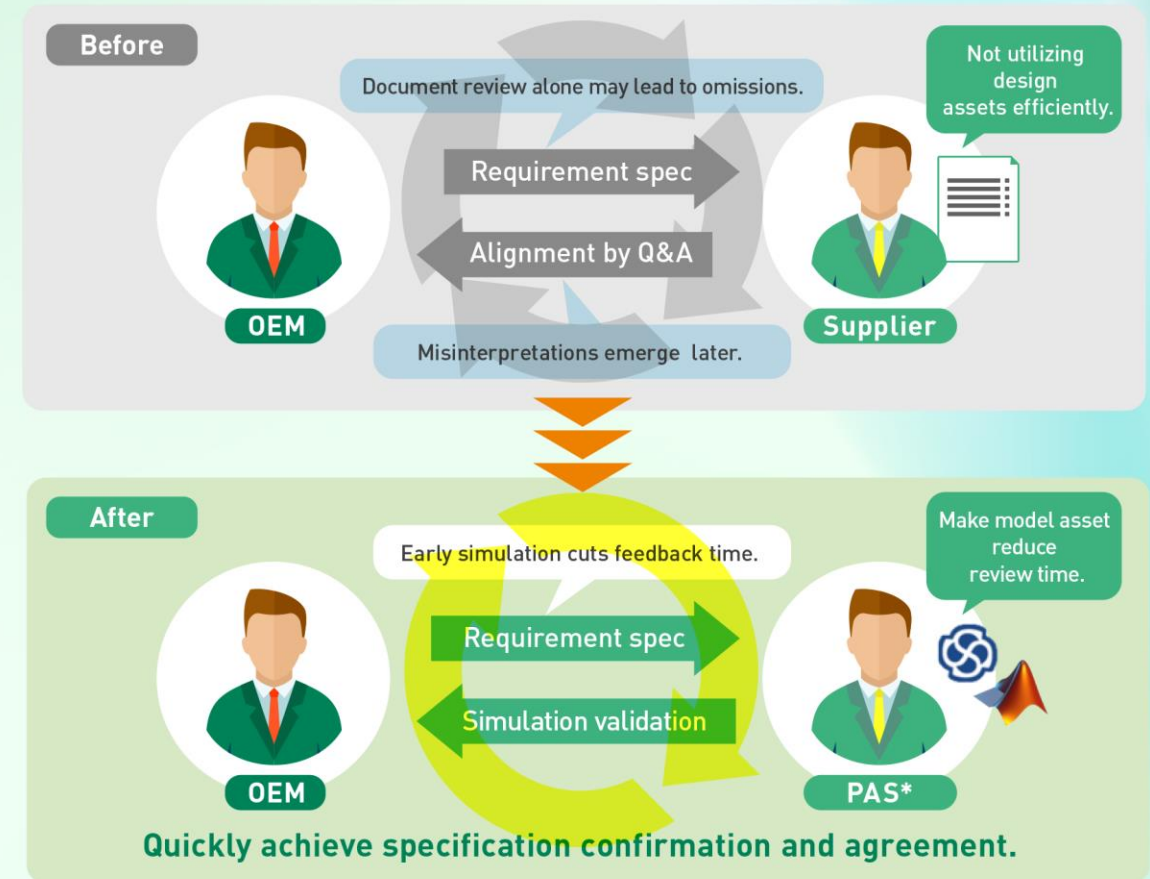
*PAS:Panasonic Automotive Systems Co., Ltd.

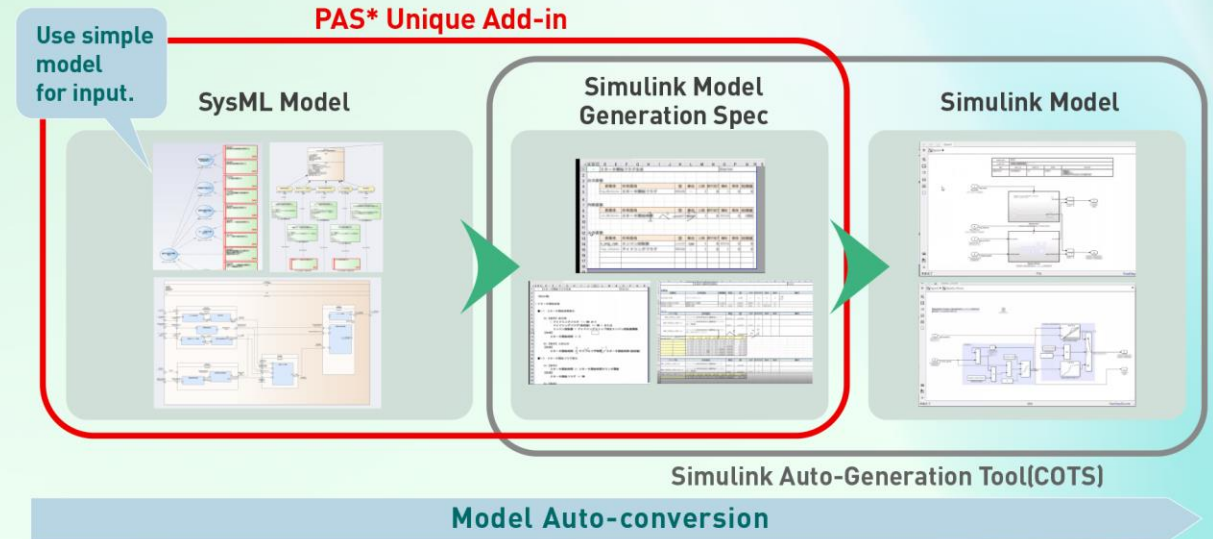# MBSE-MBD Integration : Improving Efficiency for Co-creation

Technical Advantages

Build Efficient MBSE-MBD Model Auto-conversion Flow

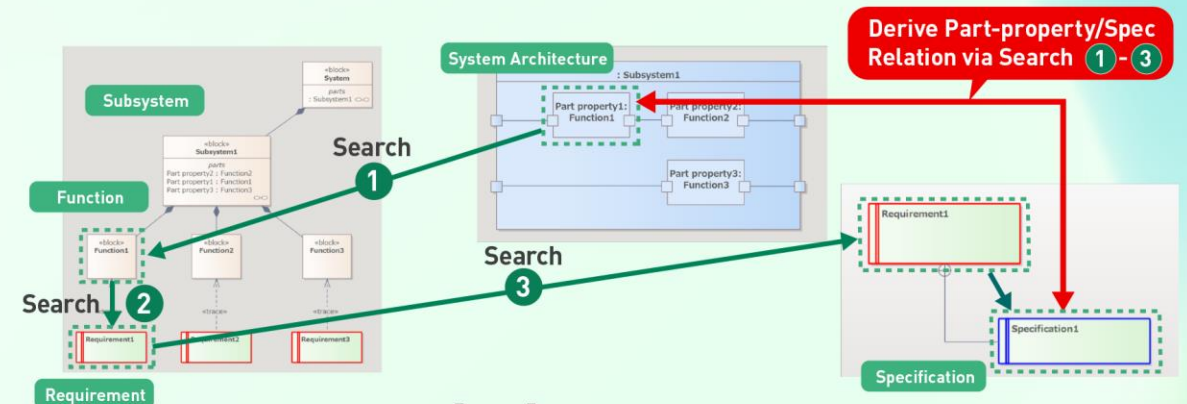Generate Simulink models from simple SysML models without extra steps. 【Fig.1】

Automate model conversion by combining commercial tools and unique algorithm. 【Fig.1】

Use a unique algorithm to find the design information needed for model conversion efficiently. 【Fig.2】

PAS* Unique Add-in

Use simple model for input.

SysML Model

Simulink Model Generation Spec

Simulink Model

Simulink Auto-Generation Tool(COTS)

Model Auto-conversion

*PAS:Panasonic Automotive Systems Co., Ltd.

【Fig.1】Model Auto-Conversion Flow

Derive Part-property/Spec Relation via Search ❶ - ❸

System Architecture

Subsystem

Function

Search ❶

Search ❷

Search ❸

Requirement

Specification

【Fig.2】Unique Algorithm

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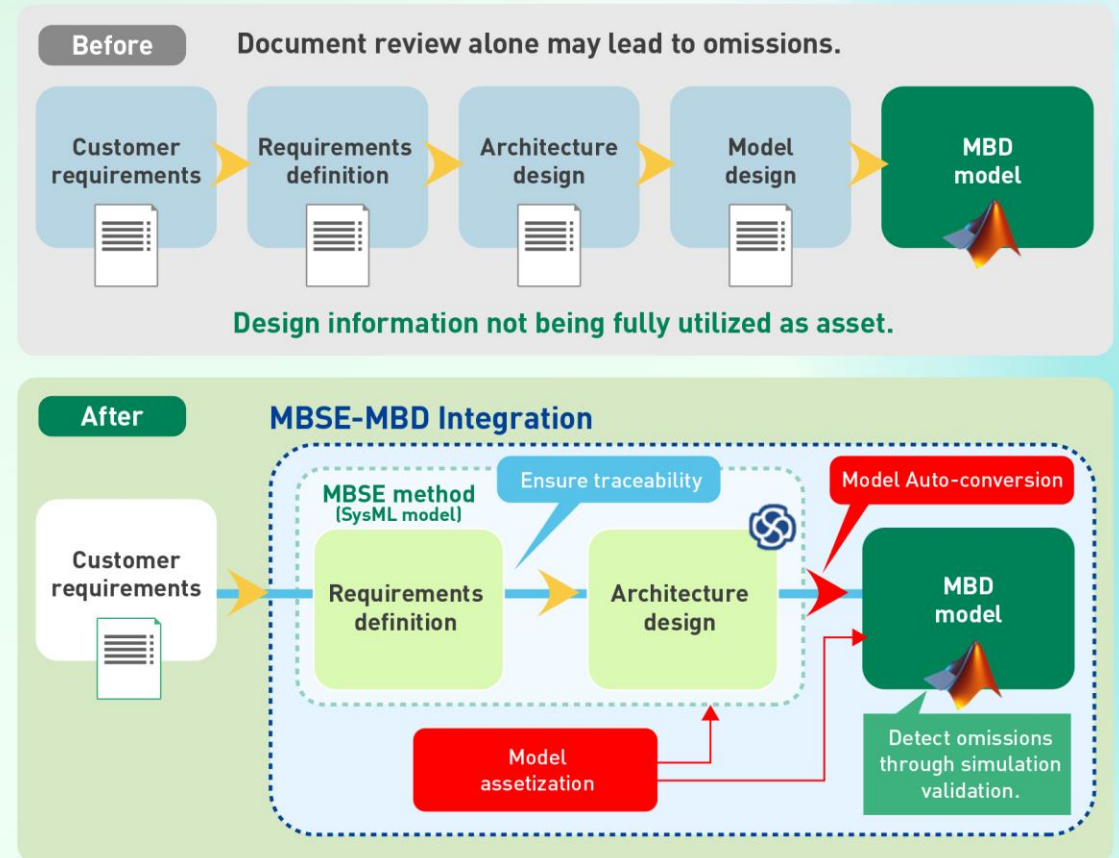
Applications

Develop Sequence Control for Large-scale IVI Systems

Problem
- Hard to spot omissions in requirements due to the complexity of state management in IVI system.
- Not utilizing past design assets efficiently, even in derivative development.
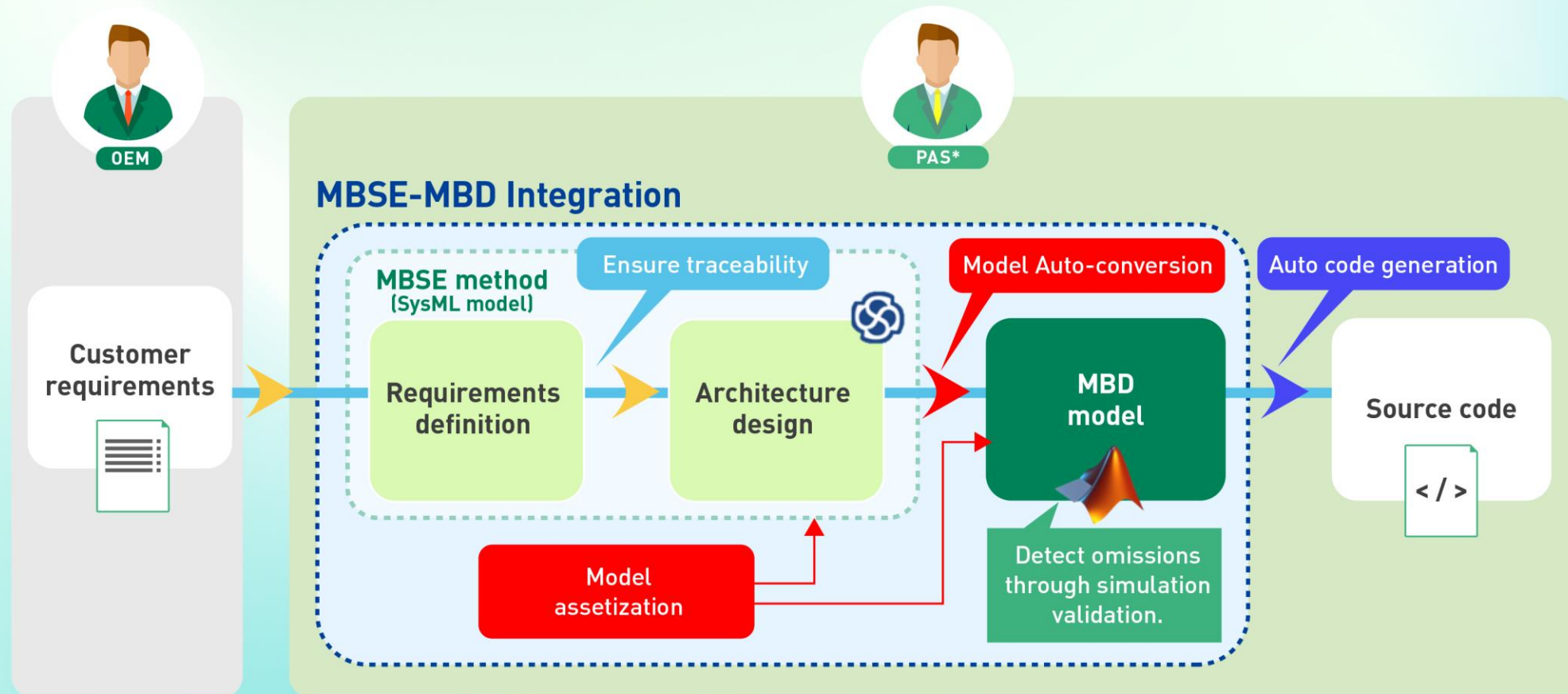
Achievement
- Identify areas of requirement changes by improving traceability and simulation validation.
- Build model assets for future development.
- Reduce design and implementation efforts with the model auto-conversion flow.

Before Document review alone may lead to omissions.

Customer requirements → Requirements definition → Architecture design → Model design → MBD model

Design information not being fully utilized as asset.

After MBSE-MBD Integration

Customer requirements →

MBSE method (SysML model)

Ensure traceability

Requirements definition → Architecture design

Model Auto-conversion

MBD model

Model assetization

Detect omissions through simulation validation.