Leveraging Dassault Systèmes' 3DEXPERIENCE Platform to Support Boeing's Digital Thread

Lucas Aviles, Boeing
John Herrold, Boeing
Ted Thiagarajah Dassault
Raphael Pioger, Dassault

GLOBAL PRODUCT DATA INTEROPERABILITY
SUMMIT
2019

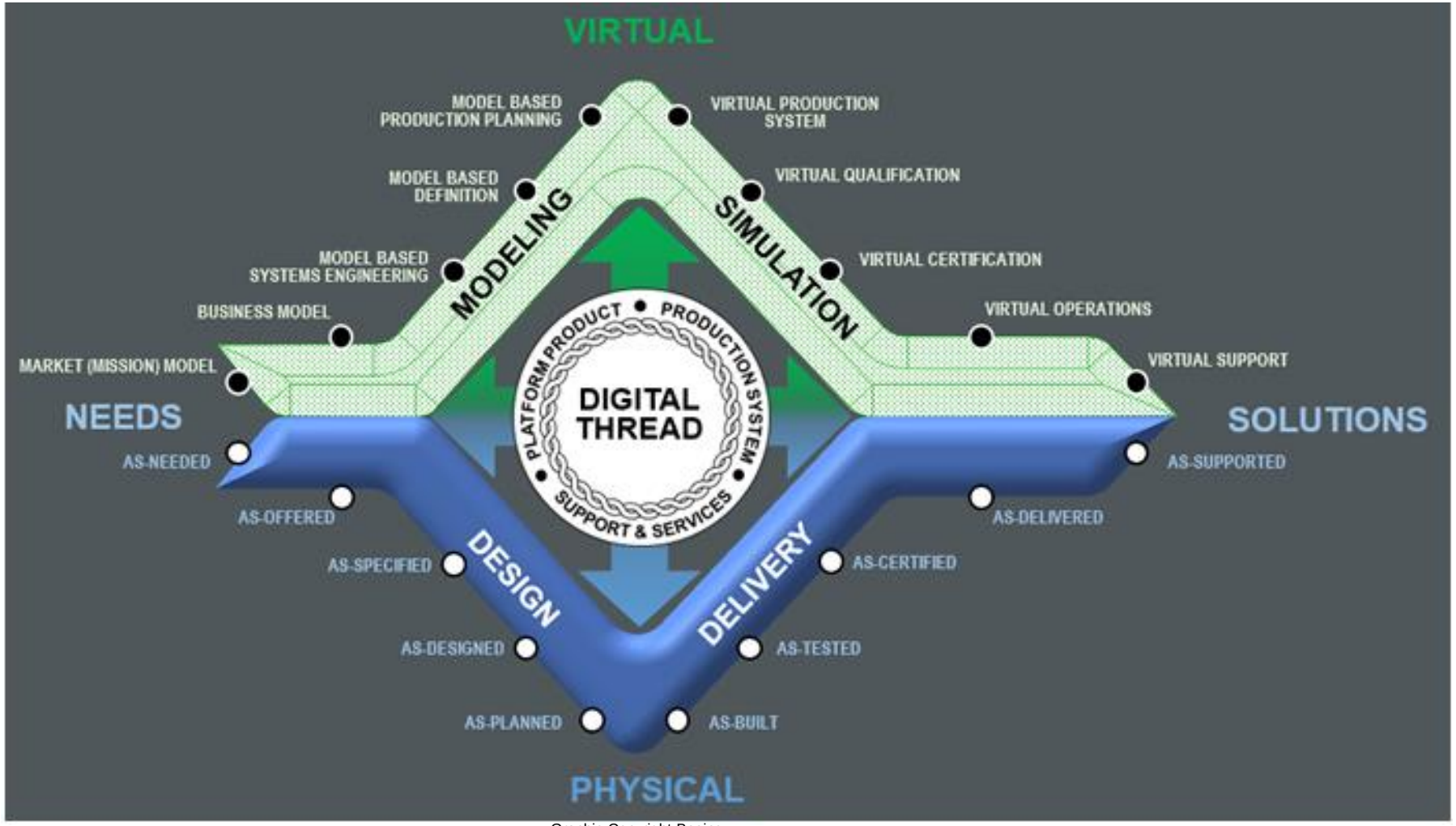
DASSAULT SYSTEMES BOEING

Outline

- **Boeing Digital Transformation Initiative Context**
- **Boeing MBSE Process and Environment**
- **System Architecting in SysML Example**
- **System Traceability Overview**
- **Cameo / 3DX Transformation Overview**
- **Cameo / 3DX Transformation and System Traceability Demo**

High Level Boeing Digital Transformation Initiative Context

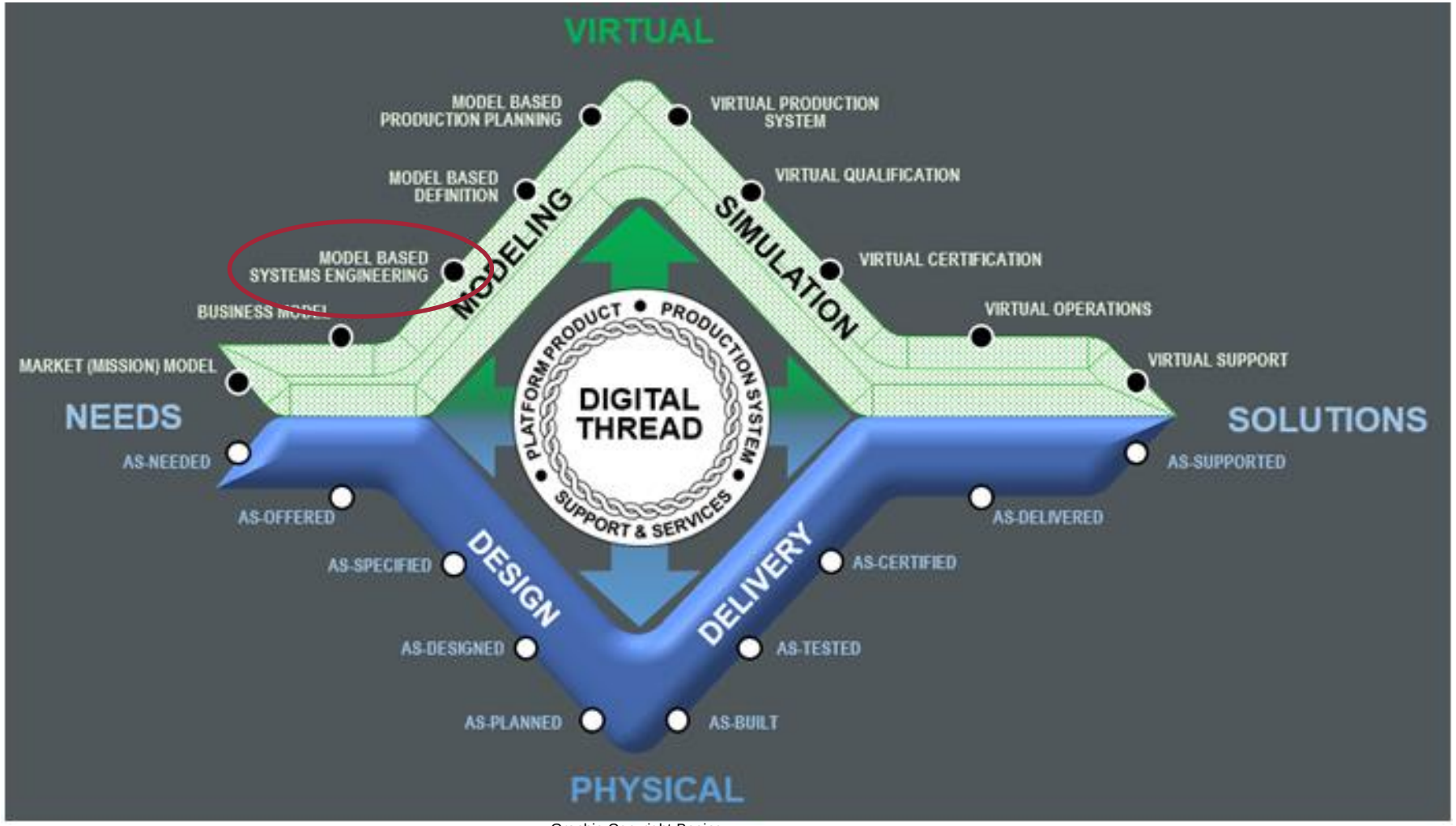
Global Product Data Interoperability Summit | **2019**



Graphic Copyright Boeing

High Level Boeing Digital Transformation Initiative Context

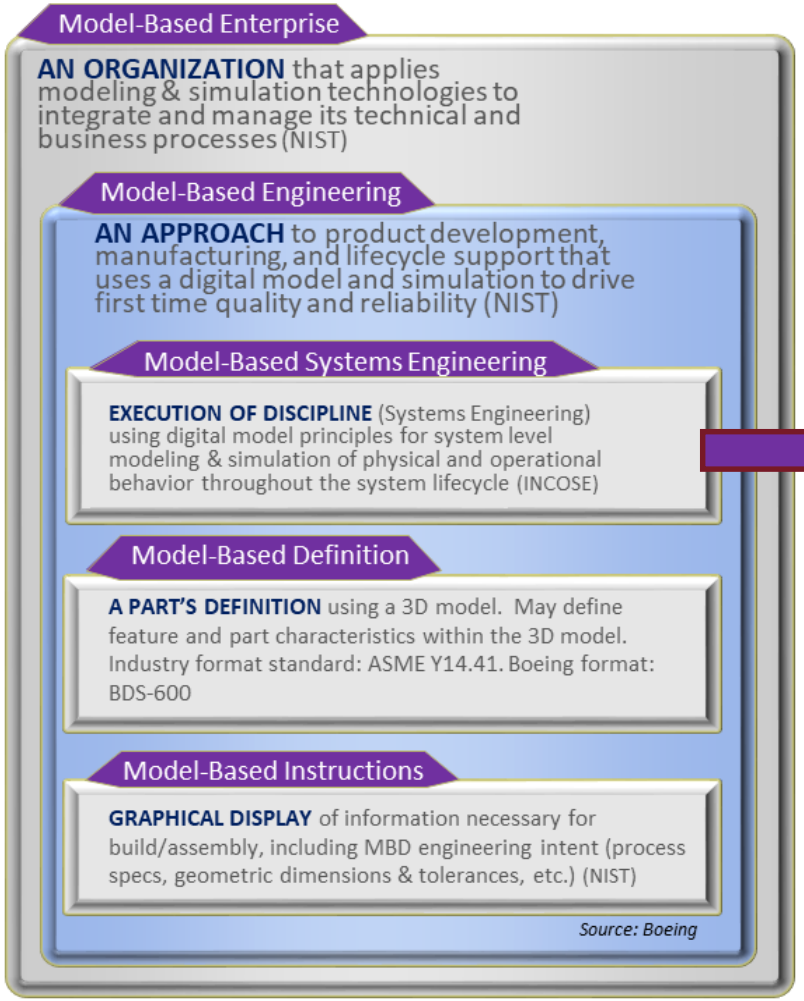
Global Product Data Interoperability Summit | **2019**



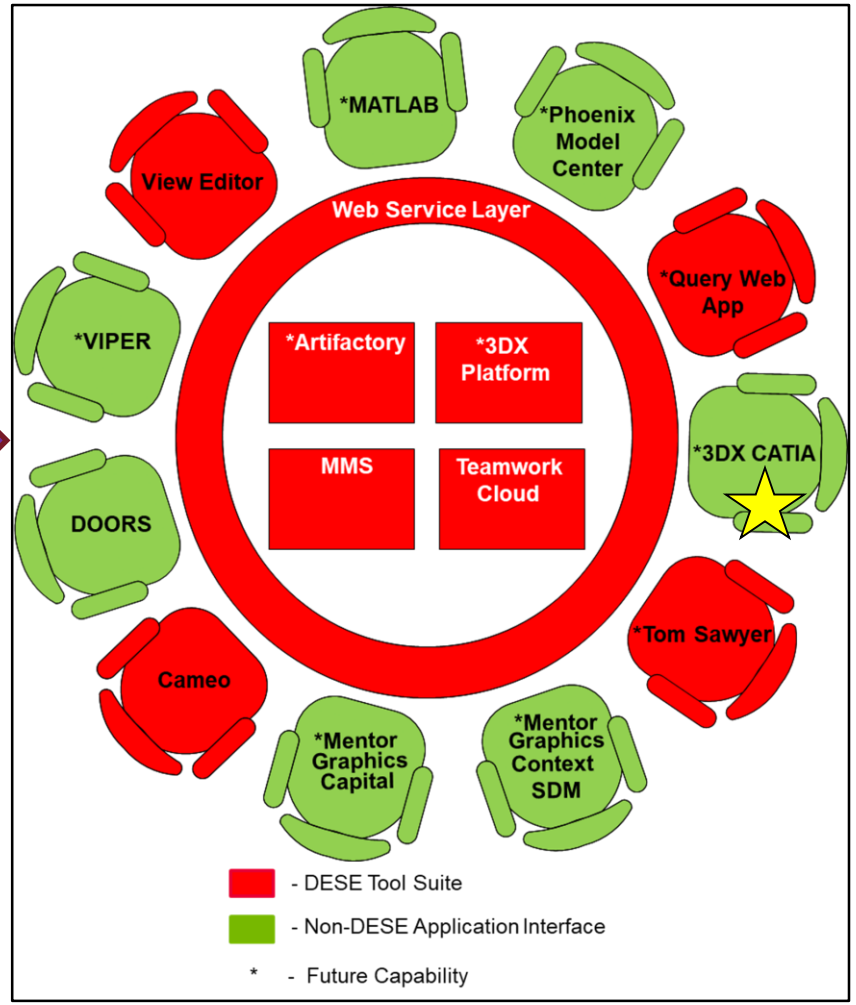
Graphic Copyright Boeing

Boeing MBSE Process and Environment

Global Product Data Interoperability Summit | **2019**

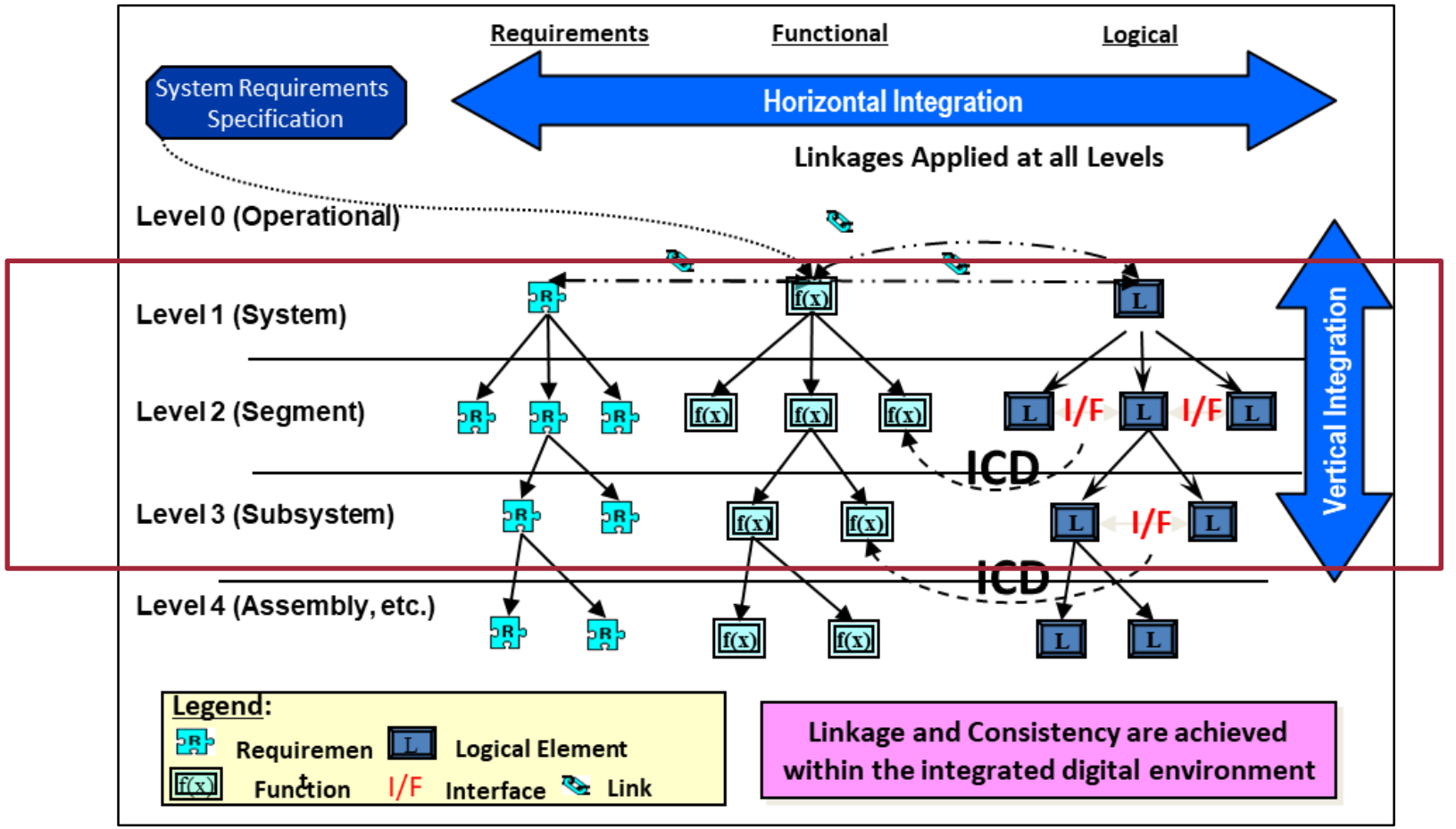


Model Based Terminology (Boeing's Lexicon



2CES MBSE Environment

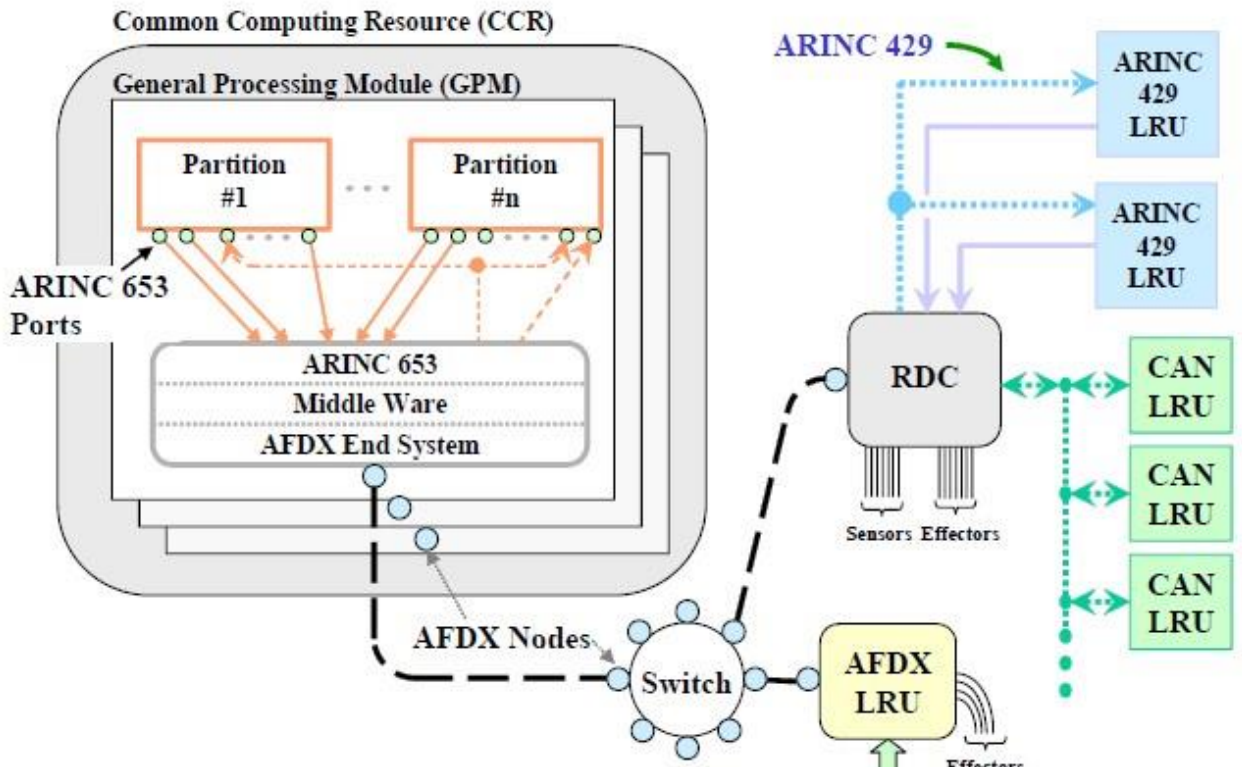
Example System Architecting in SysML
SysML Model Level



SysML

Figure 1.2 – Overview of Systems Architecture

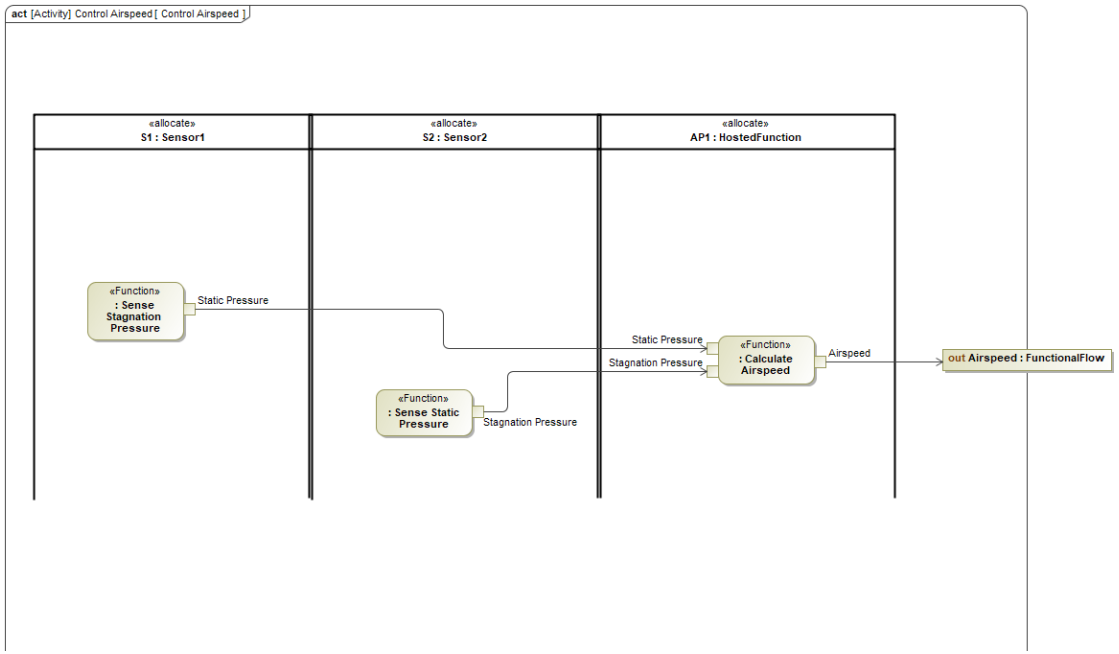
Example System Architecting in SysML
787 A664 Architoon

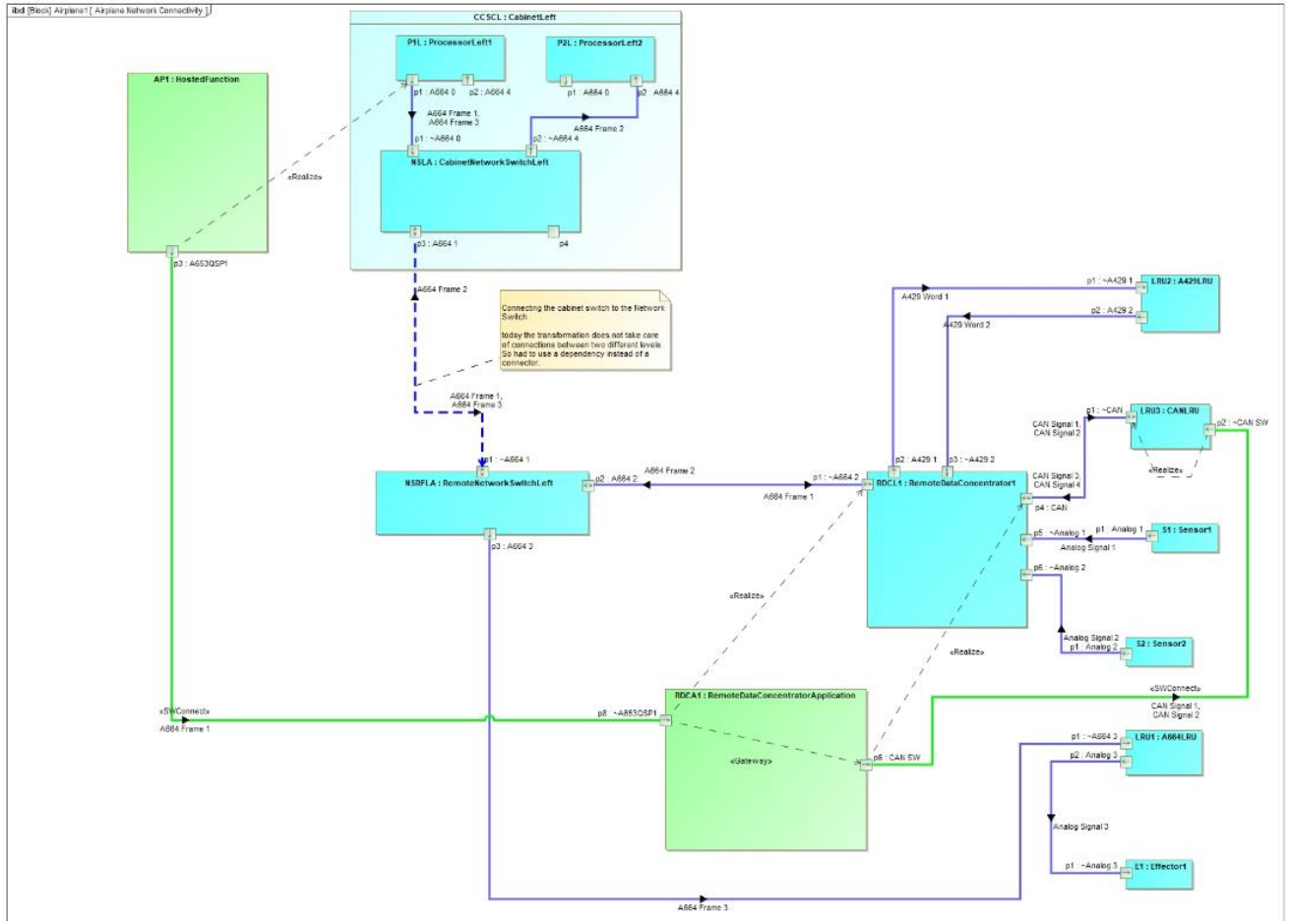


- Each Partition sends and receives Application Messages via the ARINC 653 ports.
- Each AFDX End System sends and receives AFDX frames.

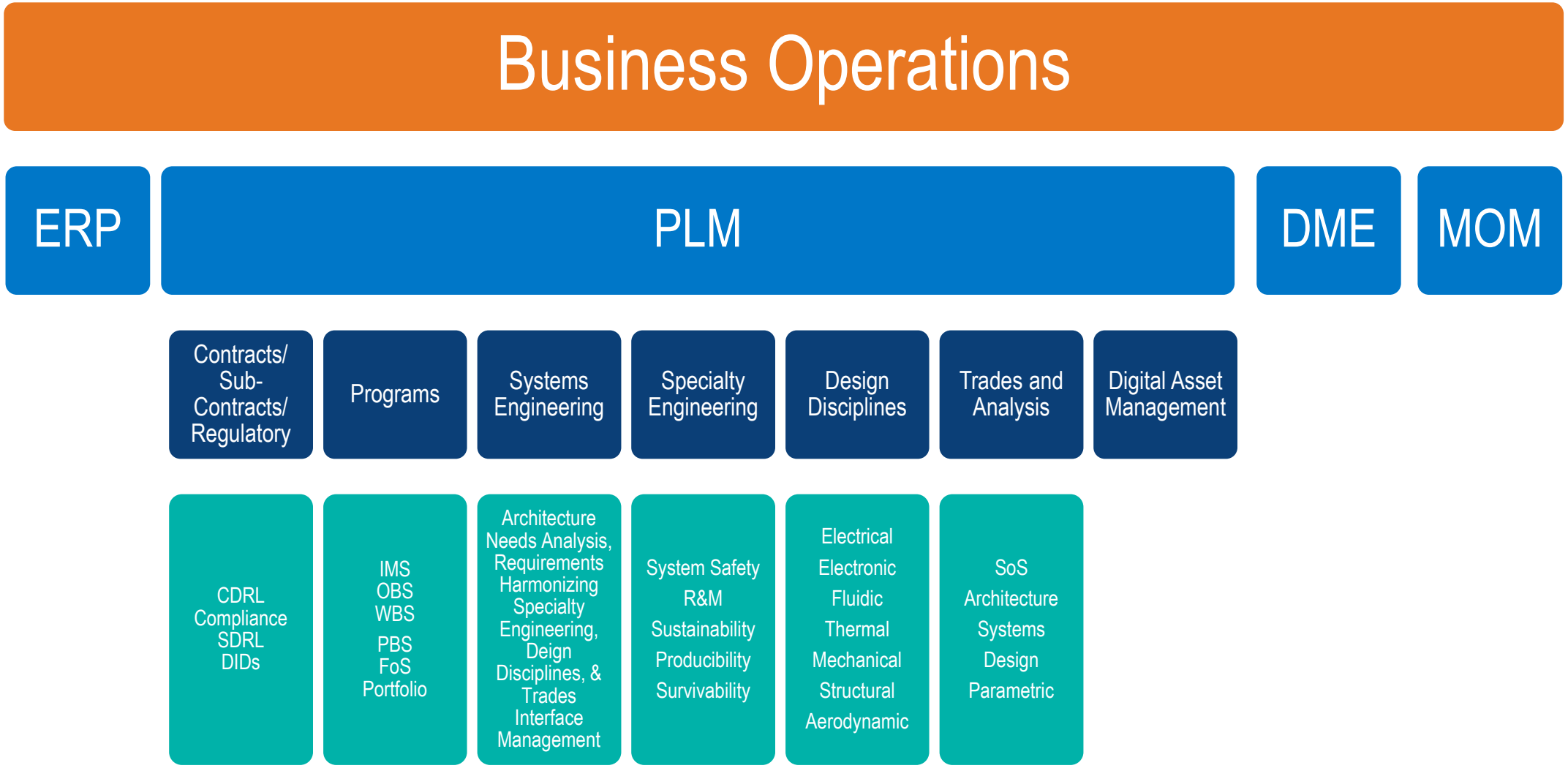
Example System Architecting in SysML
SysML Example Model

Global Product Data Interoperability Summit | **2019**





Enterprise-Ready MBSE Context



Alignment of ER-MBSE with 2CES Vision & Values

Model-Based Enterprise

AN ORGANIZATION that applies modeling & simulation technologies to integrate and manage its technical and business processes (NIST)

Model-Based Engineering

AN APPROACH to product development, manufacturing, and lifecycle support that uses a digital model and simulation to drive first time quality and reliability (NIST)

Model-Based Systems Engineering

EXECUTION OF DISCIPLINE (Systems Engineering) using digital model principles for system level modeling & simulation of physical and operational behavior throughout the system lifecycle (INCOSE)

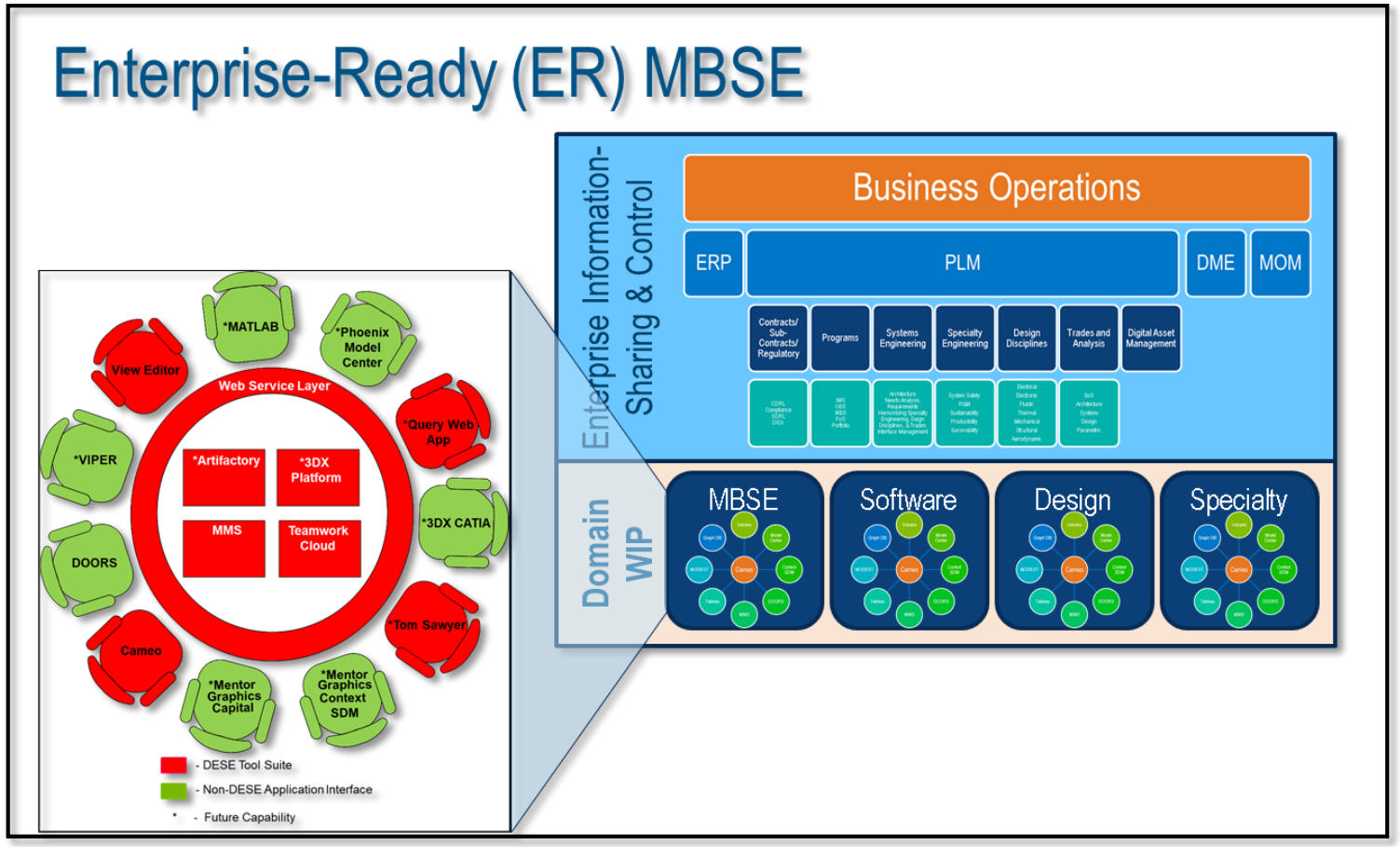
Model-Based Definition

A PART'S DEFINITION using a 3D model. May define feature and part characteristics within the 3D model. Industry format standard: ASME Y14.41. Boeing format: BDS-600

Model-Based Instructions

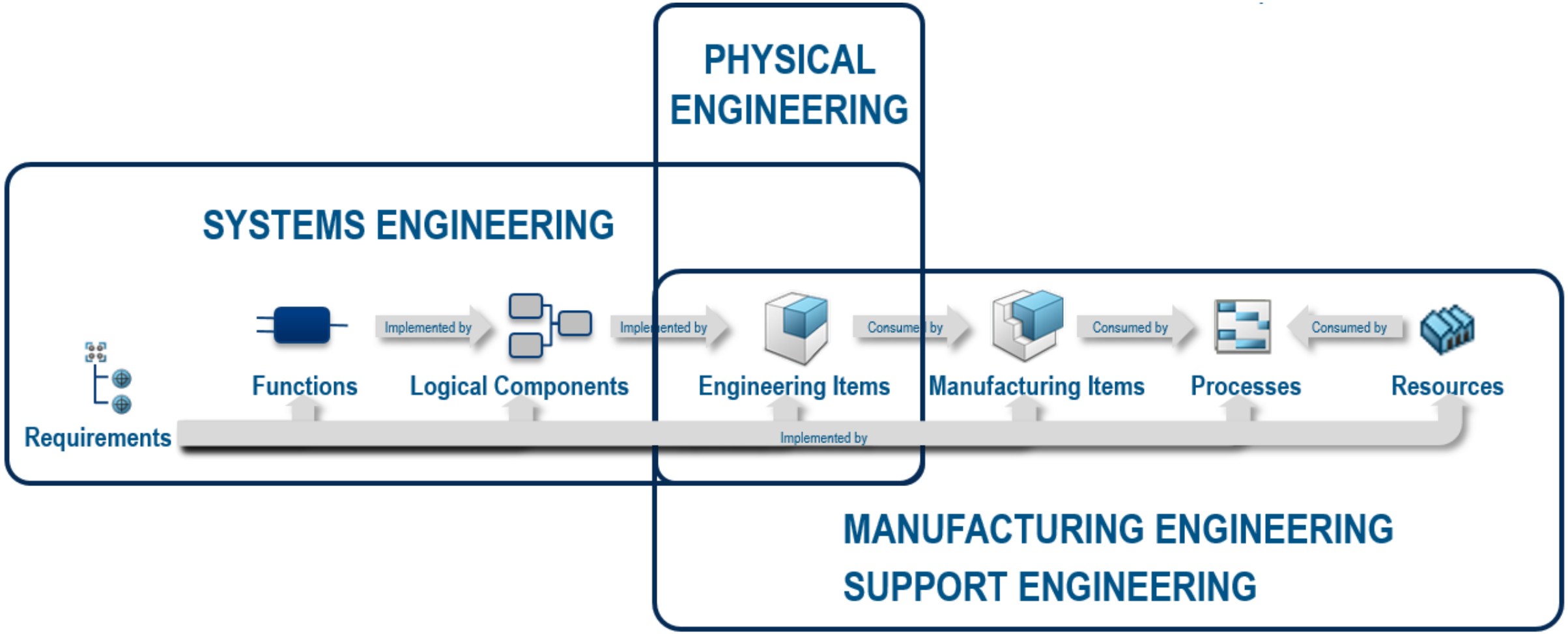
GRAPHICAL DISPLAY of information necessary for build/assembly, including MBD engineering intent (process specs, geometric dimensions & tolerances, etc.) (NIST)

Source: Boeing



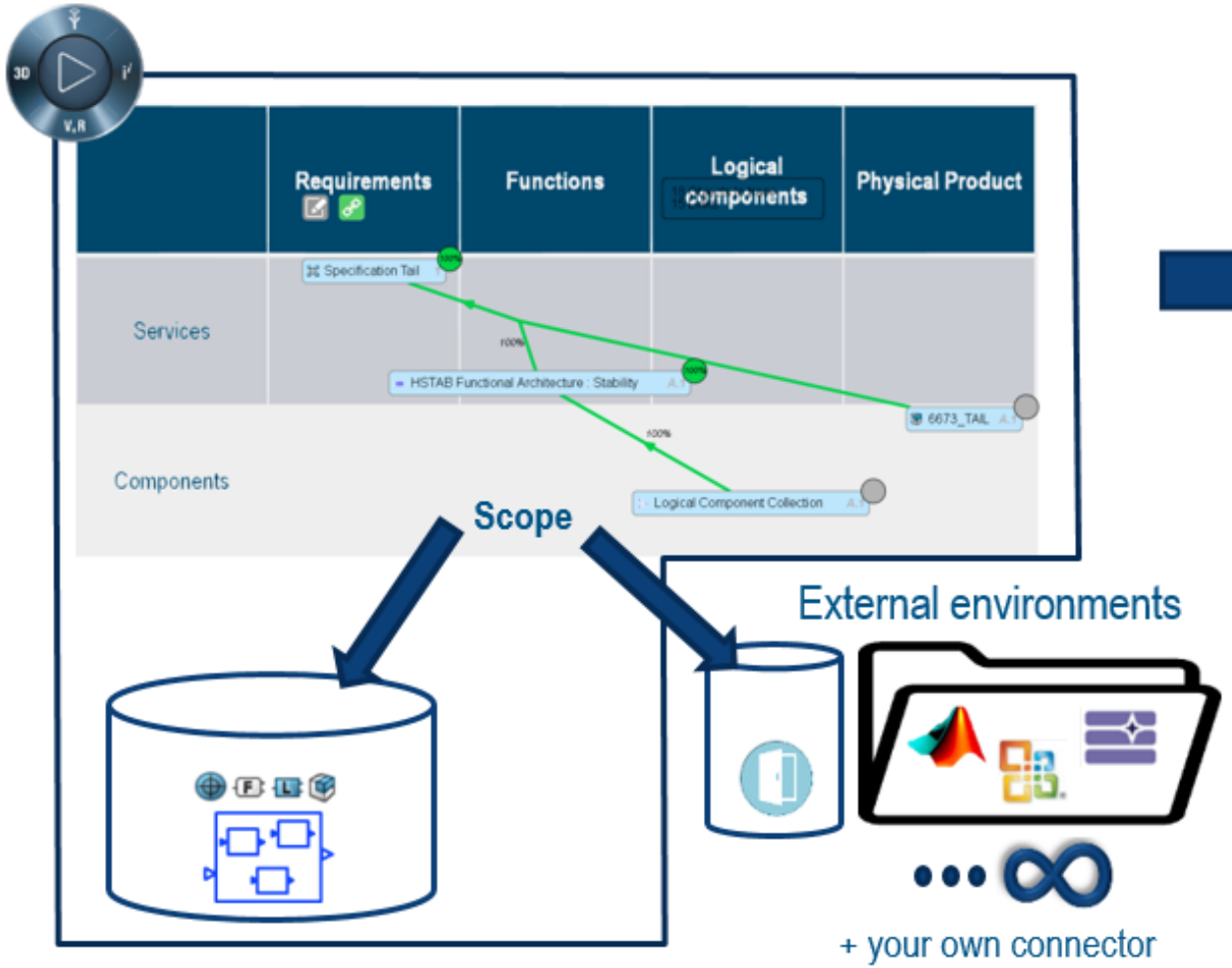
3DEXPERIENCE Platform : Digital Connectedness | Engineering Domains

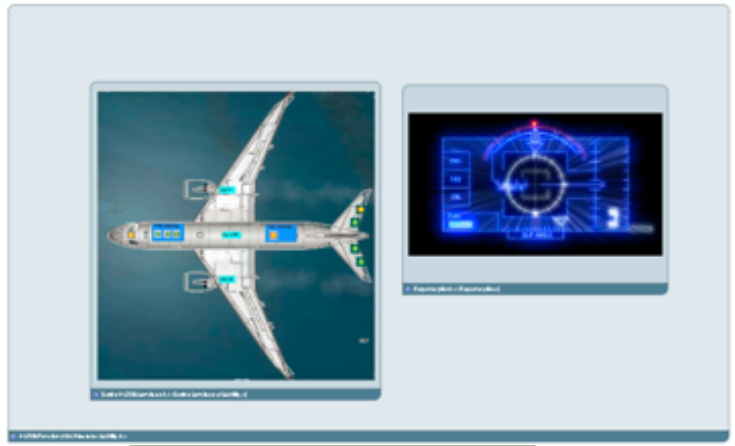
Global Product Data Interoperability Summit | **2019**



System Traceability Overview

Global Product Data Interoperability Summit | **2019**



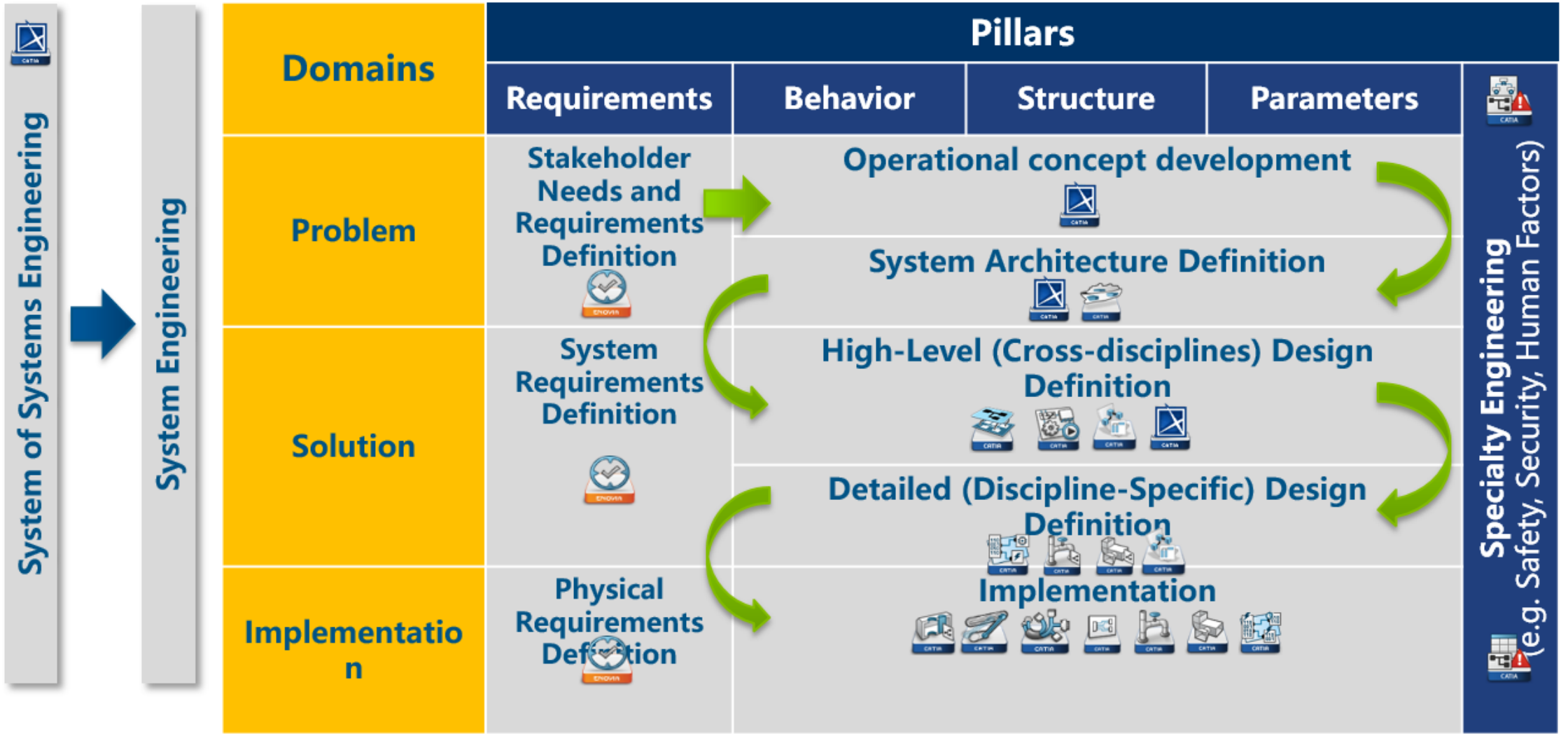


Navigation & preview

Traceability & impact

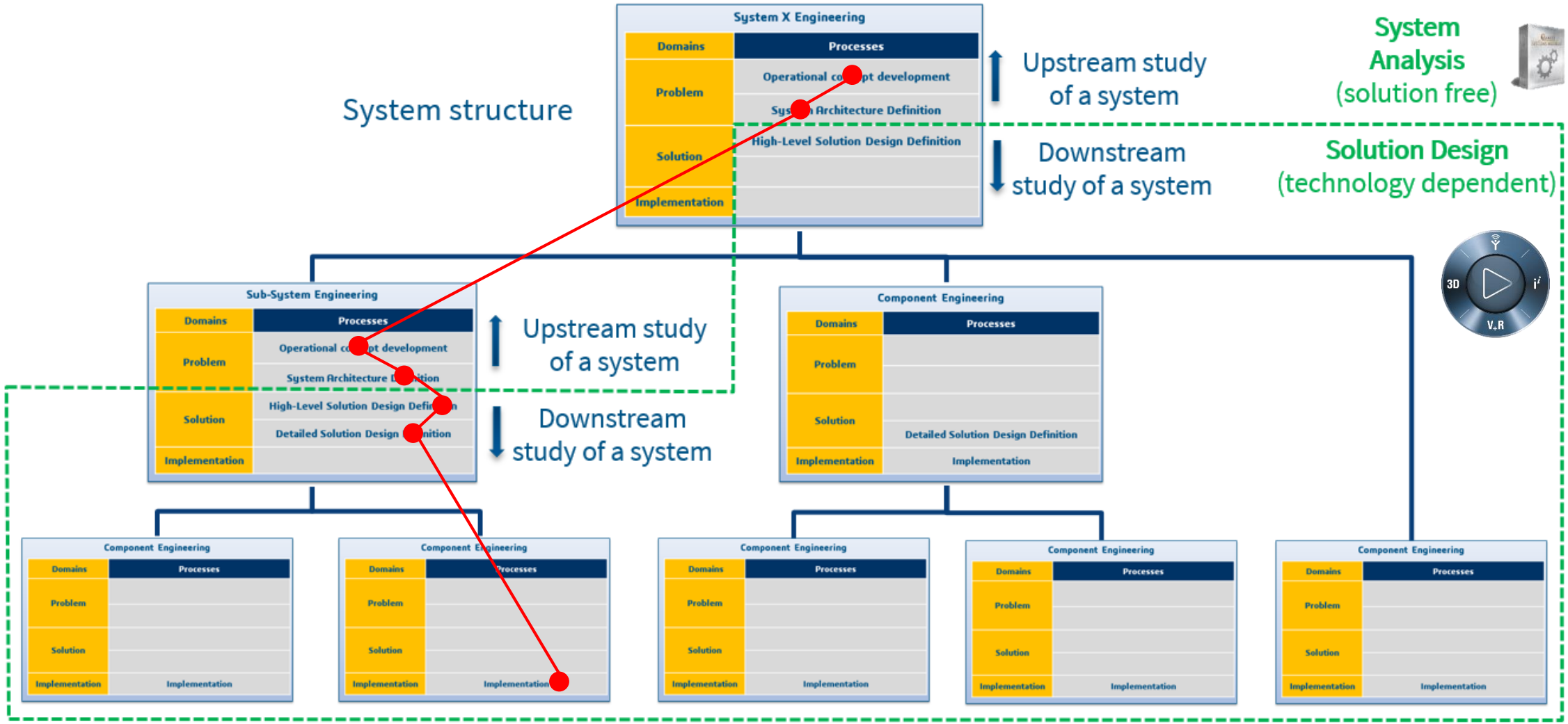
Digital grid of authoring flow summary

Global Product Data Interoperability Summit | **2019**



Cameo / 3DX Transformation Overview

Global Product Data Interoperability Summit | **2019**



Cameo / 3DX Transformation Overview

- **Manage border between concepts and implementation of a solution**
  - **Use configuration file for simple transformation**
  - **Enhance the transformation with Java**
- **Take the benefit of each tool**
  - **Model**
  - **Design and simulate**
  - **Produce**
- **Keep traceability in one tool, able to keep a single source of truth**