Competitiveness boost with MBSE in highly tailored and low-volume systems

Aapo Holsa, Researcher, University of Oulu

Presentation Abstract

Model-Based Systems Engineering (MBSE) was developed to tackle the challenges posed by increasingly complex systems in progressively challenging operational environments. Despite its proven benefits, MBSE implementation faces obstacles, especially in highly customized and low-volume systems.

Effective communication during development requires all teams to adopt a common understanding and language, and to recognize the value of model-assisted communication. Without clear objectives, motivations, and responsibilities, system-level modeling risks becoming siloed.

Previous studies have shown that these modeling practices often favor specific teams, leading to low engagement from others. Organizational and technical integration challenges further hinder MBSE adoption. Successful technical implementation requires skilled personnel and the interaction of multiple tools and data repositories, making the efficient use of open interoperability standards crucial.

This presentation aims to clarify MBSE's role in system life cycles by assessing its impact at different stages through case studies conducted at the University of Oulu. These studies will address the problems and challenges faced by model-centric development, ultimately demonstrating the added value of MBSE in various industrial cases.

The research will evaluate existing methodologies, identify opportunities for improved integration, and develop effective stakeholder communication. Case studies will focus on sustainable technologies for marine transportation, assessing model-based information exchange in life cycle processes. The goal is to demonstrate how enhanced integration into life cycle processes can help realize the value proposition of MBSE.

Cross-Partner Functional Architecture in Cameo:

Enabling an Authoritative Source of Truth Through MBSE"

Adam Lancaster, Systems Engineering Discipline Lead, BAE Systems

Presentation Abstract

Modern aerospace and defence programmes demand seamless collaboration across multiple engineering disciplines, partner organisations, and toolsets. This presentation explores how we harness the power of Cameo Systems Modeler to build an integrated architecture and functional decomposition that brings together contributions from across the engineering landscape. By establishing a model-based Authoritative Source of Truth (ASoT), we ensure consistency, traceability, and clarity across the programme lifecycle.

We demonstrate how formalised modelling using SysML in Cameo enables us to drive out ambiguity, align diverse stakeholder viewpoints, and foster cross-discipline understanding. Through structured abstraction, interface definition, and behavioural modelling, Cameo becomes the central hub for converging domain knowledge—supporting system-level decision-making, requirement validation, and design maturity progression.

This session will highlight real-world examples of multi-partner collaboration, model governance, and the value of modelling language standardisation. Attendees will gain insight into how model-based systems engineering (MBSE) enhances integration, reduces rework, and accelerates programme alignment—from concept to delivery.

The presentation itself will probably contain a short section on how we use Cameo pull together an architecture and functional decomposition but then quickly move into how we do this across multiple disciplines, across multiple partners, Resulting in a model that can be classed as part of the Authoritative Source of Truth for the programme, highlighting the value of model based collaboration, formalisation of modelling language helps drive out ambiguity and enable better whole systems and teams integration.

The Future Engineer – A Model Citizen

Andrew Pemberton, Head of Architecting and MBSE Capability, Thales

Presentation Abstract

In this presentation will explore the evolving role of engineers in shaping the future, leveraging insights from the Royal Academy of Engineers, INCOSE, Engineers Without Borders, and the Engineering Professors Council. We will begin with an overview of future engineering trends and the expected skills required to meet emerging challenges.

Comparing traditional practices with envisioned future methodologies, we will delve into how Model-Based Systems Engineering (MBSE) will serve as a cornerstone for tomorrow's engineers. Emphasizing the role of technological empowerment, we will discuss the integration of AI.

Additionally, we will address the challenges of organizational inertia and the critical need to foster a culture of innovation and adaptability.

The presentation will highlight strategies for managing change, underscoring the importance of continuous learning and development. By focusing on people, processes, and tools, we aim to provide a comprehensive vision for empowering engineers to navigate and succeed in the complexities of the future. Join us as we envision the engineer of the future and the transformational journey that awaits.

Exploring The Next Frontier: SysML V2 By Dassault Systèmes

Andrius Armonas, CATIA Systems R&D Application Director and MagicDraw Product Manager, Dassault Systemes

Presentation Abstract

Join Andrius Armonas for an in-depth session exploring Dassault Systèmes' latest advancements in SysML v2. This presentation will showcase how SysML v2 is being seamlessly integrated into the Cameo/Magic portfolio and provide a clear perspective on the transition from SysML v1.

Andrius will walk you through a live demonstration of the SysML v2 implementation, highlighting key modeling capabilities and workflows. You'll also get a preview of the planned APIs for SysML v2, along with insights into model execution and analysis features—ranging from parametric evaluation and requirements verification to analysis cases and trade studies.

Whether you're a systems engineering expert or simply curious about what's next, this session offers an exclusive look at the evolving MBSE landscape powered by SysML v2.

SysML v2: Here it Comes, Ready or Not!

Matthew Howlett, Chief Systems Specialist for MBSE, Leonardo

Presentation Abstract

After years of waiting, SysML v2 is almost upon us. The specifications are being finalised by the Object Management Group (OMG) and the first round of SysML v2 capable tools are becoming available.

SysML v2 is built on almost 20 years' experience in applying SysML v1 and promises to deliver on many of the benefits that failed to materialise with SysML v1. SysML v2 is an opportunity to do MBSE right. Removing the dependency on UML aligns SysML v2 with the way engineers think and should make it easier to learn. On the other hand, increased expressiveness and formality, along with the introduction of a textual notation, mean that there is more to learn.

The adoption of SysML v2 is about more than just an updated language. The accompanying API and Services specification opens up significant tool integration and interoperability opportunities, which is something that hampered SysML v1. The impact on existing methodologies and the amount of effort required to achieve a successful transition should not be underestimated. It will not be a simple "button push" to transform existing SysML v1 models to SysML v2.

This presentation does not attempt to teach you SysML v2. It introduces some of the transition guidance material that is available and describes the approach being taken by Leonardo to prepare its people, processes and tools for SysML v2. The intent is to provide a prompt for you to start thinking about your own SysML v2 journey.