



Powering Innovation That Drives Human Advancement

Ansys Journey Towards Digital Engineering

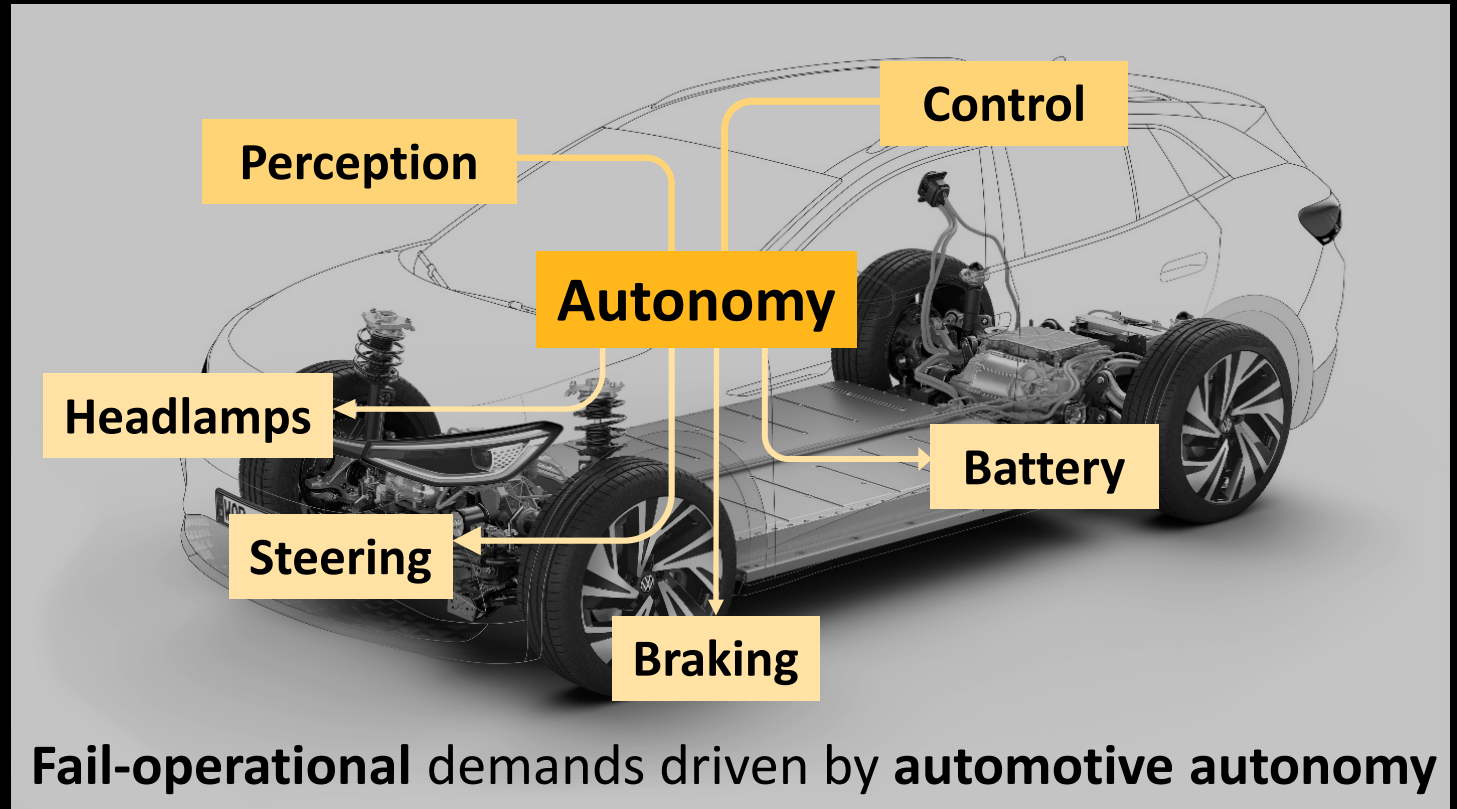
Dr. Olaf Kath

VP Product, Ansys

October 16th, 2024

Anslys' Digital Engineering Vision

Support our customers' **digital engineering transition** for **cyber-physical systems** with an integrated **suite of tools** that **connect** the **parallel engineering workstreams** for systems architecture & requirements; safety & cyber-security; physical engineering, software & controls, **across the product lifecycle.**



Digital Engineering Capabilities / Ansys Driving Principles

no lock-in

provide an **open solution** and built on a solid partner framework - openness in terms of models, data, remote APIs to permit users to adapt

future-proof

based on **most up-to-date standards & state of the art**

collaborative

truly easy-to-use & easy-to-understand engineering language, core **MBSE components in web & cloud with enterprise scale real-time collaboration**

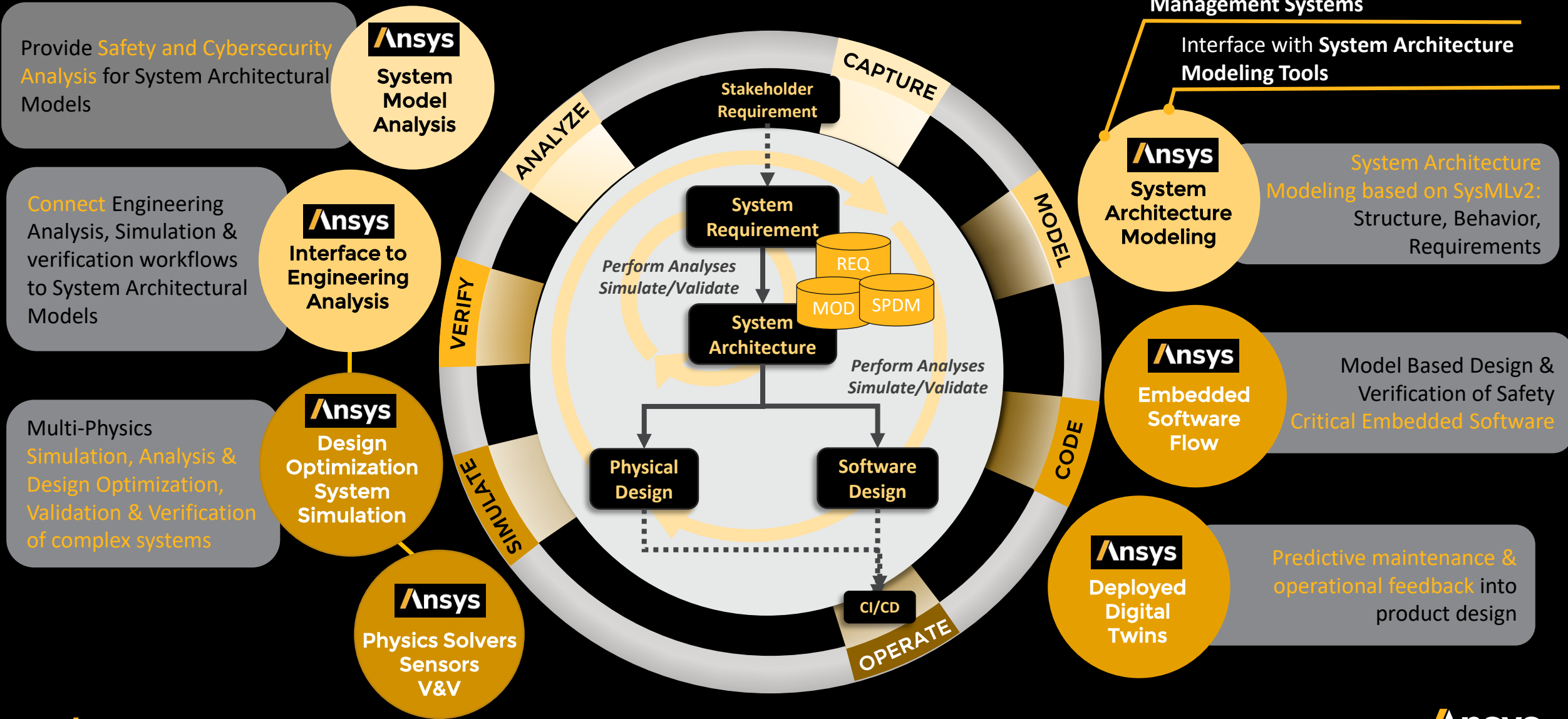
scalable & consistent

managed source of truth for models and data - holistic approach in terms of **consistent interoperability** with other Enterprise Systems

engineering in a single framework

integrate best in class solvers and analysis tools - strong and deep connection to an unmatched collection of analysis & engineering solutions.

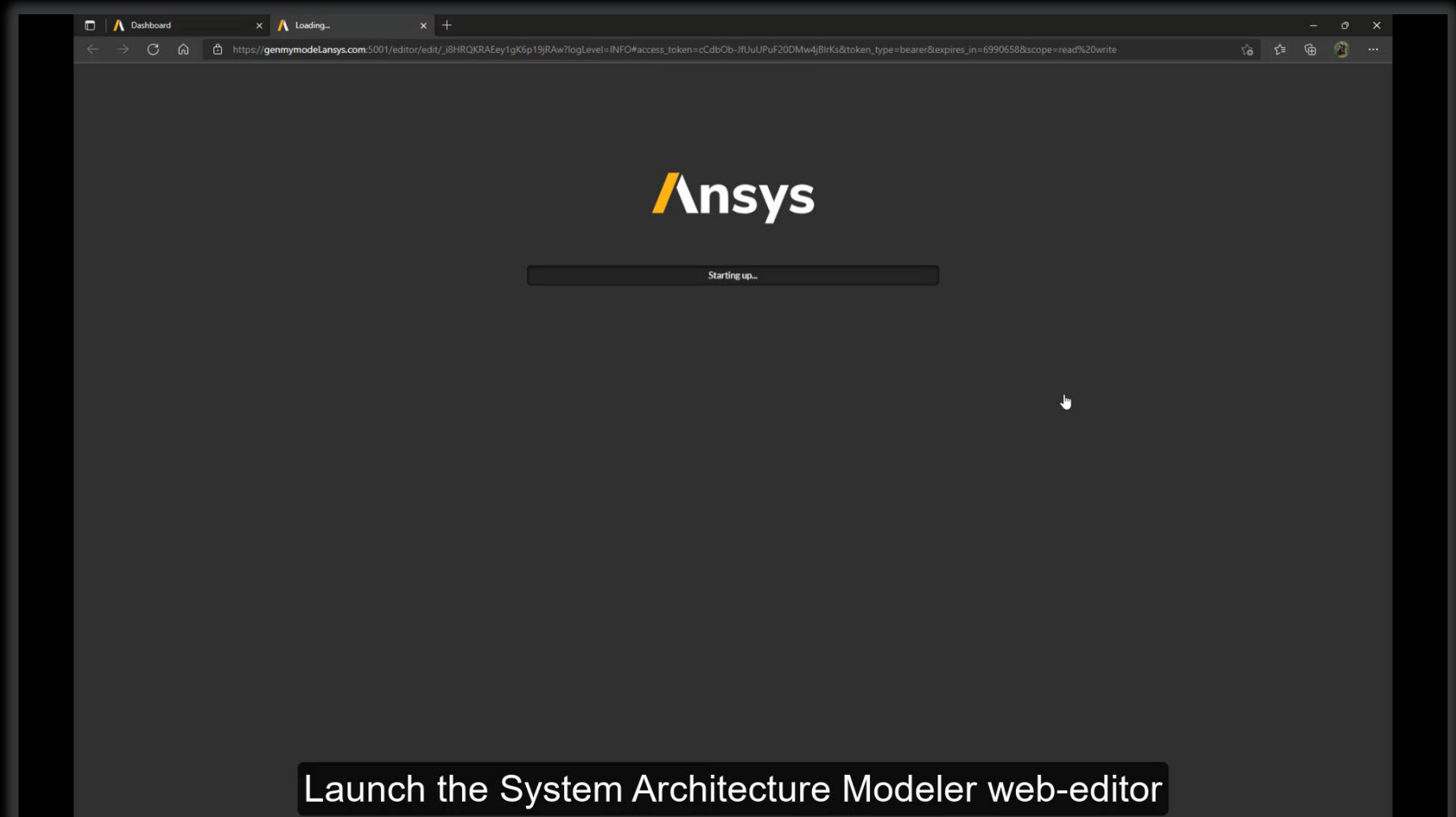
Digital Engineering Capabilities / Supporting MBSE



Digital Engineering Capabilities / Supporting MBSE

Ansys System Architecture Modeler

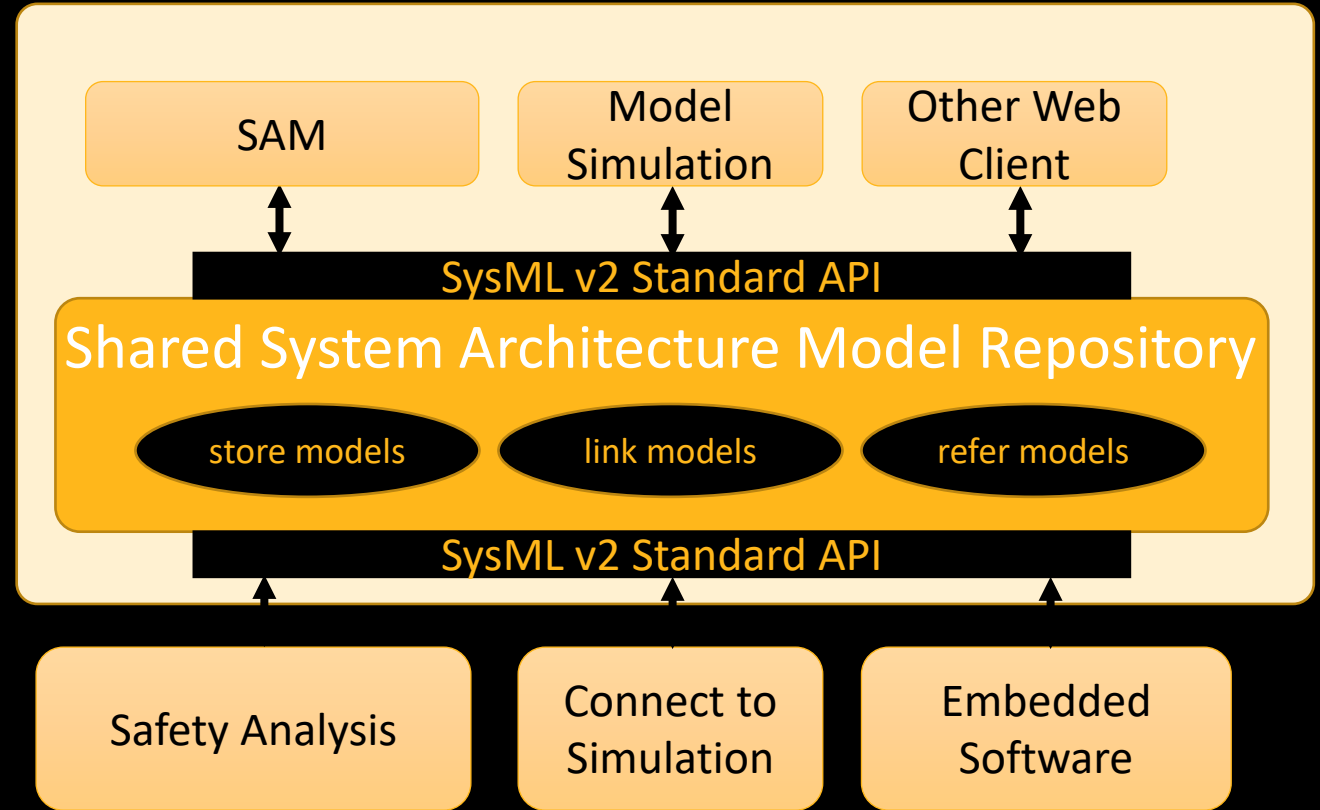
- supports **SysML v2**, the new systems engineering language created from scratch
- **integrated** with Requirements Management
- ability to **migrate** from SysML v1 products
- **commercially released** October 2023



Digital Engineering / Collaboration and Ease-of-use

Ansys System Architecture Modeler

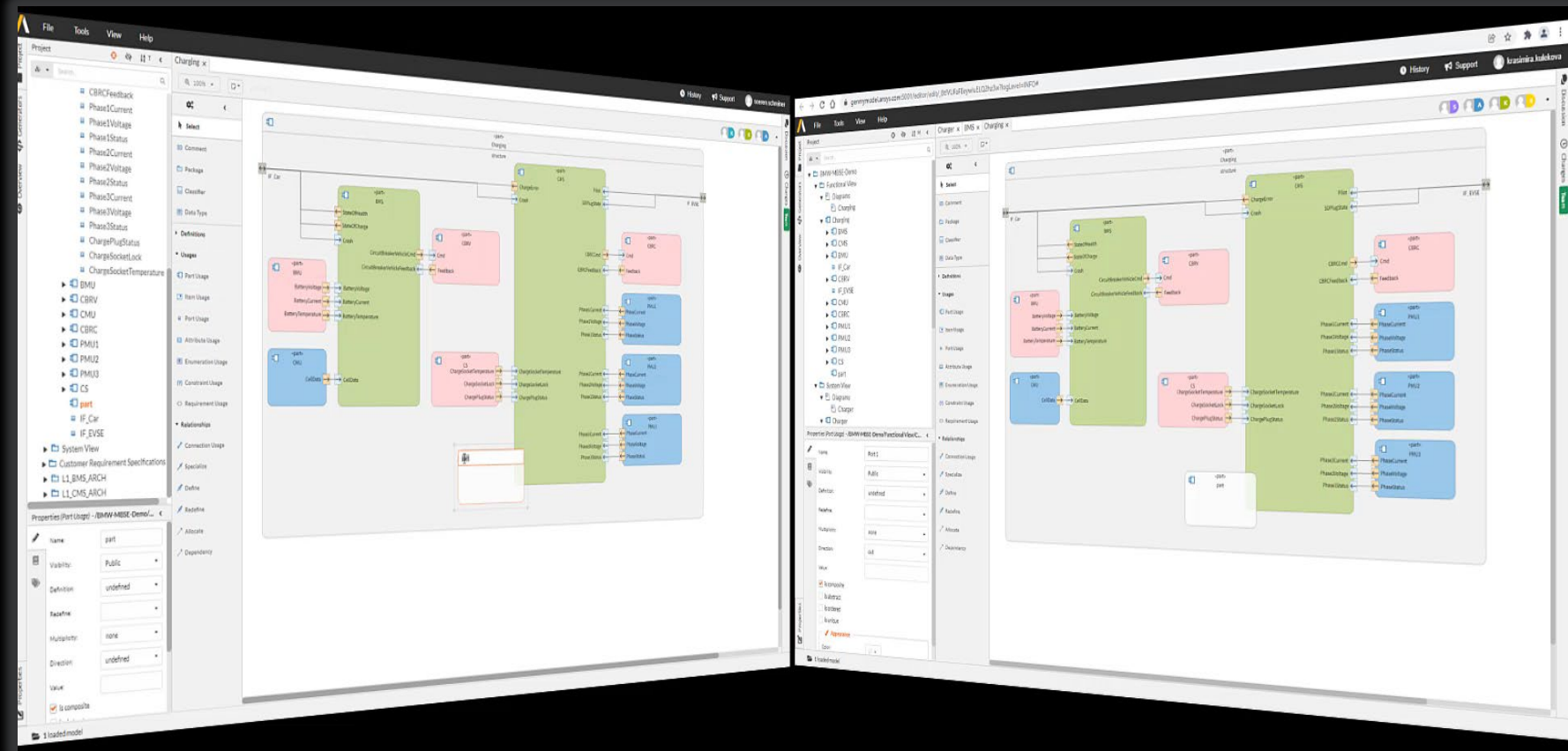
- **Shared systems model repository** with real-time collaboration support for large, multi-disciplinary teams
- **SysML v2** aware management for models, data & relationships
- Tools integrate with the repository through **open, standardized remotable APIs**



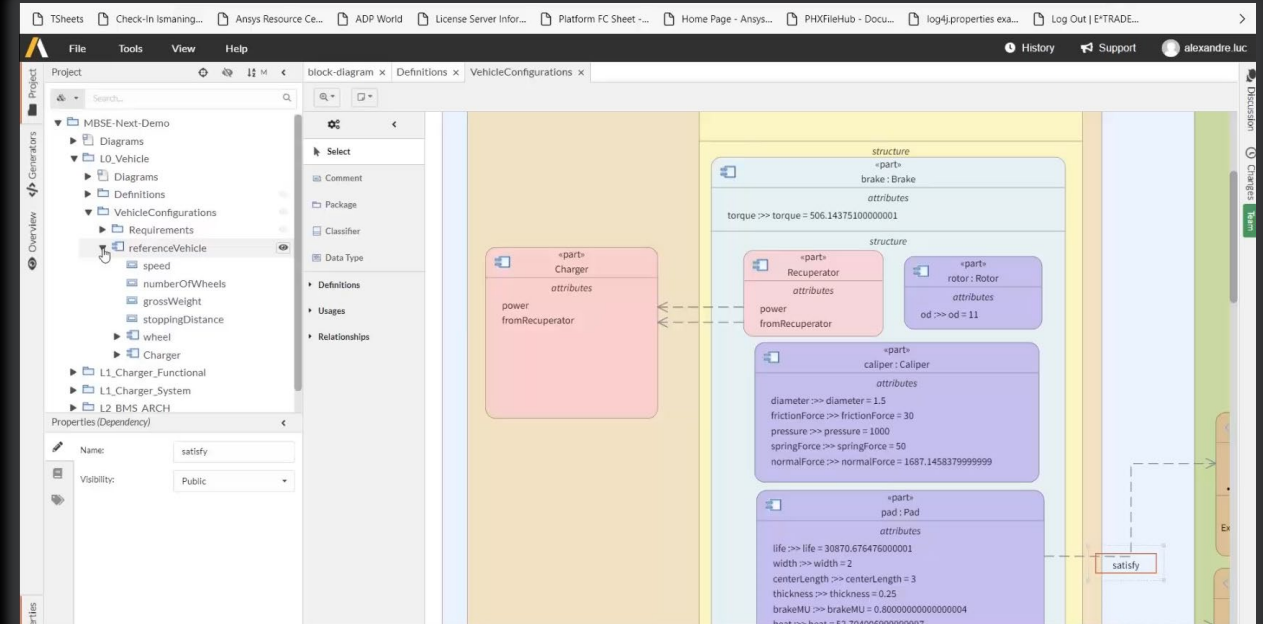
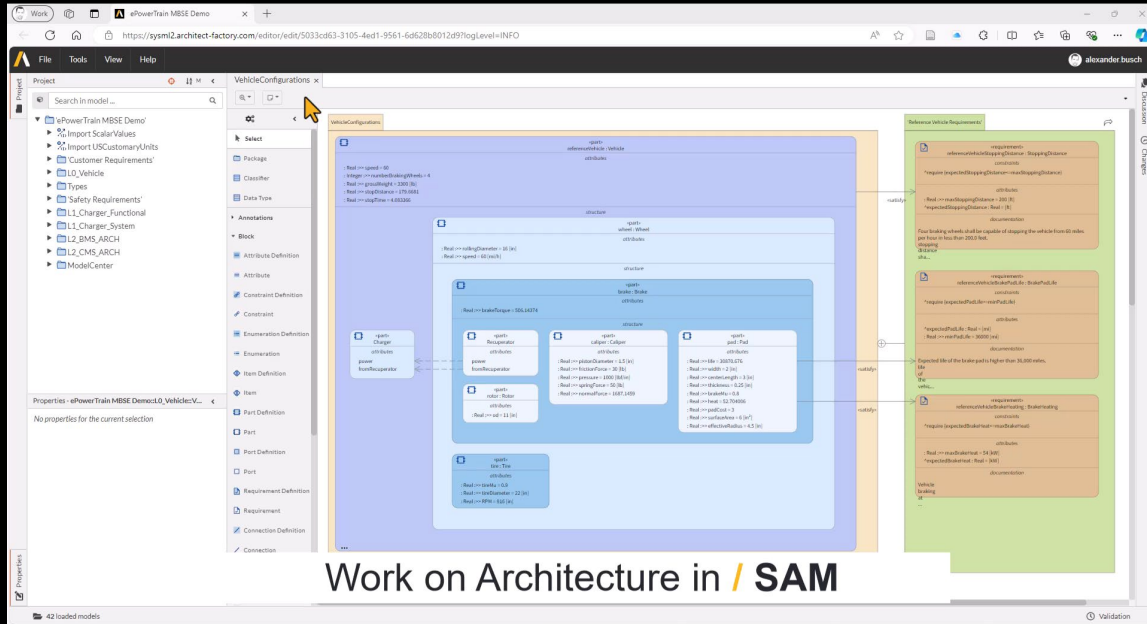
Digital Engineering / Collaboration and Ease-of-use

Ansys System Architecture Modeler

- **cloud-ready**, server-based solution
- **collaboration** and ease-of-use are of utmost importance
- ease-of-use includes **easy access** to modeling capabilities



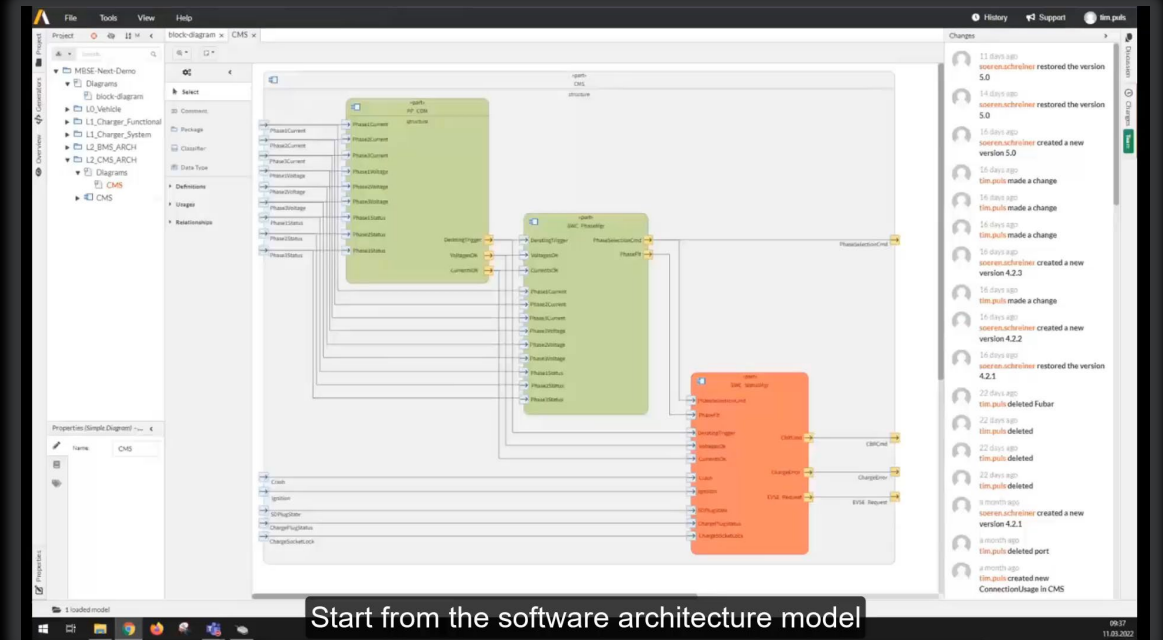
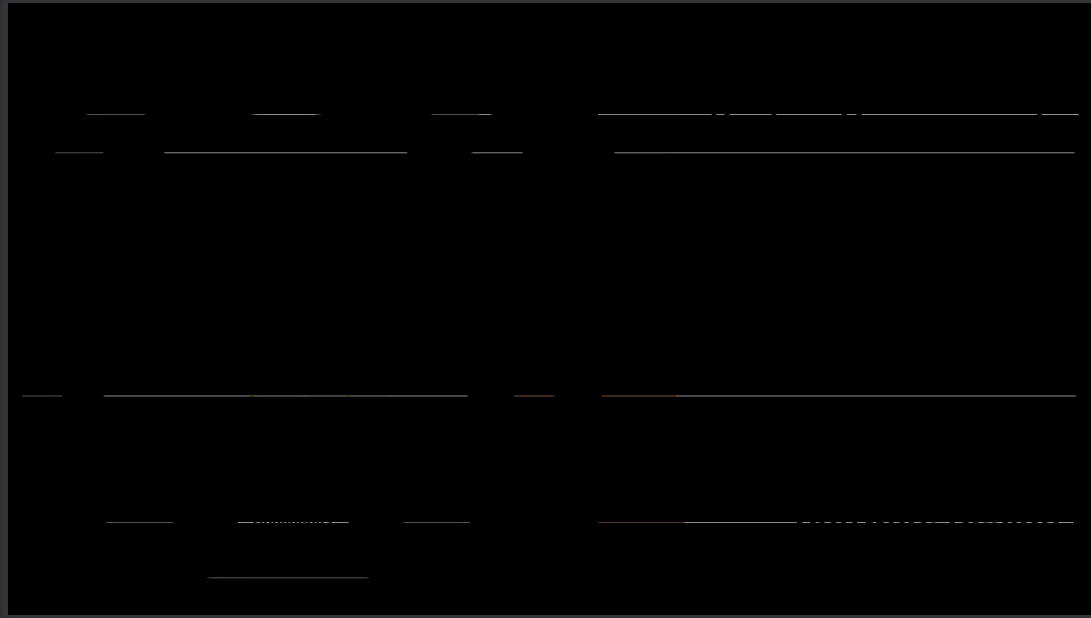
Digital Engineering Capabilities / Engineering Workflows



Ansys SAM supports engineering workflows

- running **trade studies** in conceptual design phase
- requirements **validation and optimization** in detailed design
- **results flow back** into the system architecture model

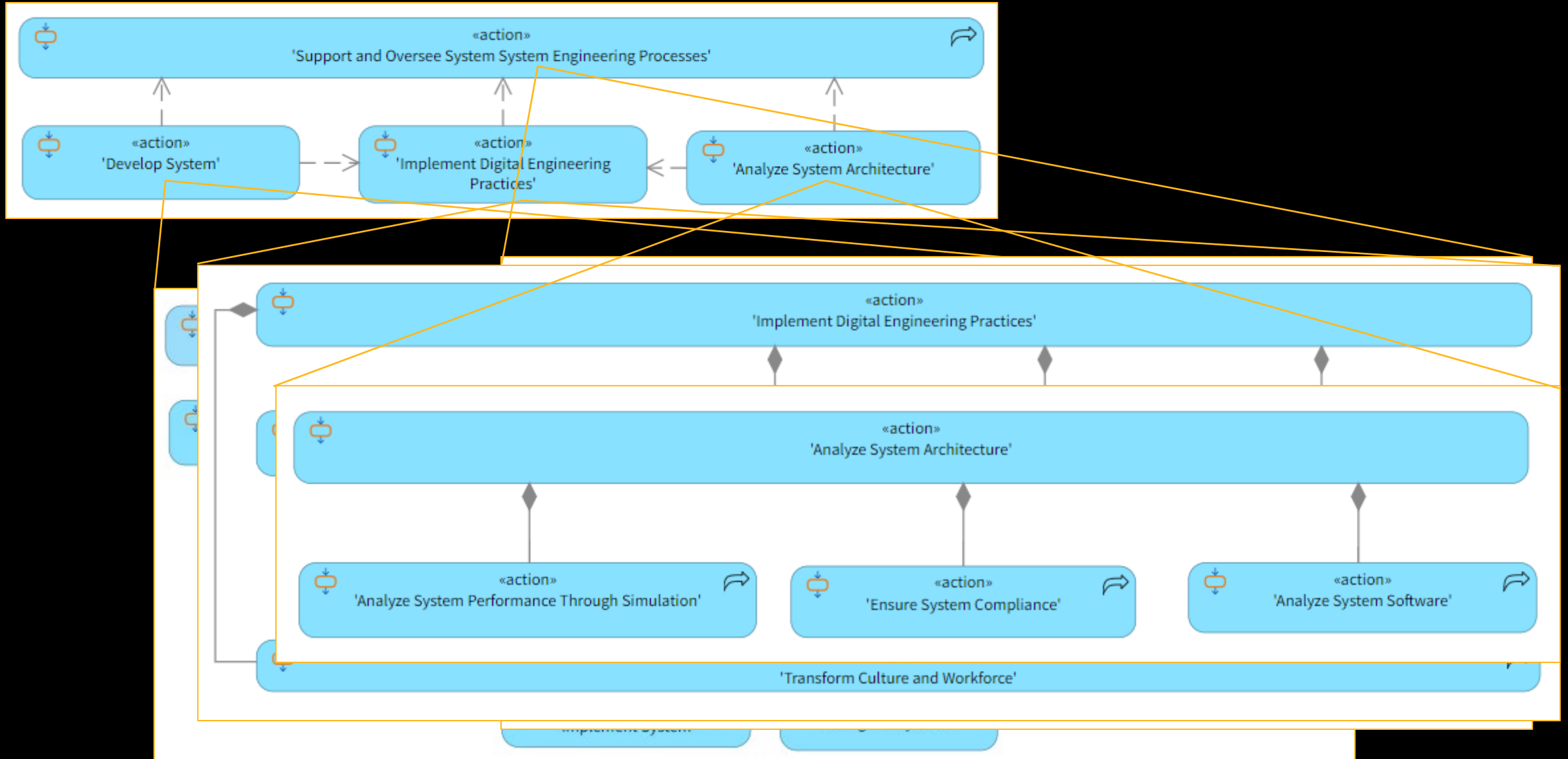
Digital Engineering Capabilities / Engineering Workflows



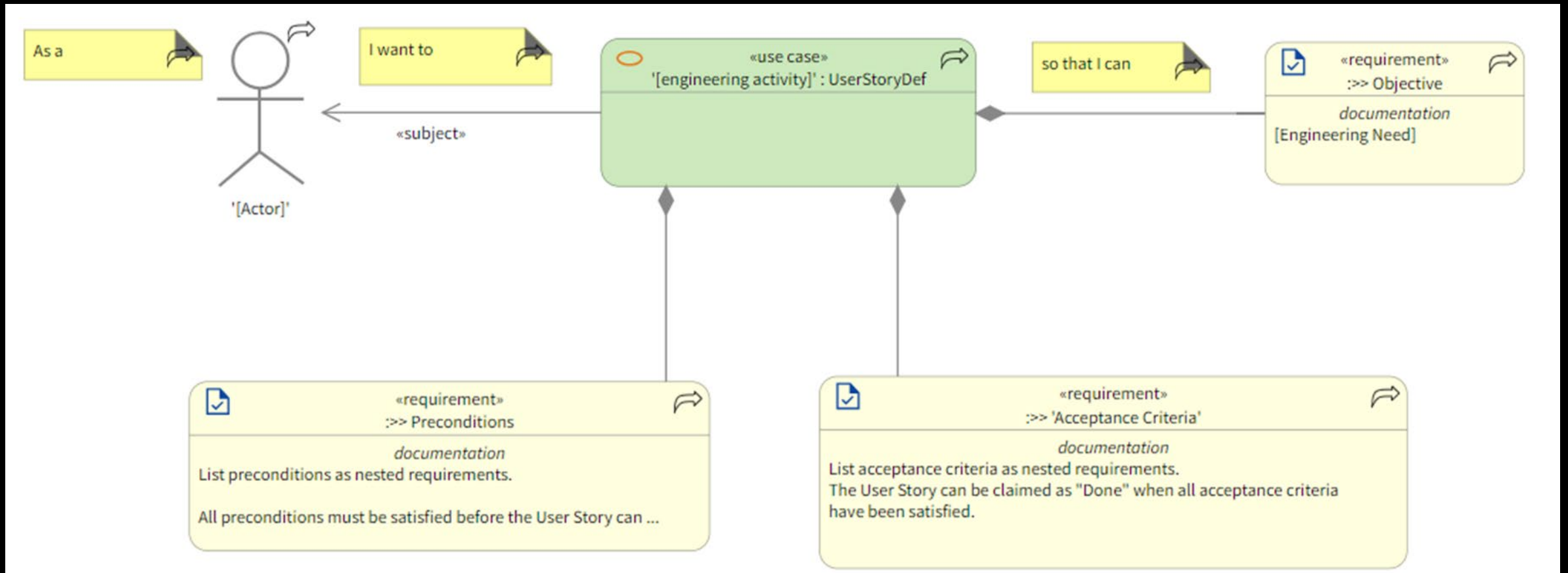
Ansys SAM supports engineering workflows

- from system architectural models to **embedded software** design
- **safety analysis of system architectural models**
- **trade studies** in concept design and requirements validation

Digital Engineering Capabilities / Methodology

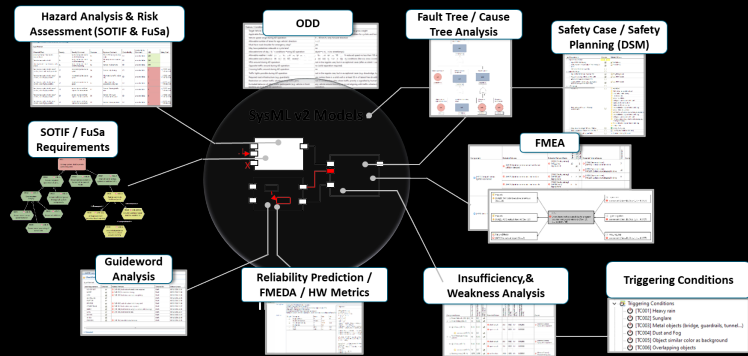
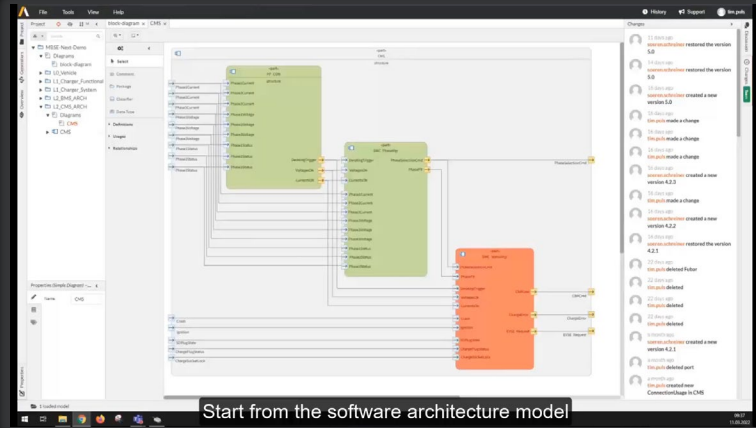


Digital Engineering Capabilities / Methodology

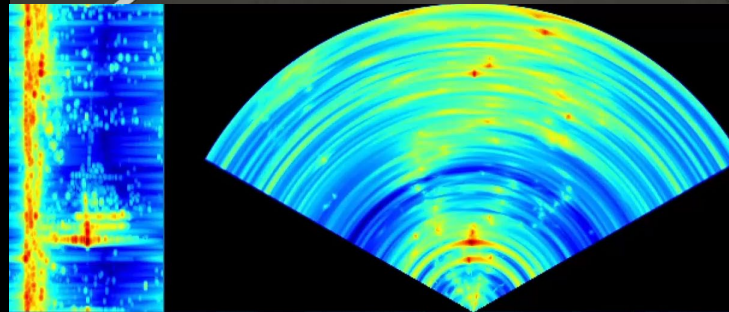


Digital Engineering Application / Demonstrating Safety of AD Functions

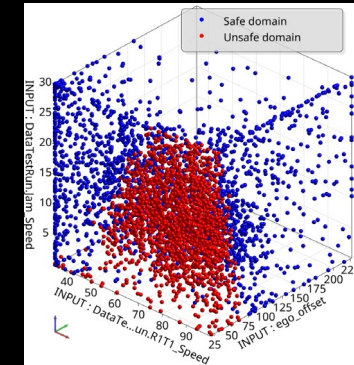
Safe Systems and Software (AD Function)



Camera and Radar Simulation (Perception Validation)



Scenario Variation and Reliability Analysis

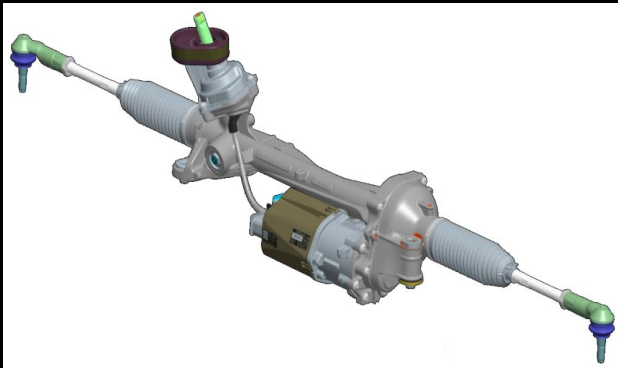


Digital Engineering / Customer Value

productivity (reduce integration & testing time) + shift left

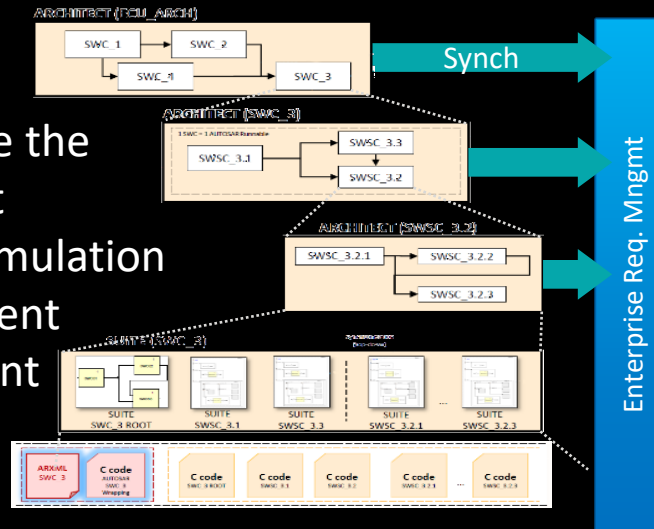
What?

Electric Powered Steering



How?

Synchronize the component
+ system simulation
+ requirement management



Value?

Productivity Gains*

Integration time reduced:
6 weeks to 2 days

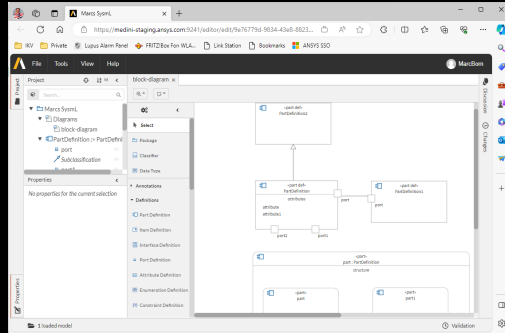
Testing time reduced:
16 weeks to 4 weeks

System retains full ASIL-D certification

(* Source: Dr. Frank Schöttler: „Using SCADE in High Availability Steering Systems”, DSC Shanghai

Ansys 2024 R2 – Digital Engineering

- Web-based **System Architecture Modeler** supporting SysML v2
- Center of gravity to support the MBSE methodology
- Works with Scade One, medini, ModelCenter, *more to come*



- **Digital Safety Collaboration Platform + DSM App**
- Accessing and collaborating on safety projects
- Plan, execute and control safety activities
- Addressing safety managers



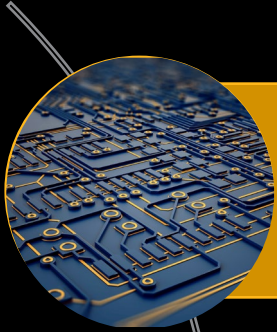
- **ModelCenter** bridges between system architecture model and engineering simulation
- Supports requirements verification and trade studies
- Integrated with the SAM



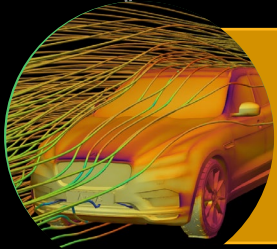
- **All new Scade One** for model-based development of embedded software
- Modern UI/UX, support of CI/CD workflows, textual and graphical modeling language
- Certified code generation that meet highest safety requirements



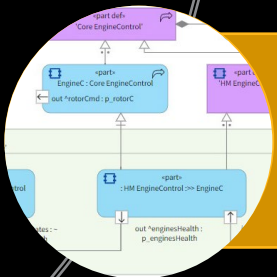
Summary



Our customers' challenges are the **efficient execution** of the individual workstreams and the **continuous integration** of these workstreams across the engineering lifecycle.



Ansys provides an integrated **suite of capabilities** that **connect the workstreams** for architecture & requirements; safety & cyber; physical and software, **across the lifecycle**.



Ansys supports capabilities including **SysML v2**, **connected & collaborative engineering** / user experience and **tighter integration** with engineering analysis and design.

The image features the Ansys logo on the left, which consists of a yellow slanted bar followed by the word "Ansys" in white. To the right is a large, stylized letter 'A' composed of a yellow slanted bar and a white slanted bar. The background is black.

Ansys