

The GOAL

System-of-Systems Modeling for Supporting Design and Deployment in Industrial IoT

Challenge

How to create and maintain a reliable design for dynamic IoT clouds?

*Within Arrowhead Tools, IncQuery Labs addresses the grand challenge of industrial IoT design: with the constantly growing presence and importance of the System of Systems concept and its diverse realizations, we also have to pay more attention to the issue of laying and adequate foundation for *system-of-systems modeling*:*

How do we design comprehensible, reliable large-scale IoT installments without limiting their autonomy?

IncQuery Labs aims at building on solid ground: the established, standardized methodology and tooling of model-based systems engineering (MBSE), and, in particular, the widely used SysML standard and language allows for extending and adapting the existing

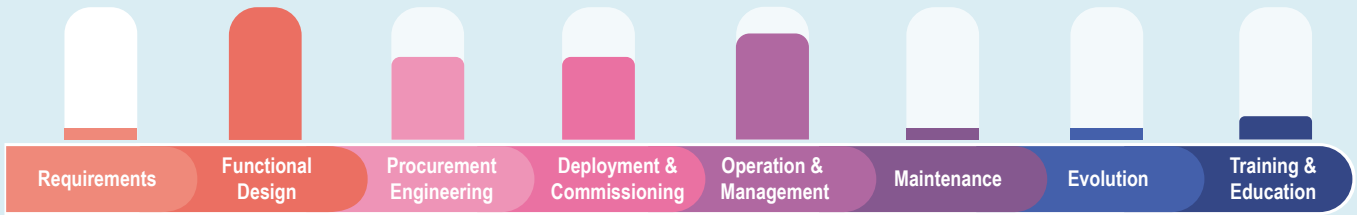
modeling concepts towards novel IoT and SoS concepts, while retaining the established technological baseline of systems modeling. Here, the main challenge is to break the data silo mentality and to provide a comprehensive, integrated engineering platform.

Within Arrowhead Tools, we propose a comprehensive SoS modeling methodology, accompanied by a novel integration approach combining design-time and run-time engineering aspects of complex industrial IoT deployments. Besides integrating our custom SysML models with the operator interface, we also offer cloud-based device digital twin modeling powered by Eclipse Vorto, as well as a collaborative systems engineering workflow via OpenMBEE MMS and No Magic's Teamwork Cloud.

ARROWHEAD and INCQUERY LABS COOPERATING ON SYSTEM-OF-SYSTEMS MODELING



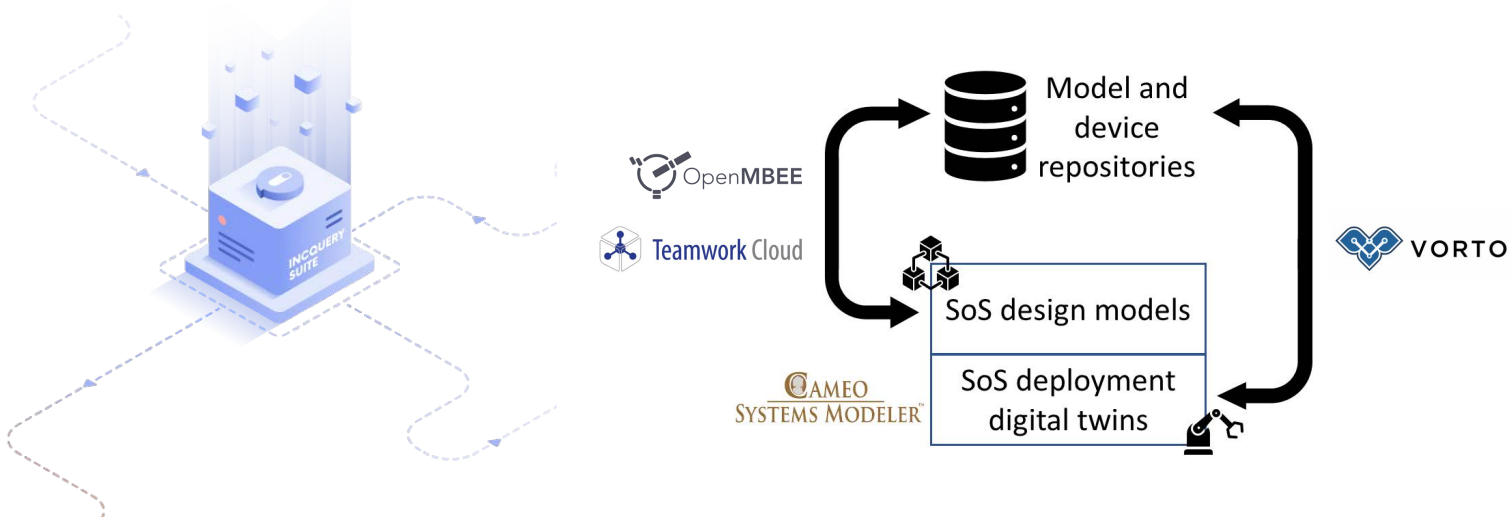
Engineering Phases



Results

The result of our work is both a novel design methodology for service-oriented Systems of Systems and an accompanying tool suite based on established CATIA No Magic technology.

During and after the project, we strive to disseminate those results in the systems modeling community and in relevant industrial domains such as aerospace, automotive and defense, in which we already have long-standing partnerships.



Partner Data



IncQuery Labs is a team of engineering experts with a strong research and development background who support systems engineers in several industries to create tailored solutions. Automotive professionals, aircraft engineers, space engineers, they all trust us to make their systems work exceptionally, safer, faster and more reliable.