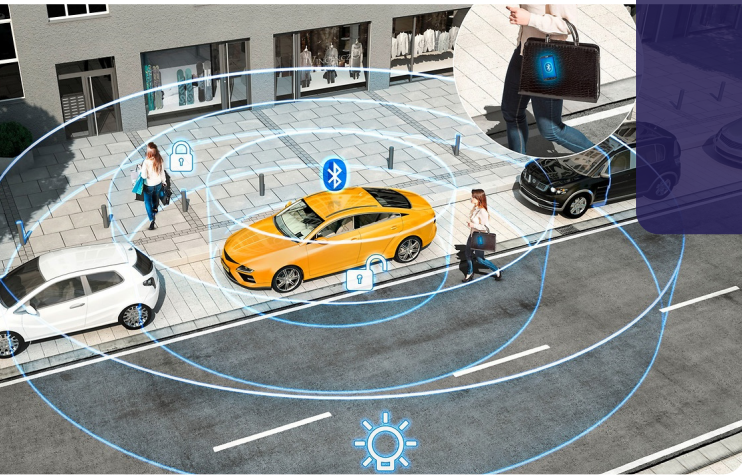# Driving Intelligent Transportation Systems with Capella

> **"** *The foreseen capability of Open Source solution Eclipse Capella overcomes actual gaps that we have identified in commercial MBSE tools, in particular due to methodological automation aspects.* - Jérôme MONTIGNY

Context

Continental Automotive develops pioneering technologies and services for sustainable and networked mobility of people and their goods. Founded in 1871, the technology company offers safe, efficient, intelligent and affordable solutions for vehicles, machines, traffic and transport.

Pushed by the introduction of Intelligent Transportation Systems communication technology and demands from customers for vehicle connectivity, new e-services are emerging in the automotive industry.

However, the service and product definitions are a tremendous issue as neither end-user nor OEMs requirements are mature enough, mainly due to innovation positioning of products and to diversity of connected devices.

In addition, the safety and security topics as well as variability are a big concern to clarify in system architecture during the requirement elicitation.

To cope with these new challenges, Continental Automotive decided to investigate Model Based Systems Engineering (MBSE) as a solution to design the complete system, from requirements to deployment, and facilitate the collaboration between systems architects and other stakeholders.
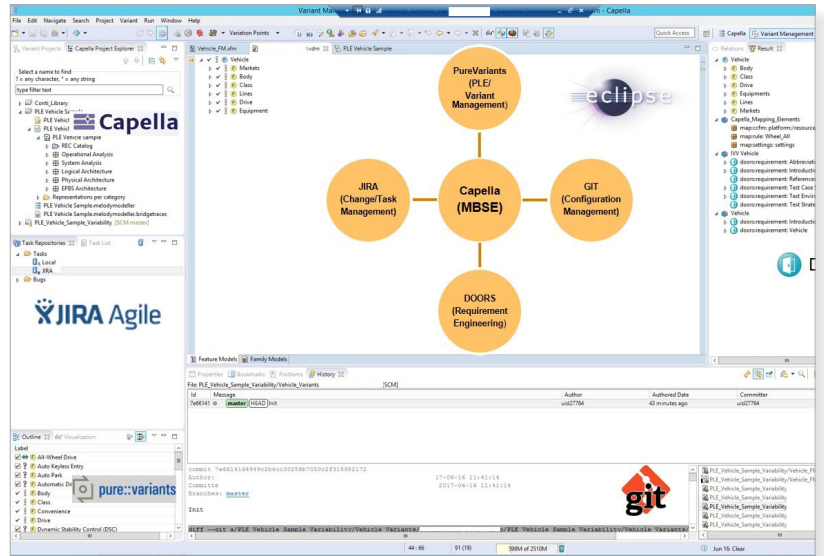
Jérôme MONTIGNY

Jérôme MONTIGNY is working in the Continental Automotive company since 2005.

As System Technical Project Leader, he is developing new generic platforms for Smart Access Systems using Capella as MBSE solution.

Capella

Solution

The initial MBSE project in Continental Automotive was to experiment Capella open source solution, with the following objectives:

- Get an operational and functional analysis of the System, within a coherent model of the complete System
- The Model shall be used since beginning of the project (even Request For Quotation) to analyse and capture requirements
- At best in collaboration with OEMs (speak formal and unambiguous language with customers)
- The produced models shall be reusable from one project to another, to speed-up initial phase of the projects
- It shall capture the overall need, solutions and deployment (operational, structure, behavior)
- The tool supporting the System model shall allow collaborative work for System Architects, without any fragmentation

A new MBSE workbench based on Capella has been defined enabling engineers to access different tools in one Integrated Development Environment (IDE):

- Pure::Variants (variability management)
- Jira (issues tracking management)
- etc.

The workbench is customizable, allowing the development of new capabilities:

- additional specialty engineering extensions,
- integration within ALM and PLM solutions,
- further performances and customizability improvements,
- etc.

Combined with Team for Capella, a commercial extension to collaboratively work with Capella, the engineering environment can be shared within large multi-partners projects.

Result

Capella is currently in use in 6 different Continental Automotive organizational units, located in 10 different locations in the world (Europe, Asia, US).

The potential process area of interest has been identified as:

- Requirement for clarification of user operational needs and functional scenario definition for system tests;
- Architecture for product breakdown structure with consistency checks;
- Domains co-engineering based on viewpoints (Functional Safety, Product Line Engineering);
- Collaborative work between Systems Architects

≡ Capella