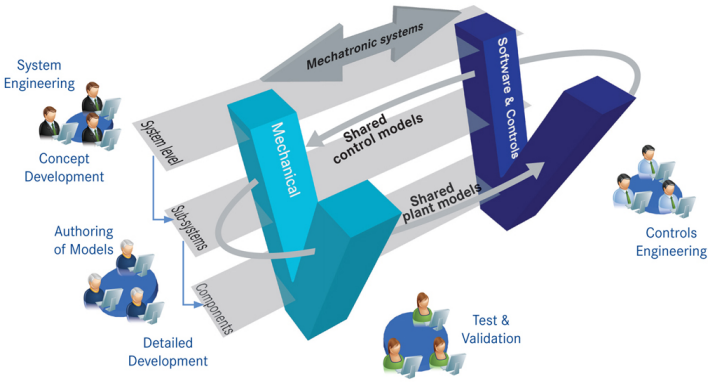
LMS 2012 European Vehicle Conference

CIMdata Commentary

LMS International held its 2012 European Vehicle Conference on April 18-19 in Munich, Germany. LMS is an engineering services and software company, headquartered in Leuven, Belgium. They are a partner for companies in the automotive, aerospace and other advanced manufacturing industries. They offer a combination of 1D and 3D virtual simulation software, testing systems, and engineering services.

This LMS event is a technical conference, aimed at the vehicle engineering community, particularly LMS' customers. Nearly 300 attendees represented 115 companies, and 44 papers were presented. The theme of the conference was "frontloading of vehicle systems engineering as a way to deliver superior brand performance." Industrial keynote speakers included Dr. Guglielmo Caviasso (Fiat), Dr. Christof Weber (Daimler) and Mr. Ryusaka Sawada (Toyota).



Model-Based Systems Engineering Process—
Supporting Mechatronics Devices and Control Systems
(Courtesy of LMS)

LMS is a leading proponent of Model-Based Systems Engineering (MBSE), and they are possibly unique in that they stress the importance of including physics-based models of mechanical systems in their analyses. For mechatronics systems, they propose the double-Vee approach illustrated above. Mechanical design and software and controls each have their development processes that are coupled by shared models to assess total system performance. This enables model-in-the-loop, software-in-the-loop, and hardware-in-the-loop capabilities at appropriate stages of product development. According to Dr. Urbain Vandeurzan, LMS' Chairman and CEO, this is "a paradigm shift whereby the mechanics, electronics and software in a new design will simultaneously be optimized as an integrated mechatronics system."

The conference featured 13 papers in three MBSE tracks. These covered a wide range of vehicle subsystems, including:

- Transmissions and drivelines
- Cooling
- Turbocharged and (electric) supercharged combustion

- Fuel
- Exhaust and catalysis (chemical)
- Controls
- Energy balance and overall efficiency
- Hydraulics and accessories

Imagine.Lab AMESim is the LMS platform for multi-physics system modeling. It provides comprehensive component libraries for vehicle systems, and interfaces to MATLAB/Simulink modeling environments. The sophistication of the systems models described at the conference was truly impressive. Even so, the models appear to be being used mostly for systems integration and optimization, activities on the right side of the Systems Engineering Vee.

MBSE should, however, be applied across the entire product life cycle, and can have a major impact on the left side of the Vee as well as the right side. Here, the need is for a collaborative environment to develop product requirements and explore product options and concepts across engineering disciplines and functional domains. Imagine.Lab SysDM enables this by providing shared, collaborative, data management with configuration and version control for AMEsim and other system simulation tools and data.

Other tracks at the Conference covered Powertrain NVH & Acoustics, Vehicle NVH & Acoustics, and Driving Dynamics & Durability. LMS provides software and hardware for test and measurement, as well as a comprehensive range of 3D mechanical simulation tools. They are a proponent of “hybrid” engineering, where test and simulation are used together for maximum impact on product development. All of these areas were well covered in the conference.

About CIMdata

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