

Simcenter Systems Simulation Strategy and Solution Update

CIMdata Highlight

On October 1, 2020, CIMdata met with Siemens Digital Industries Software (Siemens) personnel to be briefed on the latest and coming capabilities for Simcenter—Siemens' simulation solution. During the briefing, Siemens delivered a product and strategy overview and then focused on four topics:

- Model-based systems engineering
- Executable Digital Twin
- Process industry
- Autonomous driving

CIMdata has followed Simcenter from its inception and continues to be impressed with the capabilities and the closed-loop support across the lifecycle. The Simcenter portfolio includes simulations of individual product components up to system of systems simulations, CAE simulation, and physical test. These three capabilities are supported by HEEDS for exploration and analytics and the Siemens product innovation platform, Teamcenter, for data and process management. Teamcenter also acts as a gateway to the rest of the Xcelerator portfolio including MindSphere, which provides IoT support to connect models with operational data, closing the loop back to product development.

As products grow in complexity systems engineering becomes an essential capability. Siemens introduced Simcenter System Architect as the solution to define, validate, and manage product architectures to support system simulation. It includes a generative design approach that leverages artificial intelligence (AI) to optimize designs. Siemens expanded its system simulation offering with Simcenter System Analyst and Simcenter Webapp Server, which enables the application of system simulation beyond simulation experts. This enables Model-Based System Engineering throughout the enterprise. Renault and BMW were mentioned as lead customers using System Simulation for performance optimization of systems.

During the session, Siemens introduced their concept of an executable digital twin applying simulation models in combination with test applications across the full life cycle of the product not only for design and engineering the product. Simcenter has an expanded set of functions to create an executable digital twin based on Reduced Order Modeling and Machine Learning. The resulting executable digital twin can be packaged as an FMU, or neural network, that executes outside of the model authoring application. This supports Real-Time simulators and in combination with physical prototype testing and IoT data. Examples illustrated how the executable digital twin can significantly reduce cost in physical prototype testing by replacing expensive sensors with “virtual sensors.” The combination of executable digital twin with sensor and IoT data facilitates producing more actionable insights and enabling smart diagnostics, Asset Performance Management (APM), and business processes such as SLM. This capability extends the possibilities of combining Siemens and SAP applications in the recently announced partnership between Siemens and SAP.

Continuing with the automotive theme, Siemens reviewed their latest efforts in autonomous driving simulation. A multi-scale approach was used to simulate proprietary chip design up to system of system support for autonomous driving. Simulations were used for autonomous vehicles driving in traffic to validate chip designs before committing to expensive physical chip production.

Finally, Siemens reviewed their process industry plant simulation capabilities to support operational performance. By creating an executable digital twin of the plant in Simcenter, customers have the capability to improve efficiency, profitability and safety. The executable digital twin can be used to optimize the plant design before the physical plant is built, train operators using simulated or real operational data captured from CAE or IoT, and prototype physical and operational changes without putting day-to-day operations at risk.

CIMdata was pleased to see Siemens progress with Simcenter in the critical area of systems simulation. The variety of use cases supported continues to grow, giving customers more ways to understand and improve their products throughout their full lifecycles.

About CIMdata

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