Digitalization in practice

- Maserati automotive production relies on Siemens industry software
- Additive manufacturing for mass customization
- Multi-carrier system: Flexible transport enables individual production processes
- Quality, efficiency and flexibility for the process industries through integrated engineering with Comos and Simatic PCS 7

The Siemens presentation at this year’s Hannover Messe focuses on digitalization. Four digitalization showcases featured in the Digitalization Forum will be illustrating current examples taken from practice, demonstrating how digitalization is enabling greater flexibility, more availability, significant increases in productivity and a shorter time to market across the entire industrial value chain.

Digitalization in automotive engineering

Bigger, more profitable, stronger sales – Maserati has set itself a number of ambitious goals. The automaker based in Modena in Italy has embraced digital production, merging the real and virtual production processes throughout every step of the industrial value chain. It has built a new production plant near Turin, which will be partially given over to production of the Maserati Ghibli. Teamcenter is used in the new plant to enable central access to a common database.

Visitors to the Digitalization Forum, part of the Siemens booth at the Hannover Messe 2015, will have the chance to gain a first-hand impression of the new facility: The new Maserati Ghibli will be featured as one of four “Digitalization Showcases”. Together with a “digital twin”, this exhibit will illustrate the interaction between virtual and real production. Visitors will be able to experience the development of car components using NX software, gain an impression of the cost savings possible
through detailed simulation of production processes using the Tecnomatix software portfolio, and also find out how efficiently production plant automation can be simulated with the TIA portal. Complex processes during production can be planned, optimized and simulated using the MES software Simatic IT.

Additive manufacturing along the entire value chain
Within the context of additive manufacturing, geometrically highly complex structures whose realization was previously impossible or severely limited can now be generated directly from 3D CAD data for flexible production. At the Hannover Messe 2015, Siemens will be demonstrating how additive manufacturing is becoming “industrialized” and how generative production methods are opening up optimization potential in terms of efficiency, time to market and production costs. Integrated solutions from Siemens enable mass customization across every stage of production. This also applies to workpieces made of highly resistant materials, making additive manufacturing a key motor for innovation in the automotive and aerospace engineering, medical technology, power generation and machine building sectors. It also provides economic benefits such as the ability to dispense with time-consuming and costly mold making processes, reduced costs for design, production and assembly, or on-demand spare part manufacture. In the Digitalization Forum, Siemens will be presenting solutions for additive manufacture along the complete value chain. These include material qualification and product design with NX as well as workpiece design and optimization in machines controlled by the automation systems Sinumerik, Simatic or Simotion. Particular emphasis will be placed on the integration of additive manufacturing methods into line production using MES, Scada and Sinumerik Integrate.

Individual serial production up to batch size one
The increasing customization of industrially manufactured products calls for solutions suitable for even the smallest batch sizes. The world of machine building is currently facing the challenge of developing machines capable of transporting goods individually. Working in cooperation with leading automation technology provider Festo, Siemens used its hardware and software solutions to support pilot customer Optima in the development of just such a solution. Optima brought its extensive knowledge and know-how into the development of this innovative machine concept. The customer uses the Multi-Carrier System in its filling and packaging machines.
The result: individually controllable, self-propelled transport vehicles driven by linear motors. Digitalization enables processes to be efficiently and integrally designed on the basis of consistent data, from the initial planning stages through to operation. Siemens supports users back at the design phase with comprehensive industrial software for modelling and simulating the functional machine design. This makes it possible to create a seamless digital process chain, starting with product and machine design and continuing through the engineering right on to production automation. Individual controlling of the vehicles and the coordination with other servo-driven machine modules are provided by the Simotion motion control system and Sinamics drives. Visitors to the fair will be able to gain an impression of the interaction of real and virtual components during the filling and packaging of individualized products.

**Data consistency in the process industry**

Quality, efficiency and flexibility are what determine competitive standing in today’s process industries. Process steps have to be controlled along complex process chains, with the overriding aim of seamlessly linking the plants and different processes within a networked production line and planning the degree of capacity utilization as precisely and correctly as possible. Here, while digitalization opens up new potential for the entire life cycle of a plant, this can only be fully utilized on the basis of consistent data, from system planning, through implementation to control. This type of data acquisition is made possible by integrated engineering with Comos and Simatic PCS 7 from Siemens, which allows the many advantages of Totally Integrated Automation (TIA) to be consistently exploited. From the start of the planning phase, all the system data is made available in a central data platform, allowing plants to be adapted to new requirements at any time and operated at maximum efficiency.

This process is illustrated by a graphic demonstration as part of the Digitalization Forum on the Siemens booth: In an ideal liquid circuit, the existing water column is replaced by one that is x times larger and equipped with an agitator. The “digital twin” is visualized on a large monitor. Visitors can watch an expert at a workstation engaged in process planning and simulation with Comos and Simatic PCS7, in
simulation with the Simit Simulation Framework and also using Condition Monitoring for preventive plant monitoring.

For more information on Hannover Messe, please go to www.siemens.com/press/hm2015

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