Siemens PLM Delivers on Its Vision of the End-to-End Design/Build Lifecycle

By Dick Slansky

Summary

At the recent Siemens Analyst Event in Boston (September 21st), Siemens PLM provided the analyst community with a look at how far it has come in the past few years, where it is now, and what is in store for the future. This included new markets for PLM, future directions for the company in R&D, innovation, and new technologies, and realization of the company’s end-to-end virtual lifecycle, from concept and design to factory floor operations. Siemens Industrial Automation (IA), Siemens PLM’s parent business unit, along with Industrial Automation Systems (AS), are integrating product and production engineering by integrating PLM and Siemens industrial software across the entire product lifecycle, from design to automation. Siemens IA now offers a complete solution set from product design through manufacturing and operations on both the plant and factory floor.

Siemens PLM, AS Come Together to Deliver the Vision

In his opening presentation, Anton Huber, CEO of Siemens IA (and the architect behind the original acquisition of UGS to become Siemens PLM), pointed out that the next level of productivity for manufacturers will be achieved by integrating product development with production engineering. Enabling manufacturers to integrate product development and production systems has been the vision of Siemens IA ever since the business unit acquired a PLM software company. Huber pointed to the original project Archimedes, the ambitious initiative rolled out a little over two years ago to merge the software technology of product design and digital manufacturing of Siemens PLM with Siemens IA production systems and automation portfolio. Siemens has transferred products, systems, and solutions to business units and research for all five original Archimedes initiatives: Engineering for the Digital Factory, Hi Fi Machining, Virtual Commissioning, Harmonized Lifecycles, and Mechatronics.
Huber gave an example of the digital factory in one of Siemens own factories in Amberg Germany where they unify the product and production lifecycle processes through a seamless exchange of PLM and SCM data. This is a case where product design and development is integrated with the production processes and the supply chain base resulting in an integrated end-to-end lifecycle process from concept to shop floor operations.

**Siemens Industrial Automation Integrates the Total Lifecycle**

Helmuth Ludwig, Head of Siemens Industry Automation Communications, provided a view of how Siemens Industrial Automation unified the four major business units of IA: PLM, AS, Sensors & Communication (SC), and Controls & Systems Engineering (CS). According to Ludwig, integrating these business units enables integration of product and production engineering. Moreover, it fulfills the vision of Siemens IA to provide an end-to-end lifecycle of software solutions starting with concept and design, through manufacturing, and culminating with factory/plant operations and automation. In other words, integrating the design/build domains with operations and automation. Moreover, Ludwig points out that this unification under Siemens IA – which represents an integration of product and production design of Siemens PLM with automation and production of Siemens Totally Integrated Automation (TIA) -- offers a compelling customer value proposition.

Ralf Franke, CEO of Siemens Automation Systems (AS) reported on the current state of business and technology for AS, where the business unit holds the position of global market leader in industrial and automation software. The integration of Siemens AS and PLM technology and software represents the key factor in realizing Siemens IA’s vision of end-to-end product and production integration. Franke presented an overview of this strategy in which an integrated environment of product design, manufacturing process design, and process plant design enables the design, build, and operation of discrete production systems and process plants.

This complete lifecycle platform would include:

- product design (CAD) and test (CAE) with NX and Solidedge
- collaborative product data management (PDM) with Teamcenter, and
- digital manufacturing with Tecnomatix
Further, these design/build domains could then be integrated with:

- SIMATIC IT for manufacturing execution and factory operations
- COMOS for plant and process lifecycle engineering, and
- Automation Designer for discrete factory systems

At the automation and controls level, Siemens AS portfolio of automation software and hardware would include:

- Simatic PCS 7 for DCS and process automation
- Simatic WinCC for HMI, and
- Simatic S7 for PLC based automation.

Teamcenter will function as the core collaborative repository for all design and processes data. Additionally, Teamcenter will play a key role in the Siemens IA core software architecture involving the SIMATIC IT production suite, PLC/DCS automation platforms of COMOS and automation designer, along with Tecnomatix digital manufacturing.

**Siemens PLM’s Vision for the Next Generation of PLM**

Chuck Grindstaff, former CTO & EVP of Products and now new President of Siemens PLM, provided a glimpse into the Siemens PLM Vision for the near future. Essentially, Siemens wants to change the way companies design and manufacture their products, especially as the next generation of smart products become ever more complex.

Grindstaff provided an overview of Siemens PLM’s business vision in which it continues to increase its industry footprint by moving beyond the traditional discrete manufacturing sector to the hybrid and process industries. In the hybrid space, this would include life sciences, CPG, food & beverage, marine, and retail & fashion. In the process industries the focus is on energy & power, metals & mining, oil & gas (upstream and downstream), chemical & petrochemical, and pulp & paper. Siemens PLM places particular focus on continuing penetration into the life sciences, CPG, and shipbuilding markets, all industries in which it sees significant opportunity for expanding its PLM solutions.

For its technology investments, Siemens PLM is concentrating on five major areas: Systems Engineering, Integrated Product Development, HD-PLM
Technology Framework, Product & Production Integration, and an Open Scalable Backbone. In the area of Systems Engineering, Siemens PLM is introducing new technologies and interdisciplinary engineering development platforms like its Mechatronic Concept Designer. This enables a systems engineering functional modeling approach for developing machine tools. HD-PLM provides a comprehensive inter-disciplinary source of information across all product lifecycle domains. HD-PLM represents a virtual 3D repository of information that includes design models, simulation, manufacturing processes, and all data stakeholders need in the product development lifecycle to make the right decisions in the development process. Integrated Product Definition unifies all areas of the product development process at a collaborative enterprise level that includes CAD/CAE, engineering bill of material (BOM), bill of process (BOP), software, orders, purchasing, plant BOM, prototyping, and testing. Integrated Product and Production unifies PLM, ERP, and MES for both discrete and process industries.

Siemens PLM Brands Cover the Development Lifecycle

Steve Bashada, VP, Teamcenter Products, provided a strategic update for the Teamcenter collaborative product data management solution set. His message was simple: Teamcenter is the single source for all product and process knowledge and represents the customer’s best resource for productivity. Some key Teamcenter investment areas included HD-PLM (described previously), Systems Engineering, Collaborative Product Development (CPD), and client strategies. Systems Engineering was a significant focus based on the trend for more complex products along with multi-engineering discipline development requirements for mechatronic-based products. Teamcenter’s Systems Engineering methodology guides engineers through the stages of requirements mapping to functional specs, logical component development, to the physical parts.

For digital manufacturing, Siemens PLM’s Tecnomatix brand continued to expand in the scope of solutions and integration with the overall Siemens IA software portfolio. For assembly planning and validation, the company enhanced simulation solutions for automated assembly, human/ergonomic applications, and robotics. In sync with the ongoing trend in manufacturing to converge MES/shop floor operations with PLM, Tecno-
Siemens PLM has fulfilled the original promise of the company’s vision for an end-to-end design/build development platform, from concept and design, through manufacturing, to the factory floor operations and automation, utilizing the best of both worlds of Siemens PLM and Siemens IA.

**Conclusion**

Siemens PLM is clearly on track with its end-to-end PLM vision and realization of the Digital Factory. Moreover, going head-to-head against its competition, Siemens PLM routinely wins new business, which the company attributes to customers that need a very fast ROI. Significantly, some recent wins involve displacing existing installed base, a traditionally difficult task to accomplish in the PLM market.

One of the more significant factors for Siemens PLM and for the PLM suppliers in general, is the move into non-traditional industries like energy, utilities, AEC, shipbuilding, consumer products, and life sciences. In energy and power, Siemens PLM has an excellent market for its PLM solutions within its own parent company, which is a major global player. Additionally, it will be able to leverage the market dominance of Teamcenter with existing customers to move other solutions within its PLM solution portfolio (NX, Tecnomatix, Synchronous Technology, etc.). Finally, Siemens PLM has fulfilled the original promise of the company’s vision for an end-to-end design/build development platform, from concept and design, through manufacturing, to the factory floor operations and automation, utilizing the best of both worlds of Siemens PLM and Siemens IA.

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