PTC Live Stuttgart 2014 and LiveWorx

CIMdata Commentary

Key takeaways:

- *1,800 PTC customers, partners, and employees convened in Stuttgart at PTC Live Stuttgart 2014 and LiveWorx, on November 18 and 19*

- *The acquisition by, and integration into PTC of ThingWorx and Axeda, two leading Internet of Things (IoT) solution and service providers, help PTC boost realization of their IoT vision and strategy*

- *PTC's IoT Roadmap shows a solid foundation and framework, towards seamless integration of IoT into their overall Product Lifecycle Management (PLM) portfolio*

CIMdata recently attended the PTC Live Stuttgart 2014 and LiveWorx events in Stuttgart, Germany. These parallel events were held at the Messe Stuttgart venue, and registrants to either event could attend sessions in both events at will. The PTC Live event gave PTC customers the opportunity to not only hear and explore PTC's solution strategies and roadmaps, but also to showcase their own work, network with peers, share ideas, and discuss how they are addressing their challenges. At the LiveWorx event, PTC elaborated on the progress they have made on their Internet of Things (IoT) vision, strategy, and roadmap, and highlighted this with compelling client presentations.

PTC reported that the combined events had just under 1,800 attendees, which was a 28% increase compared to 2013. In total, 1,480 people had registered for the events, of which 1,310 were for PTC Live and 170 for LiveWorx. 41 Partners and sponsors attended, of which 6 focused on IoT. Some 50% of the attendees were of decision-making level (management level or higher), and CIMdata experienced an overall open atmosphere. Attendees spoken to felt comfortable to discuss their own situation and were satisfied with the conference program offered by PTC.

Earlier in the year, CIMdata attended the PTC Live Global event in Boston. A CIMdata Commentary was written on that event. Both PTC Live events covered many of the same topics. As a result, CIMdata concentrated on the sessions of the LiveWorx event, which was linked to PTC Live through PTC Live's keynote presentations.

In his welcome speech, Michael Sauter, PTC's SVP Sales for Central, Northern, and Eastern Europe proudly mentioned that PTC continues to experience growth across Europe in all areas: across their product portfolio, across the industries they serve, and company sizes. He illustrated this by mentioning some examples of wins they had, which include Volkswagen, Continental, Festo, and SMS Group.

In the opening keynote, Robert Gremley, EVP IoT and SLM, emphasized how smart connected devices and products (i.e., smart, connected products and other things that combine processors, sensors, and software with connectivity) will fundamentally change value chains, and have significant impact on industry structures. He cited a prediction from Cisco that in 2020 there will be 8 billion people on Earth, and 50 billion connected devices! In addition, he referred to a 2013 McKinsey study that estimates IoT to have the opportunity to generate 5 trillion Euros in economic value by 2025. These observations and expectations are in line with CIMdata's vision that we have communicated over the past years. Additionally, they align with visions behind various industry initiatives, like the German

Industrie 4.0. Whether the economic value will be as high as estimated is a point of discussion, however, IoT has already started a disruptive trend in many economies.

Over the past few years PTC has studied many aspects of IoT, in joint cooperation with Dr. Michael Porter, and according to their definition smart connected products have three core elements: physical components (e.g., mechanical and electrical parts), smart components (i.e., sensors, microprocessors, etc.), and connectivity components (e.g., ports, antennas, and protocols enabling connections). Such sophisticated products, resulting from multi-domain engineering, must be designed using Systems Engineering methodologies. PTC's Atego acquisition provides applications and services for model-based systems and software engineering, and fits PTC's IoT model and strategy quite well. Atego will further be branded as PTC Integrity Modeler. This is a valuable and strategically valid expansion as IoT requires that during the engineering and design phases of a product's lifecycle, all aspects of the mechanical, electrical, electronic, and software elements are combined in an optimal fashion to maximize the power of these individual areas and product's overall value. As a result, systems engineering is the best approach.

Mr. Gremley concluded his keynote with a discussion on four new capabilities that smart connected products bring to the market. These are the capability to *monitor* the condition of a product without the need to be in direct physical proximity of the product, the capability to remotely *control* and configure individual products or fleets of machines, *optimize* performance during operation, and finally the ability for the product to use algorithms to learn and *autonomously* take decisions without human intervention. These capabilities enable closed loop lifecycle management, as that real-time operational product data can be fed back into the lifecycle for improved management of the product. The differentiation in the four capabilities mentioned provides a growth path for companies, as each subsequent capability level adds to the previous. Companies that get started on their IoT endeavor can start at the monitor capability level, and then grow towards the autonomous level. The idea of feeding back in-operation data is not new in this respect. The inclusion of it into the lifecycle, however, has not been a common practice, despite the high value for product design. PTC claims to add this information into the lifecycle by default, which is a positive step forward.

Closed Loop Lifecycle Management

During a round of presentations from Brian Shepherd (EVP Enterprise PTC), Michael Campbell (EVP CAD PTC), and Robert Gremley (EVP IoT and SLM PTC), the importance of applying systems engineering methodologies and techniques in the design and development phases of smart connected products was emphasized. These phases are well supported by PTC's recently acquired Atego model-based systems and software engineering applications. Together with PTC Integrity, the Atego applications suite now has been combined into PTC's Systems Engineering Solution offering. One of the key benefits of smart connected products is that they provide feedback loops on the health and status of the product in the field. This clearly allows for closed loop service lifecycle management: to service the product through its full lifecycle, and allows for new business models to be defined and applied. Ultimately, this should result in higher quality products, products that better meet the needs and demands of the customer, and the opportunity for the client to feedback information to the producer so that the producer can better understand the use of its product and thereby is in a better position to optimize the product for their client, deliver more value, and provide better after sales support.

IoT, ThingWorx, and Axeda

Smart connected products provide a lot of data that requires processing so that data can be analyzed and business value can be created from it. For that purpose businesses require infrastructure to hold the data, and applications to process it. These capabilities are being enabled through the acquisitions of ThingWorx and Axeda. Both solutions provide their users with a platform to hold data and enable connectivity. The big difference between the two is that ThingWorx mainly focuses on providing a non-cloud platform that allows for applications to be built on top, and Axeda provides a cloud platform and applications to be applied to the data. As both solutions are quite complementary to each other and have the potential to be mutually reinforcing, these are logical acquisitions, certainly when we take into account how PTC positions them within their solution portfolio.

Both solutions are currently being integrated into PTC's solution portfolio, where the cloud capabilities of Axeda are being integrated with ThingWorx. Both solutions are now branded as PTC ThingWorx for the platform and PTC Axeda for the applications. As such, ThingWorx provides three layers: **Connect** which holds the IoT Connectivity Middleware, **Manage** which holds the data, in the cloud, and **Build** which provides IoT application enablement. Axeda provides apps for Service Lifecycle Management (SLM) as well as capabilities for customers to develop their own SLM solutions. Since IoT feedback mechanisms can provide a vast amount of data that comes from a company's in field products, the volume and diversity of that data can easily overwhelm a company looking to understand and leverage it. Having the possibility to store all this data in the cloud, so that no additional infrastructure is required locally, is very likely to remove an important financial obstacle at companies who would benefit from adopting the IoT concept. That is of course when aspects of security and privacy are well considered. Large, or Big, Data only has value when the appropriate information can be extracted from it. That is where the applications come in. The standard applications provide knowledge and experience from other companies across different industries. Each user can also define their own applications. In short, PTC does not only provide the means to collect data, they also provide the means to store it and to draw intelligence from it.

Integration is taking place at rapid pace, in three steps. PTC's first step focuses on basic data integration between ThingWorx and Axeda, their second will make ThingWorx AlwaysOn Connectivity service available for Axeda, which means that, according to PTC, instant connectivity is guaranteed. Finally, the third step will realize advanced data integration and scale, meaning that Axeda's connectivity and cloud capabilities are completely integrated into ThingWorx. This third step is scheduled to be completed by July 2015.

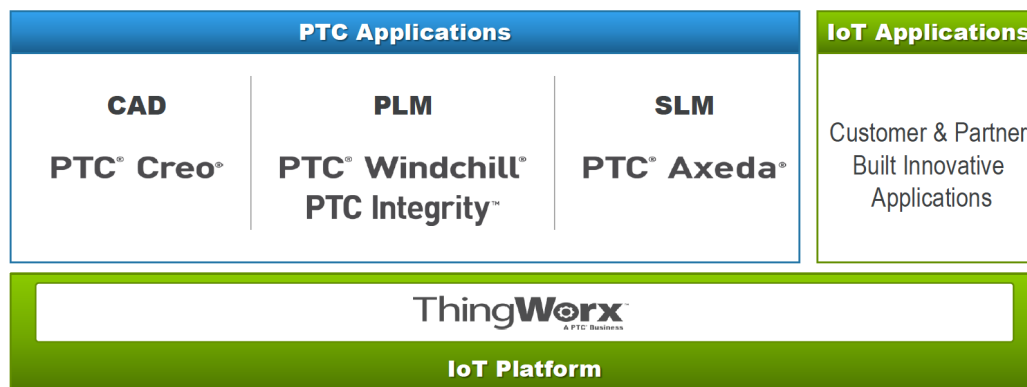Upon completion PTC's solution architecture will look as shown in Figure 1.

Figure1—PTC's Application Architecture

This is a solid architecture that positions PTC for the future where smart connected products will be more common and businesses seek to generate benefits from them. The already mentioned Industrie 4.0 initiative in Germany, to name one, that seeks to create the intelligent factory, matches quite well with this PTC architecture.

For implementing IoT into any organization and create true business value from it, PTC has defined a six level IoT Value Curve where a company starts at level 1: unconnected, and grows through the succeeding levels: 2: connected, 3: serviceable, 4: intelligent, 5: optimized to the highest level 6: Differentiated. Each level has a number of characteristics that need to be met. The 6th level has no end to it, so according to PTC the opportunities for companies at that level would be almost unlimited. At that level the limitations are very much set by the type and amount of data that is being collected, analyzed, and that can be legally used in a business.

Summary

PTC has made significant steps in transforming their vision on IoT into a vision and strategy for their entire solution architecture and portfolio, and has made reasonable progress in its realization. They have expanded their solution portfolio through the acquisitions discussed, and with these acquisitions a good number of partners appear to have embraced PTC's program, creating critical mass to serve their clients. Presentations from PTC executives were interspersed with presentations of their clients who proudly shared the steps they had already made on their IoT journey as well as presentations from several PTC partners that have practices on IoT. The majority of the client examples CIMdata sat in were still on level 2, connected, for several reasons, but all of them had recognized the enormous business potential. CIMdata looks forward to hear more examples from these clients when they progress towards the next levels on PTC's value curve, and the additional value they have received from making their lifecycle truly closed-loop.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata's services, visit our website at http://www.CIMdata.com or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, the Netherlands. Tel: +31 (0) 495.533.666.