PLM and the future of the digitalized industry

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For more than 20 years, we have the term PLM (product lifecycle management) and still a number of IT suppliers that have put such systems as standard software on the market. But the real goal of PLM – managing the data of an industrial product at the manufacturer's over its entire lifecycle centrally, current, and unambiguous – over the years it has even receded into the distance. An unbiased analysis of the status quo with suppliers and users seems appropriate. Perhaps this results in a fundamental redefinition of what kind of IT support the digital industry needs.

On October 5, 2016, Prof. Martin Eigner – many years ago one of the first providers of professional PDM / PLM software – in Kaiserslautern hosts the "8th PLM Future Conference". For eight years, therefore, a conference on the future of PLM. In July 2016, the ProSTEP iViP Association published theses on the same subject entitled "Does PLM have a future in the age of digitalization? – Free theses paper on future PLM". Therein you will not find many new ideas. Why is it that this discussion makes no headway?

Anyone who has visited the Digital Factory at the Hanover Fair 2016, found there a fairly heavily modified exhibition, spatially and thematically well above the previous topics of this "Trade Fair for Integrated Processes and IT Solutions", as the subtitle catches it. This had happened because in addition to Microsoft and SAP now also Accenture, AT & T, Bosch, IBM and other companies pushed into the Digital Factory, and besides the VDMA the BITKOM. Eventually the traditional providers of engineering software and PLM found themselves kinda outsourced in Hall 6 next to the suppliers, while many new players spread out in the original main hall 7 that had neither CAx nor PLM on offer.

First, there is an extension of the spectrum of industry software that ousted the former heavyweights from the center. On the other hand the PLM industry finds itself in a massive upheaval already for years, although no further companies have been taken over or closed recently. But a clear differentiation of the branch towards others and the individual companies against each other is becoming increasingly difficult.

Retrospect

In the nineties electronic product data management (PDM) became a new software category. At the latest with the implementation of three-dimensional CAD models as the main medium of product development, the automation and standardization of the management of the data of these geometric models became necessary. Manual storage in self-defined directories of the harddisk didn't work any longer even in small businesses.

Once available, the appetite grew to use such data in other areas of the industrial value chain, and also the appetite grew for new users in other departments beyond engineering. Why should't the marketing or the assemblage already work with the models, since they were available via a centralized data management? At first this was only all about the geometry data of the mechanical design – which in the nineties still implicated the vast majority of industrial innovation. PLM then actually became the marketing strategy in order to build width for this approach within the companies and to win as many users as possible.

Since then much has changed. Mechatronics brought more and more electronics and embedded software into the products. The 3D models were no longer adequate to reflect the logic and function of mechatronic
products. PLM hit the limits between the subject-specific IT applications that were not designed for multidisciplinary cooperation. And of course PLM wasn't designed for it either. And until now most of the users still struggle in terms of interdisciplinary cooperation. For many years now both IT vendors and integration service providers are trying to bridge these trenches - with individual successful projects and single highly integrated solutions. Model-Based Systems Engineering (MBSE) has established itself as a new keyword. But overall the kernel of PLM is usually further the data management for the mechanical geometry.

Lately even more has changed – the buzzword is Industrie 4.0. The mechatronic products are provided with an IP and connected with the Internet. They are becoming smart products in the Internet of Things, defined as "cyber-physical systems with integrated, Internet-based services." For these products, it is not only important that all engineering data from the participating disciplines are available. Now it is also important that all the information generated or collected over the entire value chain and afterwards while being used in the Internet, can be chained together. This situation represents the biggest challenge for the PLM approach for over 20 years. And maybe this challenge forces us to rethink the management and use of data in the digital industry.

**The Internet Of Things And The Business With Industrial Data**

For the future products the product data get a whole new meaning. And by connecting them with the Internet huge further amounts of data will be added that have to do with the product. There are two fundamentally differing types of product data: those of the manufacturer, which are generated during the creation of the product and its distribution; and those that are generated or collected during the use of the product. One could say that there are manufacturer product data and usage product data.

Both types of data play an important role for the future industrial products business. The first type is effectively the capital which the producer can bring to bear. The second kind, however, can be a gateway for services offered by third parties for the respective product. Because the biggest part of the data from the use are to be measured, determined, accumulated without requiring the manufacturer's data to be available. However, if both can be coupled together - and that normally something only the manufacturer can do - then particularly interesting services can be derived.

From this perspective, PLM gets a completely new importance. Those will have a great advantage over all others, who have a functioning PLM including the data from electronics and software, and who is able to couple also the data from the production engineering, from manufacturing and the subsequent processes. Therefore PLM is not becoming less but even more important with Industrie 4.0 and IoT.

**The New Weight Of Artificial Intelligence**

At the same time we have to consider, that even the best and most consistent PLM is not sufficient, because the very existence and availability of data is not enough, if you want to make business with services on the basis of product data. They must be enriched by a certain "intelligence". That is the reason why the providers of platforms for big data analytics and artificial intelligence (AI) in the cloud are suddenly experiencing a boom. Without these platforms industry apps and apps for the industry are very limited feasible.

Within the last few years artificial intelligence scored a new dimension. Cloud technology, intelligent combination of server farms and the breakthrough of artificial neural networks have lifted machine learning to a new level. When Google DeepMind's AlphaGo in March 2016 beat the 17-time world champion in Go, it had a lot to do with the fact that equipment now is able to gain very quickly much "intelligence" with the help of machine learning while it's working. AlphaGo owes its success to the "experience" that the software within a few months made in countless games against itself.
IDC believes that the next big battle in the IT and the Internet will be about the leadership in AI platforms. By 2020, this market will comprise 40 billion US $. 60 percent of it will be generated on the platforms of Amazon, Google, IBM and Microsoft. The latter two already this year were major exhibitors at Digital Factory in Hall 7. A few years ago IBM sold the entire PLM business to the former partner Dassault Systèmes. Within the Digital Factory the provider had a large booth for "IBM Watson IoT".

The question of the future of PLM therefore is certainly at least partly a question of how well PLM data can be coupled with artificial intelligence. On the other hand, however, the answer is found where all the IT vendors are going through a transformation these days: from the sale of IT systems, installed customized by the customer, towards providing customized solutions, i.e. services based on a given software. Also the industry customer will increasingly be asking for such solutions. And he will possibly soon not be interested in knowing what kind of software has to be installed, just like the user of a smartphone does not want to know on what kind of software a service on blood pressure measurement is running.

**PLM Offering To The Test**

The PLMportal was launched early 2012 with the absolute focus on PLM. Since then the topics Industrie 4.0, the Internet of Things and Industrial Internet came more and more to the fore. It seems reasonable to put today’s PLM offering to the test within the section "background" of this portal, using the above explained viewpoints. The PLMportal will address this in the coming weeks and months. All vendors are invited to participate, as they currently play an important role worldwide and in Central Europe or in German industry. In alphabetical order, these are ARAS, Autodesk, Dassault Systèmes, Oracle, PTC, SAP and Siemens. In addition, with a clear focus on Central Europe and Germany: Contact Software and PROCAD.