

The Business of Engineering

CIMdata Commentary

Key takeaways:

- *Few PLM implementations achieve their original goals and often end up as PDM silos that struggle to evolve as business needs change*
- *PLM is usually not enabled with a single technology and no solution provider has a complete end-to-end, top-to-bottom solution that fully enables an organization's end-to-end PLM needs*
- *Enabling PLM requires a platform that is capable of filling in data and process gaps to connect system silos into a holistic solution that meets current as well as future business requirements*
- *An organization's PLM platform should be easily configurable to support future requirements without exorbitant cost and effort*
- *Aras Innovator case studies show its ability to fill in PLM process gaps and tie disparate product definition silos together, and according to their clients, has the platform capabilities needed to help them achieve their PLM vision*

CIMdata has been in PLM since before the acronym PLM emerged. Over the years we have seen product complexity grow at an increasing pace. Today that growth has gone exponential and is primarily driven by embedded software and electronics. To manage the complexity, leading product developers are adopting a systems engineering-centric approach to product development.

In addition to complexity, the growth of “product as a service” and the Internet of Things (IoT) require a greater focus on managing the end-to-end product lifecycle to ensure customer satisfaction and maximize profitability. With the explosion of cloud-based services, sensors, and ubiquitous connectivity, smart connected devices can leverage information in real time and can even be updated and enhanced.

CIMdata's definition of PLM has been very clear and consistent over the years. PLM is a strategic business approach that applies a consistent set of business solutions in support of the collaborative creation, management, dissemination, and use of product definition information across the extended enterprise, and spanning from product concept to end of life—integrating people, processes, business systems, and information. PLM is usually not enabled by a single technology and we have yet to see a single solution provider deliver a complete end-to-end solution and do not expect anyone to do that in the foreseeable future.

Additionally, we rarely see companies that have implemented a complete end-to-end solution that achieves their PLM vision. But CIMdata's A&D PLM Value Gap report¹ shows that leading companies continue to invest in their quest to achieve a full PLM vision while capturing significant benefits along the way. Followers—those that don't treat PLM as a strategic business approach—typically end up with PDM silos managing a subset of their product definition information and processes.

Why do followers get stuck? PLM solutions have proven hard and costly to develop, integrate, and maintain. PLM implementations commonly run out of money, time, and

¹ <http://CIMdata.com> In the white paper section, published March 7, 2013

perhaps most important, executive support well before they are completed. This happens for many reasons including:

- Processes are not well-defined, changing quickly and changing before they are completely implemented in the solution
- Choosing the wrong solution or implementing poorly often leads to poor solution performance
- Poor user adoption due to insufficient organizational change planning and execution
- Difficulty doing updates and staying current with new releases once the system has been customized
- Scope creep

What is often the net result? Companies get stuck with an incomplete solution, with gaps in both data and processes that can reduce quality, increase time to market, and lower profitability. Furthermore, using spreadsheets to fill the gaps can lead to unclear master data, a lack of data sharing, unaddressed business processes, and a general lack of scalability. As product complexity continues to increase these conditions introduce the potential for a range of serious issues including safety, liability, and field repairs or recalls.

What can a company do?

In many cases when companies get stuck they chose to rip and replace legacy systems which is expensive and time consuming. Based on our work with industrial clients, CIMdata sees an alternative approach that automates unaddressed engineering and product definition related processes without ripping and replacing legacy PDM systems. This is a more efficient and cost effective approach, in which legacy systems are encapsulated and treated as modules of the overall PLM solution as well as data sources for other processes. This minimizes disruption by keeping the PDM systems in place and connecting them to the process layer that spans engineering and product definition across the lifecycle.

This strategy minimizes disruption and risk while providing a foundation to support the ever changing business environment. A solution architected this way will achieve value sooner and take legacy system migration off the critical path. While some of the legacy systems' operating costs will remain, the value added by enabling unaddressed engineering processes and improving data flow in complex business processes typically significantly outweighs the legacy costs.

A Solution to Support the Business of Engineering

Two customer case studies published by Aras demonstrate the power of their implementation approach. Magna Powertrain's GETRAG division, develops advanced automotive transmissions that use sophisticated software and electronics to control the transmission operation. Magna GETRAG was able to develop solutions using the Aras Innovator platform to support diverse processes including the prototype approval process and budget planning for product development while integrating the legacy CAD data management solution.

Xerox develops photo realistic solid ink printers that significantly reduce consumables-package waste. They focused on connecting a wide variety of data silos used to develop, produce, and support the product to a process management backbone implemented with

Aras Innovator. In addition legacy change management solutions including a paper-based one were consolidated into a single solution running on the process backbone.

In both cases Magna GETRAG and Xerox products have complex BOMs that include mechanical, electronic, and software components that have complex configuration rules. Product data is leveraged across diverse groups including finance, production, and service while engineering gets access to finance and field service data. While each company had unique issues to solve both used a similar methodology of connecting existing solutions and enhancing information flow through processes.

What makes Aras successful at these companies?

CIMdata sees Aras Innovator's process management capability as key to Magna Powertrain's and Xerox's success. It enables coordination across disciplines including software, electronics, and mechanical hardware without data migration. In this way, data remained in the original systems, but appears in Aras Innovator to support processes defined with the Aras platform, including BOM creation, change management, and ERP integration. Processes supported range from product development to manufacturing, quality, supply chain, and field services, essentially the full product lifecycle.

Aras Innovator's tailoring and integration capabilities enabled these companies to quickly model their processes and encapsulate their legacy systems. The graphical model-based development environment makes it relatively easy to develop and change data models as processes change and the solution grows to encompass more and more of the business processes across the lifecycle.

CIMdata [previously reviewed](http://www.cimdata.com/en/resources/complimentary-reports-research/commentaries/item/551-aras-innovator-redefining-customization-upgrades-commentary)² these tailoring capabilities and how Aras includes version upgrades, even when highly tailored, within the enterprise subscription (an extremely valuable service that PLM veterans appreciate). With upgrades included, and the ease of solution modification, the Aras Innovator platform makes it easier to stay up-to-date with current business processes while avoiding becoming another siloed system.

While not positioned as an Enterprise Service Bus (ESB), Aras Innovator can operate in that mode in addition to providing sophisticated data modeling and workflow capabilities. Aras created an extensive data modeling environment and uses an XML dialect, Adaptive Modeling Language (AML), as its native format. Using XML simplifies data manipulation for objects that include hierarchical structures, complex attributes, and change objects. This ability combined with the platform's open web services APIs make it relatively straightforward to integrate and manage complex data structures. In addition, many packaged connectors are available to other enterprise systems such as SAP PLM, Oracle Agile, ENOVIA, Teamcenter, and Windchill.

Enabling this heterogeneous model is complex and Aras believes their model-based SOA platform technology is the "secret sauce" that enables them to support the business of engineering. CIMdata also sees their flexible licensing model, including the open download strategy which makes the software freely available, as key elements to their success. These elements make it easy for customers to develop, test, and ultimately deploy in production with low risk while solving difficult problems.

² <http://www.cimdata.com/en/resources/complimentary-reports-research/commentaries/item/551-aras-innovator-redefining-customization-upgrades-commentary>

Conclusion

With the increase in product complexity and extended lifecycle business opportunities companies need PLM more than ever. They need to link and manage data and processes that are typically not supported with legacy PDM and PLM solutions. Companies get stuck with their legacy systems and solutions for a variety of reasons, even after 30 years, CIMdata still observes large gaps in companies achieving their PLM goals. Companies need platforms and technologies that can fill the large process gaps by managing workflows and capturing data while connecting and coordinating existing data silos. Aras has recognized this need and has case studies that show how they have solved this class of PLM issues and helped their customers succeed.

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.