Windchill's Evolving Lineage

CIMdata Commentary

Like any expanding and highly competitive software market, the PLM market is not immune to the technology refresh debate—a debate that marketing professionals love to use to create fear, uncertainty, and doubt, and technologists use to create elaborate justification matrices. If you remove all the hype and marketing adjectives you usually find that those technology-based solutions that sustain a positive revenue growth trajectory over at least a ten-year period usually are staying with the technological times. Those that appear to be a "flash in the pan" generally chose to go down a technological dead-end or did not invest enough to keep up with the rest of the pack.

Over the years, numerous new technologies have been touted as the latest, greatest things to happen to the world of software development. Many of those, have eventually fallen by the wayside, but some significant developments have survived. During the mid to late 1990s, the Web browser and Java were two such highly touted technology advancements. However unlike some other technologies, these two have largely delivered on their promise. The promise, and reality, of a hardware independent software delivery platform has proven to be a significant breakthrough. Today, most, if not all of the major enterprise software solution suppliers offer some type of client that is accessible via a Web browser. Many provide some, if not all, of their client functionality via some type of Java technology. And some are powered by Java in the backend servers. For suppliers like PTC who have bet their company on these technologies and information delivery paradigms, the question fifteen years later is, were they lucky or just highly intelligent? Well, luck and intelligence probably did play minor roles, but the most critical element would be the company's willingness to evolve its technology in a well thought out, intelligent and controlled manner—a manner that allowed its software solutions to continually evolve without having to be recreated every few years.

On the surface, the current release of PTC's Windchill PLM solutions appear to be based on very similar technology to that used ten years ago. But for those of us who have had a chance to look more deeply, much has changed. Yes, the user interface has changed and yes, PTC has released a number of Windchill applications over the years—Windchill PDMLink, ProjectLink, MPMLink, RequirementsLink, etc. But that is not the entire story. Those new applications, which all leverage the Windchill foundation layer, can only be as good as the foundation upon which they have been built. And as we all know, a weak foundation cannot support what has been constructed on top for long without either collapsing or being redeveloped. Fortunately, PTC has understood this basic truth for years and has a long history of evolving Windchill's foundation and the solutions that have been built on it. The bottom-line is Windchill and the 900+ SQL tables that exist across all of its modules, while still a 100% Internet-based solution, have been evolving for years. A close study of Windchill shows that it is not the same solution it was ten years ago, and that's a good thing.

Like any good software development organization, PTC has emphasized and initiated a concerted effort on continually refactoring Windchill's code base. This process of changing Windchill's source code without modifying its external functional and interface behavior has greatly improved some of the nonfunctional attributes of the solution (e.g., improved code readability and reduced complexity to improve the maintainability of the source code). Additionally, these types of improvements often result in better system performance as well

as increased user productivity. PTC has also often chosen to invest significantly to rewrite acquired software solutions. For example, Info*Engine, the Enterprise Application Integration (EAI) solution that came with acquisition of auxilium has been completely rewritten in Java while preserving backward compatibility at appropriate interface levels. Polyplan's manufacturing process management (MPM) solution was recreated and expanded on top of the Windchill foundation. It might have been more convenient in the short term to simply integrate Polyplan to Windchill, but the rewrite has netted significant long-term benefits. PTC chose to delay potential time-to-revenue from MPMLink in order to build it on top of the existing, integral Windchill architecture. This has resulted in better overall usability and consistency for the end user, and better maintainability for PTC.

From its early days, Windchill was a model driven solution that extensively used a managed code environment. Originally, Windchill was based on Unified Modeling Language (UML) and source code generation, as defined and supported by Rational Rose. With the upcoming release of Windchill, Windchill 10, the core object model is expressed using Java annotations and a corresponding annotation processor. PTC reports that it was able to transition Windchill to this new environment fairly easily because of Java's continued evolution (i.e., continued expansion of its functionality) and its support of annotations. The increased maturity of Java isn't the only thing that has allowed PTC to evolve Windchill's code base. It also benefits from the evolution of HTML and web browser capabilities that have enabled a richer, more performant and interactive user experience while maintaining a thin client.

Additionally, PTC has made a concrete effort to investigate, invest in, and incorporate open source technologies and components into Windchill and its other product development solutions. They timed this move into open source when it became considered best of breed and robust enough to be trusted. For example, PTC packages and provides full support for Apache, including the use and incorporation of Apache Tomcat, the open source servlet container developed by the Apache Software Foundation, within Windchill's application server. PTC has also replaced other proprietary capabilities with similar open source solutions because this allows PTC to leverage freely available and proven capabilities which it doesn't have to develop on its own. Other examples of how PTC is taking advantage of open source technologies include its incorporation and support of Solr, an open source enterprise search platform, and PTC's announced plans to build an "Application Lifecycle Management" solution on the widely-used open source software development tools Bugzilla, Eclipse, and Subversion. PTC's apparent commitment to the incorporation of open source tools is very consistent with a technology strategy to develop and deliver solutions that are unique, not solutions that are freely available. This allows PTC to focus on non-commodity solution components and business solutions focused on solving specific business and industry needs. This approach isn't new to the software industry—you don't have to go back too far to find software solution suppliers that developed and supported their own database systems, but today, there are almost none left.

In a similar vein, PTC is also incorporating various Microsoft components into Windchill. Windchill Web Parts for SharePoint, for example, provides SharePoint users with simplified ways to work with processes and information that remain safely vaulted in Windchill. Also, Windchill SocialLink has been built on top of Microsoft SharePoint 2010. This relatively new solution takes advantage of a number of Microsoft social media enabling technologies to facilitate ad-hoc team collaboration. PTC also recently announced Windchill PPMLink, a program portfolio management solution that is built on top of Microsoft Project Server and Microsoft SharePoint 2010. This solution supports Stage-Gate and PACE (A Practical Approach to Concurrent Engineering) processes for managing projects from conception to

realization. As with the incorporation of open source solutions, the incorporation of Microsoft solutions has allowed PTC to focus on the development of key functionality, instead of spending time and money on the development and support of basic or readily available capabilities or technologies. This is a trend we see in the general PLM industry and one that we expect to continue. It should be mentioned that there is a side benefit to such an approach. To easily and cost effectively take advantage of these third-party solutions, PTC had to define and support an open software architecture that provides the required connections into the Windchill platform. The extensive incorporation of third-party solutions clearly illustrates PTC's commitment to delivering an open strategy and technology platform.

History has proven that software solution suppliers that are willing to evolve their solutions over time—incorporating new foundational capabilities and new functionality—are more likely to stay on a reasonable growth path. PTC is certainly one of those solution suppliers that have accomplished this. Their Windchill development team has a long history of making good decisions and not being afraid of making in-course adjustments as third-party technologies evolved and were ready to be incorporated and leveraged. Technology decisions for Windchill have been intelligent, long lasting, proven, and perhaps in a few cases lucky. Fundamentally, Windchill is an enterprise class software solution that has roots that go back more than a decade, but is just about as modern as they come.

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