

Software is prompting integration of  
product line engineering and  
product lifecycle management



# Ovum view

## Summary

Smarter products have been driving more complexity into product design, and the overall product lifecycle. With software increasingly driving more differentiation – and value – into the product, the barriers are lowered to proliferating product models or configurations. Product line engineering (PLE) is an emerging discipline that embraces a higher level, feature-oriented view of the product. Although PLE should be complementary to classic product lifecycle management (PLM) where the realization of product design is managed from cradle to grave, many PLM practitioners believe that PLE overlaps the roles of existing people, processes, and tools. BigLever, which offers a PLE management solution, has established its first foothold in the PLM world with integration with Aras, a provider that is a challenger in the classic PLM market. Their integration, which provides one of the first commercially supported links, could provide a template that shows how both disciplines could complement each other.

## The engineered product lifecycle is moving out of silos

PLM is an umbrella discipline that has resisted easy solutions. Complex engineered products combine input from a multitude of engineering disciplines, and from a manufacturing view point, multiple suppliers. Integrating and transparently sharing data across the silos, suppliers, and their many tools is a huge challenge. Responsibility for governing the evolution of a product, from idea through design, production, and aftermarket traditionally rested with the constituency(s) that “owned” the product definition. Before the era of smart products, that role typically rested with mechanical engineers; for more complex products, such as in aerospace, systems engineers (who were responsible for ensuring that all subsystems worked together) had that role. However, as software has claimed a growing role in product content and differentiation, embedded software development has itself claimed a larger piece of the pie.

Yet it is significant that PLM solutions originated from the mechanical CAD/CAM world, based on the assumption that the product was defined by its physical parts. Nonetheless, even the best governed product engineering organizations tended to be highly siloed as each engineering group relied on its own toolchains; adding software engineering to the mix just compounded the issue.

## Integration across management solutions is a must have

The typical engineering firm will use a number of solutions across a range of disciplines. The increasing use of software and the need for ALM has been the most disruptive change in recent times within engineering work practices. In practice the PLM vendors are still grappling with the disruption that software richness implies and PLM users are not prepared to work with only one vendor solution. The problem of tool integration and in particular, managing the fast change that working with software entails, is an impediment to progress in engineered product manufacturing. Therefore, the need has arisen to improve integration, and allow the speed that working with embedded software introduces to benefit the complete production lifecycle.

Product line engineering (PLE) grew out of the discipline of Software Product Lines (SPL), where the goal was controlling or managing the proliferation of software designs so as to reduce the impedance

mismatch with the mechanical world, where product variation was more limited. SPL strove to organize product variation by software as features, which explains more about the product to audiences outside of engineering than specifications of different builds of software. Taking a higher-level, feature-centric view not only makes it easier to communicate and understand product variation, but also makes it easier to manage the software development component of the feature. PLE takes this concept to the next level by grouping design and software necessary for a specific product configuration to be managed as a logical entity.

## Is PLE a threat to PLM?

In actuality, the answer is “no”. But in reality, most product engineering organizations still conceive of products as collections of parts. As such, approaches to define and manage products by their features can come into conflict with traditional views that are often embedded within the PLM world. Many PLM tool providers claim that they can represent the product through higher level abstracted views, and thereby imply that feature-based PLE is redundant.

It is in this context that BigLever’s integration with Aras is a breakthrough. It provides the first commercially supported integration of a product features (PLE) management tool with a PLM supplier. It shouldn’t be surprising that Aras became BigLever’s first formal PLM partner, as Aras has played a black sheep role in the PLM world with its SOA architected, open source tool, and which hosts a highly active forum for sharing customized modules.

## Appendix

### Further reading

The Software X Lifecycle: Development, Testing, and Security. IT0022-000266 (November, 2014).

Embedded Software QA, Testing, and Security. IT0022-000267 (December, 2014).

Integrating Application and Product Lifecycle Management Systems. IT0022-000057 (May 2014).

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