ABERDEEN GROUP

PRODUCT LIFECYCLE MANAGEMENT ENABLES THE DIGITAL THREAD

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This knowledge brief looks at product lifecycle management (PLM) and its role in enabling the digital thread across the product lifecycle.

In today's complex, cross-discipline product development environment, PLM is a critical technology that enables the digital thread across the entire product lifecycle. The digital thread is a communication framework that connects traditionally siloed elements in product development processes and provides an integrated view of a product throughout development.

Today's smart, connected products have changed how companies approach product development. The Internet of Things (IoT) is happening, and the products you develop are more innovative, more data-centric, and involve more software than ever. At the same time, these innovations have introduced a new level of complexity into the product development process, and this profoundly affects the product lifecycle. In the face of these intricacies, PLM is emerging as an innovation platform that enables the digital thread, providing traceability, agility, and customization.

By their nature, smart, connected products are cross-discipline, given the inclusion of new levels of software, electronics, and electrical components, in addition to sophisticated mechanical

designs (Table 1). As a result, PLM solutions must effectively manage both software and hardware product components.

Table 1: Cross-Discipline Products Demand Effective PLM

% Increase – Past Two Years	All Respondents
Number of Mechanical Components	**14%**
Lines of Software Code	**34%**
Number of Electrical Components	**21%**

Source: Aberdeen Group, June 2017

Enter the Digital Thread

Quite simply, the digital thread in PLM is a queryable dataset (knowledgebase) containing all versions of data, results, and decisions from across the product lifecycle. At any point in the lifecycle, the digital thread allows a person to trace back in time who made a decision, why they made the decision, and what inputs they based it on. The digital thread connects ideas together; simply having a 3D CAD model does not provide a digital thread, nor do thousands of excel files constitute a digital thread.

Definition: Digital Twin

A virtual representation of the product as an integrated system of data, models, and analysis tools applied over the entire product development lifecycle.

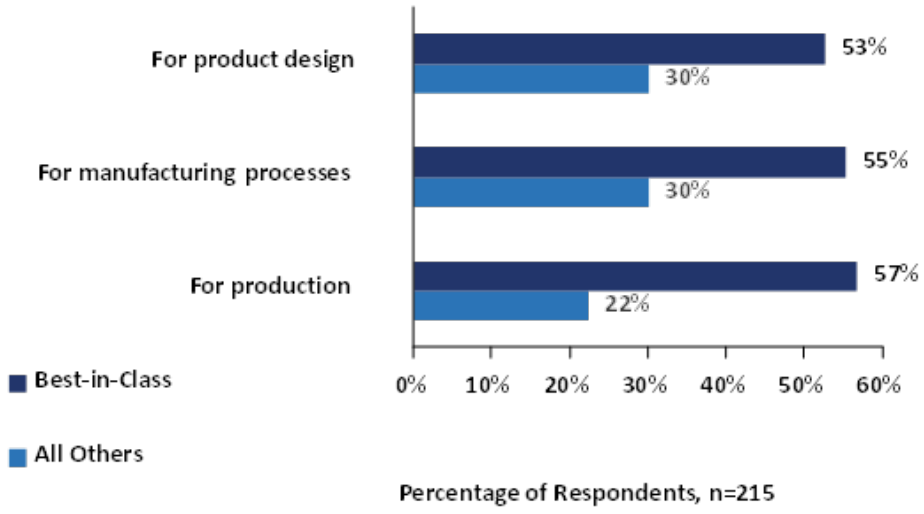
PLM software enables the digital thread across all stages of product lifecycle. PLM does this by representing the product definition (the digital twin) across the lifecycle and across product variants, providing traceability (the digital thread). This is critical, as the product definition changes, and traceability needs vary, at different lifecycle stages. PLM not only tracks data, processes, decisions, and results across the product lifecycle, it also provides the ability to trace back in time all inputs, decisions, and data involved in product development.

The Centrality of the Digital Thread in Product Development

Several factors have positioned PLM software for its critical role in enabling the digital thread across the product lifecycle. First, PLM is widely implemented; 61% of Best-in-Class firms have had a PLM solution in place for three or more years. Second, 40% of Best-in-Class manufacturers identify PLM as the primary application used for release management. Another 33% identify PLM as the primary application for change management.

The digital thread is central to product development strategies among Best-in-Class firms. They have also recognized the transformative potential of the digital thread in all major stages of product development (Figure 1).

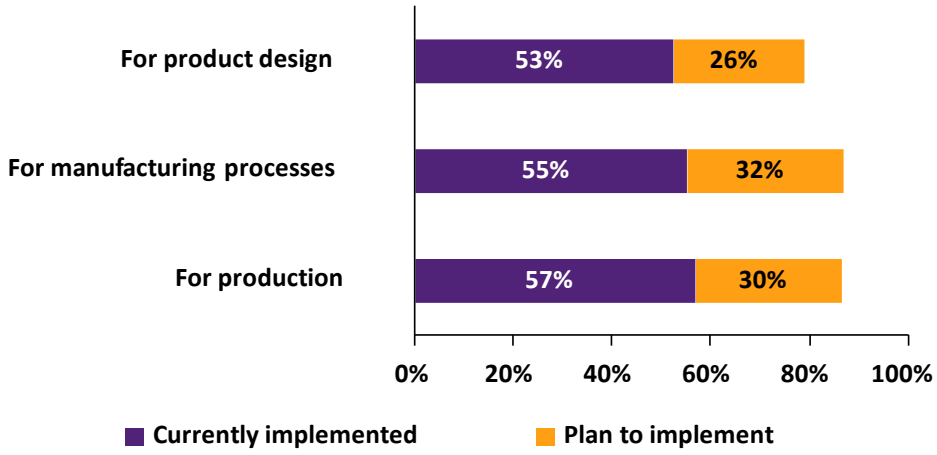
Figure 1: The Best-in-Class Rely on the Digital Thread



Source: Aberdeen Group, June 2017

Best-in-Class firms are twice as likely (or better) as All Others to deploy the digital thread during product design, manufacturing processes, and production. Further, usage of the digital thread for product development is trending in the right direction (Figure 2).

Figure 2: Trending Adoption of the Digital Thread



Source: Aberdeen Group, June 2017

The most important point is this: Among the Best-in-Class, both current and planned use of the digital thread is strong at all stages of the product lifecycle.

Takeaways

Since its inception, PLM has been about return on investment and bringing products to market faster by reducing development and production time, cutting costs, and maintaining product quality.

That's still the case today. Going forward, however, manufacturers expect more. Best-in-Class users are counting on PLM as the enabler of the digital thread across the product lifecycle.

In upscaling PLM's strategic role, its ability to reconnect siloed processes and departments is key. Via the digital thread, PLM provides "one source of truth," as it streamlines and speeds up product development by facilitating cross-discipline communication and cross-functional collaboration throughout the organization.

In combination with PLM software, the digital thread makes unprecedented product variants attainable and enables

traceability across the product development lifecycle, accelerating the product development timeline while simultaneously reducing costs.

PLM's establishment of a digital thread also benefits the overall enterprise. Today, Best-in-Class manufacturers integrate open architecture PLM into other enterprise applications, speeding up manufacturing velocity and boosting operational effectiveness.

In the era of cross-discipline product development, integration with software management, software development, and ALM is also essential.

Finally, PLM is a manufacturing cornerstone application, and 94% or more of Best-in-Class firms also integrate or plan to integrate PLM with ERP, SCM, and CRM. And that's just the start; PLM links to QMS, MOM/MES, and SRM creates visibility across the manufacturing enterprise. Making the digital thread available to the whole enterprise only enhances organizational synchronicity.

In addition to using PLM to enable the digital thread, organizations should also consider a cloud-based PLM platform for additional benefits. Aberdeen Group survey respondents identified lower cost, faster implementation speed, and scalability as top benefits of cloud-based solutions. Choosing a PLM solution provider offering premises-based, cloud-based, and software-as-a-service (SaaS) options provides additional flexibility as business needs and preferred software delivery models change.

In the face of smart, connected product development, PLM software is now undergoing tremendous renewal, emerging as an innovation platform for enabling the digital thread. Innovation, and exploring new alternatives, begins with accepting the fact that the product development process has changed. The Best-in-Class have made this leap, deploying PLM to enable the digital thread. Others will benefit from doing the same.

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