

Three steps to data-driven PLM

Data-driven, globally capable and cloud-enabled PLM solutions enable manufacturers to meet global demand and adapt to changing markets



Innovation is the wellspring companies depend on to satisfy consumer demand and remain competitive. But innovation by itself doesn't generate revenue. Products do. That's why turning ideas into goods and getting them to market requires effective, data-driven and efficient processes.

With the rapid changes occurring in markets today, the growing complexity of products and the life-cycle management required to create those products, game-changing innovation is hard to deliver. Product life cycles that were once measured in years now span just months or, in some categories, weeks. Missing a launch window can create a profitless product or, even worse, one that sits on shelves or in warehouses. What's more, today's global challenges require newly remote workforces to be productive and introduce timeline impacts on supply chains.

While globalization means access to markets worldwide, that opportunity comes with its own price tag: the need to manage multiple versions of the same product to meet differing nations' regulations and/or consumer expectations. Companies are also under constant pressure to lower costs, which drives the need for faster and more efficient design processes, such as using a higher percentage of parts' reuse in product designs.

These are just a few of the drivers forcing companies to reexamine their product life-cycle management (PLM) processes. For many companies, investigations into business processes often reveal those processes are divided by silos, calcified by habits and riddled with technical workarounds — usually manual — that can make transformation seem unachievable.

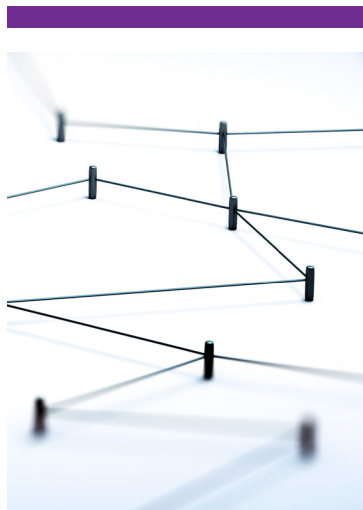
There is a path forward. Companies that have succeeded in creating a culture for digital-driven, data-driven innovation and an intrinsic desire for improvements in product development processes are thriving. Here are three significant trends companies will face as they chart a course toward digital-driven product development and PLM:

Global product design collaboration

Individualization and globalization have done more than expand market opportunities for companies. These trends have changed the way organizations need to think about developing products and managing design resources, especially skilled engineers and developers.

For individual products developed at a solitary site, a stovepiped strategy to product development might be effective at keeping skilled workers and maintaining product momentum. But as companies look to push products through channels in other regions, the limitations become apparent. As a result, companies with large product portfolios — grown through acquisitions or internal “skunkworks” development — tend to have design teams at locations scattered around the world.

After all, siloed development teams limit a company's flexibility to leverage unique or specialized workers' skills most effectively. For example, a company moving from corded to cordless products in the Americas might be able to move faster across



product lines and regions by drawing on motor design help from an expert in Europe. If access to expertise in other regions is limited, that connection might be missed. But even if the specialist's skills are widely known and accessible, differences in design tools and the latency of data exchange might hamper collaboration.

Besides hindering development, the lack of design collaboration carries another cost: Parts and software can't be reused. For many companies, reuse is now a mandate from the C-level. Without it, buying power is reduced, adding drag to margins and revenues. Without standardization, there is more product rework and a potential lack of uniformity among products manufactured at different facilities. Even worse, issues that have already been addressed could be reengineered repeatedly, causing repeat field events and risk of recalls.

Digital transformation can help companies overcome these issues, effectively blending mechanical, electrical, firmware and software design teams globally and moving to model-based designing. Global design collaboration equips workers with the ability to reuse parts, assemblies, code, and engineering plans and to collaborate effectively on product design, security and version control well before a product reaches manufacturing.

Building new products with more global and collaborative PLM teams that share and reuse parts and code will help organizations work more flexibly regardless of location. An additional benefit is increased worker satisfaction and employee retention.

Instead of operating as separate business units with separate teams of engineers and software developers, chief executive officers can challenge their leadership to look for the best people wherever they are in the world and use their capabilities globally. This adds efficiency and reduces costs by doing away with the need to hire redundant engineering and design teams for each location around the world. The right resources can be added to the team wherever they are located, and if needed, any team can pick up a project in process and continue its development with minimal interruption.

Connected complexity

In the home, the workplace and on the road, devices are becoming smarter and connecting in new and novel ways. The home thermostat, once little more than a glorified on/off switch, is now a smart device that learns a homeowner's temperature preferences and occupancy patterns, integrates into external weather sources, offers detailed energy use reports and works with other devices such as smoke detectors to take action if a problem is detected in the home.

A web of interconnected devices creates new opportunities and markets that product companies are now exploring. But the need to manage the complexity of these products, as well as the interconnections between them, will only continue to grow with the adoption of new APIs, apps and web services.

At the same time, companies are discovering the tremendous challenge presented by products that contain a growing volume of software-defined features. Vehicle manufacturers, for example, must be certain the firmware and software updates they issue for a fleet of vehicles won't render some of them inoperable due to differences between car models and years. Any small mistake can lead to costly issues or recalls.

Even differences in firmware on a smart light bulb might render a smartphone control app useless on certain bulbs, leading to recalls, additional churns on the software

or hardware, and significant customer dissatisfaction. These types of mistakes can result in social media events and negatively impact the company.

Today, some organizations still manage this design complexity with a spreadsheet. Growing product sophistication and the need to maintain better version control among all phases of product iterations — mechanical, electrical and software — will require companies to make much more effective use of PLM systems and digitally managed bills of materials. Companies will also need to integrate teams to ensure that all design variables are considered as products move from concept through design and into production.

Standardization and modernization

Businesses have readily embraced modern operating systems and devices for the added productivity, convenience and the security they provide to the enterprise. But not all parts of the organization benefit equally.

It's easy for design and engineering teams to become technologically isolated from the rest of the enterprise. Specialized engineering tools may operate only on older versions of an operating system, while sales, marketing and other corporate users transition to cloud applications such as Salesforce.com.

Complicating matters is the fact that many company PLM systems barely resemble the solution first deployed or intended by the software vendor. As custom additions and modifications accumulate, the solutions prevent users from easily transitioning to newer versions of the software. Some companies are so tied to customized systems, and are so resistant to change, that new hires may be younger than the PLM solutions they operate.

These groups are also less likely to benefit from the collaborative features that modern or cloud platforms offer because they continue to store design and engineering information locally. Teams that continue to coordinate projects with Excel spreadsheets, SharePoint or traditional file-share services miss out on the ability of modern PLM tools to easily share ideas, bills of materials and data across teams anywhere in the world.

Moving teams out of these old environments requires planning, but it is fully achievable. For example, engineering teams can begin to migrate some functions to cloud platforms, taking advantage of the latest operating system options and updates. Solutions that don't yet operate in current environments can be run on virtual engineering workstations like DXC's engineering Virtual Desktop Infrastructure as a Service (eVDI). This enables engineers to use existing endpoint equipment to access the latest Windows environments, providing engineering-class workstation experiences for nearly any device anywhere in the world.

Similarly, companies will need to house data in ways that make it more accessible to global teams inside and outside of the company. One approach is to build a central in-house data center to feed locations around the world. Or, you can leverage services such as those from DXC that employ Amazon Web Services or Microsoft Azure to store data. A managed cloud or virtual private cloud approach may offer more flexibility and scalability than a centralized solution, and an outsourced service can improve team access to data with lower latency, improved security and tighter version control.



New PLM system flexibility

Shrinking product life cycles, expanding global markets and growing product complexity have pushed legacy PLM solutions to their limits. Companies that can successfully migrate from legacy solutions to digital-driven PLM systems will gain the flexibility they need to leverage global design teams and resources more effectively, provide teams with the modern tools they need, and support the development of complex, connected products. While the task seems daunting, it doesn't have to be done alone.

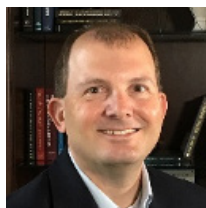
Any company contemplating the journey to a digital-driven PLM solution should consider working with an experienced partner that can help build a roadmap to best next-generation solutions. A partner can help you:

- Understand how and when to use the cloud to enable global design and scalability throughout the organization or take advantage of cloud to accommodate burst requirements
- Enable creation of collaborative teams to ensure that compliance, compatibility and security are built into products from the beginning
- Create a modern computing environment with the latest applications and operating systems
- Decide whether a centralized data center or a cloud platform is the best solution for data storage, security and management
- Improve testing to catch more issues before a product reaches production with centralized, high-performance computing (HPC) as a service to support modern simulation capabilities
- Provide secure connectivity to employees, contractors and joint venture partners as business models change
- Build a working environment that embraces mobility, enhances the employee experience and is device-agnostic

DXC Technology helps companies and government agencies solve the most complex business and technology challenges. Our experts understand the special complexities and concerns that product manufacturers face. We understand emerging technology and business models that integrate robotics, rely on automation as part of the design process, and leverage artificial intelligence, voice recognition and repeatable geometry.

Let DXC Technology help you build a roadmap to guide the transformation that will keep your organization competitive for years to come.

About the author



Nicholas Holian is Chief Technology Officer for the DXC Technology in the Americas, a DXC Distinguished Technologist and the lead PLM consultant responsible for PLM and engineering environment integration, focused on developing solutions that enable clients to build a flexible and scalable engineering ecosystem. His career includes management and technical roles encompassing engineering, software and automation development, operating system testing, and quality practices, among others. Nicholas holds several U.S. and foreign patents and has extensive international experience working with and developing teams in all regions of the world. Nicholas graduated with honors from Texas A&M University.

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