

Conversations for tomorrow

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**Intelligent Industry:
The Next Era of
Transformation**

#GetTheFutureYouWant



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BRIDGING GAPS THROUGH DIGITAL CONTINUITY



DIGITAL TRANSFORMS PHYSICAL

Catherine Kniker leads the corporate strategy, corporate development, and corporate marketing functions at PTC. She has more than 20 years of experience across internet, telecommunications, medical devices, and the healthcare sector. At

PTC, she focuses on evaluating business problems that they should address for clients and strengthening the position of the organization within its markets.

PTC has a portfolio of digital solutions that work together to transform how physical products are engineered, manufactured, and serviced. The Capgemini Research Institute spoke to Catherine about how connected products are transforming various parts of the value chain and ways to establish digital continuity.

POTENTIAL OF CONNECTED PRODUCTS

How do you see the potential of smart, connected products for transforming design, manufacturing, operations, and services in industrial organizations?

— Connected products is a significant focus point in the digital transformations of many companies. One of the more interesting trends is the growing applicability of product data across the business. We're moving well past the days of computer-aided design (CAD) and product lifecycle management (PLM) data only being applicable to a design or management function. Now, we're seeing it deployed in other areas of the value chain, such as the application of PLM data to produce digital work instructions for a factory work cell, or original CAD data being utilized for an augmented reality (AR)-based digital inspection and quality-assurance exercise. This is an example of the 'digital thread:' the connection of digital product data across a company's engineering, manufacturing, and service departments, as well as their supply-chain partners.



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An emerging symbiotic link that's still largely untapped is the one between connected products operating in the field and the design team that could incorporate real-world product performance insights into new designs. The tools are there; it's only happening in pockets to begin with, but we think there's more potential to be unlocked.

The connection that now exists between the design, manufacturing, operations, and service departments is changing the way that work gets done. This opens the door for products to get to market faster, because these processes are happening concurrently. Engineers in R&D are working directly with planners on the factory floor, and they're collaborating with the service department to identify likely challenges when a product is taken to market.

Could you share some interesting success stories from your clients?

— One of our customers, Lanzhou Electric Co., Ltd (Landian), a China-based motor manufacturer, is a good example of a company that has embraced digital to transform its product-development process. It faced dual challenges: growing market demand and, in parallel, an intensifying need to shorten its new-product development cycles. Its engineering department was still operating primarily paper-based processes, which limited design-reuse options and hindered visibility across departments.

30%

In terms of bottom-line business impact, the shift to a digital-first approach resulted in a 30% increase in the design-reuse rate [for Lanzhou Electric Co., Ltd].

Landian embraced CAD and PLM to digitize and manage its product data. Immediately, these systems offered an accurate record of all this information, giving other departments visibility of the product-development process. In terms of bottom-line business impact, the shift to a digital-first approach resulted in a 30% increase in the design-reuse rate.

We see this type of change in customers across a variety of industries, including medical-device manufacturers, automotive suppliers, and heavy-equipment manufacturers.

ESTABLISHING DIGITAL CONTINUITY

Our research has found that around 60% of manufacturers are struggling to ensure “digital continuity”¹ throughout product lifecycles. Why do you think businesses are struggling here?

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Businesses that are struggling [in digital continuity] often lack a modern PLM system and may still be relying on antiquated processes like managing product data in Excel spreadsheets.”

— Your research validates one of the more prominent pain points that we see in the industrial companies we work with, which has led us to cite the digital thread concept. We consistently see manufacturers and other industrial companies struggling to solve problems that could be addressed with the correct level of access, and the correct utilization of product data. I would point to a few reasons why businesses could be finding digital continuity a challenge:

Firstly, over the last few years, we’ve seen a significant spike in interest in PLM systems. As organizations realize how central PLM is to digital continuity across a product’s lifecycle, it is becoming a strategic, enterprise-

¹ Digital continuity is the ability for everyone working on a given product or design to view current versions of data and models simultaneously.

wide solution. It's the primary system for managing product data and it allows the entire enterprise an invaluable lens through which to view product development in a context and domain they recognize. Businesses that are struggling here often lack a modern PLM system and may still be relying on antiquated processes like managing product data in Excel spreadsheets.

Secondly, PLM and the product data that it manages serve to secure the digital thread for a company. We need to make the concept of the digital thread more actionable for businesses, and this is a key aspect. What's interesting about the digital thread is the way that it blends longstanding technologies, such as CAD and PLM, with newer technologies, such as the industrial internet of things (IIoT) and AR. Manufacturers and industrial companies need to understand the benefits of these newer technologies, and see examples of how they work with more familiar ones, such as CAD and PLM. The way PLM manages and orchestrates the digital thread helps to unlock significant value for customers, including enterprise visualization, digital product traceability, closed-loop quality, and more.

Finally, a third reason could be the fact that industrial companies have been laggards in embracing the benefits of the cloud and other digital-first tools. Far more managerial leadership and hands-on work is required in traditional on-premises processes – whether it's checking design files in and out or evaluating the benefits of installing personnel at a specific site to monitor a process versus the ability to do so remotely. It's no secret that most software markets have moved to a cloud-first model and we're pushing for the industrial space to do the same, so that these companies can realize similar convenience, collaboration, and efficiency benefits.

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Which steps should organizations take to bridge the various data discontinuities within engineering disciplines (hardware, software, electronics, etc.) and functions (design, production, service)?

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— Traditional ways of working must change, so that we see more effective collaboration between disciplines, across geographically distributed projects, within and across divisions, and with external partners. There needs to be closed-loop quality and processes to achieve compliance with regulatory requirements and quality standards. Lead times must get shorter; engineers in R&D must collaborate concurrently with planners in the factory and the service department, or there is a significant risk of falling behind.

I have mentioned the value of the digital thread and how it can be fueled by data created in engineering, manufacturing, and service. You can employ requirements, systems models, functional models, x-BOMs (such as engineering bill of materials (EBOM), manufacturing bill of materials (MBOM), service bill of materials (SBOM)), CAD and eCAD models, and software that is created by engineers to drive downstream “derivative works” in manufacturing and in service.

At PTC, we have a strong focus on applications that are used in product development, production, and quality (CAD, PLM, application lifecycle management (ALM), service lifecycle management (SLM)). In the IIoT space, we are focusing on two things that are tied to the digital thread. First, we have solutions and a platform that can address factory and service-use cases, generating data that can inform the digital thread. Second, IIoT technology helps to orchestrate data between important enterprise systems, clouds, assets in the factory, and products once they're out in the market.



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