

A N A L Y S T C O N N E C T I O N



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The Product Value Chain in Manufacturing

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The following questions were posed by Oracle to Joe Barkai, research vice president of Product Lifecycle Strategies for IDC Manufacturing Insights, on behalf of Oracle's customers.

Q. What is the product value chain (PVC) ?

- A. The product value chain is a strategic approach to understanding and managing product information throughout its life cycle in order to provide a strong foundation for high-fidelity decision making in all aspects of a product life cycle.

First and foremost, PVC is a strategy that drives better decision making. It is enabled by a set of disciplines and tools that manage all facets and phases of a product's life cycle. These are the processes that create, modify, and manage product data across organizational functions that include design, manufacturing, sales, and support, not only within the brand owner's organization but also extending to suppliers and partners.

PVC aggregates and harmonizes tools and information repositories that include managing the life cycle of products (through product life-cycle management [PLM] systems), controlling the product information (with product data management [PDM]), and managing product quality. PVC brings the different — and seemingly conflicting — disciplines and perspectives represented by individual tools and users into a cohesive framework to address and improve the entire product development process within an organization.

Q. Why is PVC important?

- A. We know that despite best intentions, most innovations and products fall short of meeting expectations. Only one-quarter of projects result in a product that actually reaches the market, and two-thirds of those projects do not meet the original expectations. On average, about 20% of projects are over time or budget, and more than one-third of product companies have experienced at least one runaway project. A different way to understand the impact of suboptimal product-related decision making is that, overall, nearly 50% of the resources allocated to product development and commercialization are wasted.

At a closer look, product failures are not necessarily a result of bad ideas (although there are plenty of those too). These failures are a result of suboptimal decisions. By suboptimal decisions we mean decisions that meet a narrow set of goals and constraints but fail to recognize the big picture — how certain decisions might impact upstream and downstream

activities. For example, a successful product in itself may cannibalize resources or market share of another product, resulting in dilution of the company's portfolio and overshadowing the product success. Another common scenario, this time looking downstream, is where a design focusing on reducing manufacturing costs results in a product that is difficult to service and repair and, consequently, incurs higher warranty service costs.

It's important to recognize that while in general basic product development processes across different industries are somewhat similar, there are fundamental differences in business drivers, supply chains, regulatory compliance, and other aspects that influence how product-related decisions are being made in each industry. PVC, as a framework, is different by industry and is reformulated to support industry-specific needs. For example, in medical device manufacturing, PVC is about device master record, design history file, global product registration, enterprise quality management, and unique device identifier management. The pharmaceutical industry has similar needs, but with major emphasis on clinical trials management. But in the automotive industry, manufacturers are challenged by managing complex configurations and assembly manufacturing and controlling manufacturing quality.

Q. What are the benefits of PVC?

- A. The most pronounced benefits of PVC usually occur in product development cycle time and efficiency. For example, a manufacturer reported a 17% reduction in design-to-release time.

As we mentioned earlier, PVC extends beyond product design and covers all product life-cycle activity; benefits can be realized in virtually any area of product life-cycle management. For example, manufacturing companies report improved inventory management that has resulted in 10% savings in inventory management and 30% reduction in stock-outs.

It is important to realize that by creating a framework for decision making, PVC engenders many benefits that, while less tangible, lead to overall process improvement and forms a foundation for continuous process improvement. A PVC implementation reduces IT complexity by reducing system and process redundancy. This, in turn, reduces data re-entry, duplications, and errors. PVC improves visibility to all product development activities under a unified framework and helps organizations become more proactive and agile.

Q. This sounds promising, but many PLM implementations are islands within engineering groups. How does the PVC model take these silos and enable them to come together?

- A. Indeed, many PLM implementations focus on serving the needs of the engineering group; unleashing the information and making it available in a way that it can be useful for nonengineers is difficult. The opposite is also true: How do we bring the nonengineering perspective into product design so that engineers design better products that have greater success rates?

PVC and, specifically, the ability to synthesize different information sources into a multifaceted decision-making context help bridge these islands and bring a broader community of decision makers into the fold.

One important point we need to remember is that all too often productivity tools are designed for a limited audience. For example, PLM tools are intended for use by engineers, and the information they store and render is not easily consumed by nonengineers. Our research shows that information visualization — that is, visual navigation and representation as a means to bring together different (geometric as well as nongeometric) aspects of a product — helps level the playing field and furthers the value of PVC.

Q. How can organizations capitalize on the potential of PVC?

A. Product companies need to take a structured approach to rationalize investment and implementation models for interdisciplinary decision making. They should expand "PLM thinking" to all product life-cycle activities. They need to implement systems and processes to enable better visibility, from innovation to end of life, into the supply chain and down to the shop floor.

Furthermore, they need to level the playing field for all decision makers and participants so that they can share models and best practices across programs and products and with customers, suppliers, and partners.

We believe that to address these needs, manufacturing companies should consider creating a unified master data management architecture, deploy a collaboration platform, and encourage the use of visualization and analytic tools to enable faster and higher-fidelity product decision making.

ABOUT THIS ANALYST

Joe Barkai is research vice president for IDC Manufacturing Insights' Product Lifecycle Strategies research service. In this role, he examines discrete manufacturing industries that include automotive, aerospace, industrial equipment, and other complex, mission-critical capital equipment to identify business imperatives, best practices, and emerging technologies. His research topics center on effective product lifecycle management and include innovation, design and engineering, service and warranty, and product end of life.

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