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Product lifecycle management: The innovation enabler goes mainstream

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Until recently, PLM was an esoteric specialty practiced deep inside the engineering departments of manufacturing companies. But today, forward-thinking business leaders in many other industry sectors see product lifecycle management as an essential cross-functional discipline for driving innovation, powering growth, managing costs and improving pricing. Here's what it takes to make it work.

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At the 2010 Beijing International Automotive Exhibition, car enthusiasts and the media mobbed the displays of shiny new models rolled out by China's own carmakers. And auto-industry observers blogged busily about how long it would take for a Chinese brand to join the league of world-class car marques.

But the grittier interactions took place behind the scenes, where global automakers discussed what it takes to engineer cars at competitive prices for buyers in various markets around the world. The conversations explored everything from the most suitable market feedback channels for global development centers to what innovations are needed in design, development, vehicle features and production processes.

And it's not just car manufacturers that are poring over these kinds of details. These days, companies in industries ranging from oil and gas to retail to consumer packaged goods are obliged to think about challenges industrial manufacturers have faced for decades: more effective product development and lifecycle management.

Maximizing returns

The business discipline that can help companies manage these complexities is called product lifecycle management, or PLM. Long known inside engineering departments in the industrial manufacturing sector, PLM is emerging as a strategic capability critical to achieving high performance. What's needed now is wider recognition of the fact that PLM is much more than simply a means of managing product data. It is in fact a tool for maximizing returns on product development spending and for getting more innovative ideas and output from the employees involved at various points in a product's lifecycle.

It's not that PLM is an alien concept. Every product has a life-

cycle, starting with ideation and moving through formal design, development, prototyping, production, spare parts and support phases before the product is finally withdrawn from the market. The idea of an overarching discipline that links many of those phases is familiar to managers in industrial companies.

Nor is it news that the development and support of a steady stream of new products is essential to robust growth in every industry. Leading retailers, for instance, are pushing for new growth and higher margins these days by adding more and more private-label products to their shelves. In the consumer packaged goods industry, competition for retailers' shelf space and share of consumers' wallets is forcing new discussions about product innovation. Take Procter & Gamble; virtually all of its organic sales growth since 2000 has come from new brands and new or improved product innovation.

What is different today is that it is much harder to do product development well—and to do it faster, more predictably and with higher returns than competitors can. Even many industrial companies that utilize PLM principles still do not apply them as part of an end-to-end discipline. Among businesses in other sectors, the use of PLM can be rudimentary at best.

A host of factors conspire to make it considerably tougher than it once was to identify, design and update new products and services that can be brought to market quickly, cost-effectively and with high quality. To begin with, it is no easy matter to serve global markets. Can a refrigerator designed for India's rural populations be adapted quickly to appeal to Brazil's exploding urban middle class? If so, at what incremental cost, if

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any? What design elements and components can be shared?

Globalization is also accelerating the spread of product development activities among many more enterprises; the rudder of Boeing's new Dreamliner 787 is being made by Chinese aircraft systems makers, for example. And in the consumer goods sector, open-innovation initiatives are making the process far less reliant on what comes out of corporate R&D centers. For example, more than half of all product innovation coming from P&G today includes at least one major component from an external partner.

Product development is further complicated by the growing use of embedded software and systems in products (think of the OnStar system in General Motors vehicles or the wash-cycle programs in Miele washing machines). Even leading manufacturers that long ago mastered the design and development of physical parts are challenged to meet the particular demands of high-tech product design, development and production. There are frequent wrenches in the works where mechanical and electrical systems and embedded software must come together.

Clamor for green

On top of those challenges comes the clamor for sustainability: products designed so that their green content—and that of their packaging, manufacturing processes and supply chains—is clearly identified and so that they can be easily recycled at the end of their lives. Adding to these complications are product regulations that are often markedly different from one jurisdiction to another. Just one example: More and more US states are passing laws that hold manufacturers responsible for recycling their products.

The challenges aren't necessarily any easier for the organizations that have

invested in PLM software solutions. Buying and implementing software licenses from leading vendors such as Parametric Technology Company, Siemens and Dassault Systèmes does not by itself constitute a PLM strategy (see "Why software isn't the answer," page 6).

So what's the accumulated impact? It is much tougher for senior executives to plan for growth through innovation. And it is increasingly difficult to hit ever narrower market windows and harder to launch products with the balance of cost and quality that generates success in new markets.

Accenture research confirms that PLM activities fall short of what is needed today. The main conclusion of our recent study across a range of industries is that most companies have only basic capabilities in key product development areas. While those capabilities may once have sufficed, they are outmatched by the complexities of doing business today.

Our research revealed that median revenue growth from new products is only 20 percent. Those companies that have mastered PLM, however, see revenue growth from new products of 40 percent. Similarly, for the typical company, median return on innovation investments comes to just 25 percent; by contrast, the ROI for companies that do product lifecycle management well is an impressive 66 percent.

At the same time, companies aren't always flexible when it comes to meeting new market demands: Only 15 percent of respondents said they can quickly change product designs with little disruption.

Another Accenture study sheds light on the need for the greater use of metrics to track the outcomes of product development investments. A meager 8 percent of respondents said

Top performers plow proportionately more investment into new-product development and actively look for innovation outside their own four walls.

their companies were “very good” at measuring product development returns.

One more indication that PLM still does not meet its potential in many organizations: Less than half the companies surveyed in a study led by the Grocery Manufacturers Association reported having effective end-of-life analysis that can help them to shed underperforming products.

A strategic discipline

Of course, it is the exceptions that prove the rule. Accenture has also found a growing number of instances where PLM is clearly helping top-performing organizations to excel through innovation. Our extensive analysis of high performance in product development reveals how far some leading companies have come in orchestrating PLM as an end-to-end process that spans corporate strategy, marketing, product planning, design, development, procurement and service.

When we surveyed product development executives worldwide across a wide swath of industries, we found a marked performance gap between the organizations that we termed product development masters and the laggards—those that finished in the top 10 percent in their industries and the bottom 10 percent, respectively, in terms of commitment to new-product development, product leadership and market position (that is, how quickly they bring new products to market and what market share they have obtained).

The masters launch new products nearly twice as fast as the laggards. Not surprisingly, these same companies view PLM as a strategic discipline. They plow proportionately more investment into new-product development and actively look for innovation outside their own four walls, for example. And they focus on warranty claims and customer

feedback rather than emphasizing conventional product development benchmarks.

Ford Motor Co. can speak authoritatively to the idea of enterprise PLM done right. The carmaker, now riding high on the success of models like the mid-sized Fusion, has completely rethought how it designs, develops, manufactures and services new products worldwide—and has put in place the PLM capabilities and resources to support its goals under its “One Ford” strategy.

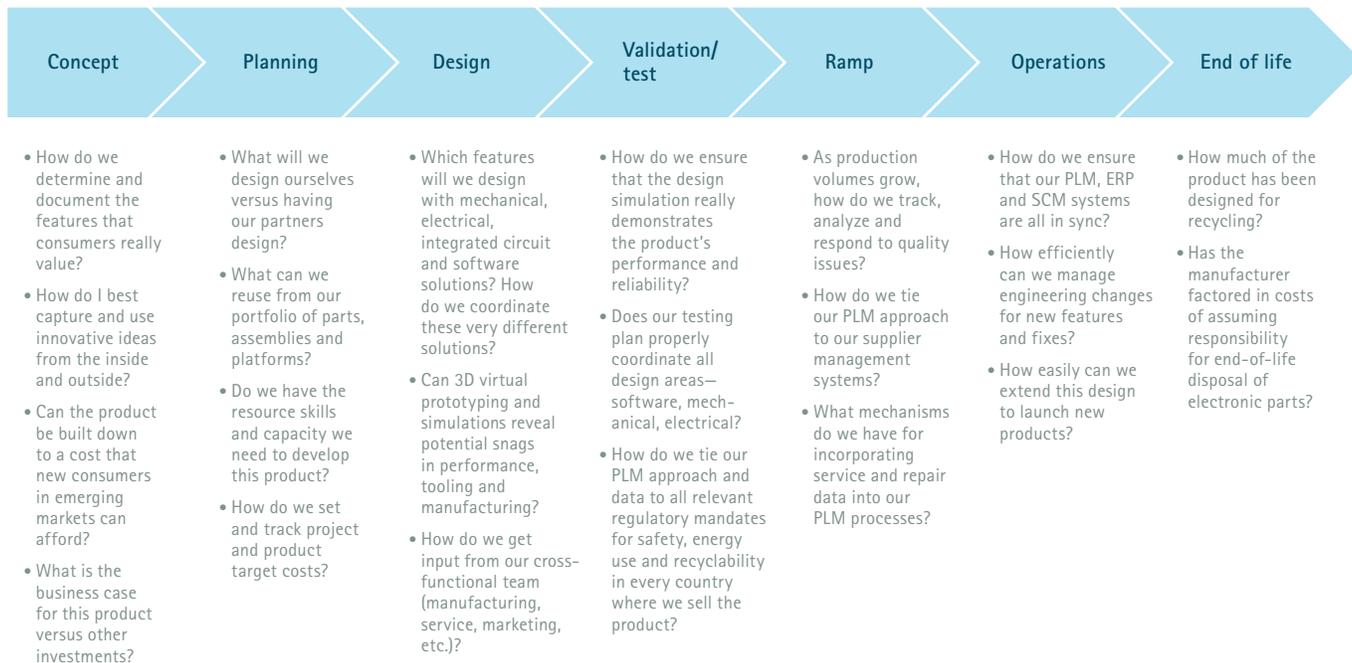
Innovation is at the heart of those goals. Last year, the automaker declared that an efficient global product development system will help to further accelerate new-product innovations. Those plans call for Ford to replace or refresh 70 percent to 90 percent of its lineups by volume in each of its three largest markets by 2012.

Whirlpool Corp. has also blazed PLM trails. Triggered in part by its acquisition of Maytag, the appliance maker recently implemented a worldwide complexity reduction program that involved moving to global product development platforms and the broad use of shared parts. The strategic objectives of the program were to eliminate waste across the entire PLM landscape and to use the consolidations of product designs and parts count to enable faster innovation.

But the initiative wasn't simply about reducing the number of parts in a washing machine or refrigerator. According to the executive in charge of the program, “Without the appropriate system and process constraints on design and sourcing, significant complexity and inefficiency would once again propagate into our design and sourcing strategies.”

PLM exemplars like Whirlpool insist on seeing strong returns for their investments in product develop-

PLM: Answering critical questions



Source: Accenture analysis

ment. Predictability and repeatability are deemed crucial to R&D effectiveness, according to related research by Accenture. More than 40 percent of respondents identified sustainable, repeatable product development as the factor that most affected their company's returns on R&D investment. While senior managers see this step as highly effective within product lines, they concede that it is much harder to replicate across product lines—and even more so across business units.

Accenture's studies also confirm that enterprise PLM involves looking outside the organization for innovation. Nearly 40 percent of survey respondents indicated that in the past three years, they have outsourced more product development beyond their core areas of expertise—integrating suppliers' product development activities and actively tapping customer input for opportunities to streamline processes.

The practice is gathering momentum in the consumer packaged goods sector. With its Connect & Develop program, P&G actively sources innovation from far afield, and has integrated the program smoothly into the rest of its product development activities. Its Swiffer line of dusting products—now one of P&G's half-billion-dollar brands—offers a textbook example of reaching outside for innovation. The original concept came from a company in Japan that produced and sold the hand-held dusting tool—but only in Japan.

True enterprise PLM requires an organization to build an architecture for its PLM capabilities—an end-to-end framework that spans the multiple solutions and accommodates business processes and data from many functions, from marketing to design to product portfolio management. Of course, there is no one-size-fits-all answer. But Accenture has found that five

Why software isn't the answer

The software offerings marketed by leading vendors provide only partial coverage of the spread of product lifecycle management capabilities needed across the enterprise. Large industrial companies can use dozens of PLM solutions, with home-grown options in the mix. One vendor may provide solutions for product data management and mechanical computer-aided design—a hint of the strength of its ties with the engineering department—but its offerings in and interfaces with other PLM processes and design areas (software, electrical, styling, etc.) may not match the realities of today's demands for growth.

The enterprise resource planning vendors hope to fill some PLM gaps. Providers such as SAP and Oracle can now manage and integrate certain PLM data into sales, cost and other ERP data. While they lack deep PLM relationships with engineering teams, they have close ties with chief information officers—and the marketing heft to broadcast their claims. In a third category are the myriad niche players with point solutions such as desktop design software for product developers and solutions for regulatory compliance. Given this fragmented PLM software market, the net effect requires planning for a business process orientated, integrated, multi-vendor PLM landscape.

key themes merit the attention of the top management team, regardless of industry sector or experience with PLM elements.

1. Create an enterprisewide framework that defines the organization's PLM capabilities.

Define what is and is not PLM, then formally break down and reevaluate current PLM capabilities across the enterprise. This involves reviewing all the processes, applications, metrics, organization, data and so forth that underpin the product development process flow, from initial concept to product retirement, and then examining the performance and maturity of each as objectively as possible.

Top performers structure PLM as a hierarchy of capabilities that span the process, represent various organizations and competencies, and connect all corners of the PLM landscape with one another.

There may be 15 to 30 "Level 1" capabilities (product development resource management, design reuse and product cost management, for example), while at Level 3 there might be more than 250 capabilities focused on specific functional areas or process needs, such as resource skills track-

ing, 3-D mechanical part cataloging or electrical design verification.

Accenture finds that most companies that go through this exercise are surprised by how disjointed and fragmented their overall PLM approaches are—and by how many gaps and redundancies they uncover across the enterprise. And they are often alarmed to find how few metrics and how little documentation supports their PLM activities.

2. Link the PLM framework's capabilities to key corporate and product priorities.

This linkage should also utilize five to 10 metrics that track the effectiveness and efficiency of the innovation and product development outputs—and that help link causes to effects.

The metrics must transcend any one department or function; they might relate to pipeline throughput, cost of engineering, reuse of platforms or components, or resource utilization. For instance, if plans call for more new products to be developed in lower-cost countries, the PLM framework would link that objective to the corresponding capabilities and metrics in global collaboration.

The PLM agenda

- How can we better measure our ROI on R&D spending?
- Do we have the infrastructure to support our global innovation and product development needs now—and three years from now?
- Who owns product lifecycle management? Who should own PLM for the company?
- Do we have a definition, strategy and roadmap for PLM?
- How do our current CRM, SCM and ERP initiatives link to PLM?
- What impact could improvements in PLM have for us?
- What's the total benefit of improving our time to market by 1 percent?
- What's the total benefit of reducing our product development costs by 1 percent?
- What's the impact of getting 1 percent more output from our product development resources?
- Can we satisfy upcoming regulations with our current PLM resources and processes—and if not, what will a regulatory violation cost us?

3. Use the new enterprise PLM framework and the link to corporate priorities as an ongoing PLM investment planning tool.

By deconstructing the organization's PLM capabilities, it is relatively straightforward to turn the results of that exercise into a powerful tool for ongoing planning activities. This framework can be thought of as a kind of Rosetta Stone, enabling the organization's varied and often disjointed constituents to have meaningful conversations.

With this framework, they can more easily analyze trade-offs, guide investments in product development improvement projects, and measure the impact of those projects over time against the key metrics referred to above. For example, one high-technology company used this approach to concentrate its future PLM focus and investment on software product development processes rather than on mechanical design, choosing to improve the productivity of its thousands of software designers instead of its hundreds of mechanical designers.

4. Build a single enterprise PLM roadmap.

The objective of the roadmap is to improve the PLM capabilities that underpin the product development process. It will consolidate all current PLM activities and help to identify and eliminate redundant or conflicting projects, greatly increasing PLM adoption rates and overall success. At one company, this exercise exposed six disconnected investments in just one of 30 PLM capabilities; it was being sponsored by several business units and program teams.

5. Establish a group whose job it is to own, review and update the PLM framework and roadmap.

Similar to the customer relationship management, supply chain management and enterprise resource planning areas in most organizations, there has to be a single, formal organization to advance and support the PLM journey—to ensure that PLM becomes part of the company's innovation fabric rather than a one-time project or program. That organization should have unambiguous, unwavering and visible sponsorship from a senior executive.

For too long, C-suite executives have viewed PLM as the engineering department's black box. That view has to change. Today's business environment requires that top management sees PLM as a strategic corporate asset—a cross-functional, enterprisewide business discipline that can augment innovation, drive significant revenue growth, and bring down the costs of activities ranging from engineering rework to regulatory compliance.

The good news is that there are now richly detailed research studies that point clearly to best practices in enterprise innovation and product development. The better news is that in many industries, the enterprise PLM trails have already been blazed. The bad news is that your competitors can now see how to follow those trails.

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