Calibrating product launch through collaboration

Industrial companies are using collaboration and advanced technologies to help products reach market at the right place, right time.
IBM Institute for Business Value

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Calibrating product launch through collaboration

Industrial companies are using collaboration and advanced technologies to help products reach market at the right place, right time

By Karen Butner

In this era of innovation – when change occurs at mach speed as a result of vanishing geographical and access barriers, as well as advances driven by wider global collaboration – a growing number of companies are focusing on managing product lifecycles. In the process, they are making substantial progress in introducing differentiated products and services to fuel top-line growth. They’re managing product lifecycle from discovery to end-of-life – and perfecting their product launches. They’re succeeding by meshing their supply chain activities and creating shorter cycles from invention to market, as well as teaming up across disciplines, specialties, technologies and expertise to engender success for their breakthroughs.

**Introduction**

CEOs are expanding their views on the importance of innovation and how closely it ties to business performance. They rely on innovation to drive substantial organizational change and business growth, but struggle with how to build innovation into the business model, especially as they bring differentiating products and services to the global market.¹ Innovative companies are developing new-product strategies to reduce costs, increase revenues and develop integrated, collaborative processes with often-global partners. They are paring costs by increasing the level of commonality of components, platforms and assets. They are improving speed-to-market. And, by building relationships with partners – including customers, suppliers, design engineers and service providers – they are managing product change and new, derivative product launches.
Product lifecycle management (PLM) is a set of capabilities that enables an enterprise to effectively and efficiently innovate and manage its products and related services throughout the entire business lifecycle, from conception through recycling or disposal. The IBM Institute for Business Value conducted research with executives from the U.S., German and Japanese automotive, aerospace and defense, electronics and industrial products industries to review comprehensive PLM processes (see Figure 1).

**FIGURE 1.**
PLM processes reviewed.

- **Portfolio planning**
- **Concept development**
- **Design**
- **Production and testing**
- **Maintenance and support**
- **Retirement and disposal**

**A. Requirements management** — Capturing and sharing of product requirements to communicate project goals, enhance development collaboration and reduce risk

**B. Configuration management** — Providing a unified product configuration viewpoint among heterogeneous PLM systems across a variety of functional domains

**C. Project and portfolio management** — Strategic planning, resource allocation and monitoring of programs across the entire product portfolio

**D. Engineering change management** — The creation, review and implementation of change requests and change orders

**E. Analysis and simulation** — Accessing product data to conduct engineering analysis and visual prototyping

**F. System integrity validation** — Validating product design against relevant requirements and functional specifications

**G. Aftermarket support** — Integrating product development with owner/operator usage and maintenance

**H. Commonality and parts reuse** — Analysis of the applicability and risks associated with reusing a platform or component

**I. Supplier and OEM collaboration** — Supply chain collaboration throughout the entire product lifecycle

*Source: IBM Institute for Business Value.*
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Complexity of global processes inhibits launch perfection

Many of the executives we surveyed reported that effective product lifecycle management is difficult because of the sheer complexity of the processes. The most resounding change has been the effects of globalization now permeating the marketplace, cost structures and overall product lifecycle activities. As products and brands are becoming more global, the level of coordination increases because of the movement of supply-base sourcing to low-cost countries, multi-tiered logistics requirements and product serviceability needs. Inasmuch as new geographies present opportunities to expand the customer base, overall product lifecycle management (component design, pricing, replenishment and service) is where the impact of global expansion is really felt by the industrial manufacturer.

In industrial product manufacturing companies, such as aerospace or automotive, the enormity and complexity of the design, sourcing, manufacturing and distribution environment makes even incrementally improved products difficult to launch. Products may require more than 1,000 different suppliers and may draw from thousands of different part numbers. This creates several new operating changes, including:

- A focus on core areas of expertise outsourced to other supply chain partners, oftentimes moving a significant source of innovation from inside the company to external vendors
- Sharing development costs and, sometimes, risks and upsides with the supply chain partners
- Distributing work to low-cost countries, either directly or through partner’s own operating models
- An increased need for capacity to work on more product development programs simultaneously.

Getting information to all of the stakeholders accurately and in a timely manner proved challenging for most of the executives we interviewed. Within departments, different systems may be used to track product specifications or sub-assemblies. Processes differ from product line to product line and from region to region. It can be a challenge to coordinate the array of departments that must collaborate and drive both the success of the end product and the real cost of the overall product lifecycle. These departments include functions such as research and development, market research, product design, manufacturing design, manufacturing, procurement, inventory control, distribution, facilities management, marketing, sales and supporting functions that must participate, such as human resources, finance and planning.

Many manufacturing operations often resemble a roll-up more than a globally integrated organization. Through geographic expansion and mergers and acquisitions, companies often hold many different operating companies and divisions that may have difficulty coordinating with each other. The company cultures are different, which may be magnified by societal cultural clashes created by different nationalities needing to work together. On top of the aforementioned cultural challenges, most divisions will have deep operational challenges as well: different
Current business practices have not kept up with the drivers of change needed to address the new product development situation that is growing increasingly more complex. According to a value chain survey by the IBM Institute for Business Value, 48 percent of products are launched late to market and 35 percent of products are over budget. These numbers show that companies aren’t only missing perfect product launches, they are failing to meet planned objectives, impacting marketing, promotions and, often, revenue-growth targets.

**Making a case for change**

From our research, we found that the problems in effectively managing the PLM process resulted in several negative outcomes. One such outcome was customer dissatisfaction from products not being designed to accurately meet customer requirements. This was especially problematic for products with long development cycles (product development that takes a year or longer) in which customer requirements changed significantly over that time period, but which may not have been accurately captured, documented and reflected in final product design. Many respondents reported that product design delays could cost them lost revenue and market share in those industries in which getting new products to market quickly was important. Others indicated that the inability of their organizations to get information into and out of the PLM process hurt their ability to effectively capitalize on market opportunities or avoid market risks.

The complications in today’s new product development cycle largely point to breakdowns in coordination, communication and other aspects of collaboration. External collaboration is indispensable to innovation, but the gap between its perceived importance and practice is large. According to the IBM 2006 CEO Study, external collaboration is of great importance to 75 percent of CEOs, but only 51 percent do so to a large extent. These challenges all point to a change in operational practices among the groups that must collaborate to deliver perfect product launches. In the next section, we will describe specific actions to meet operational goals of enabling the perfect product launch.

**Enabling the perfect product launch through extensive collaboration**

Enabling the launch requires a new set of activities, organizational structures, disciplines and supporting technologies that empower an organization to efficiently manage the entire product lifecycle from concept to launch. With this in mind, the perfect product launch becomes as much about the journey as it does the arrival. This journey is one of change, transformation and improvement. One of the key enablers of this change, and arguably the most important, is collaboration.

Collaboration is the successful coordination and communication among multiple functional departments (e.g., demand planning, sourcing, procurement, manufacturing, assembly and distribution) as well as external upstream and downstream trading partners, including design partners, building partners, material suppliers, distributors and other vendors.

Collaboration has to grow beyond an informal communication process and become a formal discipline within the organization, characterized as a collaborative development capability. With a collaborative development capability, companies are able to quickly take advantage of operational practices, new
innovations and new technologies to ramp up the rate of development. They are able to do this in both primary centers of excellence and secondary locations, including new, less-mature global locations. The typical benefits of collaboration include:

- Better time-to-market and market premiums
- Better product customization and improved customer intimacy
- Increased agility to cope with changing patterns of demand
- Increased capacity from suppliers and trade partners
- Enhanced product innovation and differentiation, including leveraging expertise and innovation from third parties
- Lower product costs and better margins
  - Reduced sourcing, supply and manufacturing costs
  - Lower supplier management costs and times
  - Less product development cost by having partners share in development expense
  - Fewer development process redundancies, mistakes and waste
- Increased efficiency in the product development cycle
- Improved organizational ability to leverage synergies among departments, divisions and partners
- Improved engineering design and performance.

Besides operational effectiveness, collaboration may create an opportunity for sustained competitive advantage. Capability for collaboration enables efficient, effective and agile new product development across multiple functional departments, multiple internal divisions (such as different automotive brands) and with external entities. Several examples include: sharing design processes and guidelines, sharing requirements and production plans and synchronizing predictive demand with supply and manufacturing.

From our recent value chain study, we found that collaboration ranked as the most significant influence on reducing product development time-to-market and successful launch processes.\(^4\)

**FIGURE 2.**
Most significant impact on reducing product development time-to-market.

Source: IBM Institute for Business Value.
Perfect product launch in action

Major aerospace manufacturer integrates risk-sharing partners

A major aerospace manufacturer believed it could improve the cooperation, innovation and performance from key vendors by increasing the use of risk-sharing partners. While the contractual and incentives part of the deal could largely be kept in the boardroom, the relationships would require a new level of collaboration on critical programs to be successful, requiring shared use of digital models across the lifecycle.

What the company did:
- Developed a coherent, comprehensive business vision for collaboration
- Created a compelling business case that measured and prioritized costs and benefits of the program
- Focused the initiative on critical suppliers for leading the program
- Geared the solution as a design principle to accelerate design, build and deployment
- Aimed to harmonize "core" engineering, manufacturing and support processes and methods available across the supplier base
- Enabled appropriate realtime access to concurrent configured product data throughout the product lifecycle among key risk-sharing partners.

Through the program, the company was able to establish a successful concurrent engineering platform with its key risk-sharing partners. Overall, it reduced the costs and dramatically improved the effectiveness of data exchange and collaboration.

Electronics product information management solution

A global consumer electronics company, competing in an industry that greatly depends on how quickly it can market new products, needed to constantly update product offerings because of changing technologies. New product information had to be quickly and accurately distributed to regional sales and marketing teams, with language translations. The company faced some key challenges:
- The current process was labor-intensive, requiring the transfer of product data to divisions and translators via e-mailed spreadsheet files.
- Updates of different systems were handled manually, post-translation.
- The speed and accuracy of this process were significantly inadequate to stay competitive, considering the breadth of products, languages and systems that needed to be managed.

What the company did:
- It deployed a product information management solution that manages the process of creating, enhancing and distributing product information to its customers, dealers, Web sites and other applications, removing many of the manual elements of the product information management process.
- With the new solution, manufacturing plants input information directly into the product information management system, where it can be imported from an enterprise resource planning (ERP) system to other applications.
- Product managers have final approval, and then the workflow sends the information out to the agencies for translations. After approvals, the translated information is ready for release. Only new information is sent for translation, and all existing material is reused.
- The company can now simultaneously release the information to its Web sites, print catalog production department and its price change notification process.
A service-oriented architecture (SOA) approach to managing product data

Manufacturers need executive-level business decision support and improved business flexibility throughout the PLM processes. Integration of product data across heterogeneous product development applications and diverse enterprise systems assists business-decision support, shortens product development and release cycles, improves reuse and commonality, supports regulatory compliance initiatives and improves customer satisfaction.

We recommend using a product development integration framework (PDIF) approach to “unify” product information. The framework integrates the information and applications used throughout the enterprise to support product lifecycle processes, supporting cross-discipline access to a variety of product data. Additionally, “translations” support the product nomenclatures or views of product information to suppliers and other supply chain partners.

This kind of approach helps:
1. Shorten lengthy product development cycle times across the complex supply chain of development and manufacturing partners
2. Increase opportunities for innovation by providing access to information distributed among disconnected PLM and enterprise repositories
3. Allow product data to be easily found, reused and changed by using a traceable and auditable process wherever the data exists in a heterogeneous, multi-vendor PLM environment
4. Enable a coherent and integrated design approach for products that are an integrated mix of electronics, mechanical and embedded software components.

Business users get the information and support they need in the context of their roles and tasks, and IT management can help improve return on investments while gaining more options to manage the landscape transition through industry standards and decoupling. This is accomplished through the use of an SOA approach. SOA refers to a way of designing and executing the software portion of an information technology infrastructure so that it supports the various individual and interrelated activities (called instances) needed for a particular business function, or “service.” These reusable services, or components, can be combined and recombined as the product lifecycle business needs change.

Guiding principles in enabling a perfect product launch

Organizations seeking to improve collaboration and, ultimately, gear their businesses to enable the perfect product launch need to understand that change and improvements are difficult, particularly when the focus is on getting multiple organizations to work together. Collaboration is a “people-intensive” undertaking, which means that even the best strategies or systems will fail unless the participants are on board with the change and are carefully shepherded through the process.
Figure 3 below is a leading-practice approach to defining and deploying a new collaboration program within large manufacturing enterprises. Surrounding each step are key attributes that characterize successful deployment efforts.

Listed below are a few guiding principles, companies should consider and apply to their overall collaboration improvement efforts:

- Business case justification: Identify a situation where new product development collaboration or master data management is a business necessity and articulate a compelling case.
- Governance: Establish program governance, including alignment with external management teams.
- Holistic focus: Focus on non-technical issues as well as technical ones. The “solution” will only be successful with the alignment of process, people, governance and leadership.
- Industry standards: Understand and use applicable industry standards to streamline and simplify adoption across the partners in the extended enterprise.
- Look beyond your immediate purview: Understand and share other supply chain collaboration solutions where possible – for example, solutions used in different functional areas or different industries.
- Design for today and tomorrow: Design how-to-deploy as well as the steady state. A careful plan in deployment will affect both short-term results as well as the success of the final end-state. Start simply and add layers of richness later as you build.
- Measurement: Define and monitor key performance indicators (KPIs) for deployment, usage and benefits of the collaboration program.
- Communicate: Communication, training and support staff are essential to navigate through the changes.

FIGURE 3.
Defining and deploying a new collaboration program.

- Focus on non-technical issues, as well as technical ones
- Understand and use applicable industry standards
- Share other supply chain collaboration solutions where possible, e.g., supplier portals for visibility and scorecarding
- Establish program governance including alignment with external management teams
- Consult and involve key suppliers throughout

- Design collaborative vision
- Identify a business necessity and articulate a compelling case
- Focus on non-technical issues, as well as technical ones
- Start simply and add layer of richness later

- Design solution
- Design the method for deployment, as well as the steady state
- Help make sure that new ways of working are easier for users than any alternative
- Communicate, train and support staff through changes

- Build solution
- Define and monitor key performance indicators for deployment, usage and benefits

- Create collaboration vision
- Define collaboration strategy
- Operate solution

Source: IBM Institute for Business Value.
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Capabilities for success

To pursue collaboration, managers should consider some of the following operational improvement areas and decision points. While there is no universal solution for all companies, many of the themes listed here recur in some fashion at many organizations. These considerations should begin to create the basis for a vision and plan of action for making a real improvement in a formal and effective collaboration program.

<table>
<thead>
<tr>
<th>Capabilities for success</th>
<th>Leading Practices</th>
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<tbody>
<tr>
<td><strong>Collaboration strategy</strong></td>
<td>Identify what is a core internal competency and what would be better outsourced. Determine which domains and processes are vital for internal execution, either because of intellectual property protection, competency or market differentiation.</td>
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<td>Consider a “tiering” strategy that classifies different vendors into different categories based on their level of contribution to the product, level of risk in engaging, level of knowledge shared, need for integration and other key criteria. Apply this analysis filter to the supplier base to determine which partners to focus integration efforts on.</td>
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<td>Base all selection decisions on a cost/benefit analysis. Measure factors such as size of purchase/transactions, quality, vendor dependence, risk and difficulty of integration. Use the return-on-investment (ROI) model to prioritize investments.</td>
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<td><strong>Operational vision</strong></td>
<td>Enable concurrent access to project management information across the supplier network.</td>
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<td>Leverage successful internal practices and promote their deployment in partner organizations, such as supporting the same workflow tools or document management programs.</td>
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<td>Define information-sharing and IP ownership protocols and arrangements from the start to avoid conflicts later.</td>
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<td><strong>Technical vision for product development collaboration</strong></td>
<td>Provide a “single face” of your company to suppliers via an extended supplier portal and automated file transfer systems.</td>
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<td>Use an agile approach to upgrade, change and cope with variants (e.g., multi-CAD).</td>
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<td>Develop a “route-book” approach to early product and non-product requirements documentation. Include such information as applicable documents lists, manufacturing logistics and timely document visibility.</td>
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<tr>
<td><strong>Technical vision for released product data</strong></td>
<td>There are many techniques and technical architectures that support a master data management strategy, from wholesale system integration to more practical and cost-effective look-up and system-of-record systems. In all cases, the change requires a programmatic approach that includes as much decision making, governance and rule creation as it does data synchronization.</td>
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<td></td>
<td>Develop and extend harmonized application sets to support sharing of engineering data across the lifecycle and across the extended enterprise. The approach for each application will be determined by data volumes, application capabilities and level of partner integration.</td>
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Conclusion
A perfect product launch includes flawless execution of research, design, manufacturing, marketing, demand generation and supply chain synchronization. A perfect product launch can help increase the profitability of a product, both in terms of better margins and a longer, better revenue generation period. Some of the characteristics of a collaborative perfect product launch include:

- Marketing campaigns synchronized with operations
- Supply, demand and production in sync to create proper inventory throughout the entire pipeline
- Distribution channels and partners are aligned to support variability in the supply chain structure and accommodate volume fluctuations
- Launch planning includes the entire lifecycle management
- Product introduction is on-time and on-budget.

While the attributes of collaborative perfect product launch are desirable and very imaginable, achieving them in a complex organization in today’s market is becoming increasingly difficult. Industrial manufacturing companies seeking to enable a perfect product launch will find themselves on a challenging journey. Arguably, establishing operations that always deliver the perfect product launch may be difficult – as competitors, markets and customer’s changing requirements continually modify the landscape.

There are many internal and external areas of expertise that must be coordinated including research and development, product design, engineering, manufacturing design, supplier management, logistics, inventory management and customer relationship management. Collaboration is not a random or natural state for any organization – rather it must be a formal thrust, a planned, programmatic, purposeful endeavor that requires strategy, leadership, investment and resources. Companies willing to invest in collaboration have the opportunity to be leaders in new product development and, ultimately, will speed their journeys on the path to enabling the perfect product launch.
About the author
Karen Butner is the Supply Chain Management Lead for the IBM Institute for Business Value and an Associate Partner in the IBM Supply Chain Management practice. She focuses on strategy and transformation competencies. Additionally, she is responsible for managing the development and deployment of the Supply Chain Management Global Solutions Portfolio—a collection of integrated business, technology and organizational solutions to support the broad and diversified, multi-industry client base of IBM. She has more than 25 years of experience in supply chain management business practices and strategies. Her concentration over the past several years has been assisting clients in the high-technology, retail and consumer products, electronics, transportation and logistics industries develop strategies and improvement agendas to gain significant value through transforming their global supply chain performance. She can be reached at kbutner@us.ibm.com.

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References


