

## Leveraging suppliers for strategic innovation

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best practice brief

- ▶ Suppliers play a crucial role in enabling companies to rise to the demanding challenges of new product development. Strategic supplier considerations should be built into improvement initiatives for product inception, product development and product launch. Supply chain participants need to synchronize their approaches for understanding the product architecture, discovering and validating new ideas, measuring success, accelerating product development and mutually protecting their intellectual property.

# PLM Software

Answers for industry.

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## ▶ Leveraging suppliers for strategic innovation

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## ► An overview to managing supplier involvement

**The value of supplier involvement.** According to recent studies, companies that involve suppliers in the early stages of the product lifecycle (e.g., during design inception) are able to reduce product development cost by 18 percent and improve their time-to-market cycle by 10 to 20 percent.<sup>1</sup>

Reducing development costs and increasing production agility are key aspects that determine the success of today's new product development initiatives. If a product's cost structure is not supported by market-based pricing – or if development is not flexible enough to meet customer needs, then the product's margins and profitability ultimately will suffer.

Best-in-class companies understand that suppliers play key roles in enabling them to successfully implement their product visions. Current research estimates that 80 percent of a product's cost is fixed by the time the design process concludes. With this in mind, it is crucial that companies make correct sourcing decisions as early as possible.

Suppliers are able to influence systems technology that directly relates to a product's functional architecture, product structure, cost structure and ultimately to customer requirements. To understand product costs and ensure production flexibility, companies need to know:

- What technologies a supplier can offer
- How these technologies map to the product's content and cost structures
- How these technologies relate to customer requirements
- How supplier availability relates to the wider product launch

Studies by AMR Research<sup>2</sup> and the Aberdeen Group<sup>3</sup> indicate that 12 percent of today's manufacturers integrate their supply chain partners into the design process prior to prototype development. The good news is that companies are beginning to understand the need to better align their design and procurement processes – and are responding appropriately. The cautionary news is that a “beginning” is far less than total mastery.

Much has been written about how to best leverage outside expertise in general terms. The scope of this brief focuses on the detailed role that suppliers can play with respect to new product development. Additional Siemens PLM Software best practice briefs focus more precisely on the tactical details of procurement.

**Suppliers and new product development.** Strategic supplier considerations need to be built into new product development initiatives in three key areas: product inception, product development and product launch.

Typically, new product introductions are measured by the success of their launches (often expressed in terms of units sold). However, product launches involve cross-functional business processes, whose successful execution demands close collaboration between organizations responsible for defining market demand, designing the product and supplying/servicing the customer. Ultimately, the supporting infrastructure for these processes is defined by technology decisions made early in the product development cycle.

### **In brief:**

Best-in-class companies understand that suppliers play key roles in enabling them to successfully execute their product visions. Supplier integration is especially important during early lifecycle stages when companies need to address key architectural, product definition, cost and requirement issues.

Companies make key infrastructure decisions by deciding where to prioritize their technology needs and how to make their technology investments. This strategic thread has to be closely managed throughout the development cycle – up to the supply/delivery stage when technology is incorporated into the final product.

Apple’s work on their iPod product illustrates a successful and highly visible example of strategic supplier interaction. Like other digital music players, the iPod offers an intricate combination of powerful branding, slick marketing, attractive design, fast electrical components, a robust mechanical structure and simple operating software.

However, one of the areas where iPod changed the competitive landscape was its coupling with iTunes and ultimately with the entertainment companies that supply music. This combination of hardware, software and content represents a unique value chain. Music lovers were suddenly encouraged to legally and affordably purchase music for their digital players. This supplier relationship not only ensures the availability of content for users, but also facilitates the strategic sourcing of hard drives and flash memory.

Other successful examples of closely managed supplier relationships include IBM with its integrated product and development processes, Proctor & Gamble with its internal connect and development strategies and Dell who has become the poster child for supply chain management.

**Strategic supplier relationships.** The following organizations have a vested interest in most strategic supplier relationships.

**In brief:**

Apple’s work on iPod illustrates a successful and highly visible example of strategic supplier interaction. Apple’s ability to establish a unique value chain plays a major role in distinguishing iPod from competitive product offerings.

Participant	Role
Product management and marketing	Outlines the core concepts that underlie the product’s ideas; typically responsible for providing a base framework for ensuring the product’s success including outlining what capabilities need to be sourced
Procurement	Manages strategic supplier relationships, including the quote and bid process for new initiatives and the coordination of communications between suppliers and rest of the product development team
Engineering design and development	Ultimately responsible for designing the product, bringing multiple subsystems together and validating system performance against established product requirements
Manufacturing engineering	Responsible for ensuring that quality goals are met, including compliance of supplier-provided components, parts and subsystems
Production engineering	Responsible for ensuring that production quantities can be reliably delivered and that supply chain production issues have been addressed for product launch

## ► Supplier challenges in new product development

AMR Research's recent report on the perfect launch interviewed more than 20 manufacturers across multiple industries to determine what challenges they faced in launching new products. While these challenges touched many parts of their business, successful manufacturers recognized the need to balance three primary business domains: demand, product and supplier execution.

### Challenges facing 3 key business domains

Demand	Supply	Product
Lifecycle demand variability measures	Supply network design	Design prioritization
Price optimization	Supply cost and management	Speed and control of innovation compliance
Channel promotion and sales strategy	Phase-in and phase-out of material	Resource allocation

As might be expected, companies that expect to balance the above considerations require a mechanism for synchronizing the performance of these domains' product development responsibilities. At the end of the day, this means that sustainable product success depends on the ability to integrate product design with its related demand and supply management processes.

While outlining the right production quantities is important to this process, it is also imperative that companies tie their supply management needs to their product definitions and product structures. Unfortunately, this level of holistic cooperation is often missing from many supplier relationships.

The following table describes typical problems that make it difficult to synchronize the needs of the demand, supply and product domains.

#### In brief:

Successful manufacturers recognize the need to balance three primary business domains. These domains have to synchronize their assumptions, responsibilities and performance to facilitate the perfect product launch.

### Common synchronization problems<sup>4</sup>

Issue	Why it matters
Unstructured discovery and ideation processes	Most manufacturers have a fragmented knowledge management and prioritization process, where it is difficult to identify what ideas have risen to the level of ideation validation. While this is a common lifecycle problem, it is generally not advisable to bring suppliers into the prioritization process.
Speed of innovation and iterative design	Bottlenecks within the design process itself are often caused by collaboration problems across the wider supplier-integrated development cycle. These bottlenecks limit product development's ability to speed creative innovation within a scheduled timeframe.
Validating demand and supply	While many manufacturers have a defined validation process, the challenge is to integrate the validation of customer alpha-beta pilot test and supplier process capabilities as the design evolves.
Channel readiness for sales and service	Delivering documentation and training to the sales channel usually is a last step and is often underestimated, thereby affecting expected revenue uplift and sustainment of the product launch.
Global rollouts beyond initial regions	While many manufacturers succeed in local product launches, they struggle to repeat their success globally (typically because they are unable to successfully integrate suppliers in other locales).
Measurement's lack of enforcement	Even when measures are in place, manufacturers rarely close the loop with corrective actions, leading to a lack of accountability and encouragement for wrong performance.

#### In brief:

Companies struggle to synchronize their demand, product and supply domains in six crucial areas, including:

- Ideation and early prioritization
- Iterative design
- Product validation
- Sales/service support
- Global rollout
- Corrective feedback

## ▶ Best practice solutions

Leading manufacturers employ numerous best practices to alleviate pain, mitigate risk and ensure product success, including the practices outlined below.

**Disciplined product management, road mapping and rationalization.** The infrastructure for the supply process is ultimately defined by technology decisions made early in the product development cycle. As outlined by the Product Development and Management Association (PDMA), the core product architecture needs to be mapped to each company's strategic direction, core customer needs and technology evolution.<sup>5</sup>

This approach allows companies to strategically understand which pieces of the product architecture are crucial to meeting customer and market needs. It also leads to a clear understanding of what critical lifecycle capabilities require focus. Over time, this understanding will evolve as new technologies and changing needs arise. Managing this process to ensure a company's best strategic fit is a core element in enabling successful manufacturers to excel at meeting market demand.

**“Designing in” agile and flexible supply networking.** After a company defines its product architecture, it can map its core competencies against the market's primary drivers. Once this is complete, companies are able to understand which competencies should be kept in house and which should be outsourced to suppliers.

Companies can leverage their product development expertise to outline their products' systems and subsystems and maximize production flexibility in terms of quantities, location and supplier participation. These decisions are crucial to PDMA's core ideas for lean launches and postponement strategy.

The PDMA lean launch method requires flexible supply chains capable of rapidly responding to early sales indicators, as well as the ability to minimize inventory commitment during product rollout.

A postponement strategy that influences time or form plays a key role in driving a lean launch. Typically, companies adopt a postponement strategy so that they can delay product finalization until the last possible moment.

*Time postponements* delay inventory deployment and minimize distribution volumes by only shipping exact quantities to meet precisely defined customer requirements. In contrast, *form postponements* leverage product variations so that companies can flexibly meet specific market requirements. Along these lines, product options – such as assembly, packaging and labeling – are left open until customer orders actually arrive.

Dell is a recognized master in time and form postponement whose strategies have transformed the personal computing industry. As real-world examples indicate, these processes require companies to “design in” their lean launch and postponement options to the product definitions and manufacturing processes established by their product marketing and procurement teams.

**Strategic partner identification, mapping and management.** Once companies outline the core product concept and define the intended delivery mechanism, they can research and identify the partners and suppliers who are most able to meet their strategic program needs. Ideally, procurement teams should be able to provide supplier profiles that identify sources for specific components, subsystems and systems.

### **In brief:**

Industry-leading companies employ best practices to:

- Define their product architectures
- Identify strategic sourcing partners
- Forecast product demand
- Integrate their S&OP processes
- Validate CTQ measurements
- Share product information
- Secure their intellectual property

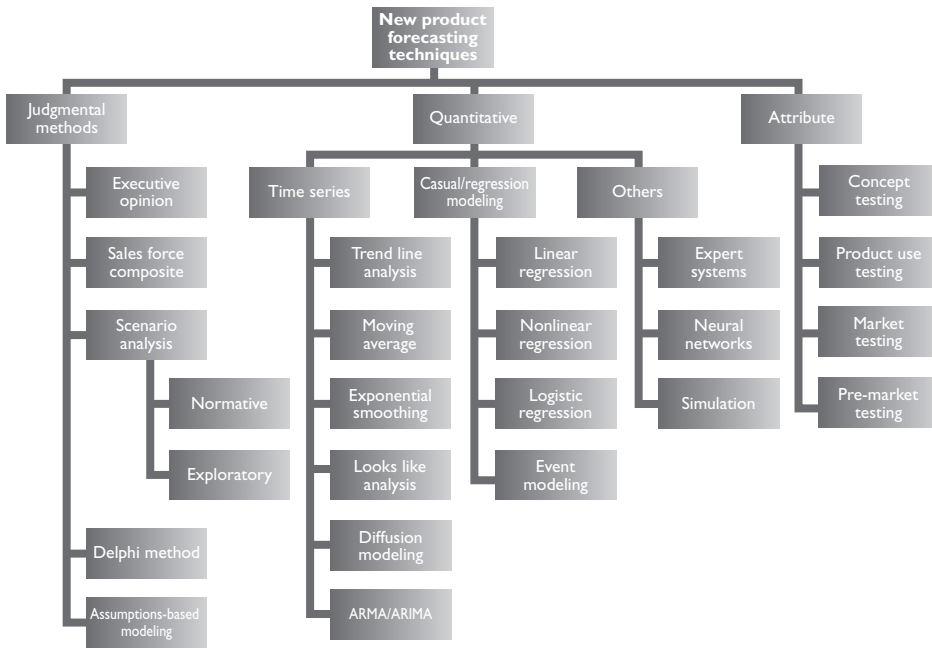
These profiles typically include details about the supplier’s product and capabilities, as well as strategic business information, such as the supplier’s mission, goals, stability, location, market size and project history. By taking all of this information into account, companies should be able to determine whether a given supplier provides a strategic fit with their long-term vision and market aspirations.

**Effective demand forecasting.** As indicated earlier, companies that synchronize the demand, product and supply domains are well positioned to perform successful product launches. Along these lines, companies need to ensure that OEM-supplier business agreements are based on realistic sales forecasts. These forecasts are crucial as the product launch draws near and companies have to make sure that production availability matches market demand.

**In brief:**

Companies need to ensure that OEM-supplier business agreements are based on realistic sales forecasts. Best-in-class companies are distinguished by their ability to sense demand changes quickly and apply attribute-based forecasting methods.

**Common forecasting techniques (PDMA)**



AMR Research’s studies on new product development forecasting indicate that companies who are able to sense channel demand changes quickly (i.e., in less than one week) have twice the new product success as companies that take two weeks or more to reach this conclusion.<sup>6</sup> AMR Research also found that 56 percent of companies who participated in the study were unable to sense demand changes as fast as the best practice companies.

Both AMR Research<sup>7</sup> and PDMA<sup>8</sup> conclude that demand sensing needs to be based on attribute-based forecasting – ideally derived from customer pilots, previous sales history and close market analysis. This forecasting outlines potential sales by asking respondents to evaluate product attributes, including key product capabilities, design variations, packaged accessories and service/warranty plans.



Ideally, these attributes should be mapped back to the product architecture defined by product management, as well as to key market segments that can be monitored closely. Market demand requirements should be shared with suppliers as early in the product lifecycle as possible to allow them to adjust their inventories.

Companies need to carefully assess market size and map this to their launch size (e.g., to make certain that they have enough inventories to meet market demand without having their warehouses full of products they cannot sell).

**Relationship between market size and market demand (PDMA)**

		Actual market size	
		Low	High
Launch size	Low	Commercial failure	Opportunity cost
	High	Cost overrun Commercial failure	Commercial success

**In brief:**

Companies need to carefully assess market size and map this to their launch size. Providing too much or too little inventory jeopardizes a company's ability to maximize product sales while minimizing operational cost.

The requirement for closely monitoring demand and sharing time-critical results is the driving motivation behind the use of radio frequency identification (RFID) tags in demand sensitive industries.

**Integrated sales and operations planning processes.** Recent studies find a strong correlation between how long an organization has had its sales and operations planning (S&OP) initiatives in place, how well the initiative's sales, marketing, operations and network supply partners coordinate their functions and the success of a company's new product development processes.<sup>9</sup>

While planning across these groups is essential, it must be followed up by close monitoring. Equally important, all of these groups need to understand, approve and orchestrate the S&OP plan.

**Continuous market and supply chain validation for CTQ measurement.**

Ensuring that delivered products meet the needs of the customer is in the best interest of both OEMs and suppliers. Before product development begins, the OEM and its suppliers need to agree on critical-to-quality (CTQ) measurements that are required to meet market demand. CTQ measures must include the actual measurements themselves, their related goals and actions and the expected consequences that will occur if these standards are not met.

CTQ evaluations need to be performed at specific stages in the development cycle, including during system definition and validation, prototyping, detailed development, manufacturing and production.

**Single source of product information.** It is imperative that product teams work together throughout the development cycle. Work on externally sourced components and subsystems need to be part of the same workflows and signoff procedures as internally developed design elements.

To do this effectively, companies need to maintain a single product definition. A single source of product information that minimizes communication breakdowns is essential for meeting this requirement. This is particularly true for companies that provide complex products requiring multiple manufacturing processes and seamless supply chain interactions.

A shared product definition also promotes joint agreements on common work practices, collaboration procedures, work breakdown structures and common IT infrastructures. These issues ideally should be included in supplier agreements to facilitate a distributed – yet integrated – development approach.

**Secure and effective intellectual property management.** Given the competitive nature of today’s global economy, it is imperative that companies protect their intellectual assets and capabilities. By evaluating a variety of case studies, AMR Research has identified five specific ways to effectively protect today’s most valuable intellectual property.

**In brief:**

Given the competitive nature of today’s global economy, it is imperative that companies protect their intellectual assets and capabilities. Companies need to make certain that they:

- Select compatible partners
- Honor everyone's property interests
- Limit information access on a need-to-know basis
- Institute organizational and technical security provisions
- Tightly restrict full access

**Keys for protecting intellectual property**

Best practice	How the practice works
Choose complementary partners	Companies should select partners and suppliers that complement their business strategy. Choosing partners that have competing aspirations is counterproductive over the long term, especially when jointly developing a project’s intellectual property.
Mutually honor intellectual property interests	Companies can foster partner collaboration by letting their partners and suppliers build their own intellectual property. Implementing complementary intellectual property and maintaining that differential bonds partners together.  In addition, since many partners will want to maintain their own IP protections, it is important to honor these requests. The best way of mutually protecting everyone’s intellectual property is to establish legally binding non-disclosure agreements.
Facilitate selective information access	Companies should provide their partners and suppliers with access to their intellectual property on a need-to-know basis. Partners should only have access to their particular piece of the IP puzzle (e.g., by using design models that do not need a complete history tree).
Define/protect keystone property	Companies should define keystone portions of their intellectual property and guard it within their own organizational and technological borders. This requires companies to understand what intellectual property is strategically crucial, map it out for special protection and keep it safe.
Limit full access	Companies should limit the number of people who are entitled to have full access to their intellectual property.

**Process management.** Successful companies are taking their lead in process management by leveraging the Six Sigma process improvement methodology. This also provides a starting point for companies that want to improve their product development processes. As outlined by AMR Research, the following Six Sigma improvement steps are commonly adopted.

- Define, where companies characterize the goals for their integrated sales and operations planning (S&OP) processes
- Measure, where companies establish and monitor their success metrics
- Analyze, where companies identify the potential causes of failure
- Improve, where companies prioritize their best practice and technology investments to correct failure modes
- Control, where companies institutionalize their processes with measurement and control

Companies and their suppliers must agree on their formal success measures *before* product launch, as well as *after* launch to ensure necessary corrective actions. These measures should be based on agreed upon CTQs with goals, specific corrective actions and noncompliant consequences explicitly defined.

**In brief:**

Companies and their suppliers must agree on formal success measures both before and after product launch. Everyone needs to understand the product's CTQ goals and what corrective actions and consequences will apply if these objectives are not fully met.

## ► Key Siemens solution capabilities

Siemens PLM Software is the leading global provider of product lifecycle management (PLM) software and services with 5.5 million licensed seats and 51,000 worldwide customers. Siemens' approach to supplier relationship management recognizes the link between strategic sourcing and product development.

Siemens' digital lifecycle management solutions enable companies to establish a single source of product data that they can use for collaborating with their suppliers. This single source of information helps companies enforce and synchronize common work practices that pertain to the inception, review, approval and manufacture of internally and externally sourced components.

Companies can complement this readily adaptable foundation with a range of collaboration capabilities they can use to enable OEMs, suppliers and partners to interact with each other more effectively.

At the base level, Siemens-driven PLM solutions enable diverse manufacturing enterprises to seamlessly share information without regard to the applications being routinely employed by the supply chain's various participants. As a result, suppliers are able to maintain close relationships with their respective OEMs while continuing to protect their own intellectual property.

By using Siemens' Teamcenter® software – the de facto standard for PLM deployment – to build this PLM foundation, companies can extend their enterprise so that individuals, product teams, project managers, suppliers, allied partners and downstream lifecycle participants can exchange information and ideas in automated workflow-driven processes.

These Teamcenter capabilities facilitate visual product collaboration, where OEMs and suppliers share complex information as it evolves across all of its lifecycle stages. Teamcenter also provides supplier relationship management capabilities that combine e-sourcing, analytics, knowledge management and collaboration technology to establish a single source of product, process and sourcing information for all supply chain stakeholders.

Siemens is uniquely positioned to fuse this technology into supplier relationships that companies can use to improve the cost effectiveness of their procurement initiatives, as well as increase the innovation and collaboration capabilities of their domestic and offshore product development operations.

Teamcenter addresses *classical sourcing* needs, such as supplier identification, supplier assessment and sourcing negotiations. Companies can also use Teamcenter to automate extended processes that drive *key supplier relationships*, including quality monitoring, engineering change, intercompany teaming, supplier training, engineering services support, joint project management, issue tracking and performance monitoring.

Companies can leverage Teamcenter's modular set of sourcing capabilities by directly linking this technology into their product development processes. Each module in the Teamcenter suite supports a key step in the strategic sourcing process, including:

- **RFP and sourcing surveys**, which support the automatic distribution of RFPs and surveys, easy online questionnaire completion, automated supplier communications and rapid response analysis.
- **Spend management**, which tracks enterprise spending and compliance by business unit, supplier, location, commodity and diversity supplier classifications.

### In brief:

Teamcenter addresses classical sourcing needs, as well as the extended processes that drive key supplier relationships. Teamcenter sourcing capabilities can be leveraged to improve:

- RFP processes
- Supplier-related spending
- Auction-driven bid processes
- Sourcing community collaboration
- Supply chain management

- **Auctions**, which bring the negotiation process online while enabling bidding on both price and nonprice components.
- **Sourcing community**, which provides a collaborative project-driven workbench with sourcing tools and resources that can be used to “market” deals, capture/share sourcing knowledge and manage sourcing projects.
- **Supplier management**, which enables companies to identify, engage and evaluate their suppliers; the module also facilitates supplier self-registration.

Companies can extend Teamcenter’s open PLM framework to link their demand, product and supply domains and enable marketing, product development, production and manufacturing teams to work together in concert. This approach lets teams perform everyday tasks using familiar tools they already understand; behind the scenes, Teamcenter brings these domains into a single seamless, highly productive value chain.

Teamcenter enables widely dispersed teams to capture knowledge from multiple applications and authoring systems and integrate this information into combined product definitions. Teams also can leverage Teamcenter to plan and manage lifecycle projects on a real-time basis and link project information and program controls into Teamcenter-managed product development workflows and review/approval procedures.

Teamcenter is adept at enabling companies to increase the value of their product knowledge by managing diverse forms of intellectual property on an enterprise basis – and allowing this knowledge to be leveraged across multiple programs and revenue-generating initiatives.

**In brief:**

Companies can extend Teamcenter’s open PLM framework to link their demand, product and supply domains. Teamcenter brings these domains into alignment by enabling extended value chains to:

- Capture diverse product knowledge
- Share/exchange this information globally
- Inject this information into automated workflow-driven product development processes

**Key Teamcenter capabilities**

Capability	How Teamcenter provides value
Linking demand, product and supply domains	<p>Enables companies to manage their lead tracking efforts and provide product development with immediate customer and sales feedback</p> <p>Provides a free-thinking and collaborative environment where ideas can be encouraged, gathered, shared and discussed among a company’s own organization, as well as between its suppliers, partners and customers</p> <p>Supports collaborative decision making by enabling promising ideas to be investigated, evaluated, compared and communicated</p> <p>Provides real-time capabilities to facilitate the rapid formation of sourcing teams, concept studies, program reviews, design reviews and engineering change reviews</p> <p>Provides a framework of lightweight planning and execution tools to ensure that the whole enterprise is able to support a company’s marketing and sales activities</p>

### Key Teamcenter capabilities

Capability	How Teamcenter provides value
Capturing knowledge for integrated product definitions	<p>Enables development teams to integrate combined product definitions into their engineering process management solution; supports all lifecycle stages ranging from concept design through engineering, initial sourcing, manufacturing and ultimately maintenance, repair and overhaul</p> <p>Provides comprehensive change and validation management capabilities</p> <p>Enables companies to integrate supplier processes and other collaboration activities into their own design process; facilitates the management of complex product configurations and the ability to make manufacturing decisions during the design cycle</p>
Managing lifecycle projects	<p>Enables companies to create, maintain and monitor complex project schedules</p> <p>Enables project and program managers to define projects in terms of work tasks, related costs, resource requirements and needed skill sets</p> <p>Highlights the current status of all projects and their related teams through the use of dashboards, email and pop-up notifications and other event-related communications</p>
Extending information's value to the enterprise level	<p>Captures information and intellectual property generated by diverse applications and authoring systems</p> <p>Facilitates robust price discovery and cost transparency throughout all lifecycle stages</p> <p>Enables product information to be shared in a distributed or federated multi-site environment by leveraging secure repositories that can be controlled, accessed and audited</p> <p>Protects the PLM environment's underlying systems and databases from unauthorized access and use; defines how individual pieces of information can be used</p> <p>Ensures the protection of web-based information across firewall boundaries through the use of security features and standard HTTPS protocols</p> <p>Controls user access and intellectual property rights by applying security clearances and enforcing entitlements that pertain to individual users, user roles, teams, groups and projects</p>

## Footnotes

<sup>1</sup> *Procurement in New Product Development*, Jim Brown, The Aberdeen Group, Inc., 2005

<sup>2</sup> *The CIO's Guide to the Perfect Launch: Translating Innovation into Business Benefit*, Michael J. Burkett, Eric Karofsky and Joyce McGovern, AMR Research, 2005

<sup>3</sup> Op cit, Brown, The Aberdeen Group

<sup>4</sup> *Three Supply Chain Actions You Can Take Today to Improve Your Product Launches*, Lora Cecere, AMR Research, 2006

<sup>5</sup> *The PDMA Handbook of New Product Development*, Second Edition, Kenneth B. Kahn, George Castellion, Abbie Griffin, 2005

<sup>6</sup> Op cit, Cecere, Three Supply Chain Actions

<sup>7</sup> *Case Study on Forecasting New Product Introductions: Three Techniques to Consider*, Lora Cecere, AMR Research, 2006

<sup>8</sup> Op cit, Kahn, Castellion, Griffin

<sup>9</sup> Op cit, Burkett, Karofsky, Griffins, AMR Research

## About Siemens PLM Software

Siemens PLM Software, a business unit of the Siemens Industry Automation Division, is a leading global provider of product lifecycle management (PLM) software and services with nearly six million licensed seats and 56,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with companies to deliver open solutions that help them turn more ideas into successful products. For more information on Siemens PLM Software products and services, visit [www.siemens.com/plm](http://www.siemens.com/plm).

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