Enabling innovation through value chain synchronization

Value chains form complex Global Innovation Networks that can be managed for profitable growth.
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Global value chains hold the key to profitable innovation and growth

Manufacturers are being driven to globalize their operations in order to better position themselves for profitable growth. Market leaders are developing geographically dispersed networks of suppliers and strategic partners that lend their expertise, market knowledge and capacity to help ensure the success of innovative products.

Of course there are issues of synchronization that are internal to product development organizations, but this paper primarily addresses the external components of the value chain. For example subsidiaries may be part of a company, but they behave and are treated as completely independent organization. In addition, even as mergers and acquisitions come into the fold, there are synchronization challenges involved in their assimilation that can be addressed by the concepts outlined below.

This trend is leading to a shift in traditional thinking about the supply chain and about the nature of the relationships that manufacturers have with the organizations to which they outsource some of their non-core engineering, production and support functions. These relationships run the gamut from joint ventures, to strategic partners and may include all levels of suppliers. In fact, market leaders consider these organizations to be part of their value chains and a foundation for their Global Innovation Networks.

Successful innovators are bringing all of the contributors and stakeholders of product development – the value chain of customers, partners and suppliers – more closely into the product development fold, effectively synchronizing their product-related processes and data. This approach affects functions from procurement to design, engineering, manufacturing, marketing and service.

At the same time, by spreading these functions across multiple organizations and geographies, manufacturers add layers of complexity, uncertainty and risk to their business. Initial cost savings can be offset by the loss of visibility and control over key processes across the product lifecycle. Without the tools and information needed to manage these relationships effectively, cost, quality, time to market and inventory can quickly get out of control.

According to Deloitte Research, leading innovators are mastering these complexities by building the capabilities necessary to synchronize product development, supply chain and demand-creation activities across the value chain. [Mastering innovation, 2005] These companies consider synchronizing the value chain as a strategic management initiative rather than a simple set of automated connections among manufacturers and their suppliers intended to reduce costs. The next frontier for improvement is to orchestrate those connections in ways that enable manufacturers to innovate more effectively, keep costs down and grow revenues and market share.

The contribution of effective value chain synchronization can be significant. According to AMR Research, value chain innovators see a reduction in finished goods inventory greater than 30 percent and a 25 percent improvement in on-time delivery. [Insights into supply chain innovation in Europe, 2006]

According to Deloitte Research, companies that synchronize their value chain can achieve 73 percent higher profit margins than those that don’t. [Mastering complexity in global manufacturing, 2003]

Value chain synchronization establishes dynamic relationships with built-in feedback systems that actually help companies choose the “right” suppliers and then develop them into more strategic partners that play an integral role in the product development process. The result is a self-improving environment that is continually updated and can readily adapt to new requirements or respond to change.

What is a ‘value chain’?

Today’s value chain is anything but simple. It is, in literal terms, not a chain at all, but an incredibly complex, dynamic, data-driven network of inter-relationships among dozens, hundreds or thousands of suppliers, customers and partners spread across the globe. It spans a multitude of touch points and processes associated with each function, creating a Global Innovation Network of symbiotic partners working together to increase innovation and optimize product value.

“We need to stop thinking of supply chains and value chains as different entities, but rather, should integrate the two. Product design should be fully integrated with production capability, delivery processes and information about customer demand.”

[Andrew Fuller, Dr. Dan Shunk, Dr. Tom Callarman. Value chains versus supply chains, BP Trends. March 2006]
While the ability to synchronize the value chain across the enterprise and extending into customer and strategic partner systems is increasingly important, it is also becoming more and more difficult to accomplish. This paper presents fundamental areas that manufacturers need to address if they want to reap the rewards of their globally dispersed supplier and partner networks while managing their complexity to minimize risk and control cost.

- **Supplier relationship management**
  Develop and maintain a superior supply chain by integrating procurement and sourcing processes more tightly with product development and managing suppliers’ capabilities to reduce sourcing risks. Identify and align the best partners, then involve them early in the product development process to streamline processes, control costs and contribute to innovation and growth goals. Automate routine sourcing processes to spend more time on building strategic relationships.

- **Value chain integration**
  Establish strong links between external contributors and stakeholders and internal departments by connecting their information systems and processes. Synchronize activities across the product lifecycle – from development to manufacturing and service – through a digital, collaborative environment.
Procurement and sourcing decisions have a major impact on new product profitability as well as on companies’ ability to manage supply risks over the product lifecycle. Most companies acknowledge this as evidenced in a recent study by Aberdeen Group which found that more than 60 percent of manufacturers have initiatives in place to involve procurement, suppliers and other financial stakeholders earlier in product development. Manufacturers that collaborate with procurement earlier in the design process and make sourcing decisions a higher priority during the early phases of the product lifecycle are realizing product cost reductions of nearly 18 percent and 10 to 20 percent improvements in time-to-market cycles. [Procurement in new product development, 2006]

According to AT Kearney, executives want their sourcing teams to create value through their relationships with key suppliers. And yet, the same study found that sourcing teams spend 70 percent of their time on tactical activities such as processing RFQs, with little value added to those strategic relationships. [Assessment of excellence in procurement, 2004]

To elevate sourcing and supply chain relationships to a more strategic level, companies must address key process and technology issues:

- Sourcing and procurement integration with product development data
- Supplier management
- Supplier collaboration in the sourcing process
- Sourcing automation

**Sourcing integration**

To manage supply risks and ensure that product quality, cost and availability goals are met, companies need to integrate sourcing and procurement more closely with product development.

A number of factors enter into sourcing decisions, including: purchase volumes, landed costs, supply stability and risk, supplier performance and geographic considerations to name a few. Given that direct material costs can account for 60 to 80 percent of total product cost (depending on the industry), sourcing decisions can have a significant impact on profitability. [Procurement in new product development. Aberdeen Group, 2006]

The ability to manage those factors effectively is extremely important. It requires that procurement and sourcing personnel have access to supplier, product and financial data in order to evaluate options and select the most appropriate suppliers for a given product. In addition to supplier relationship management (SRM), product lifecycle management or PLM solutions based on open architectures can embrace a network of other enterprise systems spanning internal departments as well as supplier, partner and customer domains. These solutions enable companies to link to data maintained in enterprise relationship management (ERP) and supply chain management (SCM), as well as customer relationship management (CRM) systems, and to synchronize the ebb and flow of data throughout the product lifecycle.

Supplier relationship management solutions that are built on PLM provide seamless end-to-end sourcing capabilities with a focus on enhanced functionality, enterprise integration and collaboration features that support varying negotiation strategies and customer look-and-feel requirements. These solutions also can be designed to support spend analysis and component standardization. Enabling all of the sourcing participants — procurement, suppliers and product development — to share up-to-date product and process data in real-time is a key differentiator from traditional SRM solutions that operate in an island of data.

Product changes introduce unnecessary time and cost to the RFQ process. Up to 70 percent of RFQs are for changes to contracts that have already been awarded. From the time an Engineering Change Notice (ECN) is issued through the time a contract is awarded, more than 50 percent

**Information control is critical to the value chain process**

For Volvo Aero Corporation, Trollhattan, Sweden, increased efficiency in the value chain represents a competitive advantage. By establishing a virtual environment that enables internal design and manufacturing teams to collaborate with suppliers around the world, the company can eliminate delays, reduce costs and meet compressed lead times. A shared environment enables the company to optimize processes and ensure that all contributors are working with the most current requirements, even in the face of constant change. Increased visibility into expected demand enables the company and its suppliers to be more accurate in their predictions for capital requirements or potential shortfalls in capacity.
of the RFQ process is consumed by understanding the impact of the change, preparing the RFQ and collaboration with suppliers who are trying to make the most accurate bid.

Through PLM, procurement and sourcing functions can be fully integrated with product development data and processes, enabling sourcing and suppliers to remain synchronized with changing design information while providing levels of security required to protect intellectual property. As a result, companies can increase sourcing productivity.

Supplier management
Despite the implementation of ERP and SCM systems, many companies still manage supplier-related information in multiple departments and locations, requiring that data be re-entered into siloed systems. This can lead to costly errors, missed opportunities and miscommunications among internal departments and external resources.

To better manage data and improve sourcing accuracy, industry analysts recommend creating a common repository of synchronized information that builds exponentially over time. The availability of supplier information such as vendor capabilities, quality ratings and even geographic coverage can influence design decisions earlier and reduce sourcing risk. An enterprise PLM solution provides the tools needed to automate routine functions, establish consistent data and processes, and streamline change requests, thereby enabling sourcing and procurement to focus more time and energy on building strategic relationships with key suppliers and partners.

With PLM, companies can transform the task of managing suppliers from a repetitive paper-based process to a fully automated one, preferably with universal Web-based access that enables suppliers to maintain their own information. This solution can streamline and standardize the data collection and analysis processes. Since data from active suppliers is in digital form, it is readily available for searching. This dramatically reduces the time involved in identifying the right supplier, freeing procurement professionals and sourcing teams from administrative details.

Supplier collaboration
Research shows that up to 80 percent of a product’s cost is committed during design. Of those costs, up to 80 percent are direct material goods. What’s more, the cost of a design change rises by a multiple of 10 with every subsequent stage of development. It is clear that there is significant opportunity for improvement when companies synchronize the contributors of that 80 percent (their value chain) with their design processes.

Manufacturers can involve their global network of suppliers early in sourcing discussions by establishing a real-time, digital collaboration environment. Through web-based portals, companies can solicit input from suppliers on change implications and “should cost” discussions. They can communicate their managed data with their trusted suppliers without requiring that suppliers adopt a particular technology.
A PLM solution that connects suppliers has a different focus than traditional SCM solutions, which focus on efficiency improvements. Similarly, managing supplier relationships through PLM represents a logical evolution of more traditional SRM systems that exist in a vacuum from product development. By providing a managed environment with secure access to the latest product information, PLM ensures that suppliers are responding to accurate RFQs and that those RFQs reflect accurate design data. Integrating supplier operations more closely with product development also reduces the impact of changes that can quickly erode negotiated pricing and cut into the bottom line.

**Sourcing automation**

To increase productivity, efficiency and accuracy of sourcing and procurement, companies need to automate the fundamental data collection and analysis that supports the procurement process and decision making.

Typically, the process of consolidating and analyzing these data is a manual one, often requiring months to aggregate data from many different sources. Complicating the process, these data often are inconsistently and poorly classified. In contrast, an open, enterprise PLM environment can bring together product, supplier and financial data, providing companies with the tools and information they need to analyze spend with suppliers world-wide and gain leverage in negotiations.

Once contracts have been awarded, buyers can track supplier performance against quality, reliability and delivery goals. Sourcing impact analysis helps companies to quickly understand the impact of their sourcing decisions across the extended enterprise and to identify opportunities for cost and efficiency gains.

Utilizing web portal capabilities, companies can establish on-line auctions and manage negotiations online. By automating the RFQ process, companies reduce the time it takes for suppliers to respond while improving response accuracy.

Sourcing automation includes the ability for process management. Because sourcing professionals are working several parallel efforts or projects, they need tools that capture knowledge and information gained during the sourcing process for re-use, as well as tools to manage concurrent activity. In addition, procurement management can use dashboards and scorecards to monitor project status and effectiveness.

Robust automated sourcing tools enable companies to increase sourcing productivity, allowing them to cut the time they spend on tactical sourcing transactions in half. That time can be utilized for more sourcing analysis to help maintain compliance with corporate purchasing standards and to eliminate maverick spend.
Value chain integration

Fundamental to the premise of a Global Innovation Network is that manufacturers can take advantage of innovations in products and process regardless of where they originate. Manufacturers cannot sustain product innovation and competitiveness unless they include their customers, strategic partners and suppliers with their internal teams in a global value chain that encompasses every stage of the product lifecycle.

By proactively managing the value chain and ensuring the input of key factors early in the product development process — from customer wants and needs specific to local markets, to supplier requirements and dependencies, to closing the loop from service experience to product improvement — manufacturers can improve the product's ultimate market success.

According to analysts, global companies spend more than $13 trillion on purchasing direct materials every year. Coupled with the fact that 80 percent of a product's cost is fixed by the time the design process concludes, incorporating procurement requirements earlier in the product development process could help companies achieve product cost savings of up to 20 percent and reduce time-to-market cycles by 10 percent to 20 percent.

These are significant numbers that can easily deliver a quick ROI. However, managing the complexities of a distributed value chain leads to significant business risks and benefits. Layers of complexity are added as companies expand into new and unknown markets and attempt to resource engineering, manufacturing and support externally. Yet, according to Deloitte Research, companies that successfully manage this complexity achieve 73 percent higher profit margins than those that do not. They are much better at managing, coordinating and synchronizing both within and across the value chain. [Mastering complexity in global manufacturing, 2003]

The most effective way to minimize the risk associated with developing an integrated, globally dispersed value chain is to establish a single source of product and process knowledge and enable the external contributors to integrate their systems into it. Making product data visible and synchronizing the data flow among the various contributors and stakeholders can eliminate many of the disconnects that result in miscommunications and errors leading to costly rework.

Development integration

According to Deloitte Research, only 13 percent of CEOs believe that they collaborate with customers enough in their development efforts. Similarly, firms’ R&D and marketing teams fail to consult with customer support and channel partners when developing new offerings — losing these partners’ innovative insights that could enhance end customers’ experiences. [Mastering innovation, 2005]

By involving suppliers, contract manufacturers and customers as well as other internal departments in the product development process, companies can capture the best ideas and the freshest perspectives. Failure to gain their input early in the process results in significant costs later on, as change orders proliferate or — worse yet — new products don’t meet customer needs and revenues miss expectations. In fact, requirements management, change management and collaboration are at the heart of value chain synchronization.

A streamlined value chain leads to profitable innovation

“Innovation leaders look at the entire value chain of activities — from the time a new product is developed, to when it is manufactured and distributed, to when it is sold and serviced, over the lifetime of the product — as one integrated feedback loop.”

[Mastering innovation, Deloitte Research. 2005]
One of the core threads through the entire process is requirements management. Starting with “voice of the customer” requirements and cascading down through functional requirements all the way to manufacturing and service, it is critical that all disciplines are working to the same set of requirements.

Using PLM to establish a single repository of product and process data, companies can ensure that all contributors are working with up-to-date requirements. The integrated requirements management capability provided by PLM enables companies to capture market and compliance requirements and to make them visible throughout the development process.

It also is critical to manage change of any kind across the value chain. Whether a change is initiated to fix an error or to improve an element of the design, proper workflow procedures ensure that the change process is consistent with company standards and policies and that it is captured for future accountability.

PLM makes it possible to manage the ripple effect of unanticipated change by providing the extended team with a virtual collaborative environment along with tools to evaluate, communicate and discuss how design, development, manufacturing and distribution issues affect requirements in real time.

Users can assess the impact of changes against specifications. Cross-functional teams can solve problems as they arise, identifying design and engineering changes before any commitment to hard tooling, where costs rise exponentially. Changes become a source of innovation rather than a source of added cost and time.

Manufacturers that want to leverage the involvement of the value chain in the development process need to focus on four key areas:

• An integrated development environment
• Process management
• Design automation
• Open information exchange
Integrated development environment

The key to requirements and change management across the value chain is to establish a shared development environment that provides robust functionality along with familiar tools that enable each contributor to make timely decisions and take appropriate action.

An integrated development environment built on open PLM technologies creates a highly productive work environment in which business processes can be managed coherently toward a common goal. It enables companies to capture insights across disciplines, allowing users to view, analyze and mark up any type of design data including CAD and CAE models through managed workflows. It also facilitates issue resolution and change management, capturing product and process data for future review.

According to a study by Aberdeen Group, two-thirds of product companies lack insight into the regulatory, environmental and operational rules that impact their products. Almost one-half of departments responsible for compliance have little or no visibility into product development. [Product compliance: Protecting the value of innovation, 2006] Companies need to manage compliance across the value chain in order to avoid unnecessary risk and exposure to future costs. For example, Sony was forced to recall 130 million units of its PlayStation® product because a supplier’s cables contained high levels of cadmium, an element that had been banned in the European Union. As a result, the company lost $162 million in revenues. [http://edition.cnn.com/2001/BUSINESS/asia/12/04/sony.playstation.block]

An integrated development environment built on a single repository of knowledge ensures that everyone across the extended enterprise is working on the most current, accurate information. Not only do suppliers know they have the right information, but OEMs know that suppliers are confident in the accuracy of their data. This eliminates the need to establish manual procedures to monitor data integrity across hundreds or thousands of suppliers. When properly implemented, this repository mitigates risk, improves accountability and eliminates quality issues.
Process management

As complexity mounts, so does the cost of change. Visibility into interdependent processes that span the value chain enables companies to include external value chain members in workflows to evaluate the trade offs that accompany any change request before costly actions are taken.

The added visibility and tracking capabilities of a PLM environment improve accountability for actions and deliverables at each stage of the product lifecycle. Project management capabilities make it possible for contributors to highlight critical program and project milestones and to understand the impact of proposed changes on the program plan. They also enable repeatable processes that can be re-used in subsequent projects as best practices.

Leading manufacturers leverage PLM to reduce their design/build cycles while ensuring quality and managing cost at every stage of the product lifecycle. By automating many routine elements of the design process, they increase productivity and make more time for innovation.

Integrating the development environment with PLM enables companies to synchronize workflows and to manage the efforts of internal and external contributors – from systems engineering to drafting, contract engineering and outsourced manufacturing – as a unified team. Suppliers and key customers become an integral part of workflow processes and can synchronize their own procedures to better support the overall development process. As a result, companies can reduce unnecessary delays, increase efficiencies at all stages of the product lifecycle and achieve more product and process innovations.

Open information exchange

As the supply chain expands, and as suppliers work with more and different customers, the issue of dealing with data from multiple CAD systems becomes significant. A solution typically referred to as multi-CAD enables the import of CAD data from any software vendor into a neutral format that allows for assemblies that are constructed of parts and/or sub-assemblies of mixed formats. Multi-CAD creates a common viewable format for visualization by anyone in the enterprise – even if they don’t use any CAD system at all.

A robust multi-CAD solution provides a fully functional environment in which design teams can create, visualize and directly manipulate assemblies regardless of the CAD system the geometry was created in. This capability eliminates error-prone CAD-to-CAD translations and enables suppliers’ CAD files to integrate with top-level design. Multi-CAD capabilities allow for visualization and even digital validation of assemblies that otherwise might never come together in any “single-CAD” solution. When properly implemented, suppliers can even deliver their final design data in the neutral format, not only satisfying the OEMs’ need for accurate design data, but also protecting their intellectual property.

Tier 1 suppliers understand this challenge all too well, and those who manage it best will be the successful ones. They need to manage not only the interaction with their customers’ CAD systems, but also the data received from all of their component and sub-component suppliers.

JT technology facilitates data sharing and visualization

Using the JT™ data format, Caterpillar was able to conduct virtual design reviews using 3D models of entire complex machines, involving suppliers that did not have the same software. Iterating designs more easily with suppliers drives out cost. In an early study with one supplier, the JT data format reduced new product introduction cycle time by four months. It enabled design collaboration that saved hundreds of thousands of dollars on the first project.
Not only is this environment inefficient, it also quickly breaks down in the face of design changes. A true multi-CAD solution is synchronized with the original CAD data and reacts to change by automatically updating the associated visualization data so everyone is synchronized with the change.

An open PLM solution that supports industry standards for data sharing enables manufacturers to collaborate on design data regardless of their CAD system of choice. This relieves the pressure on suppliers to purchase and maintain the same CAD systems as their customers, which may be more complex or more expensive than they need. Suppliers are able to pass on these savings that would otherwise increase the ultimate cost to the OEM and of course to the customer.

**Manufacturing integration**

Manufacturing and production considerations have a significant impact on product profitability. Many manufacturers are addressing cost pressures by moving production to low-cost geographies. They are establishing global production capacity and aligning with local suppliers as they enter new markets, both to cut costs and to get closer to the customer.

But these efforts will not necessarily lead to the desired result unless companies expand their collaborative environment to include all internal departments and external suppliers involved in the manufacturing and production process across the globe. It is through the integration of manufacturing process planning and product design, all the way through to suppliers and even service, that companies can achieve the necessary savings while maintaining product quality and meeting time-to-market windows.

This can be accomplished by creating a digital manufacturing environment that integrates manufacturing and production with product design in a unified PLM environment. Such an environment enables each of the domains to view the product structure relative to the bill of material (BOM) appropriate to their needs while maintaining a single instance of the product definition in the database. According to CIMdata, digital manufacturing “fully integrates the definitions of the product, process, plant and resources into a comprehensive and consistent manufacturing solution.” [The value of digital manufacturing in a PLM environment, 2006] It enables design and manufacturing engineers to collaborate on a broader scale than ever before.

While manufacturers have implemented point solutions to address specific areas of the manufacturing process, they have not realized the benefits that are possible with a fully integrated solution. A shared digital manufacturing environment based on enterprise PLM enables a company’s manufacturing resources – both internal and outsourced – to validate manufacturability, optimize production processes and align suppliers with production plans early in the product development process.

By integrating suppliers into the production management process, companies can ensure that production meets plan, facilitate continuous process improvement and capture accurate as-built data from all sources. All stakeholders gain access to reliable and accurate information on product design, manufacture and performance. This improved visibility enables companies to better manage work-in-process, materials and quality across geographically dispersed team members. It enables companies to enforce common processes and standards and to monitor quality metrics and compliance across the value chain.
A single shared environment also improves supplier communication and reduces downstream errors by making product and tooling design information readily available and by facilitating a closed-loop change control process. PLM solutions based on open standards enable manufacturers and their suppliers to share common data structures, enabling rapid response to inevitable changes. These data are used to support the procurement bid process (as described above) that must include the manufacturing and production impact of changes on both the cost and additional time needed to implement them.

Service integration

Service is driven by the as-built and as-maintained bills of material (BOMs) that cascade down from the engineering and manufacturing BOMs (eBOM and mBOM respectively). Since many products have multiple configurations in the field at any given time, and since these configurations change over the product’s useful life, it is critical to be able to track a specific configuration and its associated BOMs for proper maintenance.

PLM is uniquely suited to manage all information about a product, its parts, its required procedures for inspection and maintenance and so on that is captured and managed in the context of the product data. Maintaining this information with all other product data is critical to successfully maintaining a product throughout its lifetime.

In the aerospace industry, for example, every aircraft – or tail number – is unique and requires that every component have its serial number recorded in that tail number’s configuration. These assets undergo frequent changes for safety and performance improvements throughout their usable lifespan (often more than 30 years) and must maintain compliance with changing regulations. By incorporating the supply chain into change and configuration management through a collaborative PLM environment, companies ensure that each configuration is properly documented and that everyone involved in maintenance and repair has visibility into compliance-driven requirements.

Leading manufacturers are incorporating Lean practices into their maintenance and repair operations. They are addressing the challenge of ensuring Lean performance across the MRO value chain by giving all contributors access to accurate, up-to-date configurations and documentation through PLM. This access reduces the time and manpower needed to perform maintenance, repairs and upgrades and ensures that every component can be tracked to a specific manufacturer and even lot number should it be required.

Tracking information about part performance (such as life characteristics, removal/repair data or inspection results) and specifications enables service organizations to perform Reliability and/or Condition-based Maintenance (RBM or CBM) rather than simply swapping parts. At the same time, sharing this information with the value chain enables suppliers to predict service lives and to project inventory requirements. This can be particularly important for companies that engage in performance-based contracts, where synchronization with the supply chain is critical to avoid unnecessary costs that affect the supplier’s bottom line. Improved service responsiveness increases “up time” and contributes to increased customer satisfaction and loyalty.

In addition, by capturing the service history of each configuration with as-maintained records and feeding that information back into the system, manufacturers gain knowledge of the field performance of their products, which is invaluable information that can guide those who are servicing the same or similar products as well as influence improvements for the next generation of that product.
As operations become increasingly global and manufacturers rely more on their suppliers and strategic partners to contribute to product and process innovation across the product lifecycle, companies must manage these extended networks in ways that minimize risk and control costs.

For many, supply chain automation is a given: companies have to implement supply chain management solutions in order to remain key players. But supply chains alone will not significantly contribute to agility, collaboration and innovation. Companies must consider the entire value chain — customers, strategic partners and suppliers as well as internal departments — if they want to accelerate innovation and bring more successful products to market.

Because of the increasing complexity of value chain relationships, value chain synchronization is essential. Manufacturers must anticipate demand, adapt quickly to changing market conditions and function as a lean, highly coordinated unit.

To do this, companies must integrate their sourcing and procurement more closely with product development, and create a digital environment that enables internal and external stakeholders to collaborate in real time at every stage of the product lifecycle. The ability to share data — from text documents to 3D product models — with anyone regardless of the original source, enables teams to make informed decisions that help manage costs, quality and time to market.

According to industry experts, value chain innovators are 78 percent more likely to use sophisticated technology and sourcing tools, and they invest 189 percent more than the laggards in technology that connects them with strategic partners and suppliers. As a result, they capture four times the information about their overall spending than the average company, enabling them to sense and respond to opportunities more effectively. These companies are better equipped to make accurate sourcing decisions and to manage their supply chains for strategic advantage. [“Supply chain excellence,” BusinessWeek. April 25, 2005]

These companies are addressing the issues described in this paper:
- More strategic supplier relationship management
- Sourcing integration and automation
- Value chain integration, from design to manufacturing, service and MRO.

While companies have traditionally implemented point solutions to support various functions across the product lifecycle, they have not achieved the benefits of a fully integrated approach. A coherent environment that embraces both internal and external resources, and that integrates their systems as required to synchronize activities (such as ERP, SCM and CRM) makes it possible for manufacturers to better manage their far-flung activities as a concerted whole that is greater than the sum of its parts.

AberdeenGroup found that best-in-class manufacturers are four times more likely to have PLM-related technologies than their poorer performing competitors. [The product innovation agenda benchmark report, 2005] These companies leverage PLM technologies to facilitate collaboration, consolidate product and process information regardless of where it was created and engage all participants in the value chain in a continuous process of innovation.
Through enterprise PLM solutions, companies can establish a virtual environment for value chain collaboration. They create a single source of accurate, up-to-date product and process data that can be continually updated over the useful life of the product. With access to meaningful and relevant information, all contributors to the value chain can be more efficient and productive. At the same time, this environment gives manufacturers the visibility they need to manage their complex value chains and to ensure their success in local markets world-wide.

While the network of geographically dispersed customers, suppliers and strategic partners on which manufacturers increasingly depend creates layers of added complexity, companies that manage these invaluable resources effectively gain an unfair advantage in any market where they do business. These Global Innovation Networks become tightly synchronized value chains of symbiotic relationships that actively contribute to ongoing product and process innovation.
About Siemens PLM Software

Siemens PLM Software, a division of Siemens Automation and Drives (A&D), is a leading global provider of product lifecycle management (PLM) software and services with 4.3 million licensed seats and 47,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software’s open enterprise solutions enable a world where organizations and their partners collaborate through Global Innovation Networks to deliver world-class products and services.

For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.