



**THE FUTURE OF
SUPPLY MANAGEMENT
PART II**

Technology, Collaboration, Supply Chain Design

By Joseph R. Carter, Thomas H. Slaughter, and John D. Blascovich

What lies ahead for supply management? Part two of this three-part series examines this critical question within the contexts of enabling technology, collaborative relationships, and supply chain design. This series of articles is based on a comprehensive study conducted by CAPS Research, the Institute for Supply Management, and A.T. Kearney. (For more on the research, see sidebar.)

What is design? It's where you stand with a foot in two worlds —the world of technology and the world of people and human purposes—and you try to bring the two together.

—Mitchell Kapor, founder of Lotus Development Corporation

In Part 1 of this series on the Future of Supply Management, Professor Robert Monczka of CAPS and William Markham of A.T. Kearney described a future where there were far more comprehensive category and supplier management strategies. In this article, Part 2 of the series, we will describe a Brave New World of customer-driven supply chain complexity that will require new, externally focused technology combined with relationship-based management processes for companies to compete. In short,

- Customer demands will become more diverse and complex.
- Supply chains will multiply and will become more complex.
- Collaboration will become more important to manage complexity, externally and internally.
- Technology will extend to be an enabler in the management of diversity and complexity.

Let us examine each of these characteristics—where they have been, how they have evolved, and where they will go in the future.

More Diverse and Complex Demands

In tomorrow's world, the ability to respond to change will just be the price of admission. Competitive advantage will require agility; supply chain

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excellence, in particular, will be defined by the ability to:

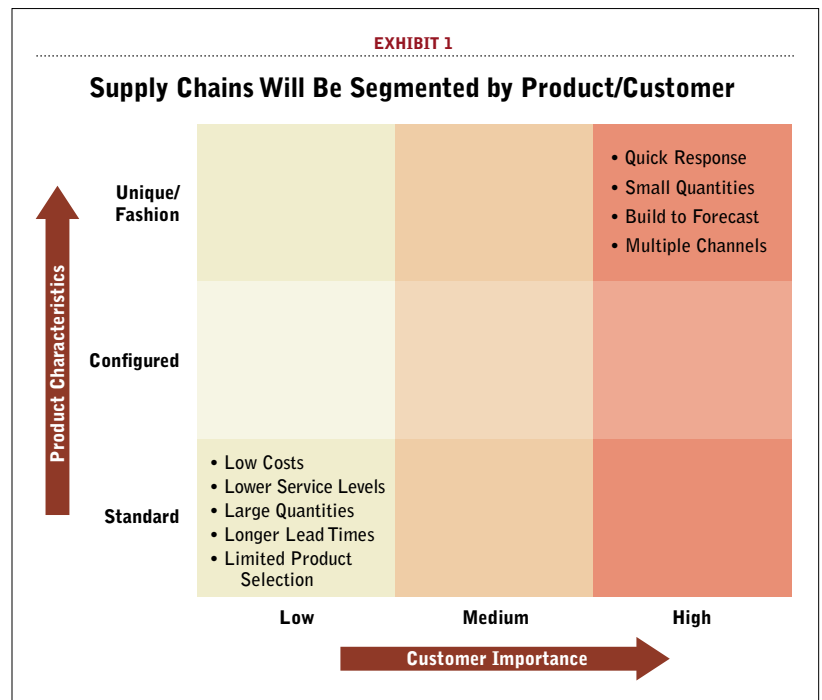
- Anticipate changes in customer requirements, product offerings, supply conditions, regulations, and competitor actions.
 - Adapt to the changes by deftly reconfiguring existing supply chains or creatively assembling new ones.
 - Accelerate implementation of change to capture the new opportunities ahead of the competition.
- Make-to-order or assemble-to-order product/service bundles that fill distinct and possibly numerous market niches will quite obviously require the management of several supply chains simultaneously on a global scale. In fact, only through multiple supply chains will a company become sufficiently flexible. When constructing flexible physical supply chains, speed and agility throughout the supply chain will be critical operational strategies.

Exhibit 1 highlights the unique mix of product characteristics and customer importance that must be considered when designing and operating multiple supply networks. As the following quotation from a study focus group participant notes, supply management will play an important role in managing these diverse supply chains:

“A lot of what’s happening to us is being driven by portfolio changes in our supply chain, distribution networks, and manufacturing networks. Those networks are becoming global and there is relentless rationalization of the portfolio, moving out of various countries and growing into new

countries. It really does drive what is required from procurement.”

Customer demands will only increase moving forward. Those companies that create supply chains that meet and exceed customer needs and service requirements will become the industry leaders. Traits like velocity (the ability to move quickly to meet customer needs and demands), responsiveness (immediate attention to customer service requests), and resilience (the ability to respond to perturbations in supply chain operations) will be hallmarks of supply chain and com-



About the Study

CAPS Research, A.T. Kearney, and the Institute for Supply Management (ISM) recently released a research study entitled "Succeeding in a Dynamic World: Supply Management in the Decade Ahead." The study updates and expands the 1998 research by these organizations.

The current research probed three key areas:

- What external forces will have the greatest effect on business over the next ten years?
- How will business models change as a result of these forces?
- How will the mission, goals, performance expectations and strategies for supply management change to support these new business models?

Over 260 companies representing North America, Europe, Latin America, and Asia/Pacific participated in the research. This included involvement by 113 supply management executives who participated in meetings and teleconferences with the research team, and 180 company responses to the e-survey (many companies participated in both). About two-thirds of the participating companies came from manufacturing industries, while the rest were from service industries.

A high-level view of the study findings and A.T. Kearney's perspectives on them are available at www.atkearney.com. A separate, comprehensive study report from CAPS Research will also be made available at www.capsresearch.org in fall 2007.

pany success.

The bar that defines excellence will continue to rise because of external forces. The speed of change will accelerate, the magnitude of change will grow, and the pressure of change will continue to be relentless. It will be driven by far more demanding customers, massive industry restructuring, breakneck technology advances, the new challenges of globalization, and new business risks.

Multiple and More Complex Supply Chain

The need to align customer, product/service bundles, and supply chains is too often overlooked as a source of sustainable competitive advantage. Those companies that have been applying this approach to supply chain design and management have met with exceptional results.

A company must seek answers to some important questions before designing its supply chains. What is the primary focus of each supply chain? Is it speed of delivery, low cost, flexibility, innovativeness in design, minimum total cost, and so forth? What are the service and cost targets needed for each supply chain so that it can compete effectively for its customers' business? What are the strategic breakpoints in performance that will yield a real competitive advantage?

The answers to some of these questions involve tradeoffs of complexity vs. value vs. efficiency. These tradeoffs play a key role in the

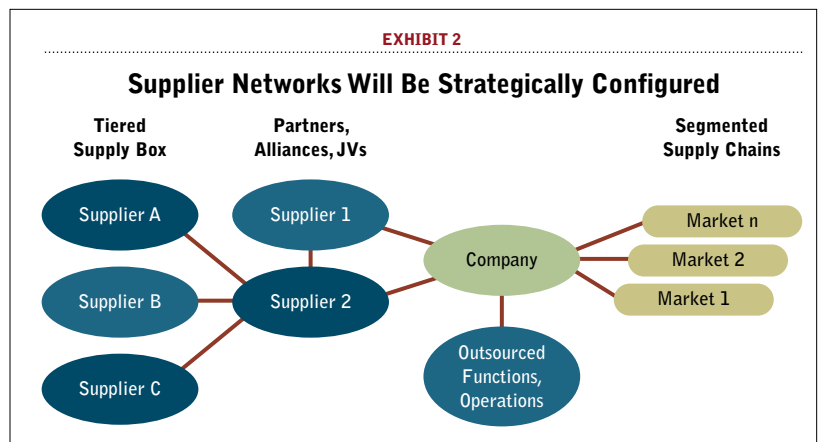
balance between revenue and profits. The ideal lies somewhere between a single supply chain for all product/services and customers and the complexity that would result from the use of many unique and separate supply chains.

Exhibit 2 provides a graphic representation of the coordination complexities of managing key strategic partner input and coordinating value-added output from multiple supply chains.

Traditionally, supply managers have focused not on collaboration, but on creating competition in their supplier markets. The aim has been to use the "invisible hand of the marketplace" to maximize the value from competitively sourced suppliers. Supply managers also have tried to offset non-competitive practices introduced by internal stakeholders as well as by external market structures. Collaboration, if practiced at all, was usually limited to product design and development efforts with counterparts at supplier companies through supplier development efforts or introduced through Six Sigma quality management programs.

While collaboration is cited by many supply management leaders as an important success factor for the future, it does not easily fit in with the traditional view of supply management's role in the organization. Four main themes around collaboration emerged from the survey instrument and focus groups:

- Internal collaboration and integration must advance further if companies are to capitalize on their future needs.
- External collaboration will signal a shift from pure competition to partnership for some segments of a company's supply base.
- Technology will be necessary to enable this increase in collaboration—internal systems will have to provide more visibility to multiple data views, while external systems will have to share information safely and effectively.
- The tension between the potential for strategic advan-



tage through supplier collaboration and the concerns about managing risk and protecting intellectual property will not be easily resolved.

Keys to External Collaboration

What are the key reasons why supply managers wish to collaborate more (and ostensibly compete less) with their supply bases? The first reason is that as companies have reduced their number of suppliers, they have also reduced potential alternative sources of supply. Self-created duopolies or oligopolies are more difficult to engage in competition. Alternatively, suppliers have choices about which customer they will give new technology to first. They have choices regarding scarce or newly planned resources. Consequently it has become much more important to become a “preferred customer” for a key supplier. A study participant from a large telecommunications company described the new supplier reality:

“My company is probably 60-70 percent dependent on its supply base. As we have aggregated spend, we dramatically reduced suppliers. Now I want those fewer suppliers to pay more attention to me as a customer. They have to be more willing to share their plans for future with me, to collaborate with me on their technology roadmaps.”

In the future, companies will need to use collaboration to keep their innovation pipeline filled. For some, this may be as simple as having purchasing interface with their own product development organization as well as with their suppliers. More complex collaboration will enable companies to link the “push” of technological advances to the “pull” of customer demand that will accelerate the pace and need for product and service integration.

Linking customer needs to supplier capabilities is difficult enough. Extending the visibility to another layer or two back in the supply chain is tougher still, even though some companies will want to collaborate with those suppliers to manage the innovation chain. One study participant described this situation: “In the future, it will be necessary to look at Tier 2 and 3 suppliers for innovation in addition to supply assurance. This visibility will require more resources and more technology even if only done selectively.”

Strong relationships built through collaboration may intentionally or unintentionally block competitors from accessing key sources of supply. Competitive blocks may take the form of technological exclusivity, or they may be as simple as tying up supplier capacity. But each such advantage is likely to have a relatively brief lifespan, as one study participant noted:

“To us the biggest issue is retaining competitive advantages created working with suppliers and their proprietary tech-

nology. We can only get competitive advantage for a limited time until the supplier wants to sell it elsewhere. They want increased sales as much as we do.”

In addition, companies that establish relationships that will allow technology to provide visibility for increased operational effectiveness will be valued by strategic suppliers. Companies will expect both their internal systems and those of suppliers to provide greater transparency of financial and performance information. “All of us are interfacing with suppliers, measuring what we can and it simply will become a more fact-based framework in the future,” one study participant related. “The clearer the data, the faster and cleaner the decisions will be.”

Supply management executives will use the additional data obtained through greater transparency across their companies and back through their supply chains to create greater analysis and decision-support capabilities in the future.

Keys to Internal Collaboration

Supply executives tend to see the need for internal collaboration initially with engineering and product development, particularly in manufacturing companies. Yet it is just as important to collaborate internally with functions like marketing, information technology, and business unit management. In the past, systems have been largely focused on historical transactional data. Consequently, information was limited to what was known about internal operations and how it interacted with existing suppliers. Supply management needs to be focused on future needs and potential new suppliers. That means it needs to collaborate to obtain functional and executive stakeholder views on the future.

Existing corporate behavior can constrain an integrated program for product development. As one participant noted, such a program is an “intimate relationship” that requires great trust—something companies may not be comfortable with. Co-location is one approach that can be used to effectively integrate supply management (and suppliers) into the new product development process. One study participant commented:

“We’ve actually put in what we call ‘new product engineers,’ which are sourcing people co-located in the laboratories, again, to assist the labs in finding the right sources of supply, developing the target class where they need to be so that we’re launching products that we know we’re going to be able to make money at, and so forth.”

Supply management has tried to achieve better positioning in the organization, earning the respect needed to make internal collaboration happen. A decade ago, supply management did not have an apparent or traditional role in collaboration. This is no longer the case, as three different study participants commented:

"I report to the CEO for one of the four companies, the largest of the four. I am well positioned, but we have not yet done enough across the group to gain synergies from our supply chains. But that would be the direction that I would see us moving in."

"I report to the chief technology officer. I sit on the Executive Committee. We get lots and lots of interaction with the CEO. We get lots of support because I think people understand that excellence in supply-based management is a source of competitive advantage."

"I'm one level removed from our CEO. I report to what's called the Chief Administrative Officer. Other key reports include the CIO, and the Vice President of Store Operations, and the Vice President of Store Planning. So I have lots of visibility to the executive level."

In other instances, holding formal business partner alignment meetings can help. One participant told us that as opportunities are identified, supply management will go to the presidents of the businesses to convince them of the advantages of pursuing that opportunity.

The viewpoints of the CEOs, for their part, have changed over the years, as one participant noted:

"Six years ago our CEO wasn't really interested in our suppliers or our relationships with suppliers; they were more downstream focused and purely customer oriented, with globalization and with higher level relationships. Now CEOs are becoming more interested in some of the supplier relationships and helping to manage at a high level, typically around the innovation."

The organizational model of the past was hierarchical; everyone knew what functional silo was home, and it was difficult to interact with anyone outside. External contact was, once again, confined to functional responsibility. Sales collaborated with customers. R&D and engineering interacted with their counterparts at supplier companies. Marketing with their external advertising agencies. Supply management interfaced with only a portion of suppliers, then with very circumscribed roles. The model of the future is a networked organization, where roles are fluid and processes are set up to meet a variety of evolving needs. Supply management collaborates with a broad range of internal stakeholders, as well as many incumbent and potential suppliers.

Previously, the difficulty of setting up three-way activities that included both parties' engineering or technical communities and supply management proved a barrier to collaboration. Now, the implementation of PLM technologies is enabling better, faster design that includes all three groups. One study participant who was in the process of implement-

ing a PLM tool commented, "It has a collaboration piece in that engineering design tool—we're expecting all of our suppliers to collaborate in the design of our new products. This new technological tool is driving suppliers to collaborate like never before."

The use of collaboration tools can have a significant impact on a company's top and bottom lines. As an example, consider how these tools could be used to make the processes around a small change in a shampoo bottle more efficient. Currently, a corporate packaging engineer would set up a meeting and likely travel to meet with several suppliers—including the bottler, closure manufacturer and cap maker—to discuss and review the impact of the change. With collaboration tools, changes can be made more quickly while costly travel is eliminated.

For procurement executives, the information provided by collaboration tools will play a critical role in improving the effectiveness and efficiency of sourcing initiatives. The data from these tools will help them understand their spend by part number, specification, and supplier. The level of specification information provided will make discussions with suppliers much more productive. These tools also allow engineering and supply management to work more closely together.

The release of Microsoft Groove and similar technologies will bring collaboration workspaces to any team. These tools will facilitate the enrollment of suppliers to participate in collaboration efforts with the companies they supply. Supply organizations will be able to set up workspaces, name the members to the site, decide on user-defined access rules, post content to the site, and ultimately email the workspace to other users.

It has taken more than 20 years for enterprise resource planning (ERP) technology to be developed, accepted, and deployed to begin providing cross-enterprise visibility into needed information. While electronic requests for proposals (RFPs) and Internet negotiations are nearly a decade old, these technologies sometimes still seem to be in their infancy. The next decade will begin to see important development work in the use of collaborative technology.

Technology as Enabler in Managing Diversity and Complexity

Ten years ago, there were only the beginning signs of the broad-based technological metamorphosis taking place in supply management. Procurement cards (or "p-cards") had lately been introduced. In some industries (notably automotive), electronic data interchange (EDI) had been implemented to facilitate ordering and payment for repetitive purchases. Purchase-to-pay modules were just being added to enterprise resource planning (ERP) systems. But generally speaking, supply management executives were only nominally affected by technology back in 1997.

Exhibit 3 depicts the introduction of the many technologies that have been introduced in the last decade. Few if any of the key technology tools existed at the time of our previous study. For example, Ariba shipped its first software product in 1997, then shifted its emphasis to spend management in 2001. E-sourcing in the form of reverse auctions burst upon the scene with a March 12, 1999 *Wall Street Journal* article (“Companies Use Internet Auctions To Purchase Industrial Supplies,” by staff reporter Timothy Appel) that described “a revolution sweeping companies as they harness the power of the Internet for buying and selling.”

Despite continuous concerns over cost, security, reliability, and responsiveness, technology has delivered a great deal over the past decade. A supply management Rip Van Winkle who fell asleep at the 1997 ISM International Conference would be stunned at the technology on display at the 2007 session in Las Vegas.

What do supply executives (who for the most part have waited for the adopters to prove a technology’s capabilities) want from technology in the future? Over the next decade, they want ease of access, both internally and externally; visibility through web-based tools; collaboration platforms for everything from product development to operations to schedules, tracking and simulation; newer and more powerful tools for risk, compliance and supply market analyses; and user interfaces that can be grasped as intuitively as they experience personally as consumers.

In 2007, we “crossed the chasm,” using Geoffrey Moore’s market introduction metaphor, for most of the functional areas for which we will have continued refinement of technologies already introduced.

Spend management will continue to expand its flexibility for analytics and will have fewer barriers to implementation—companies will be less challenged by the need to perform setup data cleansing. Spend management will also become more closely aligned with specific contract provisions.

Optimization will continue to expand features to e-sourcing as the discipline becomes more sophisticated. Contract management software will become more integrated with spend management, particularly in terms of compliance. Collaboration software will also enhance the ability to streamline the contract management process. Performance monitoring and capability mapping will continue to expand

EXHIBIT 3

Technology Tool Evolution

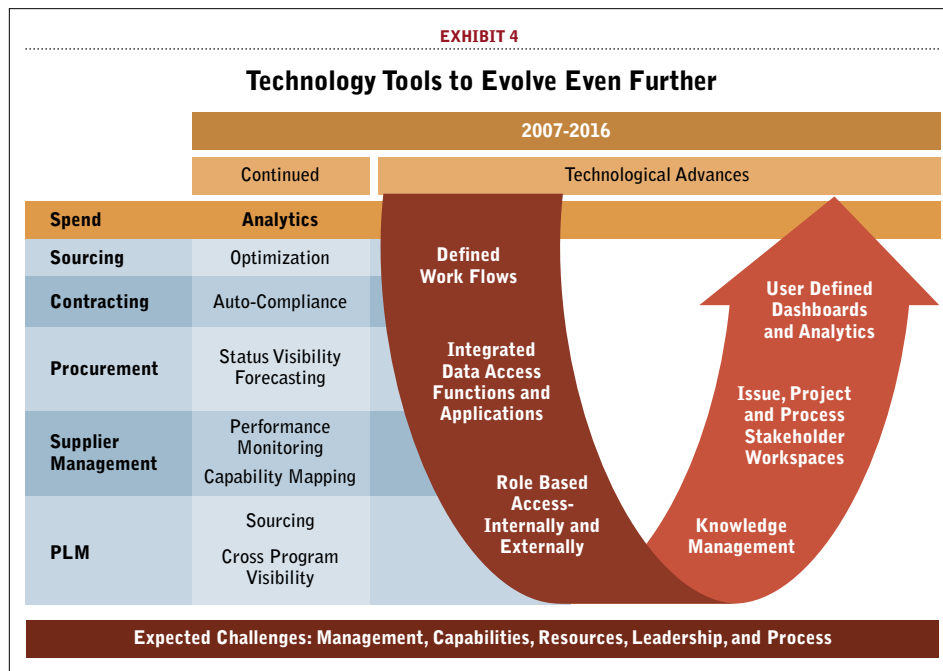
Area	1980s	1990s	2000-2007		
Spend Management		Data Cube	Visibility	Analytics	Reporting
E-Sourcing		Auctions	RFx	Optimization	Expressive Bidding
Contract Management		Document Management	Supplier Compliance Monitoring	Regulatory, SOX and Transaction Compliance Enablement	
Procurement Transaction Processing		Requisitioning	Catalogs	Configurable Compliance Processes	
			Enabled 3-Way Match	Process Status Visibility Statement	
			Multi-Tenant Architecture	Forecasting	
Supplier Management	EDI	XML/HTML Order Management	Performance Monitoring and Tracking		Capability Mapping
		Self-Administered Registration			

supply management’s potential. The flexibility provided by user definition and role-based access will enrich the potential for added supply management.

Everyone from laggards to leaders are adopting new technologies for sourcing. As one study participant remarked, “Now we have extensive use of e-tools: 90 percent of tenders are ‘e.’” The cost advantages of e-sourcing have been made clear. Next, the focus for technology will go beyond sourcing and compliance into more value-based areas.

As Exhibit 4 indicates, there will be continuing improvements to supply management applications coupled with technological advances that will integrate applications and data, improve people’s personal effectiveness and facilitate collaboration.

In addition to the continuation of existing types of technologies, there will be technological advances. Work flows for different supply chains will have different sets of processes, which can be defined by users. Data will be integrated across functions and applications, with variable role-based security restrictions for access by external as well as internal participants. Knowledge management collectors and processors will capture knowledge for use in supporting future similar situations and for training future participants. Issue, project and process stakeholder workspaces will be developed and used in a fluid, as-needed way for collaboration. Users will be able to define their own dashboards and analytics to support their projects or their roles in other stakeholders’ projects. Some of these advances seem far-fetched in a business environment; some seem to be only extensions of what we see in our personal digital lives.



emerging-market countries will require nontraditional solutions. In India, Hindustan Lever Limited (a subsidiary of Unilever PLC) set up manufacturing and distribution for single-serve packs of personal care products priced at the equivalent of a single penny. In that same country, Arvind Mills sells ready-to-sew kits of blue jeans components distributed through a network of thousands of local tailors. Significantly lower costs and widespread distribution has made Arvind the market leader.

The Next View — Anticipating Disruptive Forces

Finally, companies will need to take a longer view of effects of fundamental shifts caused by industry restructuring, technology break-

Concluding Observations

We have come a long way from the manufacturing philosophy of the Ford's River Rouge where there was one supply chain, one plant, and one product. Now there are several supply chains, with a variety of multi-national suppliers, partners, and joint ventures feeding multiple owned and contracted manufacturing facilities filling multiple customer channels with numerous and shifting customer needs.

The Near View— Anticipating Directional Shifts

Looking out to a period of anywhere from six months to a few years ahead, companies must be alert for directional shifts that signal an upcoming change in strategies and markets for their company, its customers, and its suppliers. These will trigger a rethinking of supply chain structures, processes, technology, and relationships.

New customer strategies will change ordering patterns. A shift to more frequent new product introductions or to a make-to-order strategy will place very different requirements on a supplier. New products or markets will likely require new channels of distribution. New processes supported by advances in information technology by one company will often affect the technologies that its trading partners must use.

Industry and cross-industry collaborative efforts will typically require new processes and technologies. New environmental or security regulations will mean new requirements for product tracking and recycling/reuse logistics.

Limited income and distribution constraints in some

throughs, and new business models on decisions about supply chain structures, production capacity needs, infrastructure investments, and asset ownership.

For example, digital photography has essentially supplanted traditional photography in the consumer market over the course of just a few short years. Manufacturing plants, distribution systems and photo-finishing labs that had centered on 35-millimeter film, light-sensitive papers and chemicals have largely been replaced by retailers selling glossy paper and printer ink for home use and providing drop-off or email-in photofinishing via one-hour mini-labs. As for getting those family photos to grandma, postal and messenger services have largely been replaced by the Internet.

Looking farther out, experts predict that as many as one in five automobiles will be fuel cell powered by 2020. This situation will require two different types of supply chains to make, sell, and service two very different types of autos. One supply chain will be in ramp-up mode for several years while the other will flatten out and perhaps even decline as the new technologies gain in prominence.

Responding to this increasing level of complexity will require a shift from control to collaboration--collaboration among internal stakeholders and collaboration externally among suppliers, partners, and customers.

Technology has responded to the needs of the traditional competitive world with tools for spend, sourcing, contracting, procurement, supplier management, and product life cycle needs. In the future technology applications will broaden to network based, flexible solutions that will support the collaborative world.