

# When Will Supply Chain Management Grow Up?

Answer: When companies take to heart its three underlying principles.

by Tim Laseter and Keith Oliver

Over the last few years, companies in a wide variety of industries have created increasingly senior executive positions in supply chain management. Lucent Technologies Inc., the ChevronTexaco Corporation, and H.J. Heinz Company are among the many that now have a chief procurement officer serving alongside the COO, CFO, and CIO. Other companies have created even broader positions. DuPont has a position entitled “Vice President – Global Sourcing & Logistics and Chief Procurement Officer.” IBM last year named a “Senior Vice President, Integrated Supply Chain,” a new position the company says encompasses “end-to-end supply chain operations, including procurement, systems manufacturing, logistics, and customer fulfillment processes.”

This “entitlement” of corporate executives is not surprising, given the cost and complexity of managing a global supply chain. Businesses worldwide spend more than \$19 billion annually on information technology for supply chain man-

agement, according to the International Data Corporation.

The business media, long trained to follow the money, have also become supply chain savvy. A search of ABI/Inform, a leading database of global business publications, shows that more than five supply chain articles were published each day last year, up from fewer than one article per week a decade earlier, and only one per month five years before that.

First introduced in a 1982 *Financial Times* piece about Keith Oliver, coauthor of this article, the term supply chain management (SCM) could have easily disappeared into the history of business jargon. Instead, SCM rapidly passed into the public domain — a sure indication the concept holds meaning for executives wrestling with the endless challenges of procurement, logistics, operations, sales, and marketing activities that fall within its realm.

Unfortunately, the attention has not been matched by satisfaction. Nearly half of the respondents to a recent global survey by Booz Allen Hamilton indicated disappointment in the results achieved by



their investments in SCM systems. To this day, SCM remains a primary case study subject — read “problem” — in business schools, and a headache in headquarters.

Does the sound and fury over supply chain management signify nothing? Why has this child of the '80s grown to such prominence without truly growing up? A look at its history, from best practice to worst, may provide some insight.

### Born to Run

In the late 1970s, Mr. Oliver was formulating his ideas through work with a number of clients, including SKF, Heineken, Hoechst, Cadbury-Schweppes, and Philips. Many of the ideas jelled during an engagement with Philips, the Dutch consumer electronics manufacturer. He began to develop a vision for tearing down the functional silos that separated production, marketing, distribution, sales, and finance to generate a step-function reduction in inventory and a simultaneous improvement in customer service. Looking for a catchy phrase to describe the concept, the consulting team proposed the term integrated inventory management. In a sure sign that consultants should not be allowed near promotional issues, the group expressed confidence that the world would adopt the sophisticated-looking abbreviation I<sup>2</sup>M.

Later, at a key steering committee meeting, the team shared the vision and introduced the new term and accompanying abbreviation. Eyes glazed over as the phrase failed to resonate with participants. One manager, a Mr. Van t'Hoff, challenged Mr. Oliver to explain what he meant by “I<sup>2</sup>M.”

“We’re talking about the management of a chain of supply as

though it were a single entity,” Mr. Oliver replied, “not a group of disparate functions.”

“Then why don’t you call it that?” Mr. Van t'Hoff said.

“Call it what?” Mr. Oliver asked.

“Total supply chain management.”

Both the term and the discipline it describes have evolved considerably during the past two decades. Indeed, by today’s standards, the original scope of supply chain management appears quite narrow. Initially, SCM applied only within the boundaries of a single company. The challenge was simply getting production, sales, finance, marketing, and distribution operating in concert to focus on the movement and availability of finished goods. It’s hard to believe that management’s perspective could have been so limited — until you consider that the origins of SCM predate the publication of Michael Hammer and James Champy’s *Reengineering the Corporation: A Manifesto for Business Revolution* (HarperBusiness, 1993) by nearly a full decade. Although it’s the norm today, focusing on cross-functional processes inside a company was a radical concept in the early 1980s.

When SCM began to look outside the company’s four walls, the first place attention alighted, naturally, was on customers. Since the late 1990s, however, many leading companies have placed greater emphasis on cost reduction and innovation at the supplier end of the chain. With this evolution, SCM’s scope has expanded well beyond the movement of materials. Now the term supply chain management encompasses such concepts as strategic sourcing and supplier involve-

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ment in product development.

The change in the way managers consider supply chain issues reflects an evolution in how they think about the complexities of business. Originally, supply chain management addressed the suboptimal deployment of inventory and capacity caused by inherent conflicts among functional groups within a company. Today, it addresses the risk of suboptimal deployment of *capabilities* caused by inherent conflicts both within functions *and among companies*. Yet despite this expanded scope, SCM's underlying principles have actually remained consistent — and relevant:

1. Set supply chain policies strategically
2. Analyze trade-offs holistically
3. Employ cross-functional support systems

The failure by companies to internalize these principles has generated much of the disappointment among SCM practitioners today.

### Set Strategic Policies

First and foremost, a company must define its strategic objectives and establish supply chain policies to meet them. During the period when SCM applied largely to the deployment of finished-goods inventory, advanced companies took a strategic perspective on key issues such as delivery lead times, in-stock service levels, and utilization of manufacturing capacity. These policies resolved some inherent functional conflicts. One such conflict: the tension between marketing's desire to hold stock of everything to maximize revenue and manufacturing's efforts to make everything to order (with long lead times, if possible) to maintain capacity utilization and keep production costs low.

Today, leaders in the field take a broad perspective of the “extended enterprise” to address strategic issues such as logistics outsourcing, global sourcing, and even new product strategy. The functional biases often remain, but the range of options has grown dramatically, thanks to the broader scope of SCM.

Unfortunately, too many companies have resolved the functional conflicts by making compromises rather than breaking constraints. Breaking strategic constraints opens the door for new business models

industrial engineer Shigeo Shingo and challenged him to reduce the setup time for the large stamping presses, which was then about four hours. A team benchmarked automotive manufacturers around the globe and combined the best practices to reduce setup time to a mere 90 minutes — far less than the “world class” standard at industry leader Volkswagen AG.

Mr. Ohno challenged the team for more — specifically, a target setup time of *three minutes*. His rationale? It was the level necessary

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and ultimately can create competitive advantage.

The history of the Toyota Production System provides an example of how supply chain constraints can be broken. Taiichi Ohno, the father of the Toyota Production System, was inspired by the modern grocery store in the 1960s. He imagined a system for manufacturing whereby each time a dealer sold a car, it would be replaced seamlessly, as a grocery shelf is restocked when a box of cereal is sold. That way supply and demand would match perfectly; no customer would go unsatisfied, and, equally important, neither dealer nor manufacturer would be stuck carrying the cost of excess inventory.

This was a simple desire, but to make it work, the Toyota Motor Corporation would need to produce vehicles in small lot sizes — ideally a lot size of one. Mr. Ohno turned to

to break the supply chain constraint preventing small-lot production. Mr. Shingo's team achieved the goal and paved the way for the just-in-time manufacturing revolution.

Like Toyota in the 1960s and 1970s, today's most effective companies break constraints rather than live within them. Consider a more recent example, the Dell Computer Corporation. By eliminating the retailer as an intermediary and building directly to customer order, Dell broke a constraint punishing almost every other manufacturer: the bullwhip effect of increasing demand variation and forecast error in the upstream supply chain. Dell holds less than three days' inventory and collects payment for sales more than 30 days faster than it pays suppliers for components. As a result, Dell's cash conversion cycle is a *negative* 37 days, compared with a *positive* 30 to 60 days for its competitors.

The Booz Allen survey, which was conducted in the fourth quarter of 2002 and received nearly 200 responses from manufacturing and industrial companies worldwide, provides hard evidence of the value of breaking constraints. Companies that break constraints reported 36 percent greater savings in customer cost-to-serve and 55 percent greater savings in purchasing than those that make adjustments within the existing supply chain structure. Yet most companies still feel constrained by existing channel relationships or prior investments in fixed assets. Accordingly, they pursue incremental rather than step-function improvements.

### Analyze Trade-Offs

The second enduring principle of SCM is that companies must analyze trade-offs holistically. Because we live in an imperfect world, even with clear strategic objectives and policies, tactical trade-offs remain. For example, how should the company respond to a buildup of inventory in the distribution channel due to lower-than-expected sales? Should the plant shut down for a week, or should the company offer a discount to increase sales? Such trade-offs should not be addressed with a narrow functional view. Instead, functional managers must step above their individual performance measures to objectively prescribe a solution offering the best bottom-line impact for the company as a whole.

During SCM's "intracompany" period, the original supply chain innovators initiated weekly or monthly cross-functional meetings to drive tactical trade-off decisions. Various referred to as sales and operations planning (SOP) or pro-

duction, sales, and inventory (PSI) meetings, these cross-functional decision-making forums today are commonplace in many companies.

Without a structured forum, a typical company suffers from countless dysfunctional decision processes. For example, the production department regularly adjusts (or even ignores) forecasts from sales and marketing, judging them overly optimistic. Instead, production tries to avoid changeovers and keep facilities running at the same level year-round to minimize cost. Distribution routinely delays replenishment of key items to ensure full-truckload shipments, resulting in unfulfilled, and often lost, customers. Though functional priorities might remain in conflict, an SOP/PSI forum ensures that each group understands the full implications of its decisions.

Current supply chain innovators are attempting to broaden this tactical decision-making process to encompass the extended enterprise, through a process called collaborative planning, forecasting, and replenishment (CPFR). Though it does not necessarily require the physical meetings that characterize SOP/PSI, CPFR attempts to ensure that customers and suppliers are working on the same assumptions and have a common understanding. Retailers such as Kroger Company coordinate with suppliers such as Unilever PLC to synchronize promotional plans and route shipments to minimize total cost — for example, by taking shipments directly from the manufacturing plant to avoid unnecessary handling by the distribution center.

Despite the increasing acceptance of SOP/PSI and now CPFR, most companies struggle to see sustained benefits because they have

failed to provide the appropriate strategic framework mandated by the first principle. Instead, they have institutionalized "firefighting" at the tactical level without addressing the strategic root causes.

Leading companies are moving toward an approach we call federated planning. Drawn from the Federalist view that shaped the governance of the United States, our model recognizes that members of an extended enterprise are independent entities with unique goals. However, just as the original states banded together to form a federal government for mutual benefit, members of an extended enterprise can collaborate around a set of shared goals.

The federated planning model does not depend upon a utopian dream that ignores the inherent conflicts between supply chain partners (such as the need to maximize returns to their separate shareholders). Rather than assuming this extended enterprise can be "optimized" as a single entity, federated planning accepts that each will ultimately optimize alone ... but this need not result in suboptimal solutions. Supply chain partners can collaborate to address the trade-offs and possibly even break constraints across the extended enterprise.

For example, rather than leave the product flow to a series of one-off ordering decisions, Kroger and Unilever — or Ahold USA Inc. and Procter & Gamble Company — could agree to strategically reshape their distribution networks and eliminate some of the redundant regional facilities that each operates independently, potentially loosening the tight grip Wal-Mart Stores Inc. has on both competitors and suppliers throughout the grocery

supply chain. (For more on federated planning, see “Beyond Utopia: The Realist’s Guide to Internet-Enabled Supply Chain Management,” by Keith Oliver, Anne Chung, and Nick Samanich, *s+b*, Second Quarter 2001.)

The third principle underpinning SCM is to employ cross-functional support systems, especially in information technology. Just like the first two principles, this one focuses on breaking the functional perspective at both the strategic and tactical levels; companies need process-oriented support systems that link across functions. Having independent systems for each functional area — too often the norm — encourages suboptimal decisions.

In the early 1980s, business systems were designed to support only narrow functional decision making, usually within single departments. Companies might have a distribution requirements planning system to determine a finished-goods ordering pattern, to minimize distribution cost. Simultaneously, a production, planning, and control system would independently optimize the manufacturing plan to produce the goods — quite possibly out of sync with the distribution requirements. The procurement department would issue purchase orders to suppliers with limited insight into manufacturing plans and no understanding of supplier economics. Often these systems were developed by separate software vendors, and linked only loosely, if at all.

Thanks in part to the fears of Y2K bugs, which persuaded companies to upgrade their IT systems, most major companies in the 1990s started to think outside the box. They implemented enterprise resource planning (ERP) systems to

link and coordinate their disparate systems in support of an improved process orientation. Today, software vendors tout “eERP” for linking systems among customers and suppliers over the Internet.

Though integrated systems represent an appropriate evolutionary step, we remain concerned that too many companies treat these systems as an unmanaged “black box” — a device that provides answers through an unknown process, forgetting the old computer adage of “garbage in, garbage out.”

For example, in a recent engagement for a kitchenware supplier, we found that its multi-million-dollar investment in a new, state-of-the-art ERP system was going to waste. Like many other companies, this client had fallen prey to the overhyped promises from software vendors claiming that the newest system would solve all supply chain woes, virtually automatically. More than three-quarters of the items in the purchasing system had default values for the order quantity rather than an analytically derived order size. To address the problem, the consulting team loaded the system with appropriate targets while implementing a sales and operations planning process; this drove a 20 percent reduction in inventories while simultaneously improving service levels by 5 to 10 percent.

Rather than investing in “black box” transactional systems with ever-more-sophisticated algorithms, leading SCM practitioners are turning to specialty software providers such as Viewlocity Inc. (which merged with SynQuest Inc. in 2002) and Jonova Inc. These relatively small companies have developed tools to support tactical trade-

off decisions across the extended enterprise with rigorous but comprehensible analysis. In our view, a separation of the tactical tools from transactional controls offers the best long-term answer to growing software complexity.

### Customer Expectations

Though many companies can reap rewards simply from following the original underlying principles of supply chain management, even current SCM leaders face new challenges. The dot-coms heightened customer expectations about rapid delivery, and the Internet continues to fundamentally change customer behavior. Traditional manufacturers such as IBM and Lucent have aggressively pursued outsourcing in response to nimble competitors such as Dell and Cisco Systems Inc. Competition from emerging economies such as China and Vietnam puts pressure on global supply chains. Constraints continue to be broken by supply chain innovators, but new constraints always emerge, presenting opportunities for the next generation of innovators.

Thanks to the collective efforts of executives, practitioners, academics, software vendors, and consultants, we anticipate a long — though sometimes chaotic — life for supply chain management. +

Reprint No. 03304