

# Plugging In the Supply Chain

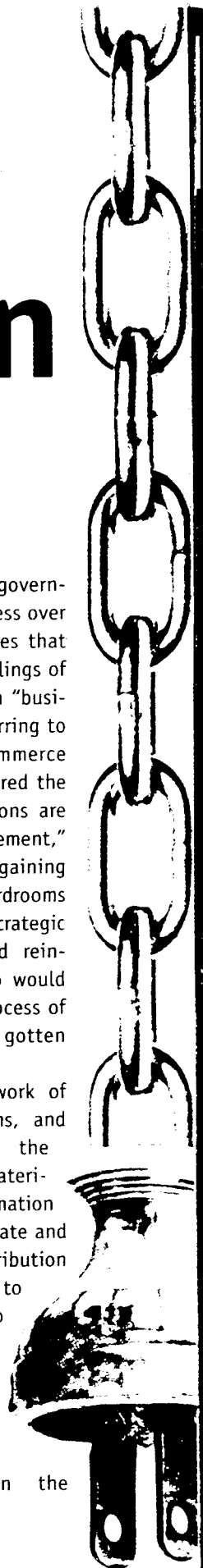
*By Ram Ganeshan*


**W**hen Samuel Morse invented the telegraph in the 1830s with the promise to connect faraway places such as Maine and Texas, it prompted the reaction:

**What do Maine  
and Texas  
have to say  
to each other?**

People, firms, and even governments routinely conduct business over the Internet, making companies that support this commerce the darlings of Wall Street. Although the term "business-to-business" (B2B)—referring to the Internet-enabled commerce between companies—has entered the layman's lexicon, its foundations are based on "supply chain management," a concept that is only now gaining recognition in corporate boardrooms usually in the context of strategic alliances, radical savings and reinventing their companies. Who would have thought the mundane process of procurement could have gotten bumped so far upstairs?

A supply chain is a network of firms, activities, organizations, and technologies that performs the functions of procurement of material from vendor firms, transformation of this material into intermediate and finished products and the distribution of these finished products to customers. It is often easy to identify a supply chain in a manufacturing enterprise, although the complexity of the chain may vary from industry to industry or even company to company. In the





consumer products industry, for example, CVS Pharmacy has over 4,300 retail outlets that are typically replenished from their own distribution center (DC) in Woonsocket, R.I. A typical product like Listerine, a popular brand of mouthwash, is stored in the Woonsocket DC for about three weeks before it is shipped to the retail outlets. When the DC needs more items of the product, it typically orders via Electronic Data Interchange protocols to Warner-Lambert, the manufacturer of Listerine. Warner-Lambert ships the required pallets of Listerine to Woonsocket from the manufacturing DC located in Litutz, Pa. and also plans production to replenish the items that were shipped. Also included in this supply chain are the suppliers that manufacture the various ingredients that make the product (in the case of Listerine this includes the corn-producing farmers in the Midwest; the eucalyptus harvesters in Australia; and natural gas producers in Saudi Arabia). In the book publishing industry, Barnes & Noble uses more than 20,000 suppliers, consisting of major publishers to small University Presses, to stock over one million books at their Jamesburg, N.J. distribution center. The distribution center replenishes the retail locations daily based on point-of-sale data that was transmitted by the store.

As the above examples indicate, a supply chain consists of a number of entities interacting with each other in complex ways. It could have vendors, International Purchasing Organizations (IPOs), to procure raw material; a variety of transportation options to ship them; numerous ways to produce the product; and finally several channels to distribute the product. Any firm can do some or all of these operations in-house or decide to outsource them typically to Third Party Logistics (3PL) providers.

One can also imagine the innumerable number of flows within and across these entities—the flow of product from the supplier organizations to the point of sale; the flow of information between supply chain entities such as orders, tracking requests, etc.; there are cash flows including invoice preparation and transacting payments; there are process and work flows that manage operations between these entities; and finally intra-firm collaborative teams constitute the people flows in the supply chain. The process to streamline and optimize these flows is what I define as “Supply Chain Management.” Following are the five major trends that firms are embracing to streamline supply chain flows.

### **Collaborative Planning: Replacing Information for Inventory**

Individual companies in the supply chain often have their own policies on forecasting, pricing and promotions, and terms of trade (minimum order sizes, transportation discounts, etc.) that often lead to demand volatility which decreases the ability of the others in the supply chain to accurately forecast demand. Additionally such volatility propagates, with increased amplitude, upstream in the supply chain (called the “bullwhip effect”). The negative effects of the bullwhip effect include increased inventory at all levels in the supply chain and inefficient use of working capital.

Many firms in different industries have already taken steps to mitigate the bullwhip effect and to improve working capital efficiencies. All these initiatives tend to be a variation of the same theme: sharing information and collaborating with supply chain partners in real-time. For example, in the consumer products industry, in addition to using EDI for order trans-

mission, several firms have initiated “vendor-managed inventories” where the supplier of the product keeps track of the retail inventories and replenishes the store as needed. The grocery industry has a similar initiative called “Efficient Customer Response” where large manufacturers like Procter & Gamble have reengineered their processes to enable the sharing of pricing and promotion information via common standards with grocers like H. E. Butt or mass merchandisers like Wal-Mart. The apparel industry has instituted an initiative called “Quick Response” that attempts to eliminate unnecessary steps in the apparel supply chain. The firms participating in these initiatives have reported substantial success.

The latest B2B-initiative in the consumer products industry, spearheaded by major manufacturers and retailers including Procter & Gamble, Pillsbury, Warner-Lambert, Kimberly-Clark, Wal-Mart, K-Mart, and Schnuck Markets along with consulting companies such as Ernst & Young and Benchmark Capital, is called Collaborative Planning, Forecasting, and Replenishment (CPFR). The central premise of CPFR is that short- and long-term information regarding POS (point of sale) data, forecasts, shipping and production plans; and order generation, is jointly planned by supply chain members over the Internet. The ultimate objective is to create a “glass pipeline” where relevant information (pricing, promotions, store openings, and other planning parameters) is shared by supply chain members in real-time.

### **Mass Customization and eDesign**

Tailoring a product to a customer's need is now a major source of competitive advantage. This raises an important question: “How can companies achieve customization with the economies of mass production?”

To answer this question, several companies across many industries are reconfiguring their supply chains by altering product flows—such as postponing the manufacture or assembly until the order is received. Dell has successfully used such a strategy by pre-manufacturing “vanilla boxes”—computers with the bare minimum parts; and then adding the right processor, memory, hard-drive, and peripherals as orders come in. Benetton, the Italian manufacturer of fashion products, uses a strategy called “process reversal”—they now knit and then dye their fabric with the current “hot” color rather than the usual practice of dyeing the yarn before knitting.

The current trend is a move towards what has come to be known as “eDesign”—suppliers and manufacturers sharing design and engineering information over the Internet in the early stages of product development. The premise of such Web-based collaborative processes is faster time-to-market, quicker upgrades, efficient life cycle management, and the elimi-

nation of unnecessary inventory. Companies in a wide variety of industries—Lucent, Adaptec, and Cisco in the hi-tech industry; GAP and Land’s End in the fashion industry; and Dana Corporation in the automotive parts industry are already embracing principles of eDesign to accelerate product development cycles.

### **Redefining Procurement: Enter the Net Market Makers**

Although estimates vary from industry to industry, the purchasing function in the firm is responsible (including raw materials and purchased parts) for anywhere from 30 to 60 percent of product cost. The cost of identifying, certifying, transacting and evaluating the supplier adds up to a substantial portion of the supply chain costs.

Items that are procured can be classified into two broad areas: “product specific” items that are directly used to make the product; and generic items that are used for maintenance, repair, and routine operations (MRO). Product specific items are often customized for the buyer—decisions to buy these products are influenced largely by price, quality, availability, delivery flexibility, and serviceability. Additionally, the suppliers are geographically diverse and highly fragmented, making the purchasing decision difficult and cumbersome. The Internet has spawned a new and powerful middleman called the “Net Market Maker” (also known as eHubs or Metamediaries) who brings the promise of connecting fragmented buyers and sellers, lower transaction costs, and price transparency in the supply chain. Certain NMMs (called “verticals”) specialize in specific industries and provide customized solutions for the procurement of product-specific items. For example, SciQuest aggregates catalogs of life sciences supplies; FreeMarkets sets up customized reverse auctions for big industrial buyers; or eSteel, which serves as a global exchange for trading steel. On the other hand, there are NMMs (called “Horizontal”) that cater to many industries, primarily MRO items. For example, MRO.com brings together buyers and sellers of

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## **Supply Chain Starting Places**

### **Web Sites:**

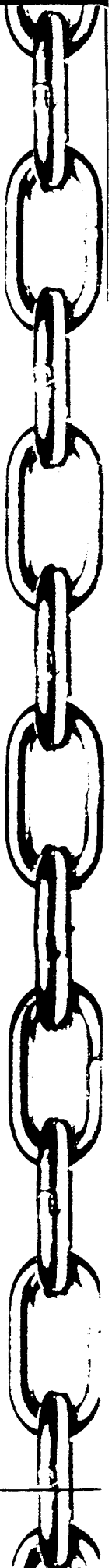
- [www.ascet.com](http://www.ascet.com)
- [www.cio.com](http://www.cio.com)
- [www.cpfr.org](http://www.cpfr.org)
- [www.netmarketmakers.com](http://www.netmarketmakers.com)
- [www.atmarkets.com](http://www.atmarkets.com)
- [www.supply-chain.org](http://www.supply-chain.org)

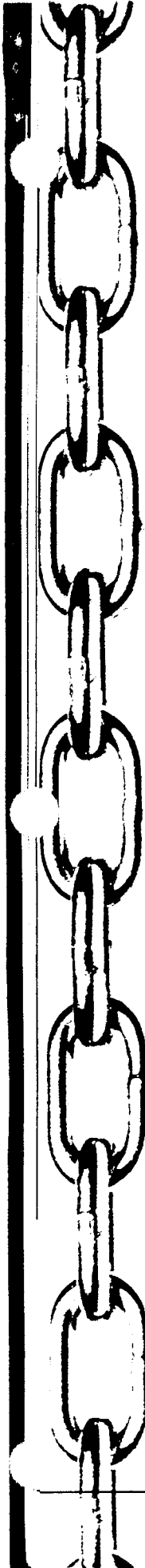
### **Books**

- *Strategic Supply Chain Alignment: Best Practice in Supply Chain Management.* John Gattorna (Editor) / Hardcover / Published by Gower 1998.
- *Supercharging Supply Chains.* Gene Tyndall, Christopher Gopal, Wolfgang Partsch, and John Kamauff, Published by John Wiley, 1998.

### **Professional Organizations**

- **The Council of Logistics Management that has over 5000 supply chain and logistics professionals as members ([www.clm.org](http://www.clm.org))**





MRO items through a number of market mechanisms such as auctions, catalogs, and exchanges.

### **Streamlining the Order Management Cycle**

The order management cycle (OMC) refers to the management of a customer order from the time it is placed to the time the product is delivered to the customer. This includes order preparation, transmittal, order picking and packing, and eventually transporting it to the customer. Often the cycle extends beyond delivery to include after-sales service. The OMC has received renewed scrutiny with the realization that any delay in the OMC translates directly into delays for the customer. The demise of many dot-com retailers after last year's Christmas season can be partially blamed on the poor management of the OMC. They had mastered the front end of the ordering process—a Web site and a comprehensive electronic catalog that literally takes the customer seconds or minutes to place the order; but lacked the requisite sophistication at the back-end—the warehousing and distribution functions that were often “handed-off” to third-party logistics providers.

The latest trend in managing the order cycle is the concept of “fulfillment at Web-speed.” The concept involves being connected, via an open medium such as the Internet or even wireless devices, in real-time to suppliers, 3PLs, carriers, and customers. This enables every player in the fulfillment process to access dynamic information that can be used to speed the product to the customer.

### **The Changing Landscape of Supply Chain Performance**

Performance measurement in the supply chain is evolving from traditional product-based functional financial measures internal to the firm to a

“dashboard” of financial, time, logistical, and service measures that span every link in the supply process. Since the supply chain usually involves more than one company, it is important for managers to understand what every company brings in terms of costs and benefits to the supply chain. The current trend is to translate supply chain operations into a set of processes by customers and analyze its contribution to the balance sheet. For example, customers with high merchandising and fulfillment needs will have different processes and hence different costs and overhead allocations from those who do not. Such a process or activity-based performance evaluation is no easy task, requiring the use of several sophisticated data warehouses and complex costing techniques. In addition to process-based measures, every firm should have overall supply chain metrics such as service levels by customer segment, time through the OMC (or supply chain velocity), Economic Value Added, and Return on Investment on collaborative practices in the supply chain.

Becoming a nimble and Internet-enabled supply chain is not easy. It warrants a fundamentally different way of doing business on two dimensions: organizational and technological. From an organizational perspective, many firms have faltered by trying to impose an innately horizontal concept to traditional vertical command-and-control structures. For example, sharing planning information and automatically replenishing warehouses, flies in the face of the traditional sales-force oriented organization where incentives are based on meeting or exceeding sales quotas. From a technological perspective, the challenge is to integrate the patchwork of information systems so a firm can provide a “unified view” to its trading partners. Collaboration is further complicated by the lack of standards, even within an industry. The

goal should be to achieve standardized technologies that are scalable, but portable between trading partners. These challenges, however, can be surmounted. The recipe for success has four steps: (1) get your house in order—flatten the organization and internally integrate all business processes; (2) explore collaborative activities with trading partners; (3) integrate and standardize business processes with your trading partners; and finally, (4) jointly evaluate your success.

A good start to reengineer the evaluation process is to follow the supply chain council's SCOR model that divides the supply chain into four major activities: plan, source, make, and deliver; and recommends best-practice performance measures for each of these activities.

I envisage a modular supply chain for the future—trading partners will possess the processes and the technologies that will enable rapid and seamless business integration. It will be the B2B version of “Plug and Play” where supply chain entities “plug-in” to their chosen trading partners to design products; manage money, information, and people flows; and fulfill orders. ☺

***Maine and Texas have a lot to say to each other after all.***

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