

# GOOD

## AND GETTING BETTER

Continuous improvement transforms the supply chain.

By Ajay Sharma

**T**he electronically powered supply chain of the 21st century is continually transforming business and continually being transformed itself. Examining the forces and elements that mold it, from within and from without, is critical to understanding how we can improve it. Taking that exhilarating leap into full supply chain optimization always begins with smaller steps. There are things we must do before we can address some of the more ambitious supply chain improvements.

Ideally, the perfect supply chain boasts a streamlined flow of raw materials dynamically transformed into assets. The main processes falling within the realm of the supply chain—purchasing, inventory management, plant performance, logistics—are molded by forces both internal and external.

### On the inside looking out

THE INTERNAL FORCES THAT mold a supply chain spring from a company's mission. A responsive supply chain creates value and accomplishes that mission by taking into account the business drivers of the organization. There are four that organizations follow—cost, quality, service, and flexibility. These lay the foundation on which the supply chain is built and they define its ultimate form. General Electric, for example, has long sold its services with a clear focus on quality and service. These business drivers dictate an infrastructure geared towards customer service and producing quality products. Therefore, this supply chain must address call centers, customer support, reverse logistics, quality vendor selection, and procurement practices such as vendor integra-

tion, purchasing, and product fulfillment. A corporation that follows flexibility and service as business drivers will have a supply chain that can quickly adapt to change and provide elite customer service. Organizations with quality and cost as business drivers may invest in improving quality standards, i.e. ISO9000, and in decreasing operational, manufacturing, inventory, and procurement costs.

A company's level of integration also molds its supply chain—is this integration functional, sectorial, or geographical? Organizations typically are functionally integrated. Marketing, payables, sales, purchasing, and other functions are integrated within the corporation. These companies have culturally and technically integrated information and product flow across the enterprise. Enterprise resources planning (ERP) systems are successful tools for attaining functional integration within the enterprise. Since major obstacles to

functional integration are within the organizational culture, proper planning for a culture shift to a technologically enabled company is essential to facilitate the transition.

Sectorial integration moves beyond the corporation and into territories. An American company that collaborates with American suppliers has attained a level of sectorial integration. Sectorial integration can also be called territorial and is at a national, not international, level. But it is the first step towards enterprise-wide collaboration.

With geographical integration, companies move into a global environment. A great example is Hewlett-Packard (HP), boasting several manufacturing locations and distribution centers throughout the world. This level of inte-

### At-a-Glance

- An enterprise's supply chain is molded by the four business drivers of cost, quality, service, and flexibility, as well as by its level of integration.
- External forces—cost, market, macroeconomical/political, competitive, technological—command different strategies and short-term tactics.
- Continuous improvement means thinking creatively. It relies on a culture that strives to become a best practice and it uses benchmarking for process improvement.

# Comprehensive Performance Metrics

Performance metrics should address quality, cost, productivity, and time. Sample measurements by functional area include the following:

## Purchasing

- Purchasing cost as a percentage of revenue (cost measure)
- Percentage of electronic purchase orders (productivity measure)
- Purchase requisition and purchase order error rates (quality measure)

## Inventory management

- Inventory management cost as a percentage of revenue (cost measure)
- Dock-to-stock time (time measure)
- Inventory turnover (cost measure)

## Transportation

- Transportation cost as a percentage of revenue (cost measure)
- Percentage on-time delivery (time measure)
- Number of carriers used (cost measure)

## Plant performance

- Plant staff to supervisor rate (productivity measure)
- Sales per employee (cost measure)
- Plant profitability (cost measure)

gration gives birth to new strategies of optimizing the supply chain that capitalize on geographical integration. Mass customization and postponement, for example, have proved successful in cost reduction and increased customer service. Once again, the business drivers are useful in shaping the level of integration and eventually in making an organization truly global.

This new era emphasizes supplier collaboration. Companies such as i2 Technologies have facilitated sectorial integration by adding online modules that allow Web-enabled sharing of information vital to streamlining the supply chain. It is most effective in reducing spikes in supply and demand for continuous flow of manufacturing, forecasting, purchasing, and delivery of materials. Difficulties with this level of integration often involve improper supplier/distributor buy-in and disparate levels of technology where upgrades are most likely required to enable effective data exchange.

Truly global companies must integrate their international partners in order to achieve a pure level of geographical integration. Indeed, software and the Web have facilitated the information flow. However, there are always such obstacles as politics, infrastructure, economics of the international environment, and competition. An example is the current situation of pharmaceutical companies in regards to the AIDS epidemic in Africa. Some of those countries hardest hit by the epidemic pose a threat to pharmaceuticals, that of product duplication without regard to patents. The production of branded items has flourished overseas, but so has the production of imitation items that enter the marketplace and steal market share. Threats like this hamper the global integration of an enterprise. Investing in wholly owned subsidiaries and/or increased partnerships can help reduce, but not eliminate, these concerns. Increased awareness and relationships will work best to solidify the bonds.

## May the force be with you

FIVE EXTERNAL FORCES FURTHER shape the design of a supply chain—cost forces, market forces, macroeconomical and political forces, competitive forces, and technological forces. Not unlike a marketing plan, the supply chain design must address each of them. These forces command different strategies and short-term tactics. For example, the growth of outsourcing to third world nations is not always the best solution for cost savings. Taking into account each of the forces mentioned above, one can see that infrastructure costs would be high, availability of skilled labor and of technology would be low, and the current economical and political instability could be problematic. Thus the strategic value proposition of the supply chain comes from not only taking into account the corporate mission and the level of integration reached, but also the external forces outlined above.

The challenge comes after the initial supply chain design. Now that it's in place, can we improve it? Benchmarking plays an essential role in continuously improving the supply chain, in refining and redefining it. Benchmarking should be done for

a process across both similar and different industries. This “outside the box” approach opens the door to creativity and innovative process improvement techniques.

## Good, better, best

THE PHILOSOPHY OF CONTINUOUS improvement radiates throughout an organization, continually shaping and reshaping the supply chain, infusing it with a means for perpetual transformation.

Continuous improvement is a large umbrella that encompasses a number of elements—creative thinking, culture, and benchmarking. Creative thinking has produced the latest trends in single sourcing, partnerships, application service providers (ASPs), and collaborative information sharing. Who would ever have thought that we would actually choose to rely on a single supplier, that we would develop and train that supplier, and share our manufacturing demands and slow-downs? Creativity has created new roads that are taking us to entirely different places.

Continuous improvement relies on a culture that strives to become a best practice. Ideally, best practices boast a stream-

lined system that will, by lowering costs and increasing customer satisfaction, command greater market share and profitability. Continuous improvement starts at an organizational level, trickles down through the organization, finally reaching each individual. It is a culture that revolves around each employee's desire to improve the organization. Effective managers and leaders embrace policies and procedures that provide intellectual stimulation of employees and contingent rewards. They empower the workforce to make decisions; they manage by exception, understanding that different management techniques are required for different situations.

It is that kind of charismatic team, made up of employees, managers, and leaders, that forms the foundation necessary to achieve a culture in which everyone cares. It's hard getting there, but it's one of the best investments a company can make. Tools are readily available that determine the readiness of a company's culture to adopt an environment of continuous improvement.

Benchmarking is also a tool—through it we learn and improve. Similar to the Six Sigma improvement process, benchmarking goes further by incorporating best practices. Benchmarking presents great value by aggregating comparable data from other corporations. This aggregation of data makes the results non-industry specific, focusing rather on process improvement. Benchmarking yields the best results when it is applied to specific processes of the supply chain like order entry, purchasing, logistics, manufacturing processes, or inventory management. Segmenting each process prior to benchmarking gives actual prebenchmarking performance, resulting in more meaningful and more measurable results.

### **Laying the groundwork**

PRIOR TO INITIATING a benchmarking study, it is necessary to prepare for proper acceptance of the research. Management buy-in, cultural change, site visits, data collection, and training are necessary. These elements ensure successful benchmarking and sensible action plans. Additionally, the process of qualifying benchmark partners must be strictly observed. Benchmarking partners are organizations that agree to mutually benefit one another by sharing information and methods. It is essential to select long-term partners who can grow and share information with you. These partners are not industry specific. Rather, a particular process is targeted—order processing, for example. Criteria for qualifying may include size of organization, revenues, customer base, existence of processes to be benchmarked, or number of employees. Further qualification can be achieved by internal questionnaires that aim to understand the company and its commitment to developing a long-term, mutually beneficial relationship.

Benchmarking methodology is broken into five key components:

- Process selection
- Process mapping
- Researching best practices and setting targets

- Analyzing the existing process and identifying opportunities for improvement
- Developing an action plan for implementation, performance metrics, and continuous feedback.

Take as an example a small electronics manufacturing firm, PowerVolt, Inc. The company wanted to improve customer service, reduce errors, and reduce costs via the order entry process. The first step was an assessment based on extensive site visits and questionnaires that served to understand and define processes. Process maps were then designed to visualize flow of material and information.

The next step was to research best practices and set achievable goals. Here benchmark partners were selected and evaluated. The partners selected included a large telecommunications provider, a stereo manufacturer, and a cell phone manufacturer. Approximately 25 performance metrics were selected to determine how well the organization performed. Performance metrics included number of orders per employee, average dollar value of order, time spent entering orders per full-time equivalent, and a rating of order processing automation where 1 represented full integration between customers and the ERP system and 5 represented completely manual process with orders received via mail or fax.

The results of the research yielded performance metrics and various process maps. These results were compared with each other to help identify gaps and opportunities for improvement. Significant findings focused on the amount of handoffs, the excessive waiting time for management approval, and the level of automation. Now able to target these weak points in their system, PowerVolt can realize substantial cost savings. Furthermore, it can formulate an action plan for implementation based on these opportunities.

Organizations have also had great success using cross-functional teams assigned to continuous improvement tasks. When Xerox, troubled by loss of market share, applied continuous improvement and benchmarking philosophies to supply chain functions, they regained their market position, reduced operational costs, and increased levels of customer satisfaction, once again developing a competitive advantage. The teams used by Xerox consisted of benchmark partners, consultants, internal auditors, production managers, sales and marketing individuals, and human resources and financial personnel. It is equally important to set up a team assigned to risk management to diagnose problems by prevention.

The overall optimization of the supply chain is a continuous process. Companies such as Hewlett-Packard, Texas Instruments, and IBM have experienced enormous benefits to their bottom line as they develop progressively more efficient supply chains. Efficiency is not just the ability to do a job well—it's that built-in desire to always do it better. ♦

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