

# The ABCs of Supply Chain Management

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### **What is supply chain management?**

Supply chain management is the combination of art and science that goes into improving the way your company finds the raw components it needs to make a product or service, manufactures that product or service and delivers it to customers. The following are five basic components for supply chain management.

1. Plan-This is the strategic portion of supply chain management. You need a strategy for managing all the resources that go toward meeting customer demand for your product or service. A big piece of planning is developing a set of metrics to monitor the supply chain so that it is efficient, costs less and delivers high quality and value to customers.
  2. Source-Choose the suppliers that will deliver the goods and services you need to create your product or service. Develop a set of pricing, delivery and payment processes with suppliers and create metrics for monitoring and improving the relationships. And put together processes for managing the inventory of goods and services you receive from suppliers, including receiving shipments, verifying them, transferring them to your manufacturing facilities and authorizing supplier payments.
  3. Make-This is the manufacturing step. Schedule the activities necessary for production, testing, packaging and preparation for delivery. As the most metric-intensive portion of the supply chain, measure quality levels, production output and worker productivity.
  4. Deliver-This is the part that many insiders refer to as "logistics." Coordinate the receipt of orders from customers, develop a network of warehouses, pick carriers to get products to customers and set up an invoicing system to receive payments.
  5. Return-The problem part of the supply chain. Create a network for receiving defective and excess products back from customers and supporting customers who have problems with delivered products.
- For a more detailed outline of these steps, check out the nonprofit Supply-Chain Council's website at [www.supply-chain.org](http://www.supply-chain.org).

### **What does supply chain management software do?**

Supply chain management software is possibly the most fractured group of software applications on the planet. Each of the five major supply chain steps previously outlined composes dozens of specific tasks, many of which have their own specific software. There are some large vendors that have attempted to assemble many of

these different chunks of software together under a single roof, but no one has a complete package. Integrating the different software pieces together can be a nightmare. Perhaps the best way to think about supply chain software is to separate it into software that helps you plan the supply chain and software that helps you execute the supply chain steps themselves.

Supply chain planning (SCP) software uses fancy math algorithms to help you improve the flow and efficiency of the supply chain and reduce inventory. SCP is entirely dependent upon information for its accuracy. If you're a manufacturer of consumer packaged goods for example, don't expect your planning applications to be very accurate if you can't feed them accurate, up-to-date information about customer orders from your retail customers, sales data from your retailer customers' stores, manufacturing capacity and delivery capability. There are planning applications available for all five of the major supply chain steps previously listed. Arguably the most valuable (and complex and prone to error) is demand planning, which determines how much product you will make to satisfy your different customers' demands.

Supply chain execution (SCE) software is intended to automate the different steps of the supply chain. This could be as simple as electronically routing orders from your manufacturing plants to your suppliers for the stuff you need to make your products.

### **Do I need to have ERP software before I install supply chain software?**

This is a very controversial subject. You may need ERP if you plan to install SCP applications because they are reliant upon the kind of information that is stored in the most quantity inside ERP software. Theoretically you could assemble the information you need to feed the SCP applications from legacy systems (for most companies this means Excel spreadsheets spread out all over the place), but it can be nightmarish to try to get that information flowing on a fast, reliable basis from all the areas of the company. ERP is the battering ram that integrates all that information together in a single application, and SCP applications benefit from having a single major source to go to for up-to-date information. Most CIOs who have tried to install SCP applications say they are glad they did ERP first. They call the ERP projects "putting your information house in order." Of course, ERP is expensive and difficult, so you may want to explore ways to feed your SCP applications the information they need without doing ERP first.

SCE applications are less dependent upon gathering information from around the company, so they tend to be independent of the ERP decision. But chances are, you'll need to have the SCE applications communicate with ERP in some fashion. It's important to pay attention to SCE software's ability to integrate with the Internet and with ERP or SCP applications because the Internet will drive demand for integrated information. For example, if you want to build a private website for communicating with your customers and suppliers, you will want to pull information from SCE, SCP and ERP applications together to present updated information about orders, payments, manufacturing status and delivery.

### **What is the goal of installing supply chain management software?**

Before the Internet came along, the aspirations of supply chain software devotees were limited to improving their ability to predict demand from customers and make their own supply chains run more smoothly. But the cheap, ubiquitous nature of the Internet, along with its simple, universally accepted communication standards have thrown things wide open. Now, theoretically anyway, you can connect your supply chain with the supply chains of your suppliers and customers together in a single vast network that optimizes costs and opportunities for everyone involved. This was

the reason for the B2B explosion; the idea that everyone you do business with could be connected together into one big happy, cooperative family.

Of course, the reality behind this vision is that it will take years to come to fruition. But considering that B2B has only been around for a few years, some industries have already made great progress, most notably consumer-packaged goods (the companies that make products that go to supermarkets and drug stores), high technology and autos.

When you ask the people on the front lines in these industries what they hope to gain from their supply chain efforts in the near term, they will all respond with a single word: visibility. The supply chain in most industries is like a big card game. The players don't want to show their cards because they don't trust anyone else with the information. But if they showed their hands they could all benefit. Suppliers wouldn't have to guess how much raw materials to order, and manufacturers wouldn't have to order more than they need from suppliers to make sure they have enough on hand if demand for their products unexpectedly goes up. And retailers would have fewer empty shelves if they shared the information they had about sales of a manufacturer's product in all their stores with the manufacturer. The Internet makes showing your hand to others possible, but centuries of distrust and lack of coordination within industries make it difficult.

### **What is supply chain collaboration?**

Let's look at consumer packaged goods as an example of collaboration. If there are two companies that have made supply chain a household word, they are Wal-Mart and Procter & Gamble. Before these two companies started collaborating back in the '80s, retailers shared very little information with manufacturers. But then the two giants built a software system that hooked P&G up to Wal-Mart's distribution centers. When P&G's products run low at the distribution centers, the system sends an automatic alert to P&G to ship more products. In some cases, the system goes all the way to the individual Wal-Mart store. It lets P&G monitor the shelves through real-time satellite link-ups that send messages to the factory whenever a P&G item swoops past a scanner at the register.

With this kind of minute-to-minute information, P&G knows when to make, ship and display more products at the Wal-Mart stores. No need to keep products piled up in warehouses awaiting Wal-Mart's call. Invoicing and payments happen automatically too. The system saves P&G so much in time, reduced inventory and lower order-processing costs that it can afford to give Wal-Mart "low, everyday prices" without putting itself out of business.

Cisco Systems, which makes equipment to hook up to the Internet, is also famous for its supply chain collaboration. Cisco has a network of component suppliers, distributors and contract manufacturers that are linked through Cisco's extranet to form a virtual, just-in-time supply chain. When a customer orders a typical Cisco product-for example, a router that directs Internet traffic over a company network-through Cisco's website, the order triggers a flurry of messages to contract manufacturers of printed circuit board assemblies. Distributors, meanwhile, are alerted to supply the generic components of the router, such as a power supply. Cisco's contract manufacturers, some of whom make subassemblies like the router chassis and others who assemble the finished product, already know what's coming down the order pipe because they've logged on to Cisco's extranet and linked in to Cisco's own manufacturing execution systems.

Soon after the contract manufacturers reach into Cisco's extranet, the extranet starts poking around the contractor's assembly line to make sure everything is kosher. Factory assemblers slap a bar code on the router, scan it and plug in cables that simulate those of a typical corporate network. One of those cables is a

fire hose for Cisco's automated testing software. It looks up the bar code, matches it to a customer's order and then probes the nascent router to see if it has all the ports and memory that the customer wanted. If everything checks out-and only then-Cisco's software releases the customer name and shipping information so that the subcontractor can get it off the shop floor.

And there you have it. No warehouses, no inventory, no paper invoices, just a very nosy software program that monitors Cisco's supply chain automatically, in real-time, everywhere, simultaneously. The chain runs itself until there's a problem, in which case the system alerts some poor human to get off his duff and fix something. Supply chain software junkies call this "management by exception." You don't need to do anything unless there is something wrong.

If there's a weakness to these collaborative systems, it's that they haven't been tested in tough times-until recently. Cisco's network was designed to handle the company's huge growth. Distributed decision making is great if the decisions have mostly to do with making and selling more things. But Cisco and its network were caught completely off guard by the recent tumble in the economy. It took awhile to turn all the spigots off in its complex network when demand for its products plummeted and Cisco and its supply chain partners got stuck with a lot of excess inventory-as did most other big manufacturers in high technology. Cisco was forced to take a hard look at its supply chain planning capability. SCP software is much better at managing growth than it is at monitoring a decline and correcting it.

### **What are the roadblocks to installing supply chain software?**

#### *Gaining trust from your suppliers and partners.*

Supply chain automation is uniquely difficult because its complexity extends beyond your company's walls. Your people will need to change the way they work and so will the people from each supplier that you add to your network. Only the largest and most powerful manufacturers can force such radical changes down suppliers' throats. Most companies have to sell outsiders on the system. Moreover, your goals in installing the system may be threatening to those suppliers, to say the least. For example, Wal-Mart's collaboration with P&G meant that P&G would assume more responsibility for inventory management, something retailers have traditionally done on their own. Wal-Mart had the clout to demand this from P&G, but it also gave P&G something in return-better information about Wal-Mart's product demand, which helped P&G manufacture its products more efficiently. To get your supply chain partners to agree to collaborate with you, you have to be willing to compromise and help them achieve their own goals.

#### *Internal resistance to change.*

If selling supply chain systems is difficult on the outside, it isn't much easier inside. Operations people are accustomed to dealing with phone calls, faxes and hunches scrawled on paper, and will most likely want to keep it that way. If you can't convince people that using the software will be worth their time, they will easily find ways to work around it. You cannot disconnect the telephones and fax machines just because you have supply chain software in place.

#### *Many mistakes at first.*

There is a diabolical twist to the quest for supply chain software acceptance among your employees. New supply chain systems process data as they are programmed to do, but the technology cannot absorb a company's history and processes in the first few months after an implementation. Forecasters and planners need to understand that the first bits of information they get from a system might need some tweaking. If they are not warned about the system's initial naiveté, they will think it is useless.

In one case, just before a large automotive industry supplier installed a new supply chain forecasting application to predict demand for a product, an automaker put in an order for an unusually large number of units. The system responded by predicting huge demand for the product based largely on one unusual order. Blindly following the system's numbers could have led to inaccurate orders for materials being sent to suppliers within the chain. The company caught the problem but only after a demand forecaster threw out the system's numbers and used his own.

That created another problem: Forecasters stopped trusting the system and worked strictly with their own data. The supplier had to fine-tune the system itself, then work on reestablishing employees' confidence. Once employees understood that they would be merging their expertise with the system's increasing accuracy, they began to accept and use the new technology.

**Many B2B exchanges say they offer supply chain software. Should I use their software or install my own?**

Public (many-to-many) B2B exchanges and private (you to everyone else in your supply chain) exchanges began with grand promises of auctions and procurement savings for members, but few suppliers were tempted. Since then, most of these websites have morphed into becoming online hosts for supply chain software. For small companies that can't afford to buy the software on their own, the public exchanges will probably be their source. But for now many of the offerings are immature and aren't getting much use. Companies that can afford to are building their own private connections with their trading partners online rather than going through public exchanges. But even these companies will eventually use the public exchanges when they can. Building and maintaining software just isn't a great deal if there's someone out there willing to do it for you.

The ambitious public exchanges, with their independence and neutrality, hold out the hope of attracting more buyers and suppliers together in one place, but the level of specificity of a public exchange's supply chain software will probably never reach the depth that a company could build with a select few suppliers in a private exchange. So most decision makers are saying they will use public exchanges for the generic supply chain connections they make, and build their own for the really strategic deep, supply chain relationships they have.

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