Partnering in the Supply Chain

“A great marriage is not when the “perfect couple” comes together. It is when an imperfect couple learns to enjoy their differences.”

Dave Meurer, Daze of our Wives

In the small town of Canton, Mississippi, employees in the Lextron-Visteon facility assemble front-end and cockpit modules for the interior of the Nissan Quest minivan in 42 minutes. In a matter of hours, these modules are assembled into a minivan in one of Nissan’s four assembly lines at its two-million-square-foot plant in Canton. Located within 100 yards of Nissan’s trim plant, the Lextron-Visteon facility builds and delivers the modules in a mixed-model sequence, the same sequence in which Nissan builds the minivans.

Nissan uses modular assembly at this plant to build the Quest; the Pathfinder, Armada, and Infiniti sport utility vehicles; the Titan King Cab and Crew Cab trucks; and the Altima sedan. Seven other key suppliers are clustered near the plant, six of them within a two-mile radius. As with Lextron-Visteon, Nissan relies on these suppliers to deliver modules and components in the same sequence as the vehicles are produced on its production lines.

The modular strategy gives Nissan a significant competitive edge. Assembling prebuilt modules frees up valuable space on the production floor and allows Nissan to focus on its core competencies: the design and performance of the automobile. In partnership with suppliers like Lextron-Visteon, it is doing whatever it can to lead automakers in their quest to emulate the successful Dell assembly model. Nissan seems well-positioned to
maintain its current status as the most efficient automobile manufacturer in North America, but it may not be able to maintain such a competitive edge unless it can continue to maintain its alliances with key supply chain members.

The Nissan example highlights the important role the purchasing function plays in the lean supply chain. It is the link between the supplier and the enterprise. Equally important is the logistics function. It helps maintain the smooth flow of material into and out of the enterprise. Together, purchasing and logistics help Nissan deal with the multiple, sometimes conflicting, objectives of speed, flexibility, and lower costs.

Consider how the purchase function helps the company meet these objectives. From a strategic perspective, one of the major roles of purchasing is to select suppliers that can support the enterprise mission. In the case of Nissan, an obvious criterion for key suppliers would be their ability to support the mixed-model build sequence flexibly and positively, delivering quality products to the assembly line promptly and cost-effectively.

Cost-effectiveness is a particularly important requirement that must be carefully articulated. In manufacturing enterprises, direct material costs can eat up anywhere between 35 percent and 90 percent of revenues. That means that a reduction in direct material costs of 5 percent can increase the bottom line profitability of a manufacturing company by as much as 45 percent.

While enterprises have recognized the huge potential savings that can result from reducing direct material costs, they have been slow to adopt the right approach: building effective partnerships with suppliers and logistics providers to reduce costs across the supply chain. Instead, their purchasing departments typically have an adversarial relationship with the suppliers, and logistics providers. Determined to pay as low a price as possible for materials, purchasing departments in less progressive enterprises either attempt to engage as many suppliers as possible in a bidding war, or they keep the pressure on suppliers to cut costs. Some enterprises in the automobile industry still expect a 5 percent price reduction from suppliers, year upon year.

---

A number of enterprises ask suppliers to deliver products on consignment. There may be good reasons for having products delivered on consignment, but unfortunately, the driving cause for this practice often is simply to comply with a management-imposed mandate to curtail inventory carrying costs. This all-too-typical local thinking has inevitable consequences. In this case, requiring materials to be delivered on consignment can lead to lax procurement practices, because the purchasing department is strongly tempted to order larger quantities than needed in order to save on ordering and transportation costs and because it is not accountable for the additional inventory holding costs.

Building supply chain partnerships and alliances requires a more progressive approach, one based on systems thinking. Enterprises should realize that suppliers' costs are, in effect, their costs. If they ask a supplier to supply three months of consigned material when only a week’s supply is needed, the cost of that inventory will ultimately find its way back into the supplier’s price. The practice of forcing unconditional price reductions on a supplier may either force the supplier to cut corners to stay in business, make the supplier continue to lose money and eventually fold, or cause the supplier to exit from the relationship altogether. None of these outcomes benefits the enterprise.

While the enterprise should place high demands on suppliers, it should also realize that all parties should share the goal of reducing costs across the supply chain. The philosophy that should drive these partnerships and alliances is summarized in the seventh lean supply chain principle:

**LEAN SUPPLY CHAIN PRINCIPLE 7**

*Build partnerships and alliances with members of the supply chain strategically, with the goal of reducing the total cost of providing goods and services.*

This chapter presents guiding principles for building partnerships and alliances to manage the lean supply chain. For clarity, supply chain partners are separated into suppliers and logistics providers and techniques for coordinating the two groups are discussed in separate sections. The discussion first centers on how enterprises form relationships with suppliers, and guidelines for partnering with suppliers are presented. Next, inventory

---

3. That is, even though these products have been delivered to the enterprise, they are deemed to be owned by the supplier until they are consumed by the enterprise. Until they are actually used, the risk of loss, damage, theft, and obsolescence remains with the supplier.
PARTNERING WITH SUPPLIERS

The success of the supply chain depends heavily on the capabilities of the suppliers that choose to participate in it, collaborating with the enterprise in anticipation of higher profits. In general, enterprises form relationships with suppliers in one of three ways:

1. **Arm’s-length relationships:** The enterprise procures parts or raw materials using a number of short-term suppliers and shops for the best prices each time it needs materials.
2. **Vertical integration:** The enterprise produces the materials it needs in-house and controls the buying and sourcing units.
3. **Partnerships or virtual integration:** The stages in the supply chain work together to leverage a competitive advantage.

Arm’s-Length Relationships

Arm’s-length relationships are formed when the enterprise outsources non-core activities to “specialist” suppliers. This relationship usually does not lead to long-term alliances. Instead, the buyer typically shops for the best prices each time it needs to procure parts or raw materials.

In arm’s-length relationships, contracts are awarded to the supplier with the lowest bid, with relatively little attention paid to quality, logistics, or life-cycle costs. Thus, a real challenge with such relationships is how to get a collection of relatively autonomous enterprises to collaborate on complex, customized products. The desire of each enterprise to maximize its own profits (local optimization) often goes counter to the profit objectives of the enterprise next to it in the supply chain, at least for the short term. Thus, enterprises are reluctant to trust each other completely, to share information, or to do anything else that would result in productivity improvements for the entire supply chain.

Low trust and an absence of information characterizes enterprises that have arm’s-length relationships, which are often held together by contractual agreements specified on paper but seldom followed. Arm’s-length relationships discourage enterprises from investing in dedicated assets—assets mainly linked to a particular
customer or supplier. The absence of such investments can hinder the productivity of the supply chain and impair the speed with which the different activities are coordinated.

**Vertical Integration**

Vertical integration gives enterprises a competitive advantage by building barriers to entry, facilitating investments in specialized assets, protecting product quality, and helping improve scheduling between adjacent stages in the supply chain—at least in theory. The conventional wisdom is that vertical integration makes for better coordination of functions and tasks.

The disadvantages of vertical integration are higher fixed costs, possibly higher variable costs if the enterprise’s internal source of supply is high-cost, and a lack of flexibility when technology changes quickly or demand is uncertain. In addition, without measures in place to enforce tight coordination, vertical integration could, in fact, result in worse coordination than if the enterprise outsourced many of its activities. With vertically integrated enterprises, a major challenge is to overcome the “familiarity breeds contempt” syndrome. When two enterprises, one a supplier to the other, report to the same board of directors, there is a real danger that the business relationship could become increasingly casual, leading to problems with cost, quality, and adherence to delivery schedules.

The other extreme of vertical integration is when an enterprise outsources all its activities. In theory, outsourcing noncore activities lowers costs and makes better use of scarce resources, allowing the enterprise to concentrate those resources on its core activities. The enterprise is more flexible and can respond more rapidly to changing market conditions because it does not own the specialized assets needed for the noncore activities. However, outsourcing may have a detrimental effect if important value-creating activities are outsourced, or if the enterprise becomes too dependent on key suppliers.

There is another pitfall to avoid. More than a few enterprises resort to outsourcing to rid themselves of problems they could not solve themselves. The real reason for outsourcing should be to better leverage core competencies by outsourcing noncore activities to suppliers that provide the same product to a number of other customers and are therefore in a better position to exploit economies of scale.
In deciding whether to outsource or to pursue vertical integration, managers face a classic dilemma: Productivity grows with division of labor, which creates an incentive to outsource activities to more specialized enterprises. At the same time, outsourcing increases the costs of communication and coordination of activities, which creates a counterbalancing force to bring activities in-house and manage them under a common hierarchical structure.

Again, vertical integration, at least in theory, makes for effective coordination of functions and tasks, but it is a poor way to achieve the focus and customization necessary for an enterprise to stay at the cutting edge. Partnerships offer an option for resolving the dilemma.

**Partnerships or Virtual Integration**

Partnerships lie somewhere between vertical integration and arm’s-length relationships. Whereas an arm’s-length relationship works well if the supplier is providing a commodity, partnerships are preferable with suppliers that produce inputs of high value, requiring a high degree of interdependence between supplier and customer. To address the high levels of coordination and customization needed, enterprises are embracing a new business model aimed at building long-term partnerships and strategic alliances called *virtual integration*, which binds together two very different business models. It offers the tight coordination expected from vertically integrated enterprises yet benefits from the focus and customization derived from outsourcing to a specialist.

One enterprise that has exploited the concept of virtual integration very successfully is Dell. When it started, Dell was small; it could not afford to create every piece of the supply chain. It decided to buck the industry trend favored by Compaq, IBM, and HP to do everything themselves. Instead, Dell dedicated itself solely to the task of assembling and delivering computer systems to its customers. That meant Dell had to outsource a number of its activities, which in turn gave Dell a number of advantages, some of them probably serendipitous. For instance, unlike other major PC makers, Dell did not need a lot of fixed assets for manufacturing and assembling parts, so it did not have to worry about recovering sunk costs in fixed assets—a perceived need still very much in evidence in traditional enterprises that often clouds decision-making.
Dell soon found that building strategic alliances with key suppliers like Sony allowed it to react to customer demands far more quickly than vertically integrated enterprises could. If there were a problem with a new product launch, for instance, engineers from Sony could be at Dell’s assembly plants right away.

As it began to forge strategic alliances with its suppliers, Dell found that it was able to adapt much more rapidly to technological advances. For instance, when Intel introduced a new chip, Dell could rely on its specialist suppliers, its strategic partners, to redesign their products to match the new chip design. Since Dell did not have a lot of fixed assets, it could move with the new technology much faster than its competitors could.

In an interview with the editor of *Harvard Business Review*, Michael Dell suggested that virtual integration, with its potential to achieve both coordination and focus, may well become “a new organizational model for the information age.” However, not all enterprises are in a position to replicate Dell’s success with virtual integration. Many supply chains are rigid; they cannot be easily transformed to take advantage of the demand information available.

**Governance Profiles**

In a study of practices by original equipment manufacturers (OEMs) in the automobile industry, Dyer found that lean enterprises like Toyota are much more likely to adopt a partnership arrangement whereas less lean competitors like General Motors and Ford are more likely to use a heavy mix of vertical integration and arm’s-length relationships. Dyer uses the notion of a *governance profile* to characterize the percentage of inputs by value that are manufactured internally, procured from supply chain partners, and procured from arm’s-length suppliers. Figure 3.1 depicts the governance profile for the automobile manufacturers named. In this figure, partnerships are governed by trust and long-term relationships rather than legal contracts, and a supplier is classified to this category if the OEM uses one or at most two suppliers for a product.

---


The governance profile for GM and Ford show clearly that they do considerably less partnering with suppliers than Toyota. GM and Ford are currently attempting to recreate their governance profiles, although the change is not likely to happen quickly in enterprises with such long-established manufacturing cultures.\(^6\)

The optimal governance profile will differ from one industry to another. Industries making complex products may demand greater coordination, resulting in a governance profile with a higher percentage of vertical integration; industries that build simple products are likely to demand a higher percentage of arm’s-length relationships. Thus, the fact that automobiles were a highly complex product in the early 1900s may partially explain why General Motors and Ford chose the vertical integration model while they were establishing their dominance in the U.S. automobile industry.

---

In any event, following Dell’s successful business model, enterprises within a lean supply chain are likely to move away from arm’s-length relationships. Enterprises trying to build a lean supply chain are also likely to move away from the vertical integration model towards strategic alliances, which arguably are just collaborative partnerships carried to the next level.

As Figure 3.2 suggests, strategic alliances involve even more “relational” arrangements than collaborative partnerships (transactional arrangements are common with arm’s-length relationships). The nature of these strategic alliances between enterprises will differ depending on whether the enterprise is dealing with a supplier or a logistics provider.

Consider the relationship between a buyer and a supplier. By entering into strategic alliances buyer and supplier gain significant benefits that are both strategic and operational. The strategic benefits include easy entrance into new markets and prompt attraction of new customers. Operational benefits emerge as a result of information transparency, which leads to lower costs, higher reliability, and better quality. What makes partnerships between suppliers and buyers effective are that:

- Suppliers are viewed as partners, not adversaries.
- The buyer’s production schedules are increasingly visible to the supplier.
• Supplier and buyer together decide where to hold strategic inventory.
• The buyer enters into long-term contracts, uses blanket purchase-orders,7 and has single-source suppliers.

**Partners, not Adversaries**

In general, establishing partnerships requires trust and cooperation. During the heyday of mass production, suppliers were typically treated as adversaries rather than partners. It was not uncommon for the purchasing departments to pit one potential supplier against another and award supply contracts to the lowest bidder without fully understanding the process capabilities of that supplier. Such arm’s-length relationships do not evolve into long-term relationships. They do not instill confidence among suppliers, or motivate them to invest in resources for building and delivering a better quality product.

The parties in an adversarial relationship implicitly recognize the potential negative dynamics that accompany such an arrangement. For instance, there is a greater temptation for suppliers to bid low to acquire the contract and then negotiate prices upward based on contingencies. Needless to say, such behavior results in a continual cycle of bidding and contract awards.

The JIT movement that gained popularity in the 1980s on the heels of the success that Japanese automakers enjoyed in the United States changed these dynamics. The Japanese philosophy was that cooperation rather than confrontation maximized the benefits for both parties. The movement took a more systemic view, emphasizing maximization of value rather than local minimization of costs. As a result, instead of working with arm’s-length relationships, enterprises formed collaborative partnerships and strategic alliances.

Stable, cooperative relationships have numerous benefits. Cooper and Slagmulder8 studied 25 innovative Japanese lean enterprises. They found that trust, clear congruence of mutual goals, and a willingness of both parties to invest in specific assets for each other to be the most important benefits from long-term buyer-supplier partnering. Enterprises that have long-term

---

7. A blanket purchase order is an agreement between the enterprise and a supplier for multiple purchases under a single purchase order number.
relationships also do not have to face the steep learning curve—required to understand and initiate transactions—that results when new contractual relationships are formed.

Once stable and cooperative relationships are established, some of the boundaries between buyer and supplier begin to fade. It is not unusual to find lean enterprises like Toyota or Honda temporarily assigning employees to work with their suppliers as resident engineers. These employees are better positioned to help the suppliers with quality problems because they can communicate the problems more clearly back to their own design and manufacturing departments. It is also not unusual to find lean suppliers sending their design or manufacturing engineers to a buyer’s facility to rectify problems at the source and/or develop solutions to prevent further problems at the supplier’s facility.

**Increased Visibility to Suppliers**

While U.S. automakers were quick to emulate the Japanese by introducing JIT operations in their facilities, they did not follow it through by creating partnerships and alliances with suppliers. Instead, their version of JIT was to ask suppliers to supply parts when needed on a “just-in-time” basis, without giving the suppliers clear visibility of assembly schedules. As a consequence, suppliers were typically forced to carry a large finished goods inventory “just-in-case” the buyer’s demands changed. The suppliers had to either pass on the cost of carrying inventory to the automakers or, more likely, absorb the cost themselves. In either case, the cost of the inventory in the supply chain was higher.

How did the Japanese automakers leverage JIT across the supply chain so much more effectively than their American counterparts? Not only did they believe in long-term partnerships and alliances with their suppliers, they were willing to grow the joint effort by sharing their production plans with suppliers.

Toyota maintains a long-term contractual agreement to purchase steering gear assemblies from TRW Koyo in Vonore, Tennessee. Toyota gives the TRW Koyo its production schedule for the coming two weeks. In other words, the supplier can see two weeks into the future what it has to supply Toyota. This in turn allows TRW Koyo to communicate its production plans to its raw material suppliers. Because of this visibility of production schedules throughout the supply chain, TRW Koyo can operate with less than two days of raw material inventory, meeting Toyota’s demand while supporting a strong relationship with its own supplier.
The Internet and business-to-business (B2B) systems have tremendously increased the ability of enterprises to make their operations visible to suppliers. Wal-Mart uses electronic data interchange (EDI) and POS data to better communicate its requirements to major suppliers like Procter & Gamble (P&G). Wal-Mart’s POS system allows its central office in Bentonville, Arkansas, to collect data on tubes of toothpaste sold over an eight-hour period at a specific store in Omaha, Nebraska, so a tube of toothpaste bought at 3:00 p.m. can be restocked in the store by 9:00 p.m. the next day. Suppliers like P&G are happy with this arrangement because it gives them clear visibility on Wal-Mart’s actual requirements every day. They do not have to rely on a forecast of customer demand.

Dell has about 200 suppliers, but 30 of them account for nearly 80 percent of its total purchases. Dell uses the Internet as a portal through which suppliers have visibility on Dell customer demands. When a customer places an order with Dell, its suppliers see the order immediately and are thus informed about the need to make the appropriate parts. Even medium-sized companies like Woodward Aircraft Engine Systems have harnessed the power of the Internet to give suppliers increased visibility of their production requirements. That goes a long way towards ensuring a stable, mutually rewarding, relationship.

The Internet has benefited customers as well. Because of its B2B systems, General Electric’s customers can operate with very little inventory and still provide excellent customer service. Home Depot, for instance, does not carry GE inventory; more than 60 percent of Home Depot’s sales of GE appliances are delivered directly from a GE warehouse, after the Home Depot system notifies the GE systems. Home Depot does not need inventory to consummate the transaction. Because GE washers, dryers, and other electric appliances have a high margin, Home Depot wants to partner with GE.

The idea of collaborating by sharing information may sound like one of those business ideas that everyone supports. In reality, though, few enterprises fully embrace the concept because many remain wary of sharing full information. It has been observed, however, that enterprises embracing collaboration find that the more they do it, the more benefits they realize: Forecasting is simpler, actual demand is less erratic and easier to meet, and there is less need for unexpected expediting in the process.
Single Sourcing and Blanket Purchase Orders

Single sourcing implicitly recognizes that buyer/supplier relationships are strengthened through long-term collaboration. In addition to the motivation and commitment to mutual success it generates, single sourcing has other benefits, among them improved quality, innovation sharing, reduced costs, and better coordination of production and delivery schedules.

For a while it seemed that every manufacturer was moving towards single sourcing, but the past decade has seen a significant split in how American enterprises perceive it. A survey by Purchasing Magazine found that 81 percent of the enterprises operated with at least one voluntary single-source supply relationship, but the analysis revealed that while the percentage seemed high, the number of enterprises that aggressively pursued a single-sourcing strategy was relatively low. The survey reported that this finding reflects a general attitude toward single sourcing. Those with less enthusiasm for it view the benefits of single sourcing as limited, often seeing it merely as a way to simplify the budgeting processes by obtaining long-term fixed prices.

Establishing single-source suppliers implies that the suppliers are certified as quality suppliers. This trust in the supplier’s ability to provide high-quality materials relieves the customer of having to inspect each incoming shipment for quality. It also implies that the suppliers are reliable and will deliver the right quantity at the right time. Unfortunately, this is precisely why a number of purchasers have moved away from the practice of single sourcing. Many suppliers have hurt their cause through the “overpromise, under-deliver” syndrome. Others bid low to secure contracts and then resort to creeping price escalation. Therefore, a large number of enterprises that do believe in the benefits of single sourcing maintain an alternate source of supply in case the primary supplier cannot deliver at the rate and the quality levels specified. Having an alternate supplier also discourages the primary supplier from seeking unsubstantiated price increases.

Another approach to building trust and engaging suppliers in long-term contracts is to use blanket purchase orders. A blanket purchase order is a contract to buy a certain number of items over a specified period. Once the initial contract is executed by the purchasing department, requests for deliveries are typically generated directly by the production department.

---

The use of blanket purchase orders is not new. They have been in existence at least since the early 1960s in many countries. However, in the past, when relationships between suppliers and customers were traditionally adversarial, the motivation for using blanket purchase orders was often either to eliminate paperwork or to ensure commitments from suppliers that they would deliver. These days, there is a subtle but perceptible shift in the way blanket purchase orders are viewed. The intent now is to stress long-term relationships with key suppliers.

**INVENTORY OWNERSHIP AND CONSIGNMENT INVENTORIES**

Many enterprises have consignment inventory arrangements with their suppliers. Under this arrangement, the suppliers place inventory “on consignment” at the customer’s site, either directly at point of use or at a warehouse, but the goods are not deemed delivered to the customer until they are actually consumed. This arrangement effectively benefits the customer, who does not have to worry about payment until the product is actually used in production.

At first glance, it may seem that the customer is taking unfair advantage of the supplier. While that may be to some extent true, the supplier benefits as well. When the customer picks up a consignment for production, it is a pull signal to the supplier. It gives better visibility on demand to the supplier, which can now better plan its production. When the partnership operates in this mode, it is more of a win-win situation. In fact, it is the basis for vendor-managed inventory (VMI).

**Vendor-Managed Inventory (VMI)**

VMI is not a new concept, but there has been renewed interest in it as enterprises analyze core competencies and work on outsourcing non-core activities. With VMI, the supplier is responsible for stocking the customer’s shelves. The quantity replenished is typically based on data obtained through EDI, although often the supplier makes regular visits to the customer’s facility to determine replenishment quantities. A good example of VMI in action is illustrated by the dispensing machines that now hold tools and tooling equipment in many machine shops. As the operators pull from them, the vendors replenishing them can accurately estimate consumption without having to rely on forecasts.
VMI is referred to by different names, depending on the industry. The apparel industry calls it efficient consumer response, the grocery industry uses efficient consumer response and just-in-time distribution, and the automobile industry uses VMI and just-in-time distribution.

VMI reduces the number of transactions for the purchasing, inspection, and stores functions. It also gives the supplier clear visibility of the rate at which its products are being consumed. With VMI, suppliers do not have to rely on a customer’s purchasing department to give them delivery schedules. Instead, suppliers now control how they replenish their stock at a customer’s facility based on shared demand information.

VMI has excellent potential to reduce inventories and stock-outs in the supply chain. It lets suppliers prioritize their delivery schedules based on which customer is expected to stock out. And with VMI there is no temptation for the supplier to induce bulk buying by the customer’s purchasing department to take advantage of quantity discounts. As we observed in the beer game, discounts produce unpredictable demand surges in the supply chain.

Another compelling reason for enterprises to consider VMI is that it enhances collaboration in the supply chain. Figure 3.3 indicates how implementing VMI has immediate impact on a customer’s production. The production department in a traditional enterprise typically transmits a request to the procurement function, which then gives the supplier either a purchase order or a delivery request (sometimes inflated by the purchasing department). This sequence of hand-offs, each with potential for error, is short-circuited by a VMI program.

In summary, the advantages VMI offers to suppliers are:

- A “virtual” shortening of the supply chain—the production function in the downstream enterprise now has direct contact with the supplier.
- Frequent communication of inventory levels, stock-outs, and planned promotions—the supplier now has better visibility. EDI linkages facilitate this communication.
- Reduction in inventories and stock-outs.
- Prioritization of shipments. For example, shipments might be classified from the top down as: (a) items that are expected to stock out; (b) items that are well below targeted stock levels; (c) advance shipments of promotional items (allowed only in the transition phase); and (d) items that are close to targeted stock levels.
Nevertheless, implementing VMI can be challenging. The problem is not merely one of logistics. When a supplier tries to implement VMI, it can encounter resistance from its sales force. At issue are the roles played by each participant, the skills required, the degree of trust, and the acceptance of power shifts. Sales might view VMI as a threat to incentive bonuses, especially if the bonus depends on how much they are able to “sell” to their customers. There may be skepticism about whether the process will function smoothly and concern that the reduced inventory that usually follows from a VMI program will result in less shelf space and thus the perception of a loss of market share.

If there is an intermediate distribution channel, distributors may also have concerns about VMI, especially if they lose control over what they receive. The distributors may perceive the VMI program as trying to push inventory onto them. Since they do not have any control on what they stock, they may also worry that the supplier could eventually take over the distributor’s function, supplying product directly to the customer. When Barilla SpA\textsuperscript{10} introduced VMI in the pasta manufacturing industry, the biggest challenges came from distributors who feared that their right to order what they wanted was being denied.

Collaborative Planning, Forecasting, and Replenishment (CPFR)

Collaborative planning, forecasting, and replenishment (CPFR) is a business practice aimed at reducing inventory costs while improving product availability across the supply chain. It is a way to synchronize the demand forecasts that the buyer and the supplier have for the product to arrive at a single consensus forecast.

The basic idea is that enterprises share forecasts and results data over the Internet. Technology, using CPFR, analyzes the data and alerts planners at each enterprise to exceptional situations that could affect deliveries or sales. The enterprises then collaborate to resolve the exceptions by adjusting plans, expediting orders, and correcting data entry errors.

CPFR can be viewed as an outgrowth of VMI, the next step in the supply chain collaboration continuum. In fact, many people believe the movement to CPFR would not have been possible without the foundation laid by VMI and other continuous replenishment strategies.

CPFR was introduced in 1995 when Wal-Mart found that the in-stock averages of pharmaceutical manufacturer Warner-Lambert were not meeting Wal-Mart’s vendor performance standards. Wal-Mart partnered with Warner-Lambert, Surgency (formerly Benchmarking Partners), and two software companies, SAP and Manugistics, to define a process that would link customer demand with replenishment needs throughout the supply chain.

The pilot project focused on Listerine mouthwash and involved one Warner-Lambert manufacturing plant and three Wal-Mart distribution centers. The results of the study were very encouraging: Warner-Lambert’s in-stock averages rose from 87 percent to 98 percent, lead times dropped from 21 to 11 days, and sales increased $8.5 million over the test period.

The CPFR movement gained momentum in 1998 when Voluntary Inter-industry Commerce Standards (VICS) got involved. VICS is a voluntary, nonprofit organization formed by retailers, textile suppliers, and apparel makers in 1986 to develop bar-code and EDI standards for the retail industry. Once VICS got involved, more enterprises were willing to participate in testing and validating CPFR.

One of the more successful pilot projects was between stores in the Wegman’s grocery chain and a Nabisco distribution center; Nabisco’s sales of 22 Planters nut products grew by 31 percent,
while Wegman’s dollar sales of nuts increased by 16 percent—yet there was a surprising 18 percent decrease in inventory.

The pilot projects demonstrated that CPFR could deliver such promised benefits as reduced inventory, higher fill rates, and increased sales. The pilot projects also showed that partner enterprises could reduce both fixed assets and drains on working capital.

CPFR success stories continue to make the headlines. More than 100 leading companies including Eastman Kodak, JC Penney, Kimberly-Clark, NCR, Kmart, and Proctor & Gamble are now using CPFR. Still, it is too early to tell whether CPFR is just a passing fad or is here to stay. It has the same problems that VMI faces, and, in addition, requires sophisticated software systems. IT is needed to build, share, and adjust on-line forecasts and plans.

CPFR also requires a cultural shift and investments of human capital. Since not many executives are familiar with CPFR, there is a need for education and better understanding of business impact.

Johnson and Carroll11 report that the U.S. Department of Commerce estimates that more than $1 trillion in finished goods are routinely held in inventory in U.S.-based stores, distribution centers, and manufacturing plants, and that much of the inventory is ‘just-in-case’ merchandise “that would not be necessary if trading partners had better visibility to each other’s plans.”

Quite often, the problem with just-in-case inventory is that, though a customer does need it, it is at the wrong location. CPFR can help determine where to locate the inventory, an added benefit that is often overlooked. Enterprises using CPFR in the supply chain can jointly decide where to locate inventory strategically to meet customer lead time expectations. The idea is to determine how far upstream in the supply chain it is possible to locate the inventory.

Properly executed, CPFR has the potential to make a huge impact on delivering the right product, in the right quantity, to the right customer, at the right cost. Kurt Salmon Associates offer a conservative estimate that the benefits of CPFR could total $8.3 billion annually for the apparel industry alone.12

12. Ibid.
PARTNERING WITH LOGISTICS PROVIDERS

Logistics is a system of related activities to manage an orderly flow of material within and between firms. Coyle, Bardi, and Langley define the “7 Rs” of logistics: namely, ensuring the availability

1. Of the right product
2. In the right quantity
3. And the right condition
4. At the right place
5. At the right time
6. For the right customer
7. At the right cost.

Broadly speaking, logistics is really the management of inventory, whether it is in motion or at rest. The term as understood here covers inventory management, materials handling, warehousing and storage, and transportation from one enterprise to another. Services provided by the logistics function range from activities undertaken in-house by users of the services (e.g., storage or inventory control at a manufacturing plant) to the operations of external service providers. Logistics services comprise physical activities like transport and storage as well as nonphysical activities like choosing contractors and negotiating freight rates.

The importance of logistics integration in the lean supply chain cannot be overstated. It allows logistics providers to deliver quality goods to their customers at the right time. Logistics integration significantly facilitates supply chain decisions about where to position strategic inventory to provide better customer service. It also allows suppliers and customers to work effectively with minimal inventories without having to buffer uncertainties in the logistics process with extra inventory or capacity.

This does not come without cost. Billions of dollars are spent on logistics in the United States. Delaney estimates that logistics costs accounted for $970 billion in 2001, the equivalent of 9.5 percent of the gross domestic product.

It is not possible to treat the logistics function in a single section, or even a chapter. The intent here is to underscore the importance of logistics integration and of partnering with logistics

---

providers. A large number of enterprises are building those kinds of partnerships. For example, Home Depot partners with J.B. Hunt to ensure the delivery of quality products from warehouses to retail stores. The trucking company has installed drop bars in its trucks to secure the different pallet shapes and sizes that it carries for Home Depot.

Logistics providers now ensure timely deliveries of small lot sizes at regular intervals. The concepts of “milk runs” and LTL (less-than-truck-load) quantities have made it possible for enterprises to streamline their operations. Milk runs are delivery routes set up by logistics providers to deliver goods to enterprises at fixed times during the day so that enterprises can rely on timely shipment of goods to their stores. In combination with LTL shipments, they make it possible to deliver small lots at frequent intervals, which considerably enhances the ability to respond quickly and flexibly to changing customer demands. Since the deliveries typically are in small lot sizes from nearby locations, the next delivery can be modified more easily than if full truckload quantities are shipped less often.

Many of the factors that promote effective partnership with suppliers also apply to partnering with logistics providers. Long-term contracts, single-sourcing, and better visibility on shipping and delivery schedules lead to more sustainable relationships between enterprise and logistics provider, though logistics has some unique characteristics not found in buyer-supplier relationships, such as the presence of third-party logistics providers (3PLs).

3PLs/4PLs

When the industrial environment became more competitive in the 1980s and the 1990s, there was tremendous pressure on suppliers to deliver products faster, cheaper, and in smaller lots. Many enterprises were reluctant to cope with these pressures, either because they did not have the resources to invest in a logistics infrastructure or simply because it did not add to their core competencies. After all, their main concern was to manufacture a product. The burden of coordinating the logistics activities thus fell on the willing shoulders of third-party logistics providers (3PLs).

A 3PL is an enterprise that provides such logistics services as warehousing, order management, distribution, and transport services to its customer, using its own assets and resources.
rationale is that cost-effective operation can only materialize from an outside party that makes it a core competency. The 3PLs thus provided integrated logistics management.

3PLs were embraced by enterprises eager to contract out logistics activities; there has been a tremendous growth in demand for their services throughout the 1990s and into the 21st century. A survey of CEOs of Fortune 500 enterprises conducted in 2002 by Accenture and Northeastern University found that over 90 percent of the respondents were using the services of one or more 3PL providers.15

A logistics firm is basically one that provides integrated transport-related or warehousing-related solutions to shippers. The primary services contracted from 3PL providers are inbound and outbound transportation, cross-docking (see below), warehousing, freight bill auditing and payment, and freight consolidation and distribution. A key differentiating factor between a 3PL and a typical transportation or other logistics service provider is that the 3PL can also manage some of the information needs of the enterprises for which they provide logistics support. The use of 3PLs is most widespread among large enterprises, such as Eastman Kodak, Wal-Mart, Home Depot, and Toyota. Examples of the 3PLs they use are Ryder, Transfreight, UPS Logistics, and Fedex Logistics.

Some of the partnerships between manufacturing enterprises and logistics providers have led to solutions beyond the traditional realm of logistics. For instance, Airborne became the air carrier of choice for IBM and Xerox. Then together they identified potential warehouse consolidation opportunities, found or built state-of-the-art facilities, and consolidated pickup and delivery points. By reducing redundant operations and eliminating nonvalue-added activities, the three partners saved $10 million. IBM and Xerox now have colocated parts centers in Seattle and St. Louis.16

In the automotive industry, Ford Motor Co., generally viewed as a trendsetter in designing processes for supply chain management, formed a strategic alliance in February 2000 with the UPS Logistics Group, a subsidiary of United Parcel Service, to reduce the time it was taking to deliver vehicles from Ford plants to dealers and customers. The alliance is re-engineering the Ford

transportation network of rail and road carriers and enhancing quick and reliable deliveries. Not to be outdone, in December 2000, General Motors formed a joint venture with Menlo Worldwide called Vector SCM to manage the delivery of more than 8 million vehicles a year from 12,000 points of origin around the world.

The more progressive 3PL providers can constantly update their information technology and equipment to stay current. Thus, the shippers using the 3PLs do not have to be concerned with constantly updating their own technology in this area but can instead focus on their core competencies. In fact, the retailers they ship to may have different, and probably changing, delivery and technology requirements that 3PLs are better positioned to meet in a more cost-effective way.

The 3PLs also give shippers greater flexibility. For instance, suppliers that must provide rapid replenishment may need regional warehouses, but by using 3PLs to handle the warehousing, the supplier does not have to invest time and money in building and maintaining warehouses. 3PLs are also in a better position to consolidate low-volume LTL shipments from different suppliers for delivery.

The services provided by 3PLs inherently depend on long-term relationships oriented towards solving problems for the enterprise, sharing risks and benefits, and recognizing mutual interdependences. The preferred mode of operation is for the enterprise to negotiate with a single 3PL that agrees to provide a broad set of order fulfillment activities from storage to order-picking to transportation to financial management. The 3PL may be given responsibility to design the logistics network and to monitor and control logistics processes.

Such a long-term arrangement demands a long-term commitment of assets on the part of the 3PL. In return, the enterprise, whether shipper or receiver, must be willing to commit to a long-term relationship to make the work of the 3PL economically feasible.

The reality is that the full benefits of 3PLs have not been realized. As 3PLs became more sophisticated at moving goods from one place to another, there was a perception that they were still not offering some activities that could well be outsourced to them. For instance, speedy transfer of and access to information was still missing. Enter the fourth-party logistics providers (4PLs).
4PLs represent further outsourcing. They were the product of consulting enterprises, in particular Andersen Consulting (now Accenture) which trademarked the term in 1996. An example of a 4PL is Vector SCM, a joint venture of General Motors and Menlo Worldwide LLC.

The 4PL is, in theory, a logistics integrator that manages not only the 3PLs but also other supply chain-related activities like IT management. It is an additional service layer between the 3PL and its customer that in effect manages these activities without necessarily carrying any assets. Armbruster\(^\text{17}\) notes that:

> "Their role is like that of a general contractor who manages plumbers, electricians, and carpenters at a construction job site. In logistics, the general contractor is the 4PL; the subcontractors are the 3PLs, truckers, forwarders, customs brokers, and other firms."

**Cross-Docking**

Cross-docking is a warehousing strategy that is gaining momentum as major logistics providers recognize the need to become more flexible while staying responsive to upstream and downstream enterprise needs.

Originally envisioned for the retail industry, cross-docking is increasing in popularity in the manufacturing sector as well.

Cross-docking is a process by which products are moved from one enterprise to another enterprise through an intermediate warehouse, where they are not stored for more than a few hours. Basically, cross-docks are an effective alternative to picking orders and delivering in small quantities to each retail outlet using LTL shipments. They enable *economies of scope*.

Cross-docks are essentially marshalling yards in the old railroad sense: Trucks arrive with products that must be sorted, often consolidated with other products, and loaded onto outbound trucks. The incoming trucks typically arrive from an upstream enterprise and the outbound trucks are typically destined for a manufacturing enterprise or a retail outlet. Figure 3.4 shows a cross-dock. Workers place pallets in lanes corresponding to the receiving doors, a second team of workers sorts pallets into shipping lanes, and a third team loads them onto outbound trailers.

In the ideal world, the goal of cross-docking is to transfer products at the warehouse directly from incoming to outgoing trailers without having to store it. Napolitano refers to cross-docking as “JIT in the distribution arena.” A number of enterprises are now actively using cross-docking as a value-added logistics strategy to slash costs in the supply chain. Cross-docking is practiced by leading logistics providers and 3PL/4PL enterprises, including UPS and FedEx, as well as the United States Postal Service. Gue mentions a number of other enterprises, such as Home Depot, Wal-Mart, and Costco, that use cross-docks.

What are some obvious differences between cross-docking and the traditional warehousing operation? In traditional warehousing, the warehouse receives products, updates its inventory records, and moves the product into a specific location in the warehouse. The product sits there in inventory until it is required by a customer, at which time it is picked, packed, and shipped, and then the inventory records are adjusted.

On the other hand, cross-docks typically do not have any inventory records to update because that is unnecessary. Instead, the products are shipped as soon as possible with, at most, a brief waiting time for other trucks to arrive with products bound for the same destination. The product does not go into long-term storage.

To be effective, cross-docking demands advance knowledge of the inbound product and its destination and a system of routing the product to the proper outbound vehicle. A specific system must be in place to ensure efficient exchange of both product and information, and to match and schedule inbound and outbound shipments so that the product flows through the warehouse as quickly as possible.

3PLs operate centralized cross-docks (typically two to four) to cover the North American market. These cross-docks may stock a strategic inventory of high-volume products for urgent delivery. One automaker uses a 3PL to collect parts from suppliers and deliver them to a cross-dock where shipments are consolidated and shipped to 12 different assembly plants throughout North America. The parts are never warehoused or inventoried at the plants.

Napolitano\textsuperscript{20} lays out criteria for cross-docking success:

- **The right suppliers:** those with the proven discipline to consistently provide the correct quantity of the correct product at the precise time when it will be needed.
- **The right information flow:** timely, accurate, preferably paperless, information flow among trading partners.
- **The right product flow:** a network of transportation, facilities, equipment, and operations that supports smooth and swift flow of products.
- **Capital,** to sustain a cost-justified cross-docking system.
- **Personnel** who recognize the urgency of moving product and not storing it.

Cross-docking does not come without headaches. It requires extensive coordination between suppliers, distributor, and customers. A cross-docking operation imposes restrictions on suppliers and customers: Supplier may be asked to deliver small shipments more frequently or to attach bar codes to packaging. Customers may be scheduled to receive supplies only on certain days. These restrictions can lead to extra costs and coordination

for channel partners. If the cross-dock facility needs to know what is on each inbound truck before it arrives, that requires good information systems.

At the same time, cross-docking promises certain benefits over a traditional warehouse. There are the obvious savings in reduced inventories, with a corresponding decrease in the storage space required. Labor costs are reduced because inventory receipts do not have to be recorded; products for inventory do not have to be stowed into storage bins; product flow is accelerated so that products reach the customer quicker; and there is reduced opportunity for pilferage.

Improved warehouse management systems, EDI, and radio-frequency identification (RFID) technology have considerably abetted the use of cross-dock programs. Advance ship notices (ASN) also help determine potential cross-dock opportunities and allow for better scheduling of events.

Radio-Frequency Identification Systems (RFID)

Logistics activities, as well as techniques like VMI and CPFR, are enhanced by developments like RFID technology. In its most basic form, the RFID system could be viewed as an inventory-tracking tool, but its potential benefits are so enormous that an entire section is devoted to discussing the technology and how it applies to supply chain management. The benefits of RFID technology range from delivering improved product availability on the retail shelf, substantially improving handling efficiency, to providing full and accurate visibility of inventory all along the supply chain.

The basic component of the technology is the RFID tag, a microprocessor chip that contains data in a machine-readable format. The RFID system has three major components: (1) the tag, (2) the RFID reader, and (3) the data managing/processing system.

In a sense, the RFID tag is like the universal product code (UPC), the familiar bar code now found on almost any package, that has encoded machine-readable alphanumeric data. Historically, bar codes have been the tracking technology of choice because they are cheap and easy to use, but they have limitations: the amount of data they can hold is restricted, scanning them requires a clear line of sight, and once printed they cannot be rewritten. On the other hand, an RFID tag can carry a lot more data that can be rewritten more than 100,000 times; and radio-frequency technology does not require that the tag be visible.
The tag can be “scanned” through materials like plastic, paper, or wood.

While UPC bar codes currently have a cost advantage, the cost of RFID tags is dropping. The cost of RFID tags depends on the application and the features. At the high end are active tags that have more features, greater functionality, and more applications than passive tags. The cost of a passive tag is currently about 5 cents, and is projected to cost a penny or less by 2010. In contrast, active tags can cost as much as $100 depending on the features built into the tag.

The RFID system, however, has significantly more potential to cut supply chain costs and improve supply chain efficiencies than the symbol. The list of possible supply chain RFID applications is very large, as has been spelled out in numerous books and articles. This chapter discusses only a few of the ways RFID applications can enhance collaboration among supply chain partners.

Within the factory, RFID can support the assembly process by ensuring that all the items needed for assembly are available in the warehouse. Next, as these items are picked from the warehouse for delivery onto the line, RFID can improve the accuracy of picking, ensuring that the correct parts get to the assembly line. Similarly, when the product is assembled, the technology can ensure that all the right components are incorporated before it is sent to the next downstream location. As the product is dispatched to the customer or the distribution center, assemblies can be counted and automatically denoted as shipped against a customer order. At the same time, the components that went into the assembled product could be automatically backflushed from the inventory records at the parts warehouse.

At the distribution center or the warehouse receiving the items, the tag can transmit, through the reader, information that would normally be keyed into an inventory management system by a worker at the warehouse or receiving dock. Eliminating manual labor means products move through the supply chain quicker, yet are tracked more efficiently, while the possibility of human error,

---

22. See ibid. for an especially useful recent summary.
23. Backflushing is the automated (computerized) deduction of all the components (sometimes including labor) that goes into an assembled product based on the assembly’s bill of material (BOM).
that arises when data is input manually, is eliminated. The RFID system can not only input exact counts of incoming items into the warehouse management system, it can also direct the shipment to the appropriate storage location. For instance, if the material is needed to replenish an out-of-stock item that is badly needed, the system could flag it as one that requires priority handling at the receiving dock.

RFID can support security by preventing pilferage. It can also facilitate bulk storage or temporary storage of pallets that do not have an assigned location. In an industry that uses chemicals, their temporary storage requires caution in order to avoid potential product compatibility problems. With RFID, if the item going into temporary storage is incompatible with the product next door, the system can alert the fork lift operator.

RFID has the potential to significantly improve productivity, accuracy, and reduce costs. For example, GE used RFID tags to reduce the time it took to inventory equipment used in one of its projects. The equipment was spread over 20 acres but the employees tracking the inventory were able to drive around in golf carts using handheld scanners that picked up RFID signals from tags on the equipment at distances of up to 100 feet. Inventory-tracking time was cut from 18 workweeks down to 5.24

Properly used, RFID technology can promote better integration between the enterprise, its suppliers, and the logistics providers. While widespread adoption is still perhaps five years away, world-class supply chain enterprises are starting to pilot RFID right now. Wal-Mart has instructed its top 100 suppliers to have RFID tags on all their pallets of products, by January 25, 2005.25 Procter & Gamble (P&G), one of Wal-Mart’s biggest suppliers, expects to have RFID tags on pallets well before that time. Their goal is to use the tags to track goods throughout the supply chain, from the time they are boxed at a P&G manufacturing plant until consumers buy them from retail stores.26 The decision by the largest U.S. retailer to adopt RFID tags for its supply chain will drive other businesses to use RFID tags as well.

Postponement in Logistics

Postponement, the philosophy adopted in lean supply chains, is in direct contrast to speculation, where channel members assume risk rather than shifting it. Speculation exploits the economies of large-scale production; its goal is minimizing stockout and order processing costs. Postponement means that a manufacturer begins production or assembly of components or subassembled parts only after receiving a firm order.

Postponement in logistics shifts the risk of owning goods from one channel member to another. Just as a manufacturer may refuse to produce goods until it receives a firm order, an intermediary may postpone owning inventories by buying from sellers who offer faster delivery, or on consignment, or only when a sale has been made. Consumers postpone ownership by buying from retail outlets where products are in stock.

3PLs participate in postponement strategies in a number of ways. They may mix pallets for individual customers as orders are received, repackage products to fit specific customer or country requirements, or perform final assembly or customization in the field.

RESOLVING POWER CONFLICTS

The advantages of partnering have been discussed at length. What about possible drawbacks? For instance, how are conflicts in the supply chain resolved? Which enterprise or enterprises should orchestrate the supply chain and will the other members accept this leadership? Would it make sense to have a truly democratic supply chain that has no designated leader?

The answer to these questions are undoubtedly specific to the dynamics of each unique supply chain, but broadly speaking there are three possibilities:

1. There is a clearly identifiable leader in the supply chain.
2. Several enterprises in the supply chain have clout but there is no single dominant member.
3. There are no dominant enterprises in the supply chain.

When there is a dominant player in the supply chain—a Toyota, a Dell, a Wal-Mart—many issues are resolved easily. The dominant player calls the shots and builds the ecosystem around that enterprise. The other members in the supply chain are usually willing to go with the power. In such a situation, the dominant
player sometimes takes steps to ensure continued dominance. For instance, by multisourcing key products to reduce the power of suppliers, or having multiple customers to reduce a customer’s dominance.

The drawback to this approach is that having multiple suppliers goes counter to the idea of a lean, collaborative supply chain. Ideally speaking, the dominant player should adopt a systems perspective and orchestrate the supply chain so that all its members benefit. Such a system is more likely to support the growth of the dominant enterprise’s ecosystem.

Consider the Wal-Mart ecosystem. Wal-Mart has two lines of business: (1) staple stock items and (2) direct freight items. Staple stock items are products like shampoo and toothpaste that are replenished by suppliers based on consumption signals from Wal-Mart stores. Direct freight items are those that Wal-Mart’s procurement department buys and sends to stores on a push basis when products are being sold by suppliers at competitive prices. For instance, in September 2002, Wal-Mart used this strategy to offer Microtel computers for $199.

As far as staple stock items are concerned, every enterprise in Wal-Mart’s lean supply chain recognizes Wal-Mart as the undisputed leader of the chain. (Before Wal-Mart attained its current stature, one of its primary suppliers, Procter & Gamble, wielded more clout than Wal-Mart in this supply chain. The roles are now reversed.) For first-tier and upstream suppliers in the supply chain, if Wal-Mart is their key customer, their role is well understood: When Wal-Mart generates more sales, they benefit. The suppliers are usually willing to do whatever it takes to support Wal-Mart’s sales. Their job is made easier since Wal-Mart works with POS data to give suppliers clear visibility on its requirements.

If there are a handful of enterprises that have the clout in the supply chain, the ideal scenario is that enterprises work together to enlarge their business. This supply chain is more likely to resemble a supply web because many of the enterprises will have suppliers and customers that belong to other supply chains or webs. Here again, the dominant players may take steps to either ensure continued dominance or reduce the dominance of others, by, say, multisourcing or expanding the customer base. In situations like this, techniques like CPFR are likely to benefit all the members of the supply chain. Unless the members are willing to work together, the long-term viability of the supply chain will be uncertain, given today’s world. Relationships between the power players are more
likely to be arm's-length and transactional here rather than strategic and relational. (See Figures 3.1 and 3.2.)

When there is no obvious dominant player in the supply chain, or web, the situation is like the previous case—unless all members recognize that they have an opportunity to work in a true democracy, which offers a greater chance of collaboration. Techniques like CPFR appear more likely to work in such a situation.

Regardless of the power structure, there are some principles that, if followed, will benefit any supply chain. The issue at hand is: Who should make the decisions? It may depend on which enterprise has the best visibility on the supply chain, but that in turn depends on whether there is trust placed on this enterprise. For instance, in the automotive supply chain, tens of thousands of suppliers have been invited to join Covisint, an electronic exchange established by several international automakers in an effort to connect the entire automotive supply system. However, a lack of confidence in Covisint’s ability to deliver has turned off many lower-tier suppliers.

If supply chain partners rely on each other for inventory management, logistics, engineering innovation, and so on, they must realize that these processes and functions cannot be strengthened without mutual trust and cooperation. Today, it is no longer feasible to continue operation without partnering with members of a supply chain. Enterprises that are not willing to play in this new world are likely to fade into oblivion.

CONCLUSIONS

The competitive world we live in today requires that enterprises rethink their strategies. In the 21st century, the spotlight has shifted from competition between enterprises to competition between supply chains. Managers of enterprises have to contend with the fact that some of the biggest challenges they face in the new millennium relate to actions that must be coordinated jointly with their upstream or downstream partners, or both.

To promote effective supply chain partnering, some things need to be kept in mind:

- Enterprises need long-term partnerships with suppliers. That means they must move away from their traditional, adversarial, arms length relationships with suppliers towards more collaborative partnerships and strategic alliances.
Enterprises will gain from offering suppliers increased visibility on their production plans.

Trust must be built so that those sharing information do not have to be concerned about their own data being used against them. Trust is nourished by working with fewer suppliers on longer-term contracts.

Inventory should be maintained at strategic locations so as to minimize the total cost of holding inventory. The 3PLs can use their information and resources so that members in the supply chain can have the right product, in the right quantity, at the right place, when wanted.