
10.1 Supply Chains

A supply chain refers to the flow of materials, information, money, and services from raw material suppliers, through factories and warehouses, to the end customers. A supply chain also includes the organizations and processes that create and deliver products, information, and services to end customers.

The Structure and Components of Supply Chains

The term supply chain comes from a picture of how the partnering organizations are linked together. A typical supply chain, which links a company with its suppliers and its distributors and customers, is illustrated in Figure 10.1. Recall that Figure 2.2 also illustrated a supply chain in a slightly different way. Note that the supply chain involves three segments:

- 1. Upstream, where sourcing or procurement from external suppliers occurs.**
In this segment, supply chain (SC) managers select suppliers to deliver the goods and services the company needs to produce their product or service. Further, SC managers develop the pricing, delivery, and payment processes between a company and its suppliers. Included here are processes for managing inventory, receiving and verifying shipments, transferring goods to manufacturing facilities, and authorizing payments to suppliers.
- 2. Internal, where packaging, assembly, or manufacturing takes place.**
SC managers schedule the activities necessary for production, testing, packaging, and preparing goods for delivery. SC managers also monitor quality levels, production output, and worker productivity.
- 3. Downstream, where distribution takes place, frequently by external distributors.**
In this segment, SC managers coordinate the receipt of orders from customers, develop a network of warehouses, select carriers to deliver their products to customers, and develop invoicing systems to receive payments from customers.

The flow of information and goods can be bidirectional. For example, damaged or unwanted products can be returned, a process known as reverse logistics. Using the retail clothing industry as an example, reverse logistics would involve clothing that customers return, either because the item had defects or because the customer did not like the item.

Tiers of Suppliers. If you look closely at Figure 10.1, you will notice that there are several tiers of suppliers. As the diagram shows, a supplier may have one or more subsuppliers, and the subsupplier may have its own subsupplier(s), and so on. For example, with an automobile manufacturer, Tier 3 suppliers produce basic products such as glass, plastic, and rubber. Tier 2 suppliers use these inputs to make windshields, tires, and plastic moldings. Tier 1 suppliers produce integrated components such as dashboards and seat assemblies.

The Flows in the Supply Chain. There are typically three flows in the supply chain: materials, information, and financial. Material flows are the physical products, raw materials, supplies, and so forth that flow along the chain. Material flows also include reverse flows (or reverse logistics)—

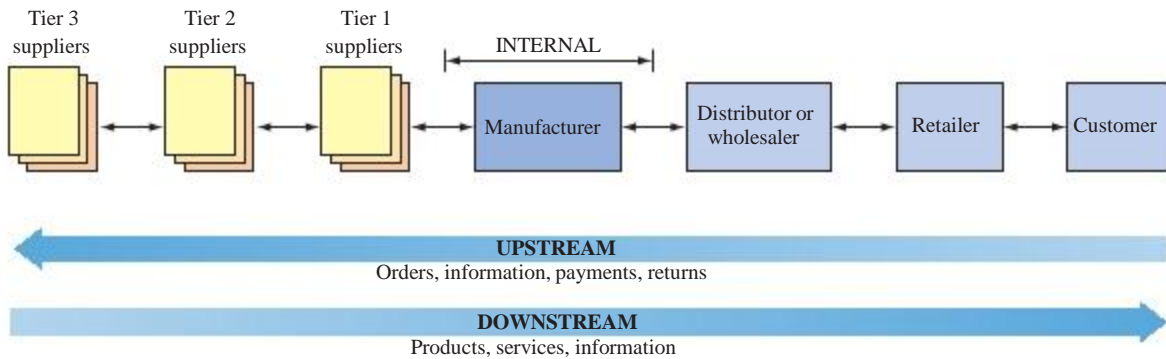


FIGURE 10.1 Generic supply chain.

returned products, recycled products, and disposal of materials or products. A supply chain thus involves a product life cycle approach, from “dirt to dust.”

Information flows consist of data that are related to demand, shipments, orders, returns, and schedules, as well as changes in any of these data. Finally, financial flows involve money transfers, payments, credit card information and authorization, payment schedules, e-payments, and credit-related data.

All supply chains do not have the same number and types of flows. For example, in service industries there may be no physical flow of materials, but frequently there is a flow of information, often in the form of documents (physical or electronic copies). In fact, the digitization of software, music, and other content may create a supply chain without any physical flow, as we saw with Disney in the chapter-opening case. Notice, however, that in such a case, there are two types of information flows: one that replaces materials flow (for example, digitized software) and one that provides the supporting information (orders, billing, and so on). To manage the supply chain an organization must coordinate all of the above flows among all of the parties involved in the chain.

Before You Go On . . .

1. What is a supply chain?
2. Describe the three segments of a supply chain.
3. Describe the flows in a supply chain.

10.2 Supply Chain Management

The function of **supply chain management (SCM)** is to plan, organize, and optimize the various activities performed along the supply chain. Like other functional areas, SCM utilizes information systems. The goal of SCM systems is to reduce the problems, or friction, along the supply chain. Friction can involve increased time, costs, and inventories as well as decreased customer satisfaction. SCM systems, then, reduce uncertainty and risks by decreasing inventory levels and cycle time and improving business processes and customer service. All of these benefits make the organization more profitable and competitive.

Significantly, SCM systems are a type of interorganizational information system. An **interorganizational information system (IOS)** involves information flows among two or more organizations. By connecting the information systems of business partners, IOSs enable the partners to perform a number of tasks:

- Reduce the costs of routine business transactions
- Improve the quality of the information flow by reducing or eliminating errors
- Compress the cycle time involved in fulfilling business transactions
- Eliminate paper processing and its associated inefficiencies and costs
- Make the transfer and processing of information easier for users

IT's About Business 10.1 illustrates these advantages as they apply to the supply chain of the Inditex Corporation.

IT's About Business

10.1 Supply Chain Management Drives the Success of Inditex

Spain's \$14 billion Inditex Corporation (www.inditex.com) is one of the world's largest fashion distributors, with eight [well-known](#) outlets: Zara (www.zara.com), Pull and Bear (www.pullandbear.com), Massimo Dutti (www.massimodutti.com), Bershka (www.bershka.com), Stradivarius (www.e-stradivarius.com), Oysho (www.oysho.com), Zara Home (www.zarahome.com), and Uterque (www.uterque.es). Inditex has more than 4,200 stores in 73 countries. The Inditex Group is comprised of more than 100 companies associated with the business of textile design, manufacturing, and distribution. The mission of Inditex is to produce creative and quality designs coupled with a rapid response to market demands.

Inditex, closing in on Gap as the world's largest clothing retailer, has nearly quadrupled sales, profits, and locations since 2000. What is the company's secret? Besides selling relatively inexpensive yet trendy clothes, the company closely monitors every link in its supply chain. As a result, Inditex can move designs [from](#) sketch pad to store rack in as little as two weeks. This "fast fashion" process has become a model for other apparel chains, such as Los Angeles-based Forever 21 (www.forever21.com), Spain's

Mango (www.mango.com), and Britain's Topshop (www.topshop.com).

[Inditex](#) has spent more than 30 years fine-tuning its strategy. At most clothing companies, [the](#) supply chain begins with designers, who plan collections as much as a year in advance. In contrast, Inditex store managers monitor daily sales. With up to 70 percent of their salaries coming from commission, managers have great incentive to respond to trends quickly and correctly. Thus, they track everything from current sales trends to merchandise that customers want but cannot find in stores. They then send orders to Inditex's 300 designers, who fashion what is needed almost instantly.

Apparel chains typically outsource the bulk of their production to low-cost countries in Asia. In contrast, Inditex produces half of its merchandise in Spain, Portugal, and Morocco, keeping the manufacturing of the most fashionable items in-house while buying basics such as T-shirts from shops in Eastern Europe, Africa, and Asia. Inditex also pays higher wages than its competitors. For example, its factory workers in Spain make an average of \$1650 per month, versus \$206 in China's Guandong Province, where other apparel companies have located their factories.

However, Inditex saves time and money on shipping. Also, their plants use just-in-time systems (discussed later in this chapter) developed in cooperation with logistics experts from Toyota Motor Company.

Inditex supplies all of its markets from warehouses in Spain, and the company is able to place new merchandise in European stores within 24 hours. Further, by flying goods via commercial airliners, Inditex can place new products in stores in the Americas and Asia in 48 hours or less. Shipping by air costs more than transporting bulk packages on ocean freighters, but Inditex can afford to do so. The company produces smaller batches of clothing, adding an air of exclusivity that encourages customers to shop often. As a result, the company does not have to cut prices by 50 percent, as its rivals often must, in order to move mass quantities of out-of-season stock. Because Inditex is more attuned to the most current looks, it can typically charge more than its competitors while reducing its fashion risk.

Sources: Compiled from K. Capell, “Zara Thrives By Breaking All the Rules,” *BusinessWeek*, October 20,

2008; “Spain’s Inditex Breaks All the Supply Chain Rules,” *WorldTrade Magazine*, October 11, 2008; “Fashion Goes 3D,” *Fortune*, September 26, 2008; J. Reingold, “The British (Retail) Invasion,” *Fortune*, July 3, 2008; “Zara’s Supply Chain Innovation,” *Kaleidoscope (www.kascope.com)*, December 3, 2007; T. Claburn, “Math Whizzes Turbocharge an Online Retailer’s Sales,” *InformationWeek*, October 5, 2007; “Merchants of Innovation,” *Crossroads 2007: Supply Chain Innovation Summit (MIT Center for Transportation and Logistics)*, March, 2007; K. Anderson and J. Lovejoy, “The Speeding Bullet: Zara’s Apparel Supply Chain,” *TechExchange*, March, 2007; “Zara Shows Supply Chain Future,” *BNET.com*, October 20, 2005; *www.inditex.com*, accessed January 20, 2009.

QUESTION S

1. Describe the “fast fashion” process at Inditex. How does supply chain management enable this process?
2. Why does Inditex not have to drastically cut prices to sell out-of-season stock?
3. Do you anticipate that other apparel firms will adopt similar SCM systems to Inditex? Why or why not?

The Push Model versus the Pull Model

Many supply chain management systems use the push model. In the **push model** (also known as make-to-stock), the production process begins with a forecast, which is simply an educated guess as to customer demand. The forecast must predict which products customers will want as well as the quantity of each product. The company then produces the amount of products in the forecast, typically by using mass production, and sells, or “pushes,” those products to consumers.

Unfortunately, these forecasts are often incorrect. Consider, for example, an automobile manufacturer that wants to produce a new car. Marketing managers do extensive research (customer surveys, analyses of competitors’ cars) and provide the results to forecasters. If the forecasters are too high in their prediction—that is, they predict that sales of the new car will be 200,000 and actual customer demand turns out to be 150,000—then the automaker has 50,000 cars in inventory and will incur large carrying costs. Further, the company will probably have to sell the excess cars at a discount.

From the opposite perspective, if the forecasters are too low in their prediction—that is, they predict that sales of the new car will be 150,000 and actual customer demand turns out to be 200,000—then the automaker will probably have to run extra shifts to meet the demand and thus will incur large overtime costs. Further, the company risks losing customers to competitors if the car they want is not available.

To avoid the uncertainties associated with the push model, many companies now use Web-enabled information flows to employ the pull model of supply chain management. In the **pull model**—also known as *make-to-order*—the production process begins with a customer order. Therefore, companies make only what customers want, a process closely aligned with mass customization.

A prominent example of a company that uses the pull model is Dell Computer. Dell's production process begins with a customer order. This order not only specifies the type of computer the customer wants, but it also alerts each Dell supplier as to the parts of the order for which that supplier is responsible. In that way, Dell's suppliers ship only the parts Dell needs to produce the computer.

Not all companies can use the pull model. Automobiles, for example, are far more complicated and more expensive than computers and require longer lead times to produce new models. However, using the push model in supply chain management can cause problems, as we see in the next section.

Problems Along the Supply Chain

As we discussed earlier, friction can develop within a supply chain. One major consequence of ineffective supply chains is poor customer service. In some cases, supply chains do not deliver products or services when and where customers—either individuals or businesses—need them. In other cases the supply chain provides poor-quality products. Other problems associated with friction are high inventory costs and loss of revenues.

The problems along the supply chain stem primarily from two sources: (1) uncertainties, and (2) the need to coordinate several activities, internal units, and business partners. A major source of supply chain uncertainties is the demand forecast. Demand for a product can be influenced by numerous factors such as competition, prices, weather conditions, technological developments, economic conditions, and customers' general confidence. Another uncertainty is delivery times, which depend on factors ranging from production machine failures to road construction and traffic jams. In addition, quality problems in materials and parts can create production delays, which also lead to supply chain problems.

One of the major challenges that managers face in setting accurate inventory levels throughout the supply chain is known as the **bullwhip effect**. The **bullwhip effect** refers to erratic shifts in orders up and down the supply chain (see Figure 10.2). Basically, the variables that affect customer demand can become magnified when they are viewed through the eyes of managers at each link in

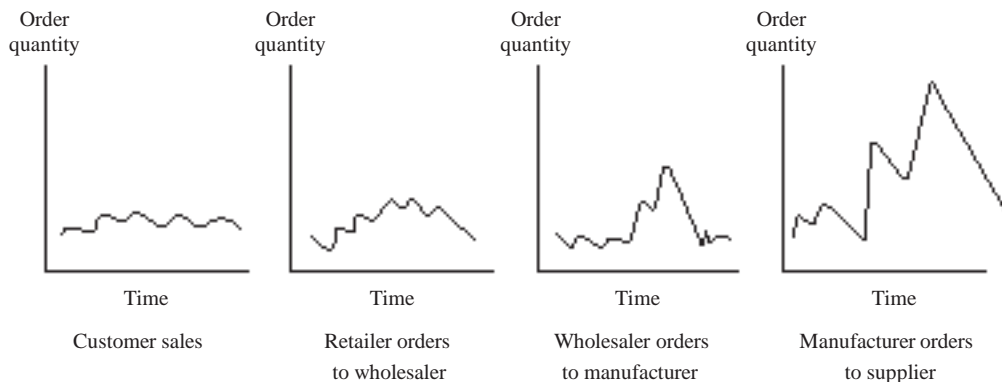


FIGURE 10.2 The bullwhip effect.

the supply chain. If each distinct entity that makes ordering and inventory decisions places its interests above those of the chain, then stockpiling can occur at as many as seven or eight locations along the chain. Research has shown that in some cases such hoarding has led to as much as a 100-day supply of inventory that is waiting “just in case” (versus 10–20 days under normal circumstances).

Another problem that can adversely affect supply chains is implementing an incorrect business model. IT’s About Business 10.2 shows how OfficeMax gained valuable benefits from its supply chain by redefining its business model.

IT’s About Business

10.2 OfficeMax Gets a Handle on Its Inventory

OfficeMax (www.officemax.com) is a leading retailer in the office products market, selling office supplies and equipment to both businesses and consumers. The company operates superstores in 49 states and in Latin America and employs more than 30,000 full- and part-time workers.

OfficeMax executives realize that there are many competing office supply stores where customers shop if the selection, service, or other factors are more attractive. In addition to this intense competition, unanticipated shifts in the market for computers and other business-related products, coupled with a consumer spending slowdown due to the contracting economy, forced the company to reconsider key elements of its strategy and to analyze its business operations.

This analysis revealed that the company’s business model was faulty. OfficeMax had established supply chain processes where its individual retail stores ordered products from suppliers, and the suppliers shipped products directly to the stores. This process, known as the direct-to-store environment, required individual stores to purchase goods in minimum quantities, which were determined by the supplier’s minimum-order quantities rather than the store’s needs. The direct-to-store environment created a situation in which actual inventory levels were too high for low-turnover items and too low for high-turnover items. Thus, OfficeMax regularly experienced shortages of high-demand items,

which caused customer dissatisfaction to rise to unacceptable levels. Additionally, the company had very high inventory carrying costs.

There were many other problems with the direct-to-store environment. The company had no intermediate distribution points, so its entire inventory had to be located in its stores. This problem was so acute that it affected store layouts. Stores had inventory stacked up to the ceiling, blocking much of the lighting. Not only did customers not like the dimness, but they complained that they had difficulty navigating through the store once they entered the “big valleys.”

In addition, associates in the stores had to manage inbound shipments rather than spending time with customers. Retail stores had to wait more than a month to receive replenishment stock, and individual stores received hundreds of small shipments every week. Further, the company could not take advantage of quantity pricing from suppliers because individual stores did not order enough products to qualify for quantity discounts. The suppliers were not satisfied either, because they had to ship to thousands of places, a very inefficient and expensive process.

To help overcome these numerous problems, OfficeMax developed a new supply chain model. The key component of the new model was the establishment of three large intermediate distribution centers to eliminate the direct shipment of products from vendors to stores.

Today, more than 95 percent of OfficeMax's inventory is replenished through these centers. This new arrangement has benefited the company in many ways. First, the distribution centers enable aggregation of demand across stores and have substantially reduced the number of deliveries to each store. Also, the replenishment cycle time for OfficeMax stores has improved from 35 days to 8 days. Finally, the company has reduced \$400 million in inventory.

Sources: Compiled from "mySAP Supply Chain Management at OfficeMax," SAP Case Study, www.sap.com,

accessed April 4, 2009; www.officemax.com, accessed March 15, 2009.

QUESTION S

1. Discuss the importance of analyzing a company's business model before analyzing its supply chain.
2. Describe the problems that OfficeMax experienced with its direct-to-store supply chain model.
3. Explain how the new supply chain model has benefited OfficeMax.

Solutions to Supply Chain Problems

Supply chain problems can be very costly. Therefore, organizations are motivated to find innovative solutions. During the oil crises of the 1970s, for example, Ryder Systems, a large trucking company, purchased a refinery to control the upstream part of the supply chain and to make certain it would have enough gasoline for its trucks. Ryder's decision to purchase a refinery is an example of vertical integration. **Vertical integration** is a business strategy in which a company buys its upstream suppliers to ensure that its essential supplies are available as soon as they are needed. Ryder later sold the refinery because it could not manage a business it did not know and because oil became more plentiful.

Ryder's decision to vertically integrate was not the optimal method to manage its supply chain. In the remainder of this section, we will look at some other possible solutions to supply chain problems, many of which are supported by IT.

Using Inventories to Solve Supply Chain Problems. Undoubtedly, the most common solution to supply chain problems is building inventories as insurance against supply chain uncertainties. The major problem with this approach is that it is very difficult to correctly determine inventory levels for each product and part. If inventory levels are set too high, the costs of keeping the inventory will greatly increase. (Also, as we have seen, excessive inventories at multiple points in the supply chain can result in the bullwhip effect.) If the inventory is too low, there is no insurance against high demand or slow delivery times. In such cases, customers don't receive what they want, when they want or need it. The result is lost customers and lost revenues. In either event, the total cost—including the costs of maintaining inventories, the costs of lost sales opportunities, and the costs of developing a bad reputation—can be very high. Thus, companies make major attempts to optimize and control inventories.

A well-known initiative to optimize and control inventories is the **just-in-time (JIT) inventory system**, which attempts to minimize inventories. That is, in a manufacturing process, JIT systems deliver the precise number of parts, called work-in-process inventory, to be assembled into a finished product at precisely the right time.

Information Sharing. Another common way to solve supply chain problems, and especially to improve demand forecasts, is sharing information along the supply chain. Information sharing can be facilitated by electronic data interchange and extranets, topics we discuss in the next section.

One of the most notable examples of information sharing occurs between large manufacturers and retailers. For example, Wal-Mart provides Procter & Gamble with access to daily sales information from every store for every item P&G makes for Wal-Mart. This access enables P&G to manage the inventory replenishment for Wal-Mart's stores. By monitoring inventory levels, P&G knows when inventories fall below the threshold for each product at any Wal-Mart store. These data trigger an immediate shipment.

Information sharing between Wal-Mart and P&G is done automatically. It is part of a vendor-managed inventory strategy. **Vendor-managed inventory (VMI)** occurs when a retailer does not manage the inventory for a particular product or group of products. Instead, the supplier manages the entire inventory process. P&G has similar agreements with other major retailers. The benefit for P&G is accurate and timely information on consumer demand for its products. Thus, P&G can plan production more accurately, minimizing the bullwhip effect.

Before You Go On . . .

1. Differentiate between the push model and the pull model.
2. Describe various problems that can occur along the supply chain.
3. Discuss [possible](#) solutions to problems along the supply chain.

10.3 Information Technology Support for Supply Chain Management

Clearly, SCM systems are essential to the successful operation of many businesses. As we discussed, these systems—and IOSs in general—rely on various forms of IT to resolve problems. Three technologies in particular provide support for IOSs and SCM systems: electronic data interchange, extranets, and Web services. We already discussed Web services in Chapter 5. In this section we examine the other two technologies.

Electronic Data Interchange (EDI)

Electronic data interchange (EDI) is a communication standard that enables business partners to exchange routine documents, such as purchasing orders, electronically. EDI formats these documents according to agreed-upon standards (for example, data formats). It then transmits messages using a converter, called a translator. The message travels over either a value-added network (VAN) or the Internet.

EDI provides many benefits compared with a manual delivery system (see Figure 10.3). To begin with, it minimizes data entry errors, because each entry is checked by the computer. In addition, the length of the message can be shorter, and the messages are secured. EDI also reduces cycle time, increases productivity, enhances customer service, and minimizes paper usage and storage.

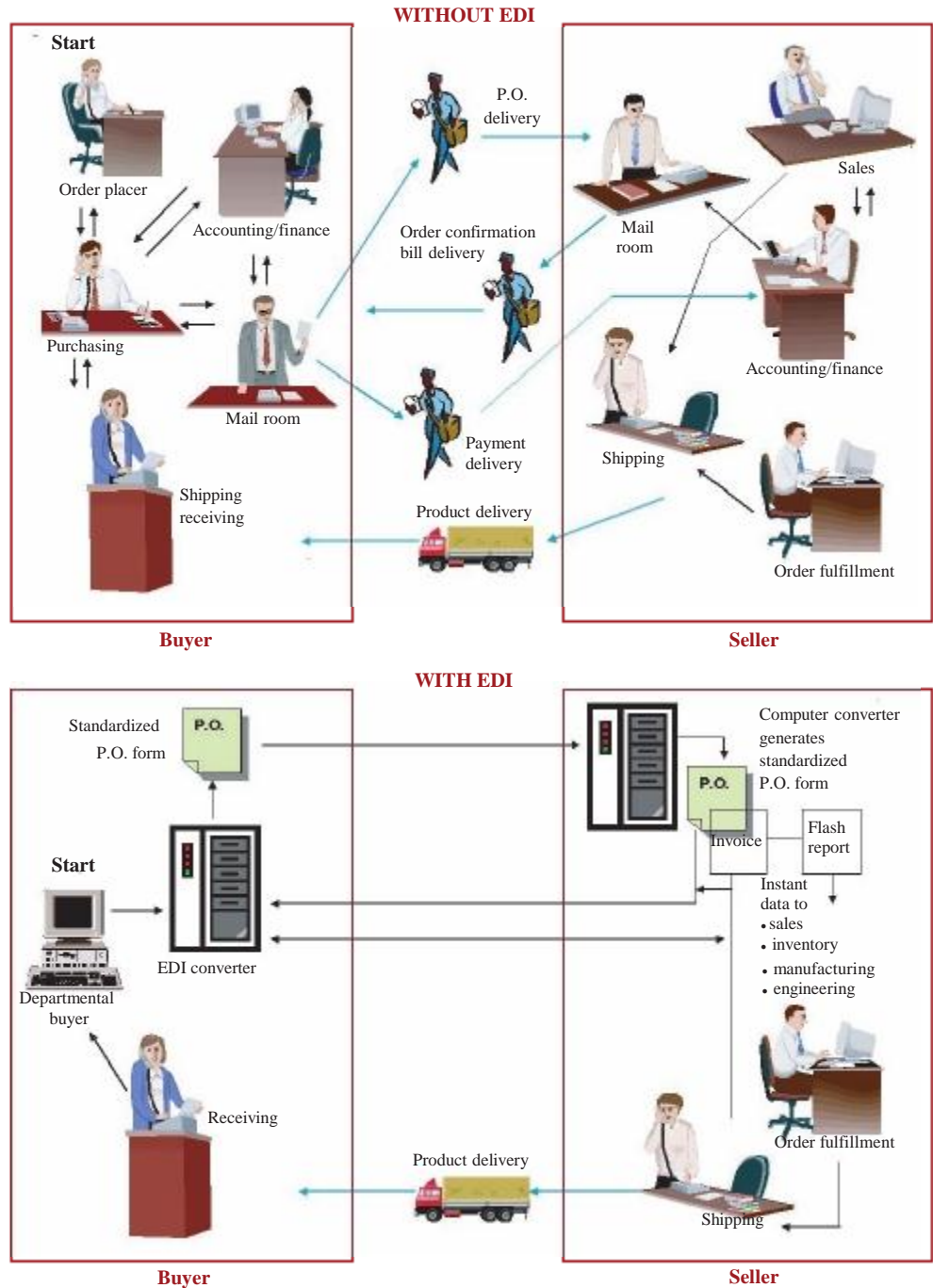


FIGURE 10.3 Comparing purchase order (PO) fulfillment with and without EDI. Source: Drawn by E. Turban.

Despite all of the advantages of EDI, several factors have prevented it from being more widely used. To begin with, implementing an EDI system involves a significant initial investment. In addition, the ongoing operating costs also are high, due to the use of expensive, private VANs. Another major issue for some companies is that the traditional EDI system is inflexible. For example, it is difficult to make quick changes, such as adding business partners. In addition, an EDI system

requires a long startup period. Further, business processes must sometimes be restructured to fit EDI requirements. Finally, there are many EDI standards in use today. As a result, one company might have to use several standards in order to communicate with different business partners.

EDI is especially problematic for small businesses, for several reasons. First, many EDI systems require support from specialized IT experts who spend an inordinate amount of time fine-tuning the data-exchange process. This requirement places the costs of implementing EDI beyond the reach of many smaller organizations. Another problem for smaller organizations arises if their larger supply chain partners mandated that all participants in their supply chains invest in and utilize EDI technology. Thus, smaller organizations must either adopt EDI technology, regardless of the cost, or lose significant business partners.

Despite these complications, EDI remains popular, particularly among major business partners, though it is being replaced by XML-based Web services. (We discuss XML in Technology Guide 2). In fact, many EDI service providers offer secure, low-cost EDI services over the Internet, as IT's About Business 10.3 shows.

IT's About Business

10.3 Mount Vernon Mills Adopts EDI

Mount Vernon Mills (www.mvmills.com) manufactures textile products for the apparel, industrial, institutional, and commercial markets. The company has approximately 3,600 employees and operates 14 production facilities in the U.S. The firm recently faced an EDI dilemma. On the one hand, could it afford to integrate EDI systems into its corporate IT infrastructure to support connectivity with its larger supply chain partners? On the other hand, would its smaller suppliers feel pressured or disenfranchised if the company moved to EDI as its preferred means of data exchange?

After extensive research into EDI systems, Mount Vernon Mills deployed EDI Integrator, a comprehensive EDI solution provider developed by EXTOL (www.extol.com). To implement EDI Integrator, Mount Vernon Mills had to upgrade its infrastructure and strategically realign its IT resources. To achieve these objectives, the company consolidated its IT resources into a

single location—its corporate headquarters in Maudlin, South Carolina. This process allowed the company to eliminate overhead and duplication of resources. Moreover, with the implementation of the new EDI system, all data from its supply chain partners were routed through a single location and a single system.

The EDI Integrator also enabled Mount Vernon Mills to exchange data instantaneously and cost effectively with its supply chain partners who were EDI-enabled. At the same time, the system was flexible enough to transmit nontraditional EDI documents such as spreadsheets, flat files, and even e-mails.

After the deployment was complete and the system was fully functional, Mount Vernon Mills was able to process orders much more efficiently. In addition, the system reduced the number of labor-intensive hours dedicated to re-entering hard copy data from both customers and suppliers.

Sources: Compiled from J. Utsler, "Grist for the Mill," IBM Systems Magazine, April 2009; "Mount Vernon Mills Selects EXTOL To Execute a Total Customer Satisfaction Supply Chain Strategy," EXTOL Customer Success Story, June 2008; www.mvmills.com and www.extol.com, accessed April 3, 2009.

QUESTIONS

1. Should a company ensure connectivity with larger supply chain partners at the risk of losing connectivity with smaller supply chain partners? Is there a middle ground? Support your answer.
2. What benefits did Mount Vernon Mills realize from implementing EDI?

Extranets

To implement IOSs and SCM systems, a company must connect the intranets of its various business partners to create extranets. As we have discussed in previous chapters, extranets link business partners to one another over the Internet by providing access to certain areas of one another's corporate intranets (see Figure 10.4).

The primary goal of extranets is to foster collaboration between and among business partners. An extranet is open to selected B2B suppliers, customers, and other business partners. These individuals access the extranet through the Internet. Extranets enable people who are located outside a company to work together with the company's internally located employees. An extranet also allows external business partners to enter the corporate intranet, via the Internet, to access data, place orders, check the status of those orders, communicate, and collaborate. It also enables partners to perform self-service activities such as checking inventory levels.

Extranets use virtual private network (VPN) technology to make communication over the Internet more secure. The Internet-based extranet is far less costly than proprietary networks. It is a nonproprietary technical tool that can support the rapid evolution of electronic communication and commerce. The major benefits of extranets are faster processes and information flow, improved order entry and customer service, lower costs (for example, for communications, travel, and administrative overhead), and an overall improvement in business effectiveness.

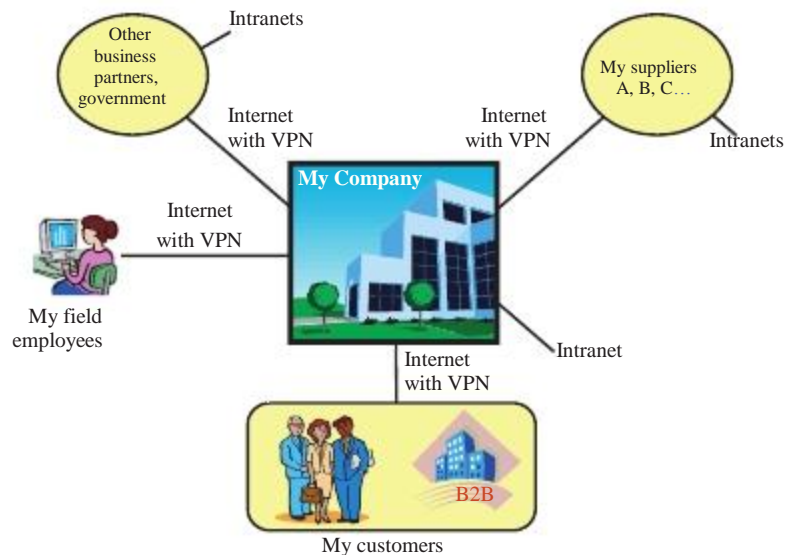


FIGURE 10.4
The structure of an extranet.

Types of Extranets. *There are three major types of extranets. Companies choose a particular type depending on the business partners involved and the purpose of the supply chain. We discuss each type below, along with its major business applications.*

A Company and Its Dealers, Customers, or Suppliers. *This type of extranet is centered around a single company. An example is the FedEx extranet that allows customers to track the status of a delivery. To do so, customers use the Internet to access a database on the FedEx intranet. By enabling a customer to check the location of a package, FedEx saves the cost of having a human operator perform that task over the phone.*

An Industry's Extranet. *Just as a single company can set up an extranet, the major players in an industry can team up to create an extranet that will benefit all of them. For example, ANXeBusiness (www.anx.com) enables companies to collaborate effectively through a network that provides a secure global medium for B2B information exchange. The ANX Network is used for mission-critical business transactions by leading international organizations in aerospace, automotive, chemical, electronics, financial services, healthcare, logistics, manufacturing, transportation and related industries. The network offers customers a reliable extranet and VPN services.*

Joint Ventures and Other Business Partnerships. *In this type of extranet, the partners in a joint venture use [the](#) extranet as a vehicle for communications and collaboration. An example is Bank of America's extranet for commercial loans. The partners involved in making these loans include a lender, a loan broker, an escrow company, and a title company. The extranet connects lenders, loan applicants, and the loan organizer, Bank of America. A similar case is Lending Tree (www.lendingtree.com), a company that provides mortgage quotes for your home and also sells mortgages online. Lending Tree uses an extranet for its business partners (for example, the lenders).*

Portals and Exchanges

As we discussed in Chapter 5, corporate portals offer a single point of access through a Web browser to critical business information in an organization. In the context of business-to-business supply chain management, these portals enable companies and their suppliers to collaborate very closely.

There are two basic types of corporate portals: procurement (sourcing) portals for a company's suppliers (upstream in the supply chain), and distribution portals for a company's customers (downstream in the supply chain). **Procurement portals** automate the business processes involved in purchasing or procuring products between a single buyer and multiple suppliers. For example, Boeing has deployed a procurement portal called the Boeing Supplier Portal through which it conducts business with its suppliers. **Distribution portals** automate the business processes involved in selling or distributing products from a single supplier to multiple buyers. For example, Dell services its business customers through its distribution portal at <http://premier.dell.com>. Portals provide an alternative to proprietary wide area networks.

Before You Go On . . .

1. Define EDI, and list its major benefits and limitations.
2. Define an extranet, and explain its infrastructure.