Chapter 5

Business-to-Business Strategies:
From Electronic Data Interchange to Electronic Commerce

At a Glance

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Chapter Overview

In this chapter, you will learn how companies use electronic commerce to improve their purchasing and logistics primary activities, and all of their support activities. Although the work might not be as glamorous as designing a Web site or creating an advertising campaign, the potential for cost reductions and business process improvements in purchasing, logistics, and support activities is tremendous. As Internet technologies become commonplace in businesses, the potential for synergies increases. Many of these synergies are forming the basis for second-wave electronic commerce opportunities. You will learn about a number of these second-wave opportunities in this chapter.

Chapter Objectives

In this chapter, you will learn about:

- Strategies that businesses use to improve purchasing, logistics, and other support activities
- Electronic data interchange and how it works
- How businesses have moved some of their electronic data interchange operations to the Internet
- Supply chain management and how businesses are using Internet technologies to improve it
- Electronic marketplaces and portals that make purchase-sale negotiations easier and more efficient

Instructor Notes

Purchasing, Logistics, and Support Activities

An emerging characteristic of purchasing, logistics, and support activities is that they need to be flexible. A purchasing or logistics strategy that works this year may not work next year. Fortunately, economic organizations are evolving from the hierarchical structures used since the Industrial Revolution to new, more flexible network structures. These network structures are, in many cases, made possible by the transaction cost reductions that companies realize when they use Internet and Web technologies to carry out business processes.

Purchasing Activities

Purchasing activities include identifying vendors, evaluating vendors, selecting specific products, placing orders, and resolving any issues that arise after receiving the ordered goods or services. These issues might include late deliveries, incorrect quantities, incorrect items, and defective
items. By monitoring all relevant elements of purchase transactions, purchasing managers can play an important role in maintaining and improving product quality and reducing cost.

**Direct vs. Indirect Materials Purchasing**

Businesses make a distinction between direct and indirect materials. Direct materials are those that become part of the finished product in a manufacturing process. Steel manufacturers, for example, consider the iron ore that they buy to be a direct material. The procurement process for direct materials is an important part of any manufacturing business because the cost of direct materials is usually a very large part of the cost of the finished product. Large manufacturing companies, such as auto manufacturers, engage in two types of direct materials purchasing. In the first type, called replenishment purchasing (or contract purchasing), the company negotiates long-term contracts for most of the materials that it will need. For example, an auto manufacturer estimates how many cars it will make during a year and contracts with two or three steel mills to supply most of the steel it will need to build those cars. By negotiating the contracts in advance and guaranteeing the purchase, the auto manufacturer obtains low prices and good delivery terms. Of course, actual demand never matches expected demand perfectly. If demand is higher than the auto company’s estimate, it must buy additional steel during the year. These purchases are made in a loosely organized market that includes steel mills, warehouses, speculators (who buy and sell contracts for future delivery of steel), and companies that have excess steel that they purchased on contract (demand for their products was lower than they had anticipated). This market is called a spot market, and buying in this market, the second type of direct materials purchasing, is called spot purchasing. Indirect materials are all other materials that the company purchases, including factory supplies such as sandpaper, hand tools, and replacement parts for manufacturing machinery.

**Logistics Activities**

The classic objective of logistics has always been to provide the right goods in the right quantities in the right place at the right time. Logistics management is an important support activity for both the sales and the purchasing activities in a company. Businesses need to ensure that the products they sell to customers are delivered on time and that the raw materials they buy from vendors and use to create their products arrive when needed. The management of materials as they go from the raw materials storage area through production processes to become finished goods is also an important part of logistics.

Logistics activities include managing the inbound movements of materials and supplies and the outbound movements of finished goods and services. Thus, receiving, warehousing, controlling inventory, scheduling and controlling vehicles, and distributing finished goods are all logistics activities. The Web and the Internet are providing an increasing number of opportunities to manage these activities better as they lower transaction costs and provide constant connectivity between firms engaged in logistics management.
Support Activities

Support activities include the general categories of finance and administration, human resources, and technology development. Finance and administration includes activities such as making payments, processing payments received from customers, planning capital expenditures, and budgeting and planning to ensure that sufficient funds will be available to meet the organization’s obligations as they come due. The operation of the computing infrastructure of the organization is also an administration activity. Human resources activities include hiring, training, and evaluating employees; administering benefits; and complying with government record-keeping regulations. Technology development can include a wide variety of activities, depending on the nature of the business or organization. It can include networking research scientists into virtual collaborative workgroups, posting research results, publishing research papers online, and providing connections to outside sources of research and development services.

E-Government

Although governments do not typically sell products or services to customers, they perform many functions for their stakeholders. Many of these functions can be enhanced by the use of electronic commerce. Governments also operate businesslike activities; for example, they employ people, buy supplies from vendors, and distribute benefit payments of many kinds. They also collect a variety of taxes and fees from their constituents. The use of electronic commerce by governments and government agencies to perform these functions is often called e-government.

Network Model of Economic Organization

One trend that is becoming clear in purchasing, logistics, and support activities is the shift away from hierarchical structures toward network structures. The traditional purchasing model had one hierarchically structured firm negotiating purchase terms with several similarly structured supplier firms, playing each supplier against the others. As is typical in a network organization, more businesses are now giving their Procurement Departments new tools to negotiate with suppliers, including the possibility of forming strategic alliances. For example, a buying firm might enter into an alliance with a supplier to develop a new technology that will reduce overall product costs. The technology development might be done by a third firm using research conducted by a fourth firm.

Quick Quiz

1. The part of procurement activity devoted to identifying suppliers and determining the qualifications of those suppliers is called _____.
   Answer: sourcing
2. The total dollar amount of the goods and services that a company buys during a year is called its _____.
   Answer: spend

3. _____ are those materials that become part of the finished product in a manufacturing process.
   Answer: Direct materials

4. Large companies usually assign responsibility for purchasing direct and indirect materials to separate departments.
   Answer: True

Electronic Data Interchange

Electronic data interchange (EDI) is a computer-to-computer transfer of business information between two businesses that uses a standard format of some kind. The two businesses that are exchanging information are trading partners. Firms that exchange data in specific standard formats are said to be EDI compatible. The business information exchanged is often transaction data; however, it can also include other information related to transactions, such as price quotes and order-status inquiries.

<table>
<thead>
<tr>
<th>Early Business Information Interchange Efforts:</th>
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<tbody>
<tr>
<td>♦ 1950s - Companies began to use computers to store and process internal transaction records.</td>
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<tr>
<td>♦ 1960s – Businesses that engaged in large volumes of transactions with each other had begun exchanging transaction information on punched cards or magnetic tape.</td>
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<tr>
<td>♦ 1968 - A number of freight and shipping companies joined together to form the Transportation Data Coordinating Committee (TDCC), which was charged with exploring ways to reduce the paperwork burden that shippers and carriers faced.</td>
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Teaching Tip:
♦ Discuss how EDI differs from traditional purchasing.
Emergence of Broader EDI Standards

After a decade of fragmented attempts at setting broader EDI standards, a number of industry groups and several large companies decided to mount a major effort to create a set of cross-industry standards for electronic components, mechanical equipment, and other widely used items. The American National Standards Institute (ANSI) has been the coordinating body for standards in the United States since 1918. ANSI does not set standards itself, but it has created a set of procedures for the development of national standards and it accredits committees that follow those procedures.

How EDI Works

Although the basic idea behind EDI is straightforward, its implementation can be complicated, even in fairly simple business situations. For example, consider a company that needs a replacement for one of its metal-cutting machines. This section describes the steps involved in making this purchase using a paper-based system, and then explains how the process would change using EDI.

Value-Added Networks

Trading partners can implement an EDI network and EDI translation processes in several ways. Each of these ways uses one of two basic approaches: direct connection or indirect connection. Direct connection EDI requires each business in the network to operate its own on-site EDI translator computer. These EDI translator computers are then connected directly to each other using modems and dial-up telephone lines or dedicated leased lines. The dial-up option becomes troublesome when customers or vendors are located in different time zones, and when transactions are time sensitive or high in volume. The dedicated leased-line option can become very expensive for businesses that must maintain many connections with customers or vendors. Trading partners that use different communications protocols can make either of the direct connection methods difficult to implement.

Instead of connecting directly to each of its trading partners, a company might decide to use the services of a value-added network. A value-added network (VAN) is a company that provides communications equipment, software, and skills needed to receive, store, and forward electronic messages that contain EDI transaction sets. To use the services of a VAN, a company must install EDI translator software that is compatible with the VAN. Often, the VAN supplies this software as part of its operating agreement.

To send an EDI transaction set to a trading partner, the VAN customer connects to the VAN using a dedicated or dial-up telephone line and then forwards the EDI formatted message to the VAN. The VAN logs the message and delivers it to the trading partner’s mailbox on the VAN computer. The trading partner then dials in to the VAN and retrieves its EDI-formatted messages from that mailbox. This approach is called indirect connection EDI because the trading partners pass messages through the VAN instead of connecting their computers directly to each other.
Advantages of Using a VAN:

- Users need to support only the VAN’s one communications protocol instead of many possible protocols used by trading partners.
- The VAN records message activity in an audit log. This VAN audit log becomes an independent record of transactions, and this record can be helpful in resolving disputes between trading partners.
- The VAN can provide translation between different transaction sets used by trading partners (for example, the VAN can translate an ASC X12 set into a UN/EDIFACT set).
- The VAN can perform automatic compliance checking to ensure that the transaction set is in the specified EDI format.

EDI on the Internet

As the Internet gained prominence as a tool for conducting business, trading partners using EDI began to view the Internet as a potential replacement for the expensive leased lines and dial-up connections required to support both direct and VAN-aided EDI. Companies that had been unable to afford EDI began to look at the Internet as an enabling technology that might get them back in the game of selling to large customers that demanded EDI capabilities from their suppliers.

Open Architecture of the Internet

In the mid-1990s, a number of firms began providing EDI services on the Internet. Companies that originally provided traditional VAN services now offer EDI on the Internet, along with a number of new companies that entered the market with their Internet EDI services. EDI on the Internet is called Internet EDI or Web EDI. It is also called open EDI because the Internet is an open architecture network. Many of the new EDI offerings go beyond traditional EDI and help trading partners accomplish information interchanges that are more complex than the EDI standard transaction sets.

Financial EDI

Although Internet EDI is growing and offering new, flexible information interchange solutions for many trading partners, some elements of EDI remain difficult to transfer to the Internet. The EDI transaction sets that provide instructions to a trading partner’s bank are called financial EDI (FEDI). All banks have the ability to perform electronic funds transfers (EFTs), which are the movement of money from one bank account to another. The bank accounts involved in EFTs may be customer accounts or the accounts that banks keep on their own behalf with each other. When EFTs involve two banks, they are executed using an automated clearing house (ACH) system, which is a service that banks use to manage their accounts with each other. In the United States, banks can use the ACH operated by the U.S. Federal Reserve Banks or one of the private ACHs operated by a group of banks or a separate company. EDI-capable banks are banks that are equipped to exchange payment and remittance data through VANs. Some banks also offer VAN services for nonfinancial transactions. These banks are called value-added banks (VABs).
Nonbank VANs that can translate financial transaction sets into ACH formats and transmit them to banks that are not EDI capable are sometimes called financial VANs (FVANs).

**Supply Chain Management Using Internet Technologies**

When companies integrate their supply management and logistics activities across multiple participants in a particular product’s supply chain, the job of managing that integration is called supply chain management. The ultimate goal of supply chain management is to achieve a higher-quality or lower-cost product at the end of the chain.

**Value Creation in the Supply Chain**

Supply chain management was originally developed as a way to reduce costs. It focused on very specific elements in the supply chain and tried to identify opportunities for process efficiency. Today, supply chain management is used to add value in the form of benefits to the ultimate consumer at the end of the supply chain. This requires a more holistic view of the entire supply chain than had been common in the early days of supply chain management.

Businesses that engage in supply chain management work to establish long-term relationships with a small number of very capable suppliers. These suppliers, called tier one suppliers, in turn, develop long-term relationships with a larger number of suppliers that provide components and raw materials to them. These tier two suppliers manage relationships with the next level of suppliers, called tier three suppliers, who provide them with components and raw materials. A key element of these relationships is trust between the parties. The long-term relationships created among participants in the supply chain are called supply alliances.

Clear communications, and quick responses to those communications, are a key element of successful supply chain management. Technologies, and especially the technologies of the Internet and the Web, can be very effective communications enhancers. For the first time, firms can effectively manage the details of their own internal processes and the processes of other members of their supply chains. Software that uses the Internet can help all members of the supply chain review past performance, monitor current performance, and predict when and how much of certain products need to be produced.

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<tr>
<th>Advantages of using Supply Chain Management:</th>
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<tr>
<td>Suppliers can:</td>
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<tr>
<td>♦ Share information about customer demand fluctuations.</td>
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<tr>
<td>♦ Receive rapid notification of product design changes and adjustments.</td>
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<tr>
<td>♦ Provide specifications and drawings more efficiently.</td>
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<tr>
<td>♦ Increase the speed of processing transactions.</td>
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<tr>
<td>♦ Reduce the cost of handling transactions.</td>
</tr>
<tr>
<td>♦ Reduce errors in entering transaction data.</td>
</tr>
<tr>
<td>♦ Share information about defect rates and types.</td>
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Issues Box: RFID Reshapes Supply Chain Management

RFID will be a major advance in supply chain management, but enterprises will need to do considerable upfront planning and testing to successfully implement and integrate the technology.

Although radio-frequency identification technology can be used in a broad range of applications, IT's focus right now should be on the supply chain. RFID will have a significant impact on every facet of supply chain management—from the mundane, such as moving goods through loading docks, to the complex, such as managing terabytes of data as information about goods on hand is collected in real time.

RFID will initially be used to manage the identification of large lots of goods—for example, at the pallet and carton levels. RFID tags, therefore, must have unique serial identifier information that associates each lot with a corresponding bill of lading sent from the originator. Because RFID readers can scan tags many times during a 1-second period, the serial identifier will prevent the application making the data request from getting multiple counts of the same items.

RFID tags are classified as passive or active. Passive tags work by taking the energy received from the reader through a tag's antenna and using that energy to transmit stored data back to the reader. Passive tags will likely be more widely used, at least at first, because of their low cost.

Active tags include their own power supply, usually a battery, to transmit information directly to a reader. The battery can also be used to help power or interact with other devices. For example, a company shipping perishable goods may want to use active tags that integrate with thermometers to ensure the goods are kept at an acceptable temperature.

RFID tags also have the potential, at the individual-item level, to store information that can be relevant to broader applications. For example, individual items with embedded RFID tags could contain information about warrantee and prior service to make it easier for companies to service those items.

Source: [http://www.eweek.com/article2/0,1759,1567819,00.asp](http://www.eweek.com/article2/0,1759,1567819,00.asp)
Questions

- What are the advantages and disadvantages of RFID?
- What do you think will be the impact of RFID on electronic commerce?
- Why do you think the focus of RFID should be on the supply chain?

Increasing Supply Chain Efficiencies

Many companies are using Internet and Web technologies to manage supply chains in ways that yield increases in efficiency throughout the chain. These companies have found ways to increase process speed, reduce costs, and increase manufacturing flexibility so that they can respond to changes in the quantity and nature of ultimate consumer demand.

Using Materials-Tracking Technologies with EDI and Electronic Commerce

In the second wave of electronic commerce, companies are integrating new types of tracking into their Internet-based materials-tracking systems. The most promising technology now being used is radio frequency identification devices (RFIDs), which are small chips that use radio transmissions to track inventory. RFID technology has existed for many years, but until recently, it required each RFID to have its own power supply (usually a battery).

Creating an Ultimate Consumer Orientation in the Supply Chain

One of the main goals of supply chain management is to help each company in the chain focus on meeting the needs of the consumer at the end of the supply chain. Companies in industries with long supply chains have, in the past, often found it difficult to maintain this customer focus, which is often called an ultimate consumer orientation. Instead, companies have directed their efforts toward meeting the needs of the next member in the supply chain. This short-sighted approach can cause companies to miss opportunities to add value in subsequent steps of the chain.

Building and Maintaining Trust in the Supply Chain

The major issue that most companies must deal with in forming supply chain alliances is developing trust. Continual communication and information sharing are key elements in building trust. Because the Internet and the Web provide excellent ways to communicate and share information, they offer new avenues for building trust. Most procurement professionals have built trust on years of doing business with the same vendors. In many industries, vendors send sales representatives to call on buyers regularly. Vendors also participate actively in trade shows and conferences. By giving buyers frequent opportunities to interact with vendor representatives, vendors help build trust.
Electronic Marketplaces and Portals

As with many electronic commerce predictions, the prediction that vertical portals would change business forever did not turn out to be exactly correct. In this section, you will learn how B2B electronic marketplaces were conceived, developed, and operated as this sector of electronic commerce matured from 1997 through the present.

Independent Industry Marketplaces

The first companies to launch industry hubs that followed the vertical portal model created trading exchanges that were focused on a particular industry. These vertical portals became known by various names that highlighted different elements of their collective nature, including industry marketplaces (focused on a single industry), independent exchanges (not controlled by a company that was an established buyer or seller in the industry), or public marketplaces (open to new buyers and sellers just entering the industry). These portals are also known collectively as independent industry marketplaces.

<table>
<thead>
<tr>
<th>Electronic Marketplaces and Portals:</th>
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<tbody>
<tr>
<td>♦ <strong>Private Stores</strong>: Has a password-protected entrance and offers negotiated price reductions on a limited selection of products.</td>
</tr>
<tr>
<td>♦ <strong>Customer portal sites</strong>: Offer private stores along with services such as part number cross-referencing, product usage guidelines, safety information, and other services that would be needlessly duplicated if the sellers were to participate in an industry marketplace.</td>
</tr>
<tr>
<td>♦ <strong>Private company marketplace</strong>: A marketplace that provides auctions, request for quote postings, and other features (many of which are similar to those of e-procurement software) to companies that want to operate their own marketplaces.</td>
</tr>
<tr>
<td>♦ <strong>Industry consortia-sponsored marketplace</strong>: A marketplace formed by several large buyers in a particular industry.</td>
</tr>
</tbody>
</table>

Teaching Tip: ♦ Examine the different marketplaces and their impact on purchasing/shopping and information gathering.

Quick Quiz

1. The long-term relationships created among participants in the supply chain are called _____.
   Answer: supply alliances
2. _____ sites offer private stores along with services such as part number cross-referencing, product usage guidelines, safety information, and other services that would be needlessly duplicated if the sellers were to participate in an industry marketplace.
   Answer: Customer portal

3. A(n) _____ is a marketplace that provides auctions, request for quote postings, and other features (many of which are similar to those of e-procurement software) to companies that want to operate their own marketplaces.
   Answer: private company marketplace

4. A(n) _____ is a marketplace formed by several large buyers in a particular industry.
   Answer: industry consortia-sponsored marketplace

5. True or False: Companies that implement e-procurement software usually require their suppliers to bid on their business.
   Answer: True

**Discussion Questions**

- What are the advantages and disadvantages of using a VAN?
- Why are many companies reluctant to use the Internet to transmit FEDI transaction sets that contain transfer instructions for large amounts of money?
- What are the obstacles to Internet EDI?

**Additional Resources**

- Value Added Networks: [http://www.computerworld.com/networkingtopics/networking/management/story/0,10801,98155,00.html](http://www.computerworld.com/networkingtopics/networking/management/story/0,10801,98155,00.html)

**Key Terms**

- **Contract purchasing**: Occurs when the company negotiates long-term contracts for most of the materials that it will need.
- **Customer portal sites**: Offer private stores along with services such as part number cross-referencing and product usage guidelines.
- **E-procurement**: The use of Internet technologies in procurement activities.
- **Financial EDI (FEDI)**: The EDI transaction sets that provide instructions to a trading partner’s bank.
- **Knowledge management**: The intentional collection, classification, and dissemination of information about a company, its products, and its processes.
- **Radio frequency identification device (RFID)**: Small chips that use radio transmissions to track inventory.