

Electronic Business

Chapter Outline

- Introduction, 429
- Selling Products Online, 432
 - Business to Consumer*, 433
 - Business to Business*, 438
 - The Production Chain and Disintermediation*, 440
 - Three Stages of a Purchase*, 443
 - Price Competition*, 444
- Services and Web 2.0, 446
 - Social Networking and Consumer Services*, 446
 - Digital Products*, 448
 - Business Services*, 449
 - Network Services*, 451
 - Search Engines*, 454
- Payment Mechanisms and Risk Mitigation in e-Commerce, 454
 - Payment Risks*, 455
 - Payment Mechanisms*, 456
- Advertising, 460
 - Traditional Media and Name Recognition*, 461
 - Web Advertisements*, 461
 - Privacy*, 466
- Developing and Hosting Web Sites, 467
 - Simple Static HTML*, 468
 - Web Auctions*, 470
 - Amazon WebStore*, 471
 - Auction versus WebStore*, 472
 - Web Commerce Servers*, 472
 - Content Management Systems*, 473
 - Application Service Providers*, 474
 - Web Hosting Summary*, 474
- Mobile Commerce, 476
- Taxes, 477
- Global Economy, 478
- Cloud Computing, 479
- Summary, 480
- Key Words, 481
- Web Site References, 481
- Review Questions, 482
- Exercises, 482
- Additional Reading, 484
- Cases: Retail Sales, 485

What You Will Learn in This Chapter

- How do you make money on the Internet?
- What types of products are sold online?
- How do Web-based services work and why do they change the world?
- How can customers pay for products and why do you need new payment mechanisms?
- How do firms get revenue from Web ads and how do customers find a site?
- How do you create an EC Web site?
- How do portable Internet connections (mobile phones) provide new ways to sell things?
- When do consumers and businesses pay sales taxes on the Internet?
- Does the Internet create a global marketplace?
- What are the costs for cloud computing?

Wal-Mart

How do retail stores handle transactions? Wal-Mart has grown to become not just the largest retailer but the largest company in the world. Each store is huge and sells hundreds of thousands of items a day. Each sale has to be recorded with absolutely no errors. Moreover, the store has to monitor sales and choose which products to order. Then it must monitor the progress of incoming items, compare the received items to each order, and resolve problems and errors. Wal-Mart has succeeded because it uses information technology to handle these operations at the lowest possible cost.

A retailer that focuses on low prices can never rest. It must continually search for new ways to reduce costs, improve store management, and choose the correct products to sell at the best price. Being the biggest provides several advantages—notably in terms of negotiations with suppliers. For these reasons, Wal-Mart is one of the companies leading the transition to radio frequency identification (RFID) chips. Initially, Wal-Mart is asking major suppliers to place the passive tags on pallets and major crates. The primary advantage is that the receiving docks can quickly scan incoming shipments and match the products to the individual orders. RFID tags carry more information and are easier to read than traditional bar codes.

Introduction

How do you make money on the Internet? In the late 1990s, the early days of the Web when millions of people first went online, thousands of companies were created to sell items on the Internet. Billions of investment dollars were spent by these firms developing new ways to conduct business on the Internet. Some managers loudly proclaimed the dawn of the “new economy” and the death of “bricks-and-mortar” companies. Most of these early firms focused on selling products to consumers—similar to existing mail order companies. In 2000 and 2001, hundreds of these firms crashed. Some managers then proclaimed the Internet dead. Yet, from the beginnings in the mid-1990s, sales using the Internet have increased—even faster than retail sales in general. The initial “irrational exuberance” (then-chairman of the Federal Reserve Alan Greenspan’s term) and consequent crash, highlight the importance of carefully addressing the question: exactly how can you use electronic business to make money? Wrong answers can be costly on both sides: wasting money on hopeless schemes or losing money by not using the Internet.

In the mid-2000s, attention and investment dollars returned to the Internet. This time focusing on firms specializing in new services, dubbed **Web 2.0**. Firms like YouTube, Flickr, Shutterfly, and social networking sites FaceBook and Twitter led the way by attracting millions of members. Following the first-round Web sites, many of these firms received millions of dollars from investors and many provide free access to consumers—relying on advertising to provide a revenue stream. There is no hard-and-fast definition of Web 2.0 firms, but the general distinction is that they provide specific services to consumers. Instead of providing products or information the sites generally provide a framework for interaction, and users provide content.

Trends

Largely because of transportation costs, consumers have been limited to purchasing products through local retail stores. Even for products produced elsewhere, it was generally cheaper to ship items in bulk to the retailer than to ship to individual customers. Plus, manufacturers and wholesalers did not want to deal with individual customers. They did not want to spend the money to create customer-service departments to handle thousands or millions of individual orders, returns, and complaints.

Eventually, shipping and transaction costs began to decline. Sears got its start and made its original reputation as a nationwide mail-order firm. Customers could now order thousands of products from a catalog and have them delivered. Over time, Sears found it profitable to build stores in thousands of cities and moved away from catalog sales. In the 1980s and 1990s, many other mail-order firms expanded to provide thousands of products direct from the manufacturer to the customer. While some people prefer shopping this way, only a fraction of total sales are made through mail-order companies. In 1998, mail-order sales were \$356 billion, or slightly over 3 percent of GDP.

Around 1997, sales over the Internet started to become important, and by 1999, e-commerce was the hot topic in the nation. By 2001, over 50 percent of U.S. households had access to the Internet and e-commerce, promising access to millions of customers. Hundreds of dot-com firms were funded with venture capital and early IPOs to define new ways to interact with customers and businesses over the Internet. Hundreds of paper billionaires were created as stock prices were driven by expectations and hype. Some people were saying that bricks-and-mortar traditional firms were dead. But in late 2000 and early 2001, hundreds of the dot-com start-ups failed, laying off thousands of workers and crashing the technology sector of the stock market. Investors are wary, but the Internet continues.

Cell phones began with slow, poor quality analog signals that were gradually replaced with the second generation digital phones by 2000. The third generation wireless phone will handle data and Internet access as well as voice. Portable data access can create new opportunities in mobile commerce to improve contact with customers. Entirely new applications can evolve from virtually immediate contact.

What is electronic business? E-commerce, or EC, can be hard to define. On the one hand, it could be defined as selling items on the Internet. But Figure 7.1 shows there are many aspects to business and many ways of using Internet technologies. Some writers refer to the broader concept as **e-business**. The main point is that EC represents considerably more functions than just putting up a Web site to describe or sell products. The fundamental goal of e-business is to increase sales and reduce costs by improving relationships with existing customers, and by reaching new customers and providing new services.

For at least the past 50 years, companies have followed and refined the modern business practices. These **business-to-consumer (B2C)** foundations were created to facilitate purchasing and distribution in a world with limited delivery systems and high communication costs. For example, retail stores for decades were small

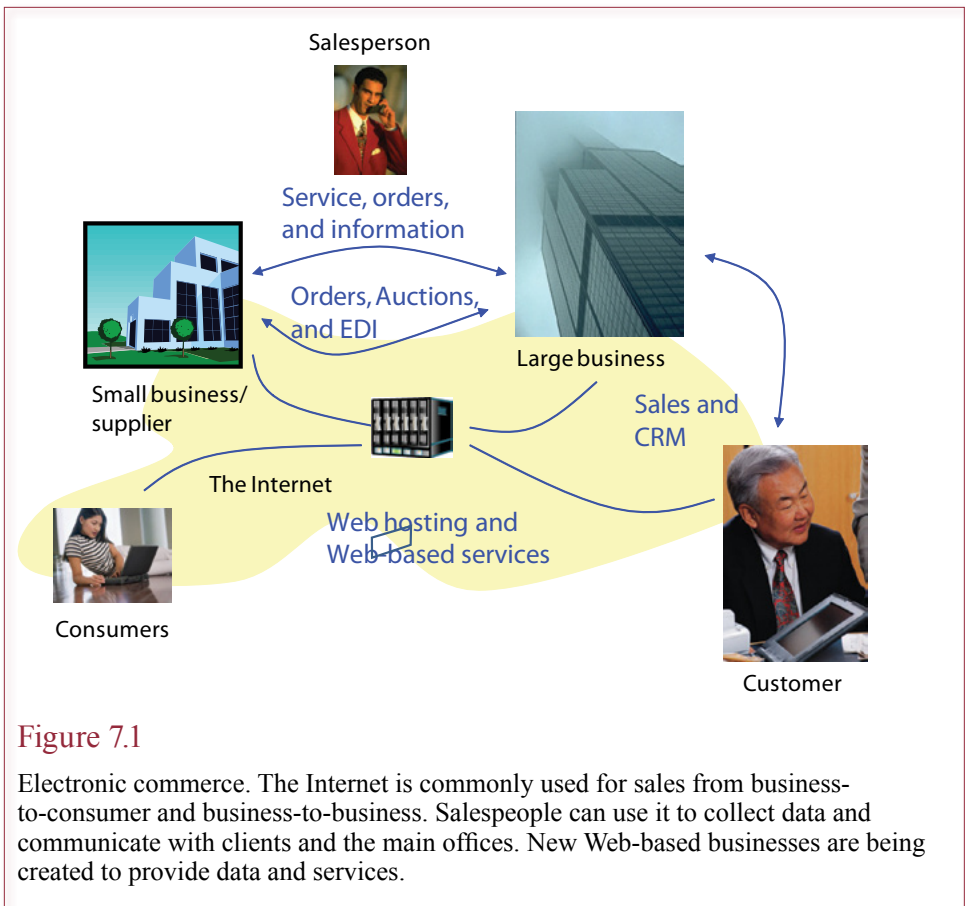


Figure 7.1

Electronic commerce. The Internet is commonly used for sales from business-to-consumer and business-to-business. Salespeople can use it to collect data and communicate with clients and the main offices. New Web-based businesses are being created to provide data and services.

local firms where owners recognized customer trends and ordered a specific mix of products. As manufacturing, transportation, and communication costs changed, some firms were early adopters and began to change retailing. For instance, Wal-Mart took advantage of size in purchasing and distribution to create giant retail stores with a relatively standard mix of products. The Internet provides even more possibilities for change. At a minimum, the Internet makes more information easily accessible to everyone. Now consumer can instantly search for products, obtain reviews, compare prices, and even get feedback from friends. Mobile phones—particularly those with bar-code reader applications—make these features instantly available, even while shopping in traditional stores. The accessibility of this information changes the relationships between consumers and sellers, which should eventually create changes in the way businesses operate.

On the business side, just-in-time inventory and EDI were only the beginning of a revolution in changing the ordering systems of manufacturers. Electronic marketplaces and auctions enable businesses to find new suppliers and obtain supplies on short notice. Sellers can find new customers and negotiate prices without expensive sales visits.

You should remember one important point: EC is not just an issue with new firms. In many ways, existing firms have the most to gain from EC, because they can leverage their existing strengths. **Business to business (B2B)** is also critical

	Business	Consumer
Business	B2B EDI Commodity auctions	B2C Consumer-oriented Sales Support
Consumer	C2B Minimal examples, possible contract employee sites such as rentacoder. com	C2C auction sites (eBay), but many of these are dominated by small business sales

Figure 7.2

E-commerce categories. E-commerce can be considered in the four categories shown. However, B2B and B2C are far more prevalent than consumer-led initiatives.

for existing firms because it can reduce costs and provide new options to managing purchases. Finally, the interactive aspects of EC will become increasingly useful for intranets to improve internal operations and facilitate human resources management.

Figure 7.2 shows a broader classification of e-commerce that includes B2B and B2C as well as consumer-led initiatives. The consumer issues C2B and C2C make up a minor portion of e-commerce. It is not even clear that good examples of these categories exist. Auctions sites, led by eBay, and social networking sites, are probably the best examples of C2C sites. Yet, the bulk of sales on eBay actually originate from small businesses, and consumers do not receive any of the revenue on social networking sites. It is even more difficult to find examples of C2B sites. Probably the best examples are contract employee sites such as vworker.com. Businesses (or sometimes individuals) post jobs online and potential workers submit a price to perform the specified task. Similarly, the job search sites might loosely be considered as C2B.

Eventually, the entire world changes when commerce systems change. But will the economy really change that far? Did the mass failure of the EC firms in 2000 and 2001 really mean that consumers prefer the traditional systems? These are the questions that make life fun and add the risk to entrepreneurship. You must understand the fundamentals before you can create your own answers to these puzzles and help shape the future of business.

Selling Products Online

What types of products are sold online? Selling products online is a natural extension of the catalog sales that existed years before the Internet was created. However, Web-based businesses can provide more pictures and descriptions. Customers can search for products and sizes. It is easier to update the data to provide new products. It is also easy to change prices or to tailor prices for different groups of customers. These factors alone would probably be enough to encourage more people to purchase goods online, but would not likely result in a huge gain in sales. Yet, as Figure 7.3 shows, U.S. Web sales increased by an average growth rate of over 22 percent from 2000 through 2010, according to

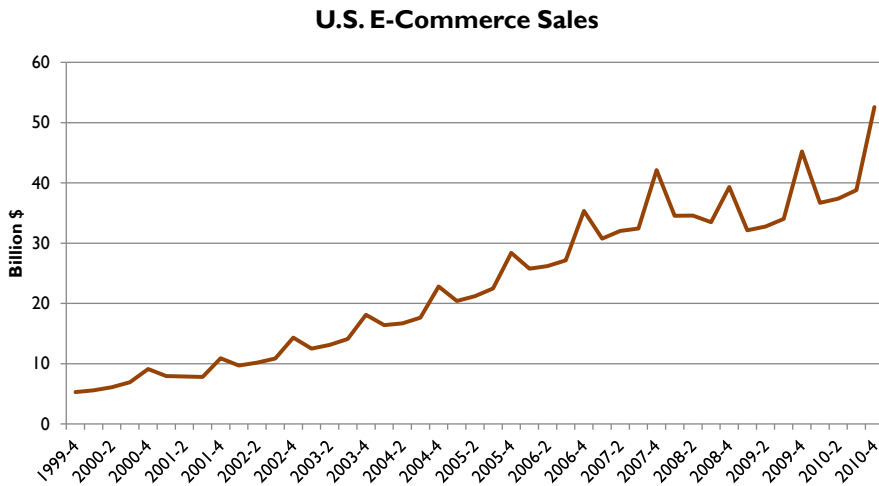


Figure 7.3

U.S. e-commerce retail sales. Census Bureau data show a 26 percent average annual increase. Sales for 2006-Q4 were 3.4 percent of total retail sales. Fourth quarter sales average about 31 percent of annual sales for e-commerce, compared to about 26 percent for total retail sales.

US Census Bureau data. In the fourth quarter of 2010, Internet sales comprised 5 percent of the total retail sales. Not enough to proclaim the demise of bricks and mortar stores, but a higher growth rate than expected from simply replacing mail order sales. Note that the Census data does not include travel, financial services, or B2B sales. One possible reason for the high growth rate might be the ability of the Web to help customers find products and compare prices from multiple vendors. Or, perhaps people simply want to purchase items from the comfort of their homes. However, even if the high growth rate continues, it would take at least 25 years for EC sales to catch up to retail sales. And, some products and services are unlikely to ever be purchased online. On the other hand, the Internet is heavily used for research even if the product is not purchased online (consider housing and automobiles).

To put the EC sales numbers in perspective, it is useful to consider one other piece of data. In the fourth quarter of 2010, Amazon reported sales of \$12.95 billion in their annual report. Compared to the total EC sales for that quarter of \$52.6 billion, Amazon alone had almost 25 percent of the online sales! Some of Amazon's sales revenue comes from services, but the percentage is relatively low. This large share partially exists because EC sales are still relatively new, and partially because Amazon handles retail sales for many other companies.

Business to Consumer

When asked about e-commerce, most people think of B2C. Everyone is a consumer, and it is easy to think about purchasing products and services over the Internet. But how is e-commerce different from traditional sales methods? And are there some products that people will not buy online?

Reality Bytes: Amazon Expenses

In November-December 2009, U.S. e-commerce retail sales not including travel hit a record \$32.6 billion, or an increase of 12 percent from 2008. For the fourth quarter of 2010 (October-December) Amazon's revenue was \$12.95 billion, for an increase of 36 percent. Think about those numbers for a second. Even assuming the U.S. sales for October were similar to the November and December values, Amazon captured over 25 percent of the U.S. online sales (not counting travel). To support its continuing expansion, Amazon added 13 distribution centers in 2009, giving it a total of 52 sites. These costs have impacted Amazon's profit, and the company's profits increased only 8 percent compared to the 36 percent increase in revenue. Some of the growth is fueled by digital products such as e-books, which now account for more sales than print books at Amazon. In other cases, simple convenience and searches encourage customers to shop online. Meaghan Keane, a Fairfield, CT nursing student noted that she did all of her holiday shopping online because "I was able to find all these different items that I wouldn't have even known where to look for in stores."

Adapted from Stu Woo, "Expenses Eat at Amazon's Profit," *The Wall Street Journal*, January 28, 2011.

A couple of simple rules dominate marketing. First, consumers prefer instant gratification. Given a choice, with everything else equal, consumers will choose the product at hand over one that will be delivered later. Related to this rule, consumers will often buy items on impulse—simply because they are available and enticing. Second, consumers will prefer to pay a lower total price. While this rule seems obvious, it can be difficult in practice. Consumers need to know that the products being compared are equal. They need to know what other products or suppliers exist and their prices. And they need to be able to compare total prices (including taxes and transportation). Third, consumers prefer to see and touch many products before they buy them. The real challenge in marketing is analyzing the trade-offs when all conditions are not equal.

Food, Clothing, Housing, and Transportation

In many ways, traditional products are the least likely to be successful in e-commerce—at least initially. Consider the four basic items on which people spend most of their income: food, clothing, shelter, and transportation. Distribution is the most critical issue with food. In the 1960s, when people lived closer together in central cities and small towns, neighborhood grocery stores provided basic food items within a short distance of many people. Yet these stores were inefficient because they could stock only a limited number of common items; and the delivery and inventory costs were high. Ultimately, large grocery chains that used their size to hold down costs, provide a large selection, and negotiate favorable terms with suppliers replaced the local stores. Consumers had to travel farther to these new stores, but they were willing to accept the distance to reduce costs. Small local stores were driven out. The two initial leading firms to sell groceries over the Internet were Peapod and Webvan. Customers placed orders on the Web site and drivers dropped off the purchases at a scheduled time, usually the next day. Customers paid a delivery charge for the service. Neither company was very successful in terms of profits. The increased costs, delivery time, and lack of ability to touch the items discouraged customers.

Reality Bytes: JCPenney's Gets Caught on the Dark Side

Search engine optimization (SEO) has become a popular topic among online vendors. The goal is to obtain as high a ranking as possible on Google and other search engines. If a site ranking closely matches a search term, it will be displayed at the top of the page automatically; without paying any money to Google. Some people spend a huge amount of time trying to determine how the search engines work. A few people spend huge amounts of time trying to figure out how to game the system and obtain a high ranking for their pages. But, trying to deceive the search engines is always a bad idea. Google succeeds only by returning accurate matches and deception can result in punishment. JCPenney's, an American department store, found out the hard way in 2010/2011. For several months in 2010, JCPenney's was at the top of the result lists for many products and even manufacturers. Apparently, the retailer tried every trick in the book to get its site listed first for hundreds of items—using methods that crossed the line to the dark side of SEO. Doug Pierce, an expert in searches, examined some of the company's practices and noted that “Actually, it's the most ambitious attempt I've ever heard of. This whole thing just blew me away. Especially for such a major brand. You'd think they would have people around them that would know better.” Eventually, Google altered its algorithms and also punished JCPenney's by forcing all of its entries to be buried several pages deep in the results. JCPenney's fired its SEO consultant. Google uses on links from other Web sites to help determine the content and importance of a site. Open Site Explorer helps identify when sites contain links to any given page. JCPenney's was paying people to post links to its pages. Google's terms of service allow it to punish any company it feels is not playing fairly. JCPenney also spent money on Google ads—as much as \$2.4 million a month. In 2006, Google penalized BMW for using a black-hat SEO strategy and basically removed the company from its search results. Overstock.com was similarly punished with a two-month downgrade in 2011 when Google found that Overstock was paying students to put links on their Web sites.

Adapted from David Segal, “The Dirty Little Secrets of Search,” *The New York Times*, February 12, 2011; and Julianne Pepitone, “Why Google Threw Overstock in the Penalty Box,” *CNN Online*, April 25, 2011.

A second way to look at EC and food is to realize that few families cook their own meals. Takeout from a variety of restaurants and even grocery stores is a popular substitute. Many restaurants—particularly pizzerias—deliver food on short notice with just a phone call. Would there be a reason to convert the phone system to an Internet connection? A few places do this, but many people still prefer phones. Theoretically, the Internet can provide menus and it is better at handling multiple customers at the same time. Furthermore, it could be used to provide feedback to the consumer—in terms of status of the order and when it will be delivered. But most restaurants are small businesses, and they have resisted building the infrastructure to provide these features.

Clothing offers more prospects for e-commerce. Selection is always an issue with local stores. No matter how large the store, it can carry only a small, targeted selection of styles and sizes. And larger selection means greater inventory costs. So, there is room for an EC firm to sell a wide selection of products across the nation. In fact, several catalog mail-order firms concentrate on these markets. These

Reality Bytes: Nestle v. Red Cross Tweets

Corporate marketing started to fall onto the social networking bandwagon by 2010. The adoption of Twitter made it temptingly easy to create a social image. Companies hired individuals and marketing firms to spread the news about the companies online. But, image is something that can be fleeting or at least easily affected by even simple mistakes. In 2010, Greenpeace convinced people to flood Nestle's Facebook page. Greenpeace objected to Nestle's use of palm oil which allegedly impacts habitat for orangutans. The organization encouraged supporters to flood Nestle's Facebook page and use profile pictures of altered Nestle logos. The person running the Nestle page responded by posting statements about taking down the negative comments. The response angered thousands of more people and the floods escalated. Eventually, the Nestle representative offered an apology, but the incident did not help the company's image. In contrast, someone @RedCross posted an accidental tweet "Ryan found two more 4 bottle packs of Dogfish Head's Midas Touch beer...when we drink we do it right #gettngslizzerd." An official response came quickly from @RedCross with the tweet "We've deleted the rogue tweet but rest assured the Red Cross is sober and we've confiscated the keys." Dog Fish beer fans latched onto the #gettngslizzerd hashtag, and breweries and pubs in many states launched beer-for-blood offers, increasing awareness and donations to the Red Cross. Other examples of good and bad responses exist, and new ones are likely to arise. Few rules exist in social networks, and tastes change. But, building a loyal following and using light humor are generally good ideas—particularly when something goes wrong.

Adapted from Julianna Pepitone, "6 Painful Social Media Screwups," *CNN Online*, April 7, 2011.

mail-order companies have also been relatively successful at e-commerce. The one problem is that clothing sizes are not quite standardized. Hence, many shoppers—particularly women—prefer to try on clothing before purchasing it. Some leading sites like Lands' End have implemented electronic virtual models that enable customers to select items and see how they might look. But many people prefer touching the individual garments first. Still, the ability to search for styles and sizes makes the Web a useful tool. And many consumers learn to trust certain brand names, so they search the Web for those specific brands.

Finding a home is always a difficult task. A medium-size city might have thousands of homes for sale at one point in time. It is hard to find and compare all of the details. The Internet has helped in some respects. Searching is an important strength of the Internet. Several real estate databases exist online to retrieve house listings based on a variety of items. However, almost no one would buy a house without seeing it in person; so the role of the Internet is limited. At first glance, it would seem that real estate might be a prime opportunity for e-commerce. Real estate commissions are often priced at 6 percent of the sale price, which can be a high value for expensive houses. So there should be strong incentives for removing the commissioned agent from the middle of the transaction. But buyers often prefer to use agents. Real estate agencies control most of the housing market data and they have resisted moving to an online world—particularly one that might result in a reduction in the commission rates. However, the Zillow.com site offers several interesting features that might enable it to encroach on the traditional retail listings.

Reality Bytes: Even the Best Fall Down Sometimes

As an early adopter and leading e-commerce company, Amazon runs one of the most sophisticated cloud-hosting services on the Internet. Several big-name Web-based companies rely on Amazon's servers to run their operations. On April 21, 2011, Amazon suffered a collapse of its internal network in its East Coast facilities. The disruption knocked out or slowed service to Internet service firms such as Foursquare, Reddit, and Quora. Despite early optimism, it took Amazon engineers several days to fully restore service. Amazon posted a detailed explanation of the problem after the site was restored. Interestingly, the problem arose partly because of the redundancy built into the EC2 facilities. A misconfigured router shifted traffic to a slow internal network and datasets were unable to connect to their replica backups. Even when the router configuration was fixed, essentially every dataset tried to re-establish a new backup copy—flooding the data controllers. With this knowledge, Amazon began rebuilding its systems to prevent similar problems.

Adapted from Shara Tibken, "Amazon Cloud Snafu Disrupts Websites," *The Wall Street Journal*, April 21, 2011 and <http://aws.amazon.com/message/65648/>.

Transportation is more interesting because it can be a product (automobile) or a service (airplane or subway ticket). Airlines have done well with direct e-commerce sales. Yes, they have offended the traditional distribution channel (travel agents), but the people who travel the most have been willing to purchase tickets directly to save money and gain control over their choices. Today, almost all airline tickets are sold online.

Automobiles are more interesting. Few people are willing to buy new automobiles over the Internet, but Web sites offering searches for specific used cars are popular. Part of the difference is that consumers have greater bargaining power with used automobiles than with new ones, so the increased information on available cars gives them more leverage. If one owner or dealer offers a high price for a specific car, you can quickly find another one. New cars are more challenging because of the strong relationship between the few manufacturers and the dealers.

Most people want to test-drive a car before they buy it, so the manufacturers have a strong incentive to keep the dealer network. Many insiders also believe that the salesperson is critical to selling cars, by overcoming objections and talking people into buying cars when they hesitate. So, if dealers and showrooms are necessary, what is the value of e-commerce in selling a car? Both General Motors and Ford have experimented with online sales of new cars, with minimal success. Currently, the auto manufacturers prefer to sell through the dealers. A few states actually have laws that prohibit auto manufacturers from selling directly to the public. While the manufacturers want to keep the advantages of the dealers, they also want to find a more efficient method to distribute cars. Manufacturers have talked about an Internet-based build-to-order system, where customers could select options and cars would be made to order. A few larger regional dealers would maintain basic inventory to support test-drives. The advantage of this system would be to reduce inventories and enable manufacturers to build only the number of cars that are needed. The main drawback is the difficulty in configuring assembly lines quickly enough to hold costs down.

On the other hand, used cars present a different situation. Buyers have embraced the Internet as a method to locate used cars and compare prices. Sellers find it a useful tool to avoid the high prices of newspaper advertising—particularly since it is inexpensive to place photos on Web sites.

The point of these examples is that without substantial changes in behavior, people will continue to prefer the traditional sales mechanisms. Particularly since these mechanisms have proven to be relatively efficient—or closely controlled by a group with a strong interest in maintaining the current system.

Product Characteristics for Online Sales

So, is the world really so bleak that B2C e-commerce is doomed to fail? What about Amazon.com, one of the larger retailers on the Internet? By selling commodities, they avoid the problem of choosing products. The latest best-selling novel is the same regardless of where it is purchased, so consumers do not need to see and touch it before purchasing it. Besides, Amazon.com can offer a wide selection of titles. It can also make it easier to find books and does a good job offering related products that might interest the consumer. But the concept is still hobbled by the distribution problem—it takes time to deliver a book or CD to the customer. So, online vendors like Amazon.com compensate by offering larger selections than those found at a traditional local store. Amazon also discounts some items to encourage people to accept the delivery delay. But, to achieve profits, around 2003, Amazon began charging list price for mass-market paperback books—which represent a substantial percentage of most book sales. Amazon has also been one of the leaders in the switch to digital books—largely by offering their own e-book reader (Kindle) at declining prices.

To find successful B2C strategies, you need to look at the features that the Internet provides that are superior to traditional stores. The most important ones are the: (1) search technologies, (2) ability to quickly compare multiple products and vendors, (3) low costs for large amounts of information, (4) ability to reach a wide audience, and (5) ability to tailor responses to individual customers.

The essence of a profitable Web site for products is to identify items that can benefit most from these features. For example, specialty products can be hard to find. A few firms could reach a national audience using EC and capture most of the market by being easy to find and offering competitive prices. Another approach is to offer products with many options that require customization. Dell has been successful at selling computers over the Internet by making it easy to configure and compare prices and by using modern production technologies to hold costs down so that the EC solution highlights their prices.

Look at the EC sales data one more time and realize that almost one-third of the sales take place in the fourth-quarter, year-end, holiday shopping season. People are searching for specific items. They might want unique items, or they might search based on availability or the lowest price. Of course, the types of items that fit these categories are also items that are likely to be purchased online during the rest of the year.

Business to Business

Business-to-business e-commerce has the potential to be more important than B2C e-commerce. First, businesses tend to buy repeat items in bulk, so they do not need to test-drive or touch every product. Second, medium and large businesses already have high-speed connections to the Internet and rely on computer

systems in their daily operations. Third, costs are becoming a driving factor, and technology can reduce the transaction costs and the number of errors.

Extended EDI

By simply offering the ability to sell products to other businesses, the Internet can be used for EDI. For materials and components that are purchased on a regular basis, EDI software can connect across the Internet to automatically monitor inventory and send orders to the appropriate company. For less frequent purchases, a buying firm could set up software to scan servers for prices, select the appropriate items, and place orders automatically.

Currently, few systems work this efficiently. Most require a human to collect data and place orders. Web sites make it easier to collect data on prices and availability, but every site has different search methods and different purchase screens. EDI software helps by following standards, but the companies involved must install and configure it. XML is a more flexible method of sharing data with suppliers and customers. Eventually, the technology can be married with expert systems to provide more automated intelligence to handle ordering basic items and to monitor the progress of standard orders.

Some companies, such as Office Depot, have leveraged the Web to lock-in business customers. Companies sign up with Office Depot and employees place orders for office supplies directly on the Office Depot Web site. Office Depot delivers the products on a daily basis and bills the company for all purchases. It is not exactly EDI, but a simpler method to connect directly to customers. Most ERP systems provide these capabilities, so almost any business can create Web sites that enable business customers to order directly.

Auctions

From an economic perspective, B2B auctions are one of the most exciting tools created through e-commerce. In the past, companies purchased materials and supplies from a complex set of distributors and wholesalers, driven by in-person sales calls. Within this context, most manufacturers dealt with only one or two suppliers for each part. To hold down transaction costs, it was simpler to establish long-term relationships with a limited number of companies. Of course, it made it harder to ensure that the buyers were getting the best price. Competition helps hold down prices during the initial contract negotiations, but if anything changes in the ensuing year or two, it is difficult to renegotiate the contract. But in exchange, the buyer gains a more stable environment.

Economic theory shows that well-run auctions are the most efficient way to establish an efficient market price. To be well run, the auctions have to be open to the widest range of participants, and everyone must have complete information on the items and prices. Several industry-specific auction sites have been established. One of the more successful sites involves the steel industry. Significant amounts of steel are still sold directly to manufacturers on long-term contracts. However, the auction sites make it easier for suppliers to unload specialty and overstocked inventory in a spot market. The auctions also give manufacturers the ability to monitor the spot market and availability of steel products, so that they can quickly pick up additional quantity.

For commodity items, auctions can hold down prices by improving competition and making price and quantity data available to all participants. Auctions are also useful for specialized products, when it is difficult to determine an asking price.

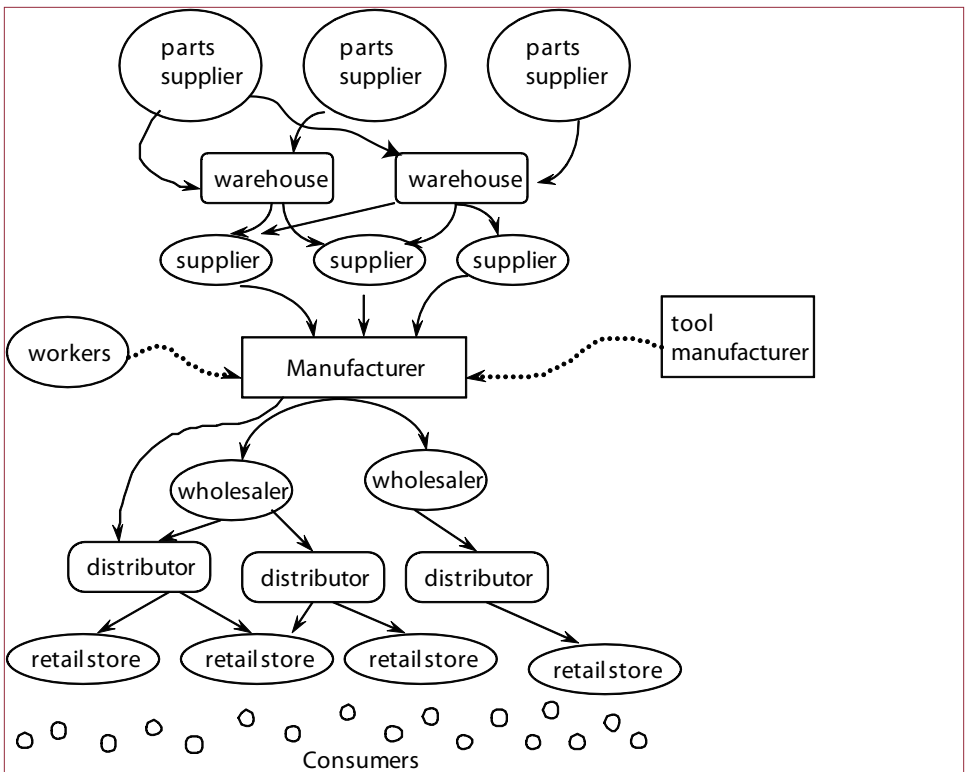


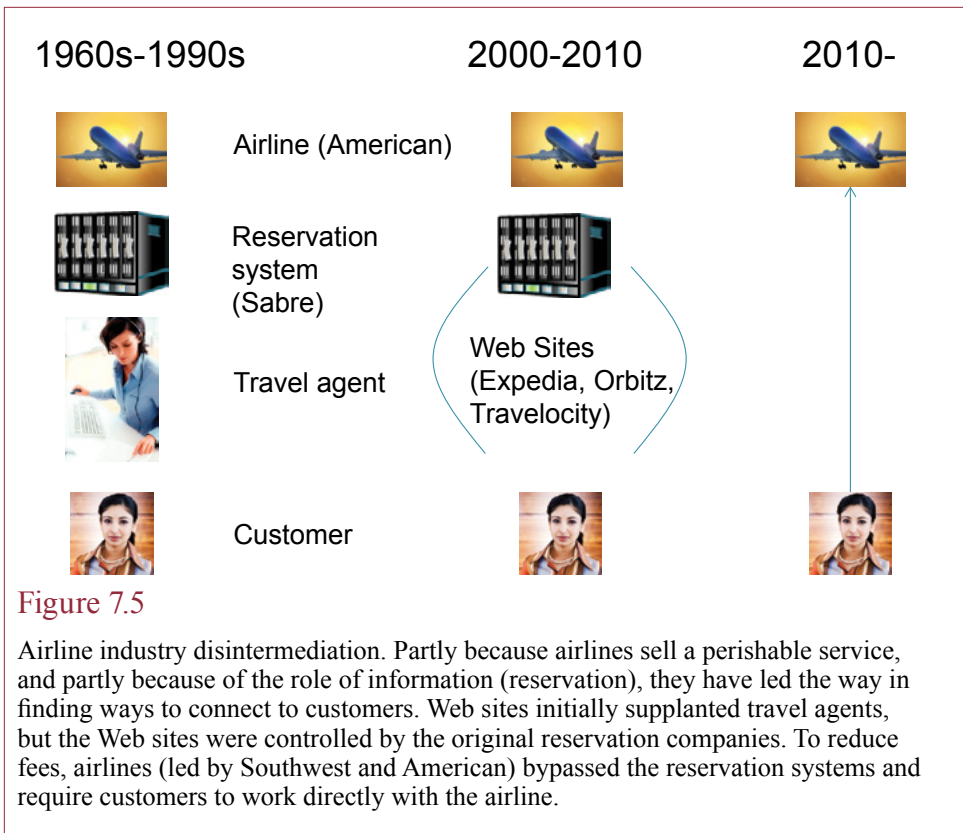
Figure 7.4

Production chain. The production chain is important to EC because EC offers the ability to skip elements of the chain. It also makes it easier to reach new customers at any level in the chain.

Some companies have found that they can obtain higher prices for their products when they sell them at auction. Also, auction prices can change easily, so if there is a short-term jump in demand for your product, you will be able to capture the additional profit. Of course, you might have to accept lower prices the next day.

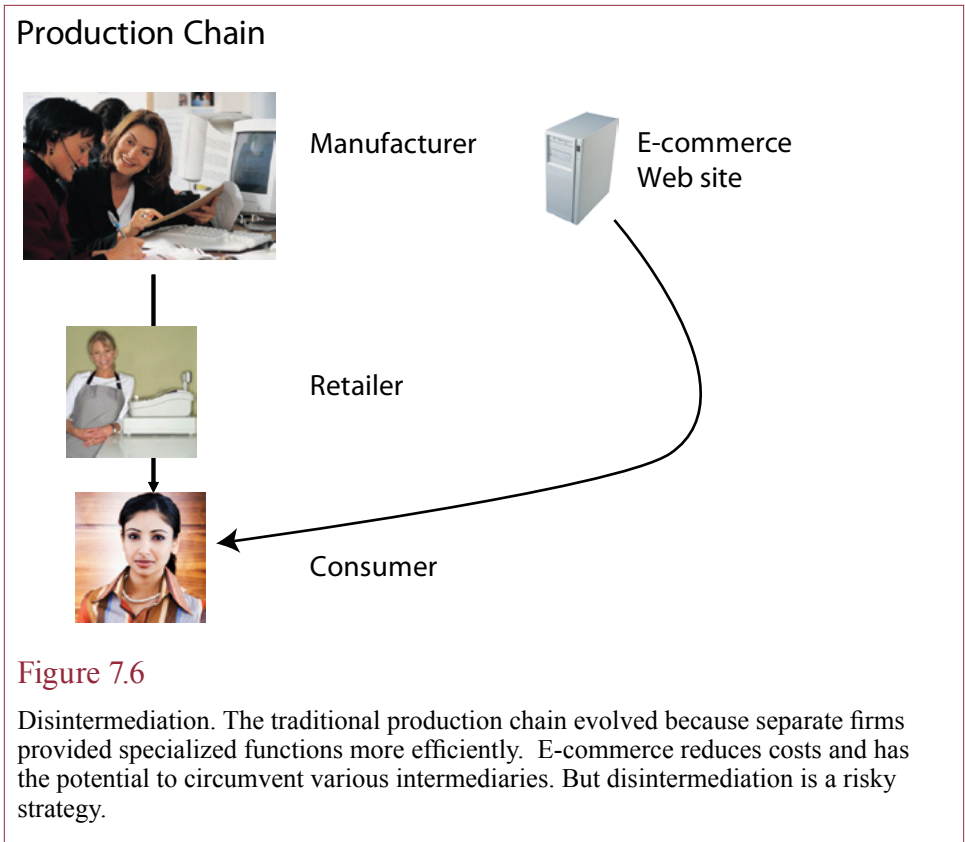
The Production Chain and Disintermediation

What problems might arise from shifting sales to the Internet? To understand the issues in EC, you must first understand the production chain. Shown in Figure 7.4, the strategic effects are important to EC. One of the key aspects in B2C e-commerce is the ability to bypass entire sections of the production chain. Consider the situation of airlines. In the 1960s and 1970s, airlines created giant reservation systems to handle flight bookings. The system consisted of the airlines' massive central computers and databases and travel agent terminals connected by a custom network. It was too expensive for customers to connect directly. Also, the systems were hard to use and travel agents needed special training. Agents were paid a commission based on the value of the flights booked through the reservation system paid by the airlines. With the advent of frequent-flyer miles, airlines encouraged consumers to book flights with the airline itself, bypassing the travel agent and saving the cost of the commission. But it is difficult to search for flights using



the telephone. The Internet changed everything. Several travel sites and the airline sites themselves make it easy to find flights, compare prices, and purchase a ticket any time of day without the assistance of an overworked travel agent or salesperson. Tickets are merely electronic reservation numbers, where you simply show appropriate identification at the airport. On the production chain, the airlines (as service providers) bypassed the intermediaries to sell directly to the consumer—a process known as **disintermediation**.

As shown in Figure 7.5, for a few years, most of the airline industry relied on a few companies to provide data and reservation services to various Web sites. These companies were the same reservation systems originally created by the airlines, including Sabre created by American Airlines, and spun off. In 2010, the disintermediation extended further when American Airlines, in a dispute with the reservation companies (including Sabre), pulled all of their data from the online systems and required customers to book online directly with the airline. Southwest Airline had long followed a similar practice—to avoid the fees paid to the reservation companies. One effect of this change is that it is more difficult for consumers to find and compare flight costs. If all airlines require individuals to connect directly, a search would require checking every airline separately. Eventually, a consolidator might be able to search and display data from multiple sites, but the airlines will be reluctant to pay the fees, so the consolidator would have to find another way to make money.



A similar process can occur in manufacturing. Instead of wholesalers, purchasing agents and suppliers are forming B2B auction sites. Companies can sell or buy products and materials on a variety of Web sites. Instead of searching out buyers or sellers, businesses simply submit a bid on a Web site that covers the desired product.

Today, it is rare for a company to be vertically integrated across the production chain. For example, most manufacturers rely on other firms to handle distribution and retail sales. In a sense, they choose to outsource these functions because of the costs. Over the last 50 years or so, firms have worked to become more efficient within their niche. As shown in Figure 7.6, e-commerce has the potential to change these relationships. By reducing the costs of dealing with individual customers, it becomes possible for firms to circumvent the retailers and sell directly to the end consumer. Since retail price markups can be in the range of 100 percent, the manufacturer has a strong incentive to sell directly to the public to capture some of this additional profit.

However, particularly in these early days of e-commerce, many manufacturers are reluctant to remove the retail role. Taking sales away from the established retail channel could alienate the retailers, who are currently responsible for almost all of the sales. If retailers decide to drop your product, and consumers are slow to switch to direct purchases, you may lose the market.

Interrelationship with the existing retail distribution channel is a critical factor in any e-commerce strategy. Removing an intermediary can increase your profits

Prepurchase	Purchase	Postpurchase
Static data sites Promotion Product specifications Pictures Schematics Pricing FAQs Interactive sites Configuration Compatibility Complex pricing	Transmission security User identification Product selection Payment validation Order confirmation	Service Problem tracking Sales leads Resolve problems Answer questions Product evaluation Modifications Tracking customers

Figure 7.7

Electronic commerce. Websites are commonly used to support the three main phases of marketing.

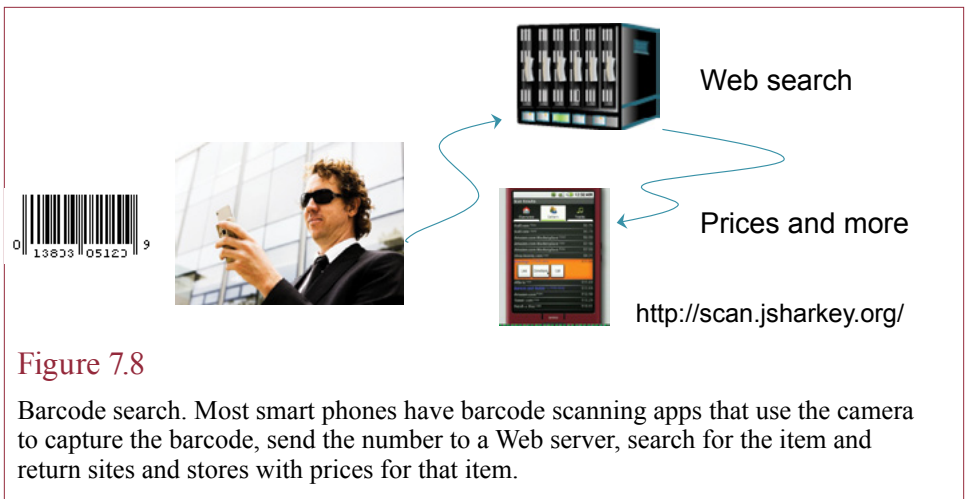
and can be used to reduce prices to capture more market share. But is the intermediary a critical component? Will your sales remain if you remove it? Are customers ready to switch to direct purchases? Some firms attempt to do both: keep sales through traditional channels and also provide direct e-commerce sales through a Web site. But they minimize competition and appease the retailers by charging the suggested retail price on the Web site. So, consumers can often find the product cheaper at a local store—which is willing to offer a discount on the list price.

In some situations, the reliance on the retail channel leads to strange conclusions. In early 2001, Compaq was producing a popular PDA with a color screen. But Compaq had trouble with production and demand was substantially higher than supply. Consequently, few retailers carried the product. Some of the businesses that were able to obtain the product did not bother to sell it at their local stores. Instead, they auctioned the units individually on eBay for several hundred dollars over the list price. Would Compaq have been better off auctioning the PDAs directly to consumers?

Three Stages of a Purchase

How do you use the Internet to market goods and services? From a marketing perspective, the buying process has been defined in three basic steps: (1) prepurchase information gathering, (2) the purchase itself, and (3) postpurchase support. Figure 7.7 lists these steps with examples. The Internet can support each of these areas. The level of support in each area depends on the industry, type of product, and capabilities of the customers. Note that the process differs depending on whether the customer is a retail consumer or another company. For example, sales to other companies are generally repetitive and typically require additional documentation and billing procedures.

In many ways, the purchase issue is a minor component. EC purchases currently offer only minor benefits compared to traditional phone orders. The main benefit to EC lies in providing additional support to customers before and after the sale. In particular, intelligent Web sites supported by expert systems can help customers select options and products or solve problems. For fixed development costs and relatively low monthly fees, the online systems can provide 24-hour



support. Sales can be increased by providing more detailed information, helping customers customize their selections, and using an expert system to build cross sales. Costs are reduced because the system is automated. Sales and costs can be further improved by providing after-sale support. Expert-system guided support can help customers solve problems faster. Any product design or production problems can be reported directly, giving you the chance to fix the product before it ships to more people.

Price Competition

A primary concern expressed by many firms investigating e-commerce is the issue of price. The Internet makes it easy for people to search vendors and compare prices. This process is particularly easy for products that are the same (such as books, videos, and electronic equipment). For example, Google (www.google.com/products), Bing (click the Shopping tab), and several other sites offer searches for products that display prices and availability for a variety of products. As shown in Figure 7.8, several cell phone apps even provide the ability to snap a picture of a bar code and look up online prices. Consumers now have easy methods to obtain more information.

However, merchants are concerned that people will compare sites based only on price. Availability of the item will also make a difference. Why are merchants concerned about price competition? First, the existing retail product chain was originally created so that retail outlets could provide personalized service and product information to customers. Vendors survived and grew based on their ability to provide customized information and support to local areas. Competing purely on price and availability changes the rules and requires a different type of merchant system. Second, if customers look only at price and availability, it is easy for a new firm to enter the market. The new firm simply slashes prices and sells products at a loss to attract customers. Of course, in the long run, the firm will fail—but so will the other firms. Economists can assume that managers and owners are intelligent and will eventually learn to charge a price that does provide a profit. But it might take time for this new economy to evolve. This fear of irrational firms does have an element of truth. Amazon gained its market position primarily by offering substantial discounts on books. In fact, Amazon's finance

Reality Bytes: Dr. Pepper's Social Networking

It took Dr. Pepper several years to build a base of 8.5 million fans on Facebook. But, the investment pays off. The company uses the group for test marketing. Each day, the company puts out two messages on its Facebook fan page and then it tracks and evaluates the responses. New York based Code & Theory created custom code to measure how many times a message is viewed and how often it is shared with other users. Robert Stone, director of interactive media services for Dr. Pepper Snapple Group Inc. notes that "We mine the data to understand what is appreciated, and what is not." One thing the company learned is that diehard Dr. Pepper fans like edge one-liners. For instance, the company heavily promoted the phrase "If liking you is wrong, we don't want to be right." Through Facebook, Dr. Pepper gains fast feedback to concepts, along with free marketing when fans spread the ads to their friends.

Adapted from Geoffrey A. Fowler, "Are You Talking to Me?" *The Wall Street Journal*, April 25, 2011.

officer made the remark in 2000 that he was surprised people were criticizing Amazon for not making a profit. He said that Amazon never intended to make a profit on sales. However, after the crash in e-commerce stock prices, Amazon has worked harder to cut costs, and has increased prices on many items to achieve a profit.

Initially, the largest impact of Internet price competition will be on the retail firms. By minimizing the aspect of location, the primary strength of local firms is eroded. If customers are willing to wait for products to be delivered, then there is no longer a point in having thousands of small local stores. But that "if" is huge. The ultimate economy will depend on consumer preferences between price and the ability to receive a product immediately.

A ruling by the U.S. Supreme Court in 2007 could ultimately affect the degree of price competition on the Internet. In *Leegin Creative Leather Products v. PSKS Inc.*, the Court ruled 5-4 that in many cases manufacturers could enforce minimum retail prices for their products. Although the case did not directly involve the Internet, one of the issues manufacturers face is that customers might go to local stores to check out products and get advice and service. But the customer might then turn to the Internet to purchase the product at the lowest possible price. Effectively, the local store does the work but loses the sale to a store that provides minimal service. The effect of the controversial ruling remains to be seen, but the most likely impact is fewer discounts available for customers. Or at least it will be more difficult to find the discounts. to obtain more information. ture the barcode, send teh icesut the airlines will be reluctant to

A few e-commerce firms have attempted to use the interactive features of the Internet to set prices dynamically. In an experiment, Amazon.com charged different prices to different customers. It appears to have been a relatively standard attempt to statistically evaluate price sensitivity to various products. However, when customers learned that others had obtained the same product for a lower price, they complained. Yet, in traditional stores, customers routinely are charged different prices for the same items—for example, through coupons or negotiation. As shown in Figure 7.9, part of the fear is that the Internet might someday be used to force people to pay the highest amount they are willing to pay, as opposed to

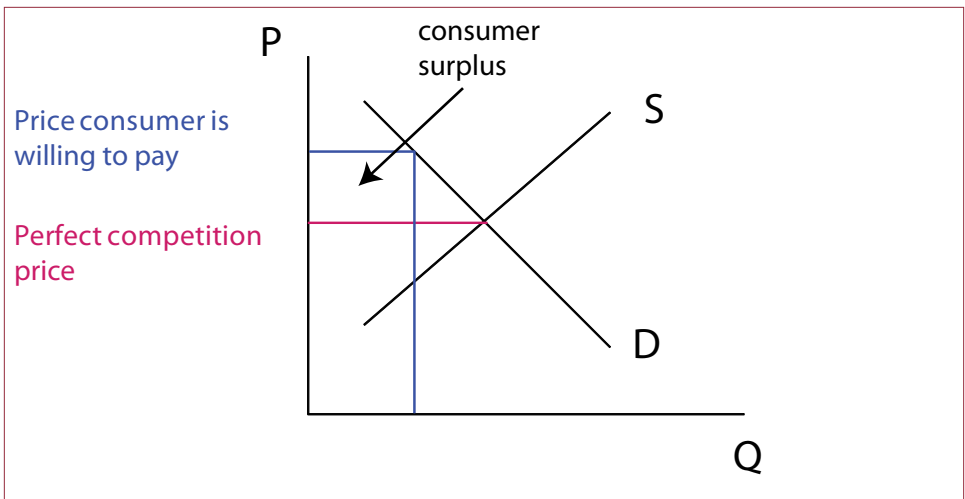


Figure 7.9

Dynamic pricing. The ultimate goal is to set individual prices for each consumer to capture the maximum price each is willing to pay, as opposed to the perfect competition price, where everyone pays the same price, and some customers gain because they were willing to pay more.

perfect competition price. At a perfectly competitive price, many customers pay less than the maximum amount they are willing to pay, providing them with a consumer surplus. If vendors can charge the maximum price to each person, the company can capture some, or all, of the surplus resulting in higher prices for consumers.

Services and Web 2.0

How do Web-based services work and why do they change the world? As households and businesses obtain higher-speed connections, new Web-based services become possible. You have probably heard about some of the consumer-oriented sites such as YouTube, Facebook, and Flickr. Other sites offer more sophisticated services to businesses. For example, several companies provide online accounting or even ERP services such as customer relationship management. The purchasing companies pay a monthly or annual fee to use the applications. All of the processing and data storage is handled by the providing company, leaving the customer firm free to ignore the technical issues and focus on running its own business. Some companies, such as Google, provide applications such as a word processor, spreadsheet, and communication systems that can be used by both individuals and entire organizations. A third important category of services relates to the Internet itself: providing network access, developing new applications, and hosting applications on servers.

Social Networking and Consumer Services

YouTube, Flickr, FaceBook, Twitter, and similar **social networking** Web sites led the service revolution for consumers. These applications provide new tools for people to interact with each other, offering more reasons to spend time online. Most of the consumer-oriented sites do not charge customers to use the applica-

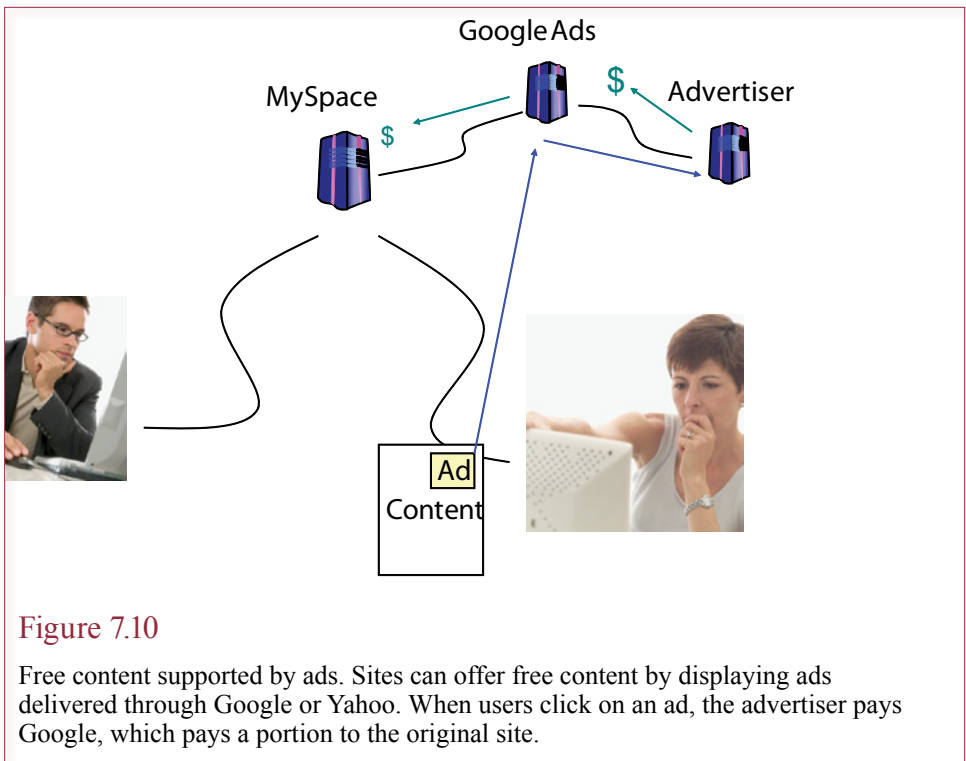


Figure 7.10

Free content supported by ads. Sites can offer free content by displaying ads delivered through Google or Yahoo. When users click on an ad, the advertiser pays Google, which pays a portion to the original site.

tions. Instead, they make money by selling ads. Consequently, the sites that grow the fastest and attract the largest number of users stand to make the most money. Giving free access helps attract users, but the sites still need to provide a service that users actually want. There are still plenty of opportunities to invent new services that will attract users, but as always, the challenge lies in finding an application that is useful to millions of people. On the other hand, as users gain even higher-speed connections, particularly mobile ones, new opportunities become feasible.

Some Web sites are actually services in disguise. For example, 1800flowers sells flowers, but the company does not grow or ship the flowers. It contracts all of the details to other firms. What the main site really does is keep track of special event days, such as birthdays and anniversaries. It basically provides a reminder service and makes it easy to order products corresponding to those dates.

The challenge with consumer-oriented service sites is to make money. The choices are (1) charge for the service, (2) sell related products, (3) sell advertising space, and (4) sell the service to another company. Many of the failed dot-coms chose option three. When the advertising market crashed, they could not cover their costs and went out of business. Option four is discussed in the business services section. Selling related products is probably the easiest solution today. In this case, the service is simply another feature that will attract customers to your site. But the additional costs can make it harder to compete on the basis of price, so you have to be certain that customers really do value the service. Figure 7.10 shows the basic process of generating money through ads. The Web site (such as Facebook) contracts with Google to display ads on pages. No money is received at this point. Ads are displayed along with the content. If a user clicks on an ad,

Reality Bytes: Fox Broadcasting Sells More Online Ads

Fox Broadcasting, a division of New Corp., announced plans to increase the number of online video ads. The goal is to match the number of commercials in traditional TV broadcasts. Pricing of commercials would also change as the broadcaster strives to combine TV and online audiences into a single group. Toby Byrne, the president of Fox's ad sales noted that "This is what our business is becoming. There shouldn't be a different commercial experience by virtue of which way you choose to watch our content." For early 2011, Fox's traditional prime-time audience share for 18-49 year old viewers had dropped 5.4 percent to 4.6 million. One goal of the new pricing strategy is to capture the number of viewers who watch the show online instead of through broadcasts. Fox is following in the footsteps of the CW joint venture between CBS Corp and Time Warner Inc. who adopted the same approach a year earlier.

Adapted from Sam Schechner, "Fox Shifts How it Sells Online Video Ads," *The Wall Street Journal*, May 16, 2011.

Google tracks the click and directs the user to the advertiser's page. At the end of the month, the advertiser pays Google, and Google pays a small percentage to the original site owner. The site usually receives only a few cents per click, so it takes thousands or millions of clicks to make money. But the site has almost no costs for carrying the ads, so it is easy to experiment with sites to see what brings in money.

Financing and building an ad-based application is a challenge. Revenue does not arrive until the site succeeds in attracting thousands or millions of users. In the meantime, you need millions of dollars to build, host, and market the new service.

Digital Products

This category blurs the lines between products and services. You can buy music as CDs, movies on DVDs, paper books and newspapers. If you buy these items as traditional products, they need to be shipped to you. But all of these products can be sold and delivered as digital products or services that you download immediately. For example, some music sites, such as Rhapsody, provide the music as a service because you only rent the music. If you drop your subscription, the music will no longer play.

Digital products are a field where e-commerce will eventually dominate. Already, many products are stored in digital format: music, news, books, movies, software, and games. In late 2000, many consumers found how easy it was to distribute digital music over the Internet using MP3 files and Napster—even though it was illegal. Digital content over EC meets two of the main consumer criteria: it is instantly available at any time, and costs should be lower since distribution costs are small. Furthermore, digital content is more portable than traditional CDs, DVDs, and books.

The main challenge to digital content revolves around **intellectual property** rights and laws. Digital content can be easy to copy and redistribute—depriving the owners (artists) of any reward. The risk is that free distribution of digital content would remove all incentive for artists and authors to invest time for which they receive nothing.

Several companies (particularly Apple, Microsoft and RealNetworks) have developed **digital rights management (DRM)** systems to prevent unauthorized copying. Microsoft and a couple other companies have systems in place for books. Most systems take advantage of the Internet. When a consumer purchases a digital product online, the purchase is recorded in a digital rights management server and issued a unique ID. From this point, the systems vary. Some work by periodically checking the Internet server as the product is used to verify that it is an authorized copy. In some systems, the generated ID can work only on the computer for which it was first created, so giving the file to someone else does not allow it to be played or viewed. Some systems enable users to transfer rights to another person; others do not.

Another challenge with digital products is the payment mechanism. The transaction costs on credit cards and checks are too high to enable low-price purchases, such as buying one song for a few cents. Until micro-payment systems become accepted, it is difficult for sites to charge for content. Currently, subscriptions are the most common solution. One of the more successful sites is *The Wall Street Journal*, which charges an annual subscription fee to several hundred thousand subscribers. And even the *Journal* admits that it has difficulty preventing people from paying for one subscription and sharing it (although that would be in violation of the subscriber agreement).

One difficulty with any protection system like the digital rights management schemes is that it is difficult to stop someone from breaking the system. Early software vendors in the 1980s learned the lesson that copy protection schemes were routinely defeated and removed. However, the digital millennium copyright act (DMCA) in the United States makes it illegal to break copy protection schemes. As a relatively new law, it remains to be seen whether this condition can be enforced. Also, the law does not apply to people outside the United States. DVD vendors pursued this issue in 2000 and 2001 when a group broke the encryption scheme used to slightly protect DVD movies. The Motion Picture Association of America (MPAA) has sued several companies in the United States for even linking to sites that list the decode algorithm, but the code remains on thousands of sites around the world. A major question exists in terms of whether copy protection schemes can survive. In 2007, Steven Jobs at Apple began pushing the recording publishers to enable Apple iTunes to sell music without DRM. In general, customers do not like DRM because it limits how the content can be used. In Apple's case, songs purchased on iTunes can be played only on the Apple hardware; and DRM-protected songs purchased from competing sites cannot be played on that equipment. Protecting content has been one of the biggest hindrances that has delayed the introduction of many services, including downloadable videos and books.

Business Services

Providing online services to businesses is similar to providing services to consumers, except that the services differ and it is easier to charge other companies for using the application. Services can be as simple as providing direct applications such as ERP or e-mail. However, the Web infrastructure has the ability to support distributed services, where companies provide various pieces of a Web page—which appears to the consumer as a single integrated page.

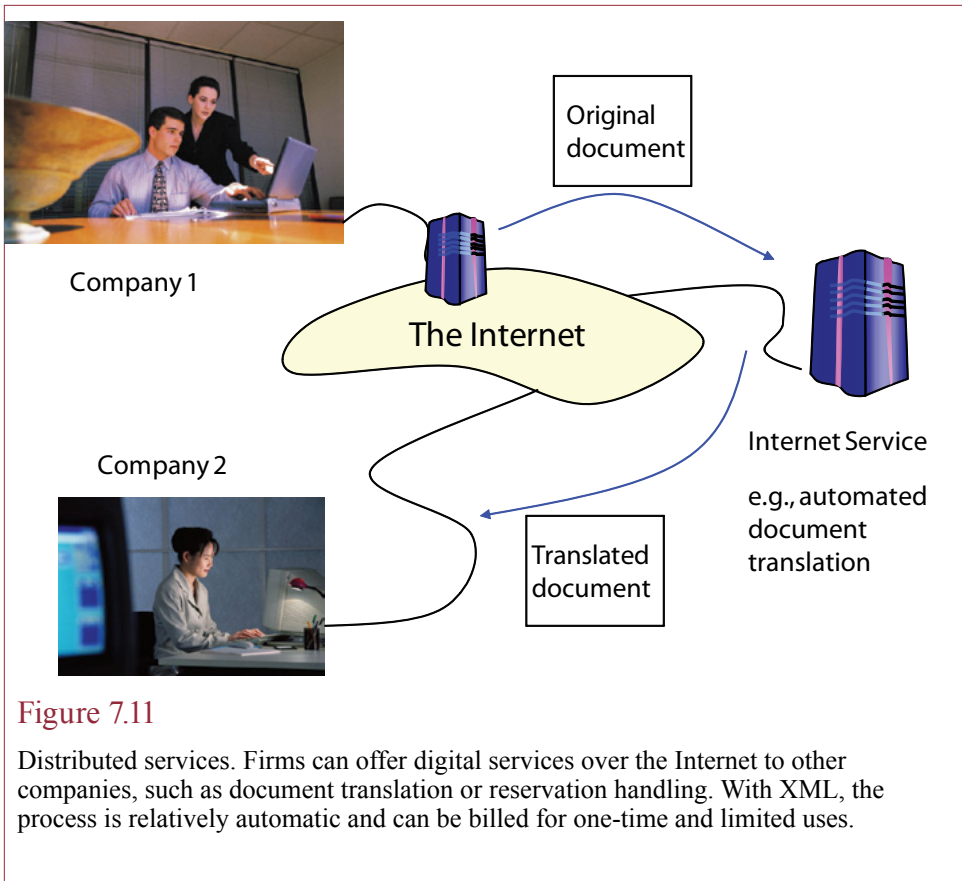


Figure 7.11

Distributed services. Firms can offer digital services over the Internet to other companies, such as document translation or reservation handling. With XML, the process is relatively automatic and can be billed for one-time and limited uses.

Applications

Many of the applications are aimed at small to medium businesses that lack the resources to pay huge upfront costs to purchase expensive applications. For instance, several companies provide online ERP services. Smaller companies configure their accounting systems and employees access the system through Web browsers. Since everything is Web based, it does not matter where the application is hosted. And, the smaller company can rely on the service provider to keep the servers running, provide backups, and monitor security threats. Salesforce, the leading customer relationship management system runs purely as an online service. Companies pay by the month or the year based on the number of employees using the system. Companies can expand or contract their usage by purchasing access for additional employees.

Google has purchased several companies to provide even more online service applications to businesses (and consumers). An e-mail and calendar communication system was the first main application. Companies simply pay an annual fee to maintain all of their e-mail on Google servers. They get to use their own domain name (as opposed to gmail.com), and Google handles all of the servers, backup, and security issues. Google (and other firms) also offer online service applications to handle word processing, spreadsheets, and slide show applications. Although they lack some of the features of standalone packages, basing them on a central server makes it easy to share the data created with other team members. For in-

stance, someone in marketing can write a marketing plan. By simply assigning permissions, other employees in the company can work on the same file—from anywhere in the world.

Distributed Services

XML and other standards create opportunities for a new type of B2B e-commerce. Web sites can provide specific automated services that can be sold to other businesses. One example would be a Web site like Altavista (babel.altavista.com) that has an automated document translator. Figure 7.11 shows the basic concepts. The key is that the services are automated and simply called from your Web site. This arrangement is actually more of a peer-to-peer system than a client-server technology. You can create a Web site that uses services from many different companies. For example, you might create a Web site that pulls current stock price data from one site, performs some complex financial calculations on a second site, and converts currencies using a third site's exchange rates. All of these activities happen behind the page, so your users see only the final application.

The main advantage to this type of system is that experts can build objects and maintain and run the services on a Web site available to anyone willing to pay the service fee. In many cases, the service fee could be a small per-usage value. So you could build a composite application that has state-of-the-art features and pay only for the actual usage of these features. The other alternative would be to license these technologies on an annual basis for a higher fee and run them on your own server, where you continually need to maintain and upgrade the services.

The technologies to support these services are still being developed. XML and the **simple object access protocol (SOAP)** are two important technologies. SOAP is a method of describing and activating services across the Internet. Ultimately, to make it easier to find services on the Internet, companies will want to register with a directory. In many ways, Google is a primary Web service because it provides searches, and more importantly, delivers ads that generate money.

Network Services

A third category of Internet services consists of the network connections. As a consumer, you see a portion of this industry because you have to pay an Internet service provider (ISP) to connect to the Internet. Businesses also have to pay an ISP, but they have additional expenses that are provided by other companies. To create a Web site, you need to register the domain with a registrar paying an annual fee, purchase a security certificate for an annual fee, pay a hosting company to run your Web servers for a monthly fee, and pay someone to design, develop, and maintain your Web software—usually for a fixed fee plus maintenance costs. Several companies compete in these various businesses, and the industry brings in billions of dollars a year.

Internet Service Providers and Hosting

Providing Internet access to households and businesses is a big business. Think about how much you pay for monthly Internet service and multiply that number by several million. The business also has large economies of scale, both in providing services to users and providing facilities for businesses to host Web sites. Consequently, the industry has consolidated over the past decade. However, there is still a relatively intense battle for providing service for the final mile to individual households. Chapter 3 describes the various options and costs, but the

Technology Toolbox: Paying for Transactions

Problem: As a business, how do you get paid?

Tools: Many mechanisms have been proposed to handle payments, from cash to credit cards to cell phones.

Payment Method	Fixed Cost	Fixed Fee	Discount Fee	Fraud/Insure
Cash	Low except for security	\$0.00	\$0.00	Physical security
Check-physical	\$20/month	\$0.25	1.7%	Included
Check-electronic	\$20/month	\$0.25	2.5%	Included
Credit card-physical	\$10/month Minimum \$25	\$0.25 - \$0.50	1.6%	Covered: 0.08% fraud average
Credit card-electronic	\$30 - \$50/month Minimum \$25	\$0.25 - \$0.50	2.6% - 4%	Not covered: 0.25% fraud average
Debit card	Setup/key pads	\$0.35 - \$.055	0% - 2%	None
PayPal	None	\$0.30	2.2% - 2.9%	Covered for physical shipments

For decades, checks were the dominant payment mechanism in the United States. Only recently has it been possible to use electronic checks—essentially a direct debit to your checking account based on the routing numbers. Each method has potential advantages and drawbacks. As a businessperson, you might be tempted to accept as many methods of payment as possible, so you do not shut out potential customers. However, many of the methods have setup and fixed costs, so it can be expensive to accept everything.

Any payment method essentially has three main costs to the business: (1) fixed setup costs, (2) transaction costs as a fixed number and a percentage of the price, and (3) the expected loss from fraud or the cost of an insurance system. Often, there is an implicit cost to train employees in the proper procedures as well, which increases as you try to accept more variations of payments.

The transaction costs and risk are all paid by the seller. Merchant banks usually charge a monthly document or connection fee, and sometimes a one-time setup fee. A fixed cost per transaction is common, as well as a percentage of the sale. Customers often prefer credit cards, although in 2002, 15 percent of U.S. purchases were made with debit cards, and that number is increasing rapidly. Debit cards are useful to brick-and-mortar merchants because of the lower transaction costs and minimal risk. However, they are rarely accepted for online commerce because of the potential risk to consumer accounts. Checks and credit cards carry similar transaction costs today—when you factor in the insurance coverage for insufficient fund checks. One challenge with most of the payment mechanisms is that merchant banks usually require a monthly minimum fee charge. If your firm has few sales through the system, you will still have to pay \$25 per month. For small companies just starting out in business, this fee can be expensive.

Quick Quiz:

1. Why have consumers rejected most electronic payment mechanisms?
2. What additional fees are charged for international transactions?
3. What happens if a customer refutes a charge?

primary choices are telephone (dial-up, DSL, or FiOS) and cable modem. Cell phone or mobile access is gaining in popularity but cannot deliver the same high-speed service of cable modems. Providing business connections generates even more revenue, with prices for a T1 line running about \$400 a month. Most of the providers in this market are large and difficult to compete against. However, many small wireless firms have arisen to provide niche services in small markets. For instance, you could pay \$400 a month for a T1 line and install a wireless modem and sell access to the Internet to your neighbors for a monthly fee. You can break even (not counting initial hardware costs), if you find 10 neighbors willing to pay \$40 a month. Of course, you have to handle billing, marketing, and some legal and technical issues. So, you probably will not make much money, but a T1 line provides bi-directional speeds of 1.544 mbps, which can be useful if your neighbors want reliable speeds for video conferencing or other activities.

Web hosting is also a large industry. It has several major providers, led by those who have built huge data centers around the nation and world. The large ISPs, telephone companies, also provide hosting services because they have direct access to their networks. However, many of the large data centers cater to larger companies. So intermediaries have evolved who purchase space in the data centers and then resell services to smaller companies.

Design and Development

Compared to the other areas of Web infrastructure, design and development is highly fragmented with thousands of firms and millions of individuals working on applications and Web sites. The existing and potential demand is huge, both for individuals and for firms specializing in developing Web sites and applications. Chapters 12 and 13 discuss the various information technology careers and methods of organizing and managing the IT processes. For now, it is important to recognize that many Web-based careers exist, with a variety of skills ranging from artistic to programming, security, and management. It is relatively easy to establish a Web design firm and substantial demand exists for these services. Startup firms might need to focus on low-price jobs to gain experience and respect. Businesses can find several firms that will help with everything from art design, to programming, and custom marketing strategies.

Facilitators

Creating a commercial Web site requires a fair amount of effort and knowledge. Several companies advertise plans to put you on the Web for a low cost. These systems might work well for small businesses with a limited number of customers. However, few of them will scale up easily if your business suddenly grows. Creating and managing a Web site can be a complex process—made increasingly more difficult due to security issues. Consulting and specialist firms have arisen to help you understand these issues and design large, secure, complex Web sites.

Other facilitators have arisen to help with more mundane tasks. For example, most cities have small businesses that will help people sell items on eBay. In general, it is relatively easy to set up an account on eBay and sell various items. However, many people have only a few items to sell, do not want to take the time to learn the details of how eBay works, and are uncertain about their technical skills to handle the process. For a percentage of the revenue, facilitator firms will handle the complete process, including taking photographs, pricing the item, posting the information, validating the purchaser, and shipping the item.

Search Engines

Most people have used search engines to find information on the Internet. The searches are not always successful and tend to return a large number of sites unless the key words are specific and relatively unique. Nonetheless, search engines are an important method for potential customers to find your site.

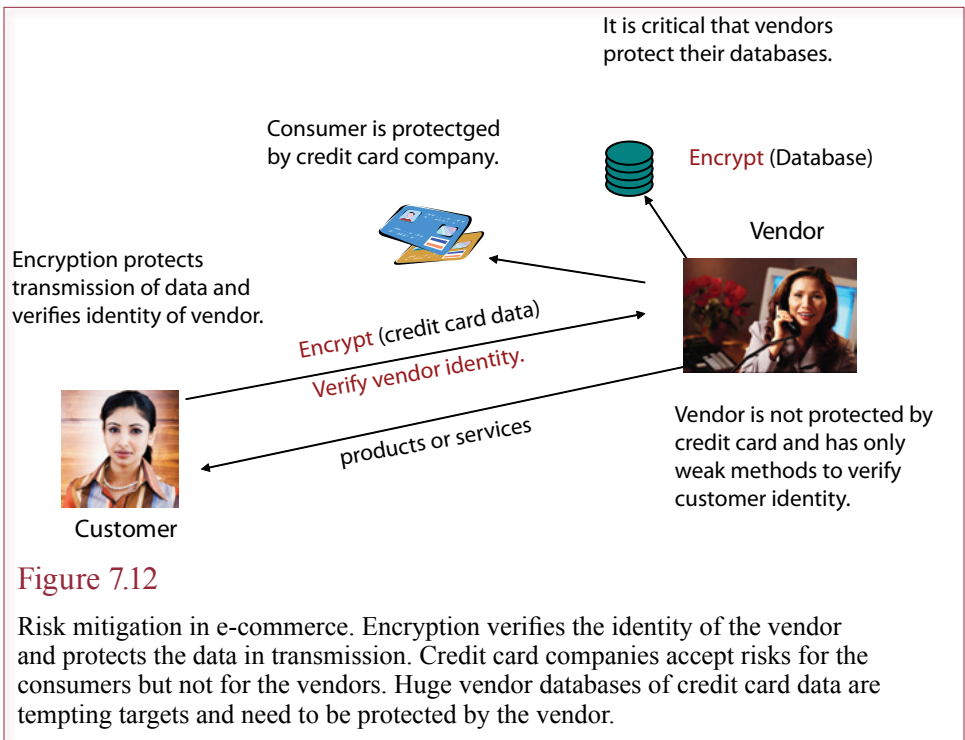
One of your first objectives is to get your site listed and indexed on the major search engines. Each system uses a different process to search and categorize your site. All of the search engines have a Web page where you can register your Web site by entering the Internet address and a description of the purpose of the site. Eventually, your site will be added to the search engine list. Once your site is listed by one of the major services, the other search engines will also find it earlier.

Some companies offer to register your Web site with the search engines for a fee. While this process might be convenient, it is rarely necessary. The good search engines eventually find your site even if you do not register it at all. Some people claim to know tricks to make your page appear at the top of the search engine listings, known as **search engine optimization (SEO)**. Do not believe them. In some cases, the advice is harmful—search engine developers know most of the same tricks and will automatically punish Web sites that use the blatantly bad ideas. Read the Web site descriptions at the search sites for more useful advice. Basically, make sure your main page contains a precise description of the site's purpose. Include key words that consumers are likely to search for. Be as accurate as possible. Think like a customer and try searching for other sites. Look at the key words you used. Include them on your Web page. The problem with SEO firms is that the search engines continue to change their algorithms, and trying to optimize your site for one version can result in a huge drop when the search method changes. The ultimate goal of a search engine is to identify exactly what the user wants to see and provide just those pages. So your best objective should be to carefully define exactly what your site and pages contain so the search engine can match those pages to specific searches. The main focus should be on the page content and descriptions, meta tag keywords, and links from legitimate sites.

In some cases, there is a way to get your site listed higher up in the search engine results. Many of the sites accept advertising payments to give higher priority to your site. You will have to carefully evaluate the costs and benefits of this approach compared to other advertising strategies. Most search engines also rank sites based on their linkages from other Web sites. So, if you can get your site listed on established pages, with an accurate description, it can be found faster by the search engines and will often be listed higher on the results page. Remember that most people will not scroll through more than a couple of pages of search results to find your page.

Payment Mechanisms and Risk Mitigation in e-Commerce

How can customers pay for products and why do you need new payment mechanisms? Credit cards remain the most popular method of paying for items and services purchased on the Internet. In other transactions, debit cards have become more popular, but they are basically processed as credit cards for Internet transactions. Consumers like credit cards because they are comfortable with them and because banks have largely removed the risks to consumers. Chapter 6 describes the various transaction risks to the consumer, business, and government.



Payment Risks

The transaction risks in e-commerce are similar to those of traditional commerce, but with a couple of twists because of the network connection. The Internet is an open network where messages can be intercepted and transferred at will. Consequently, it is challenging for the merchant and customer to verify the other's identity. Similarly, both merchant and vendor need to be concerned about the transfer of money and digital products. Because these two issues stem from the same cause (the insecure network), they have both been solved through the use of strong encryption methods. These techniques are described in Chapter 5. They are commonplace on the Internet today, and consumers and vendors face minimal risk from the interception of data. Figure 7.12 shows that encryption can protect the transmission and storage of credit card data, but vendors still assume several risks because the only method they have to identify customers is by the credit card data. Some vendors attempt to reduce this risk by shipping products only to the home address corresponding to the customer's credit file.

The risks of nonpayment or nondelivery are more difficult to solve. They have been particularly challenging in an international environment where governmental jurisdiction and enforcement are not effectively defined. For the most part, consumers are still protected if they use a credit card to pay for a product. However, the consumer may still find it hard to prove that a product was not received. On the other hand, e-commerce businesses have virtually no protection from fraud. The credit card rules specifically exclude mail orders, telephone orders (MOTO), and Internet orders. The card companies will assist merchants in identifying invalid cards, but will not guarantee the transaction. This issue is important because the Gartner Group (*Computerworld* 8/11/2000) estimated that credit card fraud is

Credit card drawbacks

High transaction costs.

Not feasible for small payments.

Do not protect the merchant.

Characteristics needed

Low enough costs to support payments less than \$1.

Secure transmission.

Authentication mechanism.

Easy translation to traditional money.

Alternatives

Mobile phone bill.

Smart cards.

Digital cash.

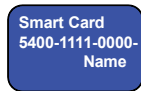


Figure 7.13

Payment mechanisms. Credit cards do not protect merchants and have high transaction costs, so they cannot be used for low-price items. Several systems have been created to provide the desired characteristics, but customers have not yet been willing to adopt them.

12 times higher for online merchants—with about 1.1 percent of all online transactions fraudulent.

Technically, it is relatively easy to use encryption to verify the identity of the merchant and the customer in any transaction. In fact, the common Web encryption system works because the merchant buys a digital certificate from an encryption company. Customers could obtain similar certificates or digital signatures, but they have little incentive to do so, since the credit card companies protect them. With today's encryption systems, transmission risks are relatively minor. Two far more serious risks are (1) theft of consumer data from the vendor's computer and (2) alteration of the purchase documents by either the merchant or the customer (repudiation).

The risk of theft is real and has happened to several vendors. The potential target is huge: thousands or millions of validated credit card numbers—all accessible via the Internet. The only effective solutions are for vendors either to keep the card numbers off-line or to encrypt them and bury the encryption key.

The second risk arises because digital orders are easy to alter. The solution is to create electronic orders that cannot be altered. Again, this solution requires encryption. In this case, the customer and the vendor both need a digital certificate. When both parties encrypt the order, it cannot be altered later.

Payment Mechanisms

Payment mechanisms must change along with the changes in transactions. Years ago, when purchases were made locally, currency was the primary method of settling transactions. Eventually, as banks stabilized and gained respect (and government guarantees), transactions were settled by checks. Business transactions (particularly internationally) are often settled with letters of credit from banks. In the United States, many payments have migrated to credit cards and debit cards.

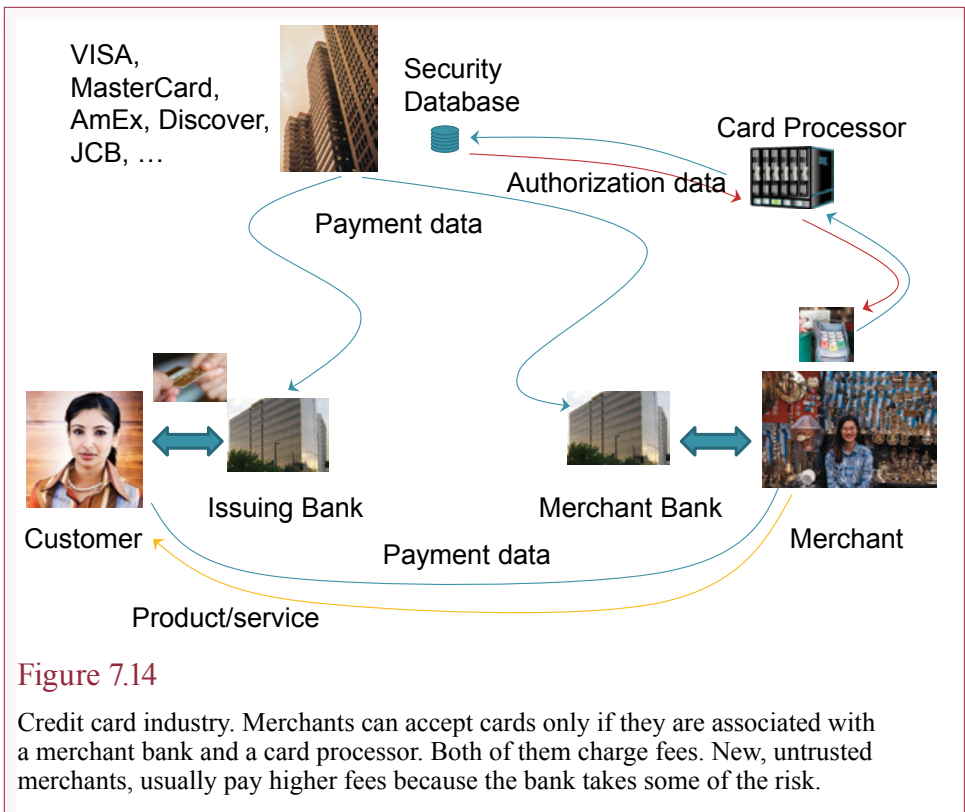


Figure 7.14

Credit card industry. Merchants can accept cards only if they are associated with a merchant bank and a card processor. Both of them charge fees. New, untrusted merchants, usually pay higher fees because the bank takes some of the risk.

From a consumer standpoint, credit cards are easy, available, provide short-term loans, and offer protection from fraud and errors. Figure 7.13 shows the drawbacks to credit cards and lists the characteristics desired from a new payment mechanism. From an e-commerce merchant perspective, credit cards offer only minimal support and are expensive. From the perspective of a mobile-commerce merchant, credit cards will be unacceptable because the transaction costs are too high to support small payments.

From a theoretical perspective, e-commerce payment mechanisms should be easy to create. In fact, dozens have been proposed or started in the past few years. None of them have garnered enough support to be successful. Some, like PayPal process payments, but most of those payments today are based on credit cards.

Figure 7.14 shows the main participants in a credit card transaction. The first important concept is that all of them charge for their services—and those fees are billed to the merchant. The second issue is to examine what happens if something goes wrong with a transaction. For instance, if a customer fails to pay bills, the issuing bank is stuck with the charges. Similarly, if a merchant skips town without shipping products, the merchant bank is on the hook. Both banks cover these risks by charging higher fees and limiting who they provide services to. So, small startup merchants might have problems finding a merchant bank and will probably have to pay higher fees.

Several companies have proposed alternative payment mechanisms, but most of them failed. PayPal (owned by eBay) has survived, but it is largely a credit card processing system now. Google and a few other Web sites also offer credit card

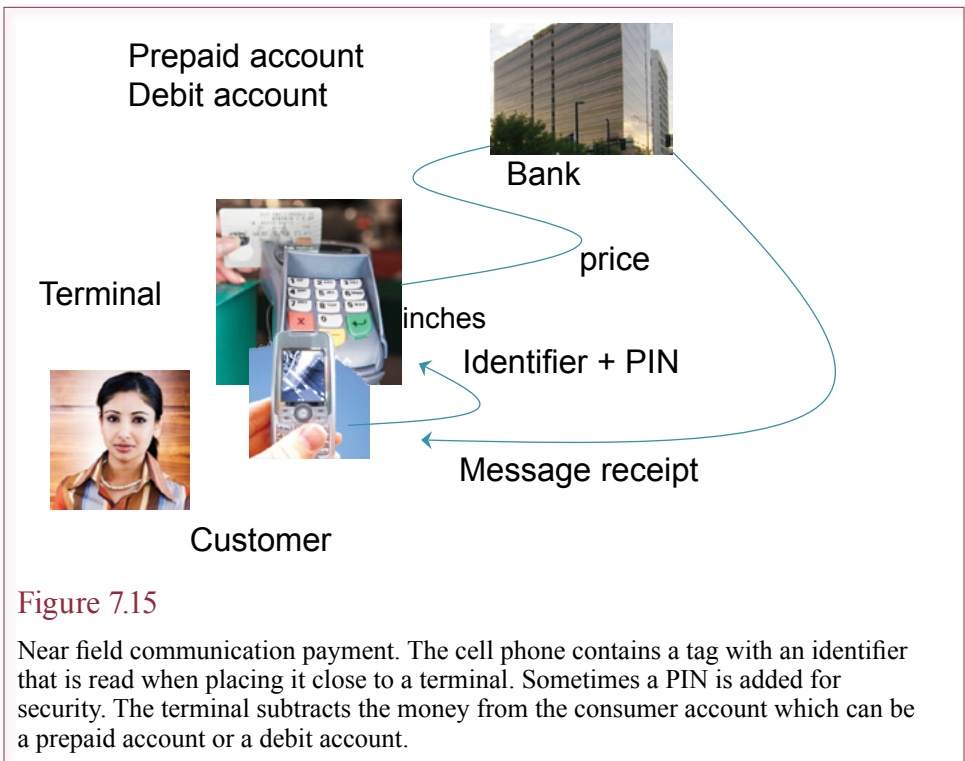


Figure 7.15

Near field communication payment. The cell phone contains a tag with an identifier that is read when placing it close to a terminal. Sometimes a PIN is added for security. The terminal subtracts the money from the consumer account which can be a prepaid account or a debit account.

processing. The main difference between these companies and traditional card processing is that the merchant never sees the credit card data. Customers enter the data through the PayPal or Google site and merchants receive an e-mail notifying them of the payment. By not handling the actual credit cards, the merchant faces fewer security issues, but pays higher transaction costs.

The main challenge with credit cards is the relatively high fees. The per-transaction costs make it difficult to accept credit cards for an amount less than \$10. Mobile commerce offers one possibility for handling small transactions: put the cost on the customer's cell phone bill. Most phone bills already contain lists of small transactions, and the total monthly fee is high enough to pay using traditional mechanisms. As long as the vendor builds up enough credits with the phone company, the transaction costs on that side will be reasonable. Currently, the biggest potential drawback is the limited security. Phone numbers are easy to find, although a 4-digit PIN would improve security a little. Requiring physical access to the phone will provide more security, until the phone is lost or stolen.

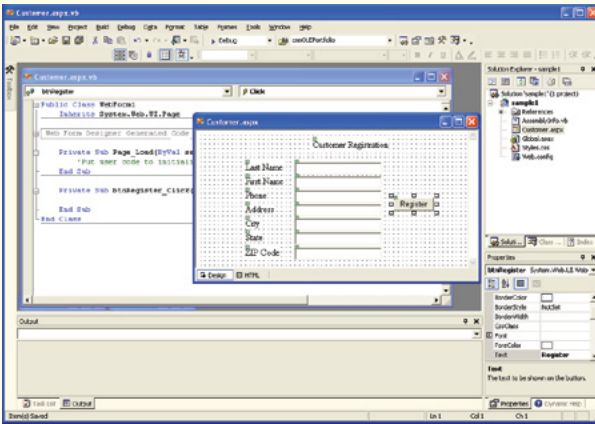
For on-site transactions, mobile phone companies are beginning to offer **near field communication (NFC)** payment methods. NFC is similar to RFID in that it uses tags and readers that pick up data at very short range (a couple of inches). Essentially, cell phones have a chip (or perhaps a chip on a sticker) that contains encrypted identifiers. As shown in Figure 7.15, waving the phone next to a terminal transmits the ID and the terminal subtracts the payment amount from the consumer's account. This account could be a prepaid account or perhaps tied directly to a bank account similar to a debit card. In advanced systems, the terminal can send a message to the phone with the receipt and details of the transaction. Some systems require a PIN as well as the phone—which is useful if the phone is

Technology Toolbox: Choosing Web Server Technologies

Problem: How do your Web servers handle interaction and database tasks?

Tools: Web servers require special code engines to handle the interaction with users and the database. Three basic systems have evolved over time: Java (J2EE), PHP/PERL/PYTHON, and Microsoft .NET. Websites today are built using one of these

three technologies. There are major differences in the underlying technologies and philosophies of the three approaches, and some developers treat them as “religious” issues—which is a way of saying that proponents of each often argue over the relative merits of their choice of technology. As a manager, why do you care about the three technologies? The main answer is that you will probably have to make a decision between



them if you develop a website. All three have evolved considerably over the past few years and will continue to improve.

Of the three, Microsoft’s .NET is the newest and has some features that do not yet exist in the other methods. It is also considerably faster and more efficient at processing code and connecting to databases. It is also the most expensive. Java is probably the second most powerful technology. It has the advantage of being a standard that is supported by many vendors. Systems developed using standard Java code can be transferred to run on Web servers built using a variety of hardware and operating systems. Not only is the server code inexpensive, but the hardware and Web server software are inexpensive. The other approaches use scripting languages that have diverse features. Websites built on these systems can be run on a variety of hardware and software platforms. In all three cases, you need to work closely with the hosting company to ensure that the proper hardware and software packages are installed.

Building interactive websites generally requires custom programming to tell the server how to handle the customer responses. Development environments exist for Java and .NET that help programmers write the code. Most applications are built as Web forms where the user enters the data. This data is then transferred to the server, and the code behind the form examines the values. Based on the responses, the data can be stored in a database, e-mailed to someone, or additional pages can be returned to the user.

The differences between the systems lie in the capabilities of the underlying code and the amount of effort it takes to write the code and connect to database systems. Increasingly, vendors are developing libraries of code for the three systems that pre-package common procedures. These packages enable developers to build new applications faster and with fewer errors

Quick Quiz:

1. Why would programmers become so attached to one system?
2. What are the advantages of choosing the most popular server technology?
3. What are the dominant costs of creating a Web site?

lost. The method is popular in Japan—particularly to pay for subways and trains. Apple and Google have both begun offering the chips in some phones. However, vendors need to upgrade their terminal systems and it is not clear yet whether the transaction fees will be low enough to justify adopting this payment method.

In summary, electronic payment mechanisms are still in their infancy. It could take years for a standard to evolve and be accepted by enough merchants and customers to be important. In the past, governments have borne the costs of creating and printing money. Today, most seem unwilling to become involved, and they have left the mechanisms to the private sector—which is more focused on developing a system that provides profits to the issuing authority, instead of developing a system that would be widely accepted.

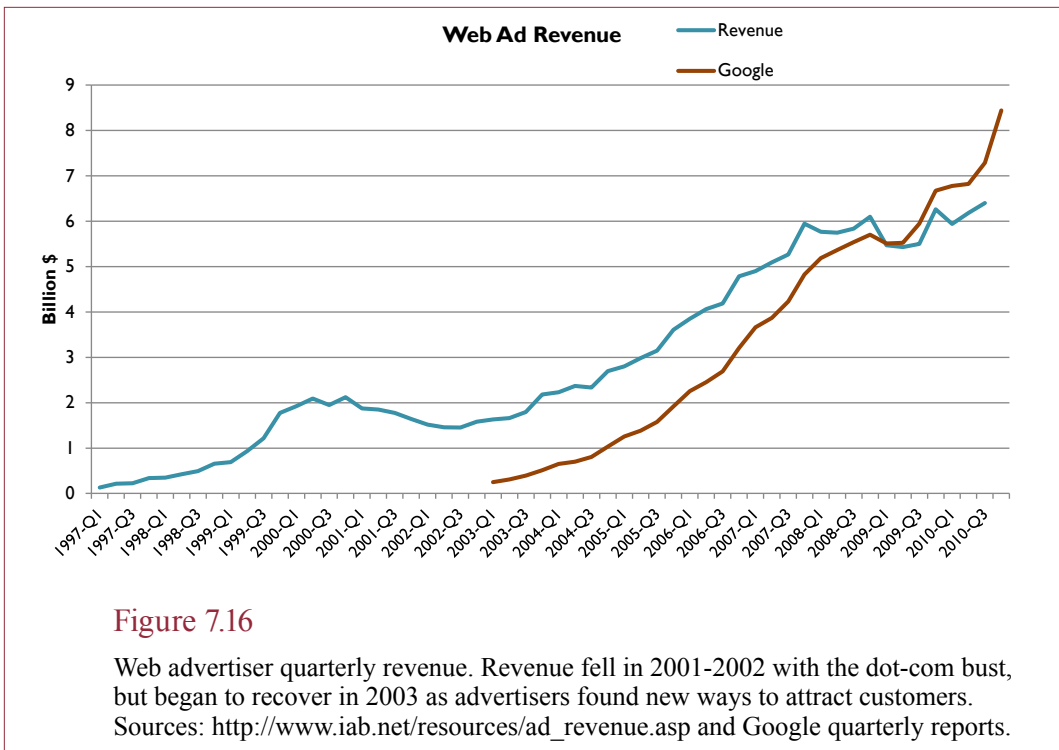
Even for traditional businesses, **bill presentation and payment** mechanisms can make life easier and save money. Service businesses in particular can benefit because they tend to bill clients on a regular basis. The goal is to send all bills electronically and provide a simple method for clients to transfer funds to your account. If clients are large businesses, they may wish to use existing EDI or banking systems (wire transfer) to transfer money. Smaller companies with smaller payments will generally prefer the newer online payment systems because they have lower costs to the customers.

The electronic systems save time because the bills can be created automatically from the in-house billing system. They do not have to be printed or mailed. Customers can feed the data into their own accounts payable systems and create electronic payments with only a few review steps. The payment data, and any disputes, can be processed electronically and automated. Many systems work directly from checking accounts, effectively transferring an electronic check. As of 2007, the U.S. checking system supports completely digital copies of checking data, processing transactions within the existing system at relatively low transaction costs.

Advertising

How do firms get revenue from Web ads and how do customers find a site? Advertising has become an important source of revenue for Web sites. To understand and take advantage of advertising, you need to look at the process from three perspectives: (1) the advertiser, (2) the publisher Web site, and (3) the consumer or ad viewer. You probably have the most experience as the user, but do you recognize the three main types of ads in use today? As with other components of the Web, consolidation among companies has reduced the complexity of advertising. Today, you can deal with two or three companies to handle most of your advertising needs—both as a publisher and an advertiser. In fact, for 2010, the Interactive Advertising Bureau (IAB) statistics showed that the top ten Web advertising firms were responsible for over 70 percent of the total advertising revenue.

The three main types of Web ads are: (1) Small text links provided by Google or Microsoft that provide publishers with a small fee when users click on them; (2) Banner ads that contain images and flash video, where publishers are usually paid simply for displaying the ad to visitors; and (3) Independent links to third-party Web sites where the site pays the publisher based on the number of visitors generated.



Traditional Media and Name Recognition

To a consumer, name recognition of a company is an important element of buying products over the Internet. Trust is particularly critical when the consumer is not dealing face-to-face with the merchant. Depending on your target customers, it might be necessary to build this name recognition through advertising in traditional media (television, radio, or newspapers). Some early start-ups chose the splashy, but expensive, method of buying television spots during the Super Bowl to reach a large audience. If you do use traditional advertising, make sure that your Web site name is easy to remember and easy to type. Avoid words that are commonly misspelled.

Web Advertisements

Web advertising offers some potential advantages over traditional advertising. Ads can be delivered to specific audiences and to some extent controlled so that people continually see new ads. Increasingly, Web ads deliver on their original promise of tracking responses by measuring the effectiveness based on the **click-through rate**, or the number of people who actually click on an ad and go to a site to get additional information. The original ad model matched the offline model by simply displaying banner ads on a page and waiting for people to click an ad.

Figure 7.16 shows the estimated total advertising revenue by year as reported by the IAB. Advertising fell from 200-2002 because of the dot-com crash and then accelerated when Google introduced keyword advertising. Google has since purchased several other advertising companies, including DoubleClick—one of the leading portals for banner advertising. Along the way, advertisers developed more

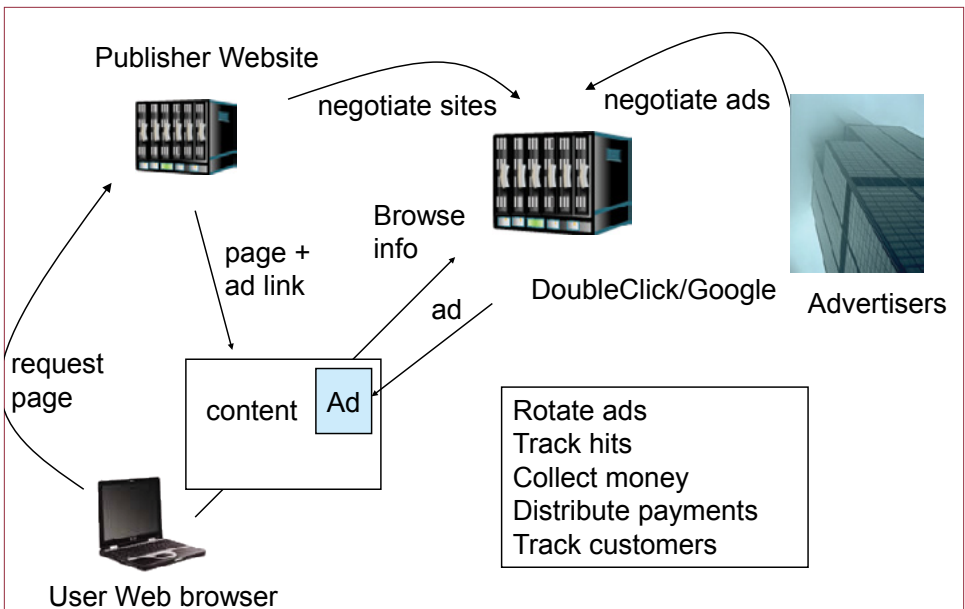


Figure 7.17

Advertising consolidator. DoubleClick provides advertising services by functioning as a central point for both advertisers and publishers. DoubleClick handles the details of delivering the correct ads, tracking impressions and collecting and distributing the money.

sophisticated ads using Flash and video. All of the parties have also increased the ability to track customers and monitor the performance of all online advertising. Still, the comparison to revenue earned by Google shows a strong correlation with the growth of online advertising. By 2008, Google was also generating some revenue from other sources, including hosting e-mail and Google docs, so Google's total revenue now exceeds the total online advertising revenue. Estimating total advertising spending is a challenge, but some reports suggest that online spending represents about 9-10 percent of the overall U.S. total. Based on changes in the industry, much of the online spending has come at the expense of advertising in newspapers and magazines.

Banner Advertising

If you want to advertise on a site, how do you get started? If you have a popular Web site, where do you find advertisers? Like the traditional world of print, radio, and television advertising, the daily issues of handling the ads, monitoring placements, finding clients, and billing can be time consuming and expensive. Most sites choose a third party to perform these tasks, and DoubleClick is by far the largest such company. Of course, DoubleClick takes a portion of the ad revenue for its services. Figure 7.17 shows the intermediary role played by DoubleClick. The third party also simplifies the process for advertisers, since it would be difficult for a company to contract with hundreds of sites to place ads. In 2007, Google purchased DoubleClick from a private equity firm, to consolidate its role in the advertising market, but it still operates under the original name and Web site. In

Want viewers to see the ad.
Want viewers to click through to the main site.
Want to collect contact information from viewers.
Need to match site demographics to target audience.
Monitor response rates.
Cost.

Figure 7.18

Web advertiser perspective. Advertisers want the biggest target audience possible. They need demographics about the Web site visitors, and they monitor response rates.

2004, DoubleClick earned about \$300 million in revenue, so despite its position, it receives only a small percentage of the total advertising spending. Although it is convenient for advertisers and publishers to deal with a single central intermediary, it is relatively easy for users to block ads from the central server. Check the Internet for information on how to add the DoubleClick sites to your hosts file and your computer will stop receiving any information from them.

An interesting twist on banner ads is that video games are now beginning to place ads. Games that connect online can download new ads. Generally, the ads are embedded within the game, such as billboards on car-driving games. But at least one pizza company added a link to a game so that players can click an icon within the game and order a pizza for delivery.

Advertiser and Publisher Perspectives

In the world of traditional banner ads, similar to the offline world, advertisers will place ads based on the demographic characteristics of the potential viewers. Figure 7.18 summarizes the perspective of advertisers—the ones who pay for the ads. They generally want the ads to be seen and to generate click-through responses. There is some argument that click-through rates are not an effective measure of advertising. Possibly the effect of an ad is to build an image or a brand name. Consumers might not need to purchase something immediately, but they might remember the ads later and use them to accept the validity of the company.

Increasingly, advertisers want to establish a relationship with the potential customers. Consequently, audience size and demographics are important to advertisers. In particular, advertisers are finding the most success in targeting specific sites. For instance, automobile manufacturers find it worthwhile to advertise on sites dedicated to automotive topics (such as vehix.com, Edmunds, and autobytel.com).

Many Web site publishers would like to get a share of the advertising revenue, but keep in mind that according to the private Internet advertising bureau (IAB), about 75 percent of online ad revenue goes to the top 10 Web site publishers. So, there is not much left for “your” share. The first catch is that you need a substantial volume of visitors to get anyone to consider your site. Probably at least 25,000 unique visitors a month, and 1 million would be a more likely minimum—since advertisers prefer larger audiences. Figure 7.19 shows some of the key points from a publisher’s perspective.

One of the most difficult issues is obtaining the demographic data. You need some mechanism to identify your Internet users and to obtain some personal data

Income
 Cost per thousand viewings (\$1 - \$50)
 Need volume (25,000 or 1,000,000 per month)
 Need demographics

Tasks
 Ad rotation software
 Tracking and monitoring
 Ad sales staff
 Billing
 Third Party: DoubleClick

Figure 7.19

Web publisher perspective. There is money being spent on advertising, but your rates depend on volume and the ability to provide detailed demographic data. The daily tasks of sales and providing the ads are often handled by a third party like DoubleClick.

from them. Of course, this data raises many privacy questions. Most sites find that they have to reward customers in some fashion to get them to provide personal demographic data, but it is often amazing how little is required to get customers to respond. Common tactics include random drawings for prizes or free trinkets. The other approach today is to have focused Web sites and then match the demographics against the existing public data. For example, antique car sites attract a particular demographic, while baby sites attract another group.

Google Keyword Ads

In 2002, Google changed the online advertising world by introducing click-through ads tied to searches. Look again at Figure 7.16 and it is clear that the entire increase in online advertising since 2002 has been due to Google ads. The basic concept is straightforward, but to use the system effectively, advertisers must make some complex decisions. Advertisers choose keywords. When a user enters that keyword in a Web search, Google displays an ad from a company that purchased that keyword. Users win because the ads are likely to match what they are searching for. Advertisers win because users are more likely to respond to the ad—and advertisers pay only when a user clicks on the ad.

One twist is that prices for keywords are not fixed. Instead, advertisers purchase keywords based on an auction process. The company that bids the highest price for a specific keyword gets listed higher in search results. Since thousands or millions of people might search for a keyword, advertisers need to control expenses by specifying a maximum budget, such as a maximum daily amount. When the budget is spent, your ads will no longer appear. So the highest-price bid can vary throughout the day, week, or month depending on the bids and budgets of competitors. Advertisers must choose keywords, the bid price, and the budget amount.

As shown in Figure 7.20, Google provides support for selecting keywords and estimating bid prices and daily budgets. In particular, Google shows the average number of daily searches for the keywords you select so you get some idea of the popularity of each word. Google also shows the current average prices being paid by your competitors for each keyword and the approximate position your ad will get. You can use this information to set a daily budget. Be careful—some words

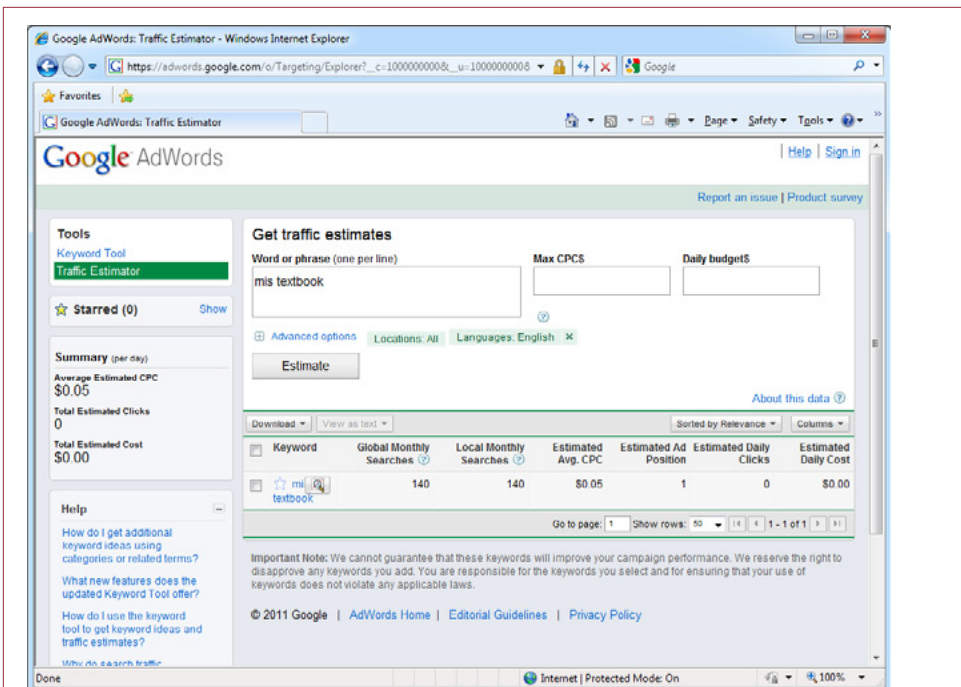


Figure 7.20

Estimating budgets for Google AdWords. Google provides estimates on the number of daily searches for each keyword you select. It also looks at the average bid price for those keyword ads and estimates a daily cost and ad position.

can be expensive. Paying a higher price will put your ad near the top of the list, but it will quickly blow through your budget. Pricing your ad too low means that it will not make the first results page. Increasingly, people will never look beyond the first page of results or ads. On the other hand, if customers never see your ad, they will not click on it and you will not have to pay anything to Google. So, perhaps there is a strategy of bidding low and waiting for all of the other budgets to run out. Ultimately, results also depend on the number of competitors. In the end, you have to experiment with different words at different times to see which customers actually click your ad and how many then complete a purchase. Oh, you also have to write the ad—but it is easy to look at the format of other ads to see what features are attractive and which ones are not.

Google AdSense

Another Google twist was the introduction of AdSense—which is designed for publishers of other Web sites. Basically, anyone can place Google ads on their Web pages. The process works the same way as AdWords, but Google matches the keywords to specific sites (instead of waiting for a search). Visitors to your site see ads that are placed by Google. When visitors click an ad, the advertiser is charged through Google and Google shares a portion of the revenue with your publishing Web site.

One of the strengths of the Google approach is that it is relatively easy for both advertisers and publishers to join the program. And both can experiment without

Reality Bytes: Sales Tax Revenue Declines

Citizens often want governments to provide services such as parks, education, roads, police, and so on. Many of them do not realize how cities and counties fund those operations. In most states, property taxes are the primary source of revenue—followed closely by sales taxes. The Census Bureau reports in 2008 that on average 23 percent of U.S. state and local taxes come from sales taxes. The recession of 2008 resulted in declines in purchases—hence a reduction in sales tax revenue. But, the National League of Cities reported that municipal sales tax revenue declined in six of the ten years from 2005-2010. Part of the problem is that cities and companies overbuilt the number of malls. The amount of retail store space increased by 126 percent from 1970-2010 while population increased only 52 percent. But, city leaders are concerned that online sales ultimately are a problem because they will reduce sales tax revenue collected through traditional stores.

Adapted from Miguel Bustillo and Kris Hudson, “Faded Malls Leave Cities in the Lurch,” *The Wall Street Journal*, June 8, 2011.

long term contracts and can begin with low numbers and small budgets. In other words, it is easy to experiment and tweak your involvement until you find a combination that works. Even small advertisers and Web sites with a small number of viewers are welcome. In many ways, Google democratized the online advertising world. Almost anyone can now advertise or receive money from ads even with low traffic volumes.

Click Fraud

One potential problem with Google’s approach is the opportunity for click fraud. In theory, you could enter a search at Google for your chosen keyword; then repeatedly click on your competitor’s ad—driving up its costs and forcing it off the list when the budget is reached. Google claims to have software in place to recognize these attempts, and claims that fraud rates are relatively low. For example, ad clicks from the same IP address in the same day are supposed to be charged only one time. Fraudsters have to be a little more sophisticated than sitting at their desk clicking away. And most people are probably relatively honest and would avoid such behavior. Nonetheless, you need to monitor your usage data and click through rates to watch for potential problems.

Privacy

Privacy is the important flip side of advertising. The more serious privacy problems that have arisen were due to issues with advertising. The problem is the trade-off faced by advertisers. Companies want to target ads as closely as possible to people who are likely to care about and purchase the product. Hence, advertisers want to know a considerable amount of information about current customers and viewers of various Web sites. Yet collecting this data creates a loss of privacy for the customers.

DoubleClick instigated one of the broader privacy problems. By routing so many ads through its servers, DoubleClick is able to track the Web pages visited by each of millions of Web browsers. At one point, DoubleClick wanted to sell this information along with demographic data on the individual consumers.

Most consumers are not happy when a company tracks the sites they visit without informing them of the process. The basic premise of tracking demographic and customer data is that, by knowing more about the customer, it is easier to provide specific ads and data that might appeal to the customer and, in essence, fewer “junk” ads the viewer does not want.

Most advertising sites, including DoubleClick, use third-party cookies to track sites visited by as many people as possible. When you visit a site that contains a DoubleClick ad, DoubleClick inserts a cookie on your computer that records the time, Web site, and ad displayed. Any other site that uses DoubleClick returns that tracking cookie. Because thousands of sites use DoubleClick, the company can generate an extensive summary of your online activity. In 2010, the Wall Street Journal ran an extensive series of articles on the area of Web advertising and privacy. Consumers can take some actions to protect their privacy. For example, most browsers have privacy settings to block third-party cookies. These settings have to be made manually. Browsers also have more advanced “private” modes which block almost any data and cookies, but allegedly in response to advertiser complaints, the developers (particularly Microsoft and Google) have made it somewhat difficult to enter that special mode. In 2011, Microsoft announced that it would support an opt-out privacy filter that would give people some ability to prevent Web sites from tracking any information about them. It remains to be seen if these tools will be implemented or if they will be useful.

Developing and Hosting Web Sites

How do you create an EC Web site? Once you have decided that you want to participate in EC, you need to figure out how to create the site and get it hosted. In part because of the expense of maintaining a high-speed Internet connection, several companies have been created to provide alternative Web-hosting options. These hosting companies already have high-speed Internet connections, Web servers, databases, and management staff. They provide a variety of leasing options to host your site. One of the most important decisions to make regarding the Internet is where to locate the Web files. A variety of choices exists, and each method has different advantages, costs, and drawbacks. The choice of Web-hosting method depends on several characteristics of your business. Companies will often start with one option and move to other selections as they expand—particularly small firms or start-ups.

Today, companies rarely host their own Web sites. Several huge companies provide comprehensive capabilities with servers located around the world. Even if you want total control over your own servers, several companies provide colocation services, and with high-speed Internet connections, it no longer matters where servers are physically located. Even large companies that have the expertise to run servers typically make use of these large server farms. Virtual machine technology has made it even easier to use hardware maintained by other companies. The virtual servers can be configured and moved to any physical hardware. Even if you want a retail Web page to display the current inventory level (to indicate if an item is in stock), the Web server can connect to your internal databases across the Internet. Still, there are times when companies will want to run their own servers. The bigger question is when you can use existing software and when it is necessary to create custom software to run on the servers.

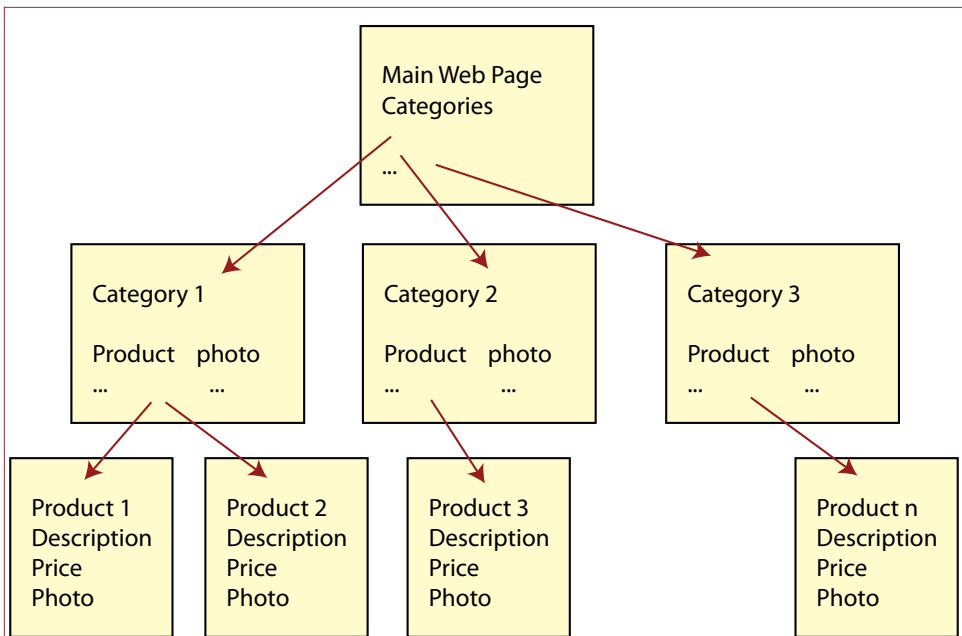


Figure 7.21

Retail website with simple pages. Each product will generally be on a separate page, but each page must be created individually and linked by hand.

Simple Static HTML

The most basic Web site consists of simple HTML pages—text and some images. These pages are generally fast to load, require minimal support from the server, and are relatively easy and inexpensive to host. For example, many Web providers offer free Web space. Most developers try to hold Web pages down to about 50KB per page, including graphics. The goal is to keep download times to an acceptable level even for slow connections. These basic Web sites cannot interact with the viewer. For example, you cannot accept form data or process credit cards. Similarly, the Web pages cannot interact with your internal databases. Generally, a single set of pages is made available to everyone, with little or no customization for individual users.

Although these relatively simple pages are easy to create, it is difficult to change them and keep them up to date. All changes must be made individually, and the developer must keep track of the details.

Consider the steps involved in creating a retail Web site with **static HTML** pages. You write a page that describes each product, including price and photo. You create a style for the site, adding fonts and colors. You can link the pages, probably using some type of index or a start page that lists major categories. With free hosting, it is rare to have a personalized search engine, so customers will need an easy method to find the products you are selling. Figure 7.21 shows the resulting hierarchical structure that you will have to follow. Each product will ultimately be displayed on a separate page. Each of these pages must be created individually, and links created by hand. To change any content, such as prices or

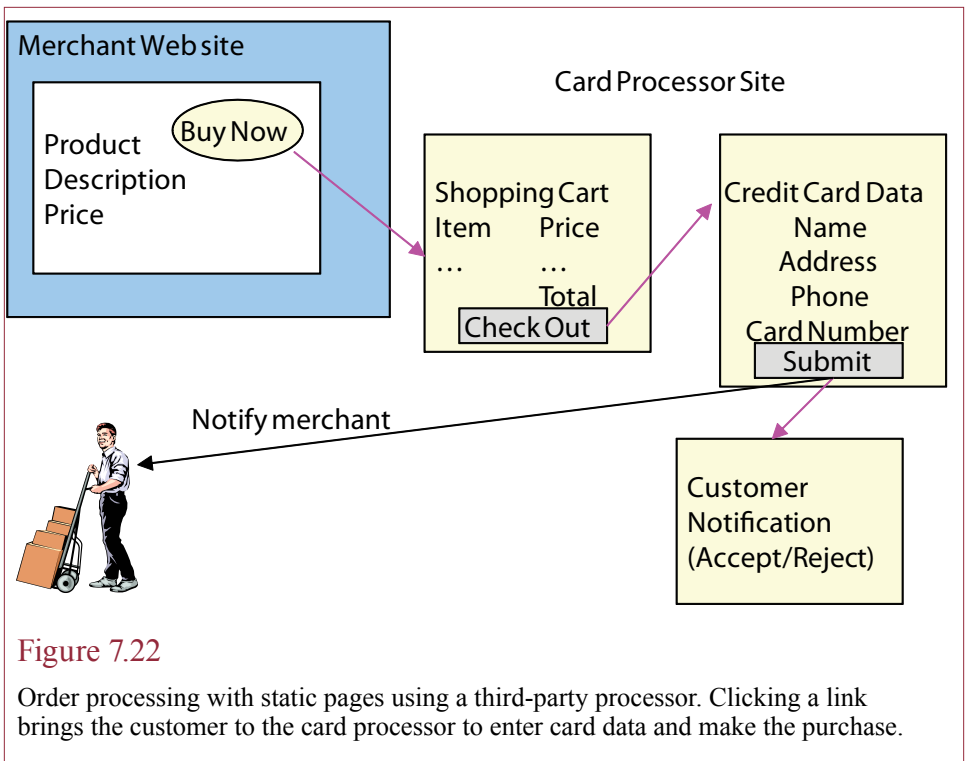


Figure 7.22

Order processing with static pages using a third-party processor. Clicking a link brings the customer to the card processor to enter card data and make the purchase.

descriptions, you must go to the desired page and make the change. This method may work for a small number of products, but as the number of products increases, it will become difficult for the developer to keep content and links up to date, and virtually impossible for users to find anything.

The other challenge with this Web structure is that the static Web server will not collect customer data, and because it cannot process form data, it is challenging to process a sale. One method is to use e-mail, where the customer enters product choices into a message that is e-mailed to your order-processing department.

The “Buy Now” or “Buy Me” button is one of the easiest methods to accept on-line payments. Several companies, such as gomerchant and Google, offer these checkout services. You set up a merchant account with one of these services and place a couple of lines of HTML text on your page. When users click the displayed “Buy Now” button, the item is added to a shopping cart that is maintained by the service provider. As shown in Figure 7.22, to purchase the items, the user is taken to the checkout form run by the service provider. All credit card and payment data is handled by the provider—the merchant never sees the customer’s financial information. This process makes it easier for the customer to trust the merchant, and the merchant does not have to handle the security problems and costs associated with collecting and storing credit card data. Because all of the interaction and processing is handled by the service site, the merchant site can run as simple HTML pages. Of course, this convenience carries a price—the service provider collects a fixed fee per transaction and a percentage of the sales revenue. However, if you decided to handle your credit card processing by yourself, you would still have to pay the credit card company and a card processor firm. So the net cost to using Google is relatively low. Plus, you can get a service that does

Uncertain prices
 Can set reserve price
 Good for unique items
 Efficiency depends on
 Full information
 Adequate number of
 participants



Figure 7.23

Auctions. Good for unique items where you do not know what price to set. Economic efficiency depends on the number of participants and full information.

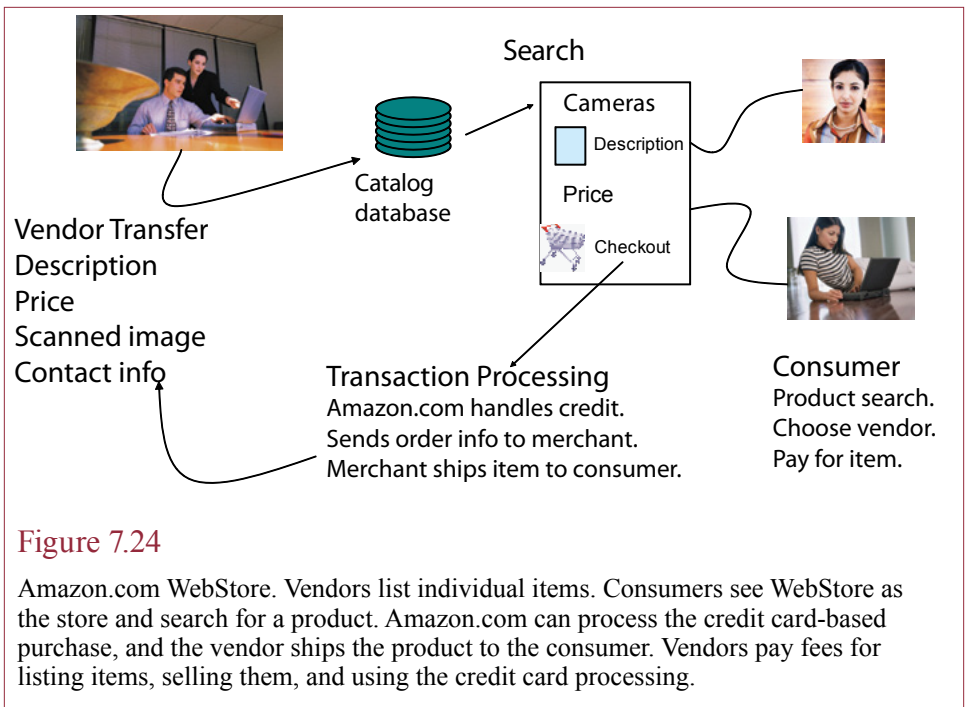
not charge fixed monthly fees, enabling you to start small and pay only when you actually have sales. However, these services tend to provide less vendor protection than you get by using a credit-card processor. Many seller complaints against PayPal are listed on various Web sites with claims that PayPal does not support vendors. It seems to be a risky PayPal strategy, because vendors are the ones who pay the fees and choose the provider.

The main drawback to this method is the difficulty in updating the data, and the related challenge for the customer in finding specific products. Because the pages are static, you have to edit each page separately if you want to change data. And it is difficult to add search and filter conditions to help customers find specific products. Static pages work when you have a limited number of products that tend to remain the same and do not require customization.

Web Auctions

Some companies are interested in selling only a few individual items. If you want to experiment with the Internet, have a few unique items, or need to clear out a couple of items, it usually does not pay to set up a separate Web site—primarily because it would be hard to attract customers on a part-time basis. EBay.com is the best-known general **auction** site. The system operates similarly to newspaper classified advertising, but interactively enables potential buyers to bid on items. As highlighted in Figure 7.23, anyone can buy or sell products. The Web site lists the products and tracks the bids. At the end of the bidding period, the seller contacts the high bid and arranges shipment and payment.

One of the major difficulties with individual sales is authentication and ensuring that the transaction is handled properly. The buyer runs the risk that the seller is dishonest. If the seller ships the item before receiving payment, the buyer may never pay up. Most sellers are unwilling to accept this risk, so they generally require the buyer to send payment before the item is shipped. However, the buyer runs the risk of fraud. In 2000, eBay recognized the importance of this problem and added the ability for sellers to accept credit cards from any buyer (called Billpoint).



Several layers of pricing exist at auction sites. Generally, the seller must pay a fee to list the item and a second fee once it sells. If the item does not sell, the seller pays the first fee. The fee amounts depend on the value of the item being sold and on the options you choose. Read the fee schedules closely. For an average, figure \$1 to list an item and about 3.5 percent of the value when it is sold. If you choose the credit-card billing option, the seller will generally pay another 3.5 percent of the selling price. As eBay has grown in size, the other auction sites (such as Yahoo) have left the industry. Economic theory states that relying on a single provider of auctions might affect the charges because of a lack of competition. However, a single site makes it easier for buyers and sellers to find each other.

Amazon WebStore

Amazon.com was one of the early e-commerce sites to enable small merchants to start Internet sales. As shown in Figure 7.24, the system (Amazon WebStore which used to be called MarketPlace) enables merchants to sell items by setting a fixed price. Listing items for sale is similar to the auction process. The seller pays a fee for listing the item and a fee based on the selling price when the item is sold. The fees change over time, but are loosely \$1 per item plus 6 to 15 percent of the item's value. Amazon also imposes some limits on the prices you can charge for various items. The company provides a bulk loading program to transfer all of the product descriptions and prices.

Amazon is essentially a Web mall that supports a number of sellers. Since the products show up in a regular search at Amazon, many customers do not know they are dealing with a third-party supplier. Consequently, although the costs are relatively high, the sellers gain instant credibility from the Amazon name. Other companies offer merchant mall services, but few have the name recognition and customer base provided by Amazon. Amazon also provides a system for vendors to create their own store sites.

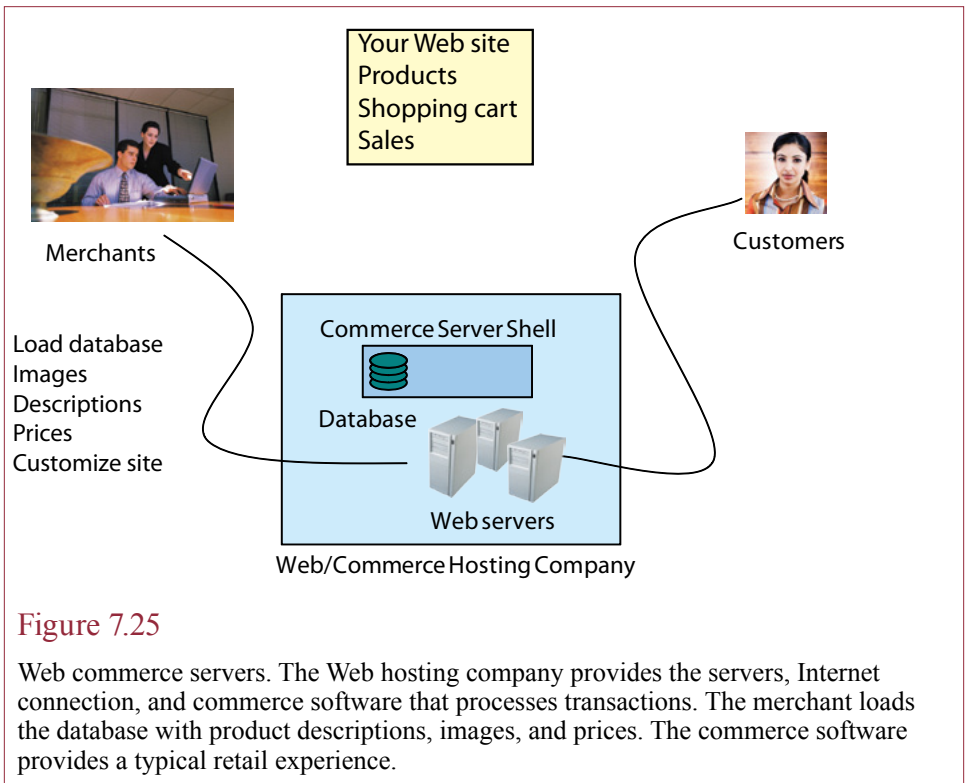


Figure 7.25

Web commerce servers. The Web hosting company provides the servers, Internet connection, and commerce software that processes transactions. The merchant loads the database with product descriptions, images, and prices. The commerce software provides a typical retail experience.

Auction versus WebStore

If you wish to sell a small to medium number of items, then auctions and Amazon are a good option. The transaction and shipping costs tend to rule out low-priced items. On the other hand, buyers are somewhat leery of high-priced items from unknown sellers. For example, most people might consider buying a rare coin from a dealer but would be more reluctant to deal with an unknown independent seller.

If you have a small number of intermediate-priced items to sell, should you choose an auction site or Amazon? Auctions are particularly useful for unique items or items where you are uncertain of the value. The WebStore system has a good search engine and works well for small retailers who wish to maintain a continued presence on the Web. Auctions present a slight uncertainty in the final price. However, economic theory observes that an auction that is based on free information, and attracts all the relevant participants, will result in the highest price. One computer manufacturer that traditionally sold only through distributor channels tested this theory in 1999 by offering a limited number of machines at an auction site. All of them sold for higher prices than could have been obtained through traditional outlets. Keep in mind that if you have several products, you can always try multiple outlets and test the response.

Web Commerce Servers

Transactions on Web sites are often handled by Web commerce servers. These software programs provide all of the features needed to run a commercial Web site. As shown in Figure 7.25, the site can be run by a specialty hosting company,

or you can run it on your own servers. The software is used by companies like Amazon to host multiple sites. You can also lease it from specialty hosting firms just to provide services for your company. The capabilities of the site depend on the features available in the software. As a vendor, you should examine the features of different site products to see which ones you need. Software systems are available from several companies to run on your own servers or as a hosted service. Dot Net Nuke is a popular open-source system for Windows-based servers and Joomla is sometimes used on Linux-based servers.

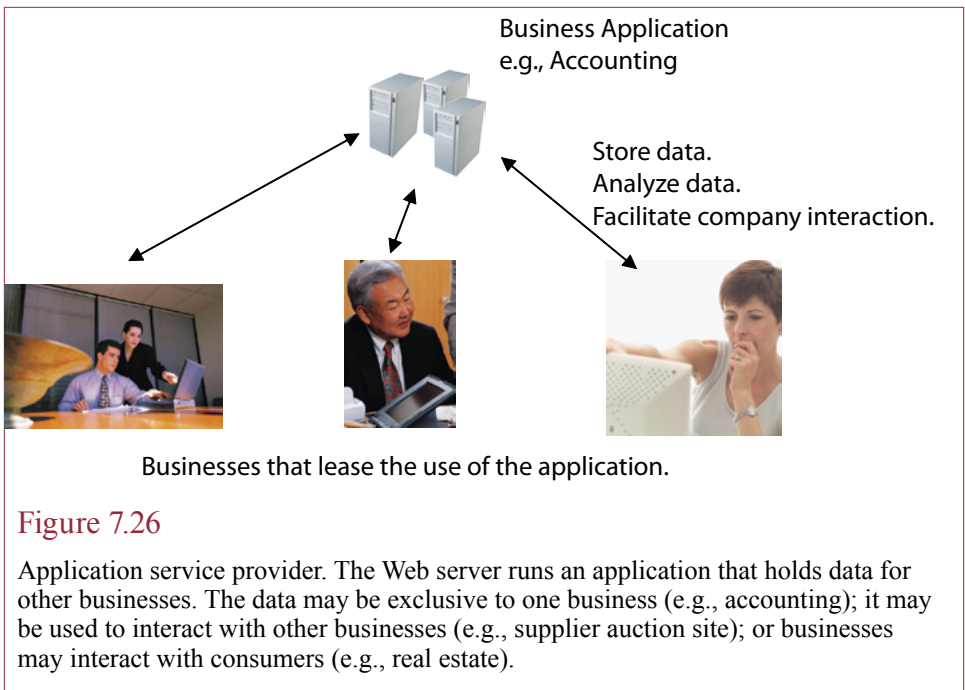
The Web hosting company provides a server, a connection to the Internet, an account for the hosting software, and credit-card processing. The Web **commerce server** hosting software provides displays of your products, the ability to customize your store's displays, a search engine for your products, and the ability to process transactions securely. Some of the hosting software packages offer detailed customization options, while others are more restrictive; but all of them provide the basic elements you need to create and run a retail Web site. The Web hosting company generally charges the retailer a setup fee, a fixed monthly fee, and a transaction fee—particularly for processing credit cards. The fees are highly variable and each company bases them on different parameters (such as number of products versus number of transactions). The main strength of the Web commerce software is that you load product information into a database so it is easy to update and easy for customers to search. The software contains all of the code to build a relatively sophisticated Web site—you simply customize it with your own designs. Today, you can build many elements of a commerce server using components produced by the open source community.

Content Management Systems

If you have a small business with a Web site that sells only a few items, it is relatively easy to create and manage the Web site. On the other hand, you might have hundreds of products and need to change descriptions, photos, or prices on a regular basis. Or you might have thousands of pages of content that need to be updated. For example, a service organization might include descriptions of services or analysis of recent events. Keeping pages up to date can require the participation of dozens or hundreds of workers to create and edit the content.

A **catalog management system** is designed to help you maintain a database of products for sale on Web sites. You enter product descriptions and prices on a local system and it updates the Web site catalog. The system has to recognize and know how to communicate with your commerce server software. The main strength of the catalog management system is that it focuses on the products and provides tools to group them into categories and change prices. It can then automate the Web server updates.

Web sites that focus on text pages instead of products are often more complicated. The pages can be written by hundreds of different employees. You want all of the pages to follow a standard style and to fit into your Web site's structure and search system. You cannot let hundreds of employees edit the Web site directly—it will be next to impossible to maintain consistency and security. A **content management system** is designed to make it easy for nonprogrammers to update content, maintain a consistent style, and keep track of changes to a Web site. The systems generally allow workers to create content using traditional editors such as Microsoft Word, and then convert the text into HTML and store it in the appropriate pages. They also track the revisions, so you know who changed each page and



when it was modified. Most of the systems also maintain version control so you can switch back to an earlier version of a page if something goes wrong.

Application Service Providers

An **application service provider (ASP)** is a Web-based business that provides a specific service to other businesses. The service is very specific, and might or might not involve interactions with customers. For example, as shown in Figure 7.26, one company provides online accounting services for small businesses. For a monthly fee, you can enter all of your transaction data and generate standard reports. Other ASPs act as intermediaries in providing services. For instance, a few major companies provide Web-based real estate listing services. Other companies provide online reservations services for service businesses.

If you can find an ASP that provides the services you need, it will generally be easier and cheaper to use the services of the ASP than to create your own Web site. Competition should eventually give you greater choices in price and quality. Even if an ASP does not exist for the service you wish to provide, it might be possible to convince a firm to adapt their products or create a new service.

The other way to look at ASPs is to find your own application service that you can provide to other organizations. It takes time to create the application because it is almost always custom programming. But, once the application is running, it generates money on a regular basis. And you might be able to collect advertising revenue from the site—which also rolls in every day.

Web Hosting Summary

As shown in Figure 7.27, once you know the type of e-commerce site you wish to run, you need to select a hosting option. Today, most companies outsource their Web sites to specialty data-center companies that have direct high-speed connec-

Business Situation	Hosting Options
Small business with a few basic items.	Static HTML with a Buy Now button.
Unique items of uncertain value.	eBay auction.
Many items but minimal configuration issues.	Web commerce server hosted by third party.
Many unique items and merchant identity is not critical.	Amazon WebStore
Unique service.	Custom programming, probably run on a hosted server.
Custom application with tight linkages to in-house applications and databases.	Custom programming running on your own servers.

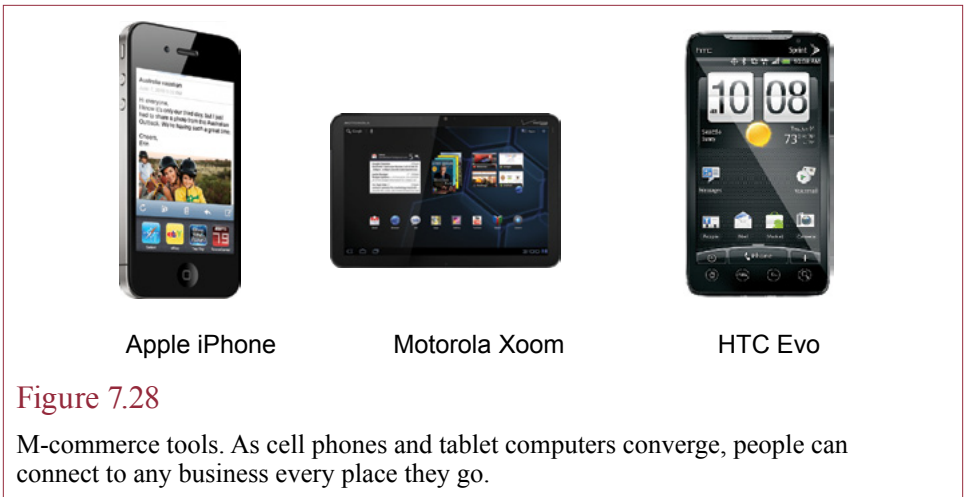
Figure 7.27

Web hosting options. Today, most companies host their Web applications on the servers of specialty companies. Your job is to match the services you need for your business.

tions to the Internet. But, you can choose from thousands of companies with many different options. You need to begin the process by identifying the primary features that you need. For example, if you need your own brand identity, you will want your own URL, so Amazon WebStore might not be the best solution. If you need custom programming, you will have to find a hosting company that provides support for the languages and databases you need. If you need Web commerce software, you will want to test the catalog management system to ensure it is easy to use and compatible with your existing systems.

Web hosting companies typically charge fees based on the disk space used by your site and by the monthly data transfers. The monthly data transfers become one of the critical issues and tend to affect the price. If your site contains lots of video and large photos, or if you expect millions of visitors, you will need to look at hosting packages that provide the ability to transfer huge amounts of data each month. The monthly data transfer number represents the cost of the bandwidth that you are using. It is a difficult number to estimate for startup firms. You can try to estimate it based on the expected number of visitors, the average number of pages viewed, and the size of the page in bytes. But the expected number of visitors can be hard to estimate. Once the site has been operating for a few months, you can get a better idea of the data rates. Until your site gets mentioned on a national radio or TV show and the number of visitors skyrockets.

Web hosting companies provide several levels of service—with increasing prices for each type of service. The simplest hosting consists of basic HTML pages, with no database connectivity and limited programming. You might or might not get your own name as a Web address; but you can probably find this level of service at almost no cost. You can add more features to basic sites to add more e-commerce options. For example, database connectivity makes it easier to store product details. Programming support is useful if you need to customize the Web site. Preprogrammed shopping carts and security certificates are useful if you handle payments yourself. Web commerce software simplifies the tasks of handling product sales. Most companies provide these services on a shared server—where



hundreds or even thousands of other company sites are hosted on the same physical server that is owned and managed by the hosting company. Another option is **co-location**, where you own the server hardware and install the software and manage the system and security. Essentially, you just rent space and a high-speed Internet connection from the hosting company. This option is useful if you are concerned about security or interference from other Web sites, and have the personnel to manage the server and security issues.

Running your own Web server is a challenging task. The software and servers are relatively easy to deal with. Security and monitoring are considerably more complex. Plus, it is expensive to install high-speed Internet connections to your premises. But, sometimes you have no choice and need the total control over your applications. Before you take this step, be sure to hire experienced security experts. And keep in mind that even large firms like Yahoo host their servers at specialty sites. Google is an exception—in addition to running its own Internet connections, the company custom-builds its own servers.

Mobile Commerce

How do portable Internet connections (mobile phones) provide new ways to sell things? In many ways, mobile commerce may not be much different from the existing Internet. As shown in Figure 7.28, users have cell phones and tablets with wireless connections to the Internet. However, for the near future, these appliances will have small, even tiny, screens. With 3G wireless networks, led by Verizon, the data transmission speeds have improved but are still relatively slow. From a technical standpoint, companies will have to rebuild their Web sites to support these devices. Each screen of data will have to be carefully designed, most graphics will have to be downsized, and the page navigation will need to be simplified. Because the keyboards are hard to use, the Web sites will have to reduce the amount of data to be entered. The most recent 4G services are relatively fast (particularly LTE offered by Verizon) as long as congestion stays low. Higher speeds lead to new possibilities, including video; which might open more opportunities for sales and marketing.

The real benefit of wireless connections is that they create new opportunities. If people are connected everywhere (or at least in the major cities), a vast amount of

information becomes available at any time. Stores could instantly provide detailed product information to customer phones. For B2B sales, a salesperson could instantly retrieve data on competitor products, build charts, and transfer the presentation to the customer's system. Payments could be handled with wireless transfers of secure code, digital signatures, or even biometric data.

M-commerce will have an impact even on businesses that choose to stay with traditional sales methods. Consider a customer shopping for a product at a retail store. The customer can instantly get comparative price quotes from a dozen other sources and make an informed decision about whether to purchase the item electronically and wait for it to arrive, or to pay a premium to take the product home immediately. Several companies offer comparative shopping sites that make it easy for customers to check prices on their cell phones. With GPS chips, cell phones also provide the ability to expand location-based applications, including advertising. For example, Google maps enables companies to advertise businesses, such as restaurants, that are displayed on a map when the customer searches for an address. With a little additional effort, the restaurant could offer coupons or make it easy for customers to make a reservation or check waiting times.

A newer use of cell phones is to tie shopping into social networks. Several companies encourage shoppers—particularly women—to share potential purchases with friends. For example, try on a piece of clothing virtually and let friends vote. Even basic tasks such as reviewing products and recent purchases for your friends to see might lead to increased sales.

Taxes

When do consumers and businesses pay sales taxes on the Internet? Sales taxes present a problem in the United States. Most states tax sales of products and services to obtain revenue to pay for public services. Many municipal governments add their own sales taxes to cover costs of local services. Consequently, over 7,800 separate tax districts exist, with the possibility of several thousand—based on each city. The system works reasonably well for small stores located in one district. But businesses that operate in more than one district must register and file tax forms within each district.

If the sales tax rate were the only issue, the situation might not be too bad. The difficulties multiply because each district has different categories of products and different taxable items. An item taxable within one district might not be taxed within a second. A third district might place the item in a different category and impose different taxes.

The interesting legal aspect of the taxes is that they are defined as use taxes on the citizens—and are supposed to be paid by consumers regardless of where the product was purchased. Since consumers are generally slow to volunteer payments, the states require businesses to collect the taxes and forward them to the appropriate agencies. This situation causes problems when the business is located in a different state. At various times, states have attempted to require out-of-state firms to collect the taxes, but the U.S. Supreme Court has always ruled that the U.S. Constitution clearly forbids the states from taxing interstate commerce. The fact that it is a constitutional issue is important, because it would require a constitutional amendment to change the situation. Congress has discussed creating a simpler tax system, but it is unlikely that it will pass as a constitutional amendment.

Local merchants often complain about the difficulty of competing with out-of-state firms that do not have to collect taxes. However, these same firms could

Reality Bytes: How Do People Communicate?

Texting, or short-message service (SMS), grew to huge volumes in the 2000s. In the second half of 2010 alone, U.S. cellphone users sent more than 1 trillion text messages. Although the number seems huge, it actually represents a slowing of the growth of text messages. Eelco Blok, CEO of Dutch provider Royal KPN NV, noted that the company's youth-oriented brand saw an 8 percent decline in SMS messages in the first quarter of 2011. As the number of smart phones increases, vendors are adding apps to send text messages over Internet connections, bypassing the phone company SMS system. This distinction is critical to the mobile phone carriers. AT&T and Verizon, the biggest carriers, charge \$20 a month for unlimited texting. This huge price provides at least an 80 percent profit margin, compared to 35 percent for data or voice. If customers switch from texting, carriers will need to make up the lost revenue through data prices.

Adapted from Anton Troianovski, "Carriers Sweat as Texting Cools Off," *The Wall Street Journal*, June 8, 2011.

sell into other states, so the issue could be neutral. Also, consumers who want to touch the product and bring it home immediately are still going to buy from local merchants. More important, state and local governments are concerned about losing their tax base. If consumers shift more of their purchases to e-commerce, the states will lose substantial revenue. For instance, consider the fact that Dell is one of the leading retailers of personal computers—relatively expensive items. Yet Dell has a physical presence in only a few states, so they do not collect taxes for most of the sales. This multi-billion-dollar industry represents hundreds of millions of dollars of annual tax revenue to the states. On the other side, some large companies, such as Cabela's (Idaho Statesman May 8, 2007), have argued that their mail/Internet companies are distinct subsidiaries from their physical stores; and sales from the Web site remain nontaxable, even when a physical store is opened in a new state. Ultimately, states will have to increase other taxes to compensate for this lost revenue. Since most economists consider an income tax to be more progressive than sales taxes, the effect is not all bad.

Sales taxes on services are an even trickier issue. Since a large portion of the GDP is based on services instead of product sales, many states have begun taxing services. In 2003, Congress allowed the federal moratorium on Internet taxes to expire. States are now free to charge taxes on Internet connections. Just as you now pay several dollars a month in taxes and fees for telephone service, you might be asked to pay more for your Internet connection.

Global Economy

Does the Internet create a global marketplace? E-commerce has the potential to open up the global economy. Theoretically, anyone with access to the Internet can purchase products directly from anywhere in the world. However, actual practice cannot live up to the expectations of theory. Three major issues still limit international trade: (1) transportation costs, (2) national policies, and (3) payment and trust limitations.

Transportation costs will always exist, but they can be relatively high for individual orders. International bulk shipments are considerably more economical,

- Fixed monthly fee
- Cost per processing
- Data storage costs
- Data transfer in and out
- Database/software fees
- Examples:
 - Amazon: Elastic Cloud (EC2), Simple storage service (S3)
 - Microsoft: Azure and SQL Azure
 - Rackspace
 - Equinix

Figure 7.29

Cloud computing cost structure. Most costs are variable and it is usually easy to scale up the capacity. Costs will increase but they can be matched to increases in usage.

so there will always be an incentive for retailers to purchase in bulk and resell individual items. Transportation companies consolidate shipments to reduce costs, but customers often want products relatively quickly, and shipping by air is more expensive than shipping by sea.

Nations have many different policies and taxes regarding imports and exports. Most shipments have to go through a customs agent. Even digital products carry restrictions. A few nations attempt to monitor and control all Internet usage—to the point of insisting that all Internet traffic be channeled through government computers.

Think about the consequences if every nation imposed its will on Internet sales. While individual nations do have the right to control sales within their territory, it would destroy e-commerce if every nation imposed its control on all Internet sales. As e-commerce increases in importance, more of these issues are going to arise, and firms will need to have technology ready to handle them.

Global e-commerce is evolving—from many nations, you can buy English rugby jerseys from British vendors. But, the payment mechanisms need considerable work. Many U.S. Web sites will not accept overseas shipments because the risk is too great. Many companies will not sell to nations in eastern Europe, southeast Asia, and the Middle East because the risks are even higher.

Cloud Computing

What are the costs for cloud computing? Many of the e-commerce hosting methods rely on cloud computing. Today, most of the major providers offer virtual machines—where the hosting company runs massive server hardware and hosts independent virtual machines that you can lease. In true cloud computing systems, you pay only for the machines when they are used and you can usually expand the capacities by adding more servers on demand. As shown in Figure 7.29, the basic cost structure can include: a fixed monthly fee, charges based on processing, monthly data storage costs, data transfer in and out of the server, and fees for databases or specialized software.

Amazon is one of the most advanced providers of cloud services. The company offers three major services: virtual machines in the Elastic Cloud (EC2), data storage with Simple Storage Service (S3), and a couple versions of database access.

Microsoft offers similar capabilities with Azure and SQL Azure. Amazon includes calculators on the Web site to estimate monthly costs based on expected usage rates. Data transfer costs are a large component of the total bill, but they typically increase only as the site usage increases. Presumably, increased use and data transfer leads to more sales revenue to cover the costs.

Summary

E-business is a complex topic. On one hand, the Internet and mobile commerce simply represent new ways to interact with customers and handle transactions. On the other hand, they have the potential to change the economy and society. The Internet continues to expand into more areas business and consumers' lives. Businesses at all levels need to find new ways to connect to customers, while staying on the right side of the thin line of privacy—which keeps moving.

Businesses have many ways to make money on the Web and with mobile commerce, but ultimately, revenue comes from sales of products, sales of services, or advertising. Although anyone can make money with advertising thanks to Google AdSense, currently a handful of firms receive the bulk of Web advertising dollars. So, you should probably think about finding ways to sell products and services.

Advertising on the Web is straightforward—but also controlled through a few primary sites. Google is the main advertising point on the Web and it controls most of the keyword search ads as well as banner ads through DoubleClick.com. You should be able to use Google's keyword tools to find keywords, estimate the bid prices for them, and establish a daily advertising budget.

E-commerce sales can be analyzed in three phases: prepurchase, purchase, and postpurchase. The prepurchase phase consists primarily of advertising, providing specifications, and product configuration or selection. Purchase largely consists of handling the transactions, including verifying the customer, protecting the data transmissions, and handling the money transfer. Postpurchase support includes service, problem tracking, and cross selling.

Developing and hosting Web sites is a relatively complex business. Most companies choose to outsource these activities to specialists. However, it is relatively easy for small businesses to create a Web site and begin selling items online. The Buy Now button approach is relatively inexpensive and easy to experiment with. Web auctions are useful for unique items, particularly when the value is uncertain. Amazon Web-Store is a good alternative for small businesses that want to sell products online to an established set of customers, without the costs and hassle of building a separate brand name. More complex sites, such as Web services are still built with custom programming, but several firms can help develop and host these new services.

Mobile commerce is similar to e-commerce, but the wireless capabilities can provide some interesting applications—particularly for B2B e-commerce. Sales taxes and the Internet are a challenging problem for states. Ultimately, states will have to alter their tax systems. Similar problems arise on a global scale. Many issues involving customer authentication, payment validation, and national control need to be resolved before global e-commerce can seriously expand.

A Manager's View

Making money on the Internet is not easy, but it is possible. Internet sales are increasing faster than sales through traditional channels. The challenge is to use the Internet to increase your sales while still maintaining existing relationships. New services are being created and the sales of digital products are expanding. M-commerce offers the potential to provide another shift in business and society—but it will be a while before the hardware, networks, and software become widespread enough to make a difference. You need to understand how customers use Web sites to purchase products. Attracting customers or making money through advertising requires a thorough understanding of Google's keyword sales method. Developing basic sites and finding hosting companies for them is relatively easy. Creating custom service applications is still difficult. Choosing the right hosting approach is a key step in getting online with an affordable system.

Key Words

application service provider (ASP)
 auction
 bill presentation and payment
 business to business (B2B)
 business-to-consumer (B2C)
 catalog management system
 click-through rate
 co-location
 commerce server
 content management system

digital rights management (DRM)
 disintermediation
 e-business
 intellectual property
 near field communication (NFC)
 search engine optimization (SEO)
 simple object access protocol (SOAP)
 social networking
 static HTML
 Web 2.0

Web Site References




Amazon (EC2)
 Amazon (S3)
 Microsoft Windows Azure
 Microsoft SQL Azure

IBM
 Savvis (CenturyLink)
 RackSpace


Cloud Hosting

aws.amazon.com/ec2/
aws.amazon.com/s3/
www.microsoft.com/windowsazure
www.microsoft.com/windowsazure/sqlazure
www.ibm.com/cloud-computing
www.savvis.com
www.rackspace.com/cloud

Review Questions

1. What types of products are easy to buy online and which ones are difficult to sell solely online?
2. What are the potential benefits and costs to disintermediation that can be accomplished with e-business?
3. How does B2B differ from B2C e-commerce?
4. How does EC differ in the three areas of prepurchase, purchase, and postpurchase?
5. How do Web 2.0 sites make money?
-  6. What are the primary payment risks in e-business and how do firms reduce the risks?
-  7. What options are available for promoting a Web site?
8. What choices do advertisers need to make when dealing with keyword ads?
9. What options are available for building and hosting Web sites?
10. How do people use cell phones when making purchases?
11. Many people were concerned that by not requiring EC firms to collect sales taxes, traditional firms would eventually lose business and the states would suffer large declines in tax collections. Why did this scenario not happen? Might it still happen in the future?
-  12. What problems make it difficult for EC to be global?

Exercises

1. Choose a non-digital item that can be purchased online. Find at least three sources for it and compare the prices. How can different prices exist for the same item?
2. Using the Web or by talking to retailers, find a company that only sells through retailers. Or, find a company that sells direct, but only at list price. What characteristics of the product and industry support or encourage this choice?
3. How can the Web site Twitter make a profit?
4. Choose an industry and assume you are running a Web site for a company in that industry. Select keywords that you might use to advertise your Web site. Estimate the amount you would be willing to bid for Google ads on the keywords and specify a budget. Hint: How many people who click-through an ad will become customers?
-  5. Select a Web site and identify the prepurchase, purchase, and postpurchase elements.
6. Check with a Web advertising site and identify the cost to run a banner ad on the site. Specify the type of ad and the number of times to run.

7. Obtain the financial statements from a publicly traded social network site and identify the major sources of revenue and costs.
8. Research PayPal from the perspective of a vendor and briefly describe what happens if a consumer claims that they never made a purchase that has already been shipped.
9. What percentage of apps in the mobile market are for games, books, or entertainment?



Technology Toolbox

10. Select one of the major Web server tools and identify how it handles multiple languages.
11. Find a reference that identifies the percentage of sites based on Microsoft Web servers.
12. Check your school's course catalog or talk with instructors in computer science and MIS to see which Web technologies are taught at your school. Also check a local community college catalog.
13. Use Dice.com to compare the number of jobs available for the three main Web technologies.
14. Find current costs for processing credit cards through (a) PayPal, (b) Google, (c) an independent merchant processor.
15. Find the current VISA merchant security requirements if your Web site handles credit card data directly. Estimate the costs of complying with the requirements if you are a small merchant.



Teamwork

16. Search for a common product such as a camera and choose three Web sites with at least one of them from a small company. Compare the three sites in terms of their support for purchase, pre-purchase, and post-purchase support; and their use of social networks.
17. Have each person choose a different item for sale on eBay that has similar items for sale at retail stores or other Web sites. Compare the final eBay price to the other prices. Summarize the differences for the team.
18. Assume that a friend wants to start an online business selling jewelry. Have each person find a hosting company that could handle the site. Identify the costs and tools provided by each company. Share the results and choose one to recommend to your friend. Briefly explain the basis of the decision.
19. Assume the team wants to create a new cell phone app. Find estimated data on prices and sales for existing apps. Estimate the costs of developing and marketing an app and use the data to estimate potential profits.
20. Choose a Web site. Evaluate all aspects of the site and write a plan to suggest how it can be improved.



Rolling Thunder Database

21. Identify at least three areas in which Rolling Thunder Bicycles could profit from e-business. Be specific, and explain what technologies would have to be added (for instance, Web hosting).
- ✓ 22. Find at least five sites on which it would make sense to advertise Rolling Thunder Bicycles. As much as possible, identify the advertising costs and the demographics of the site visitors.
23. Develop a plan for expanding Rolling Thunder Bicycles into international sales. Be sure to identify any potential problems, and discuss how you will deal with them.
24. Develop a plan for creating a Web-based system for connecting to suppliers. What software would you need? How can you convince the suppliers to cooperate?
25. The management of Rolling Thunder Bicycles cannot decide on a Web strategy. For the three main approaches (simple HTML, auctions, and commerce server), list the primary strengths, weaknesses, and costs as they apply to this company. Make a recommendation and briefly explain your choice.

Additional Reading

- Barzo, Jeanette. "Online Micropayment Systems See New Interest but Face Old Hurdles," *The Wall Street Journal*, April 3, 2001. [Decline of e-commerce advertising revenue and increase in selling of content.]
- CNN, "Study: Four sites account for half of Web surfing," June 5, 2001. [Dominance of a few large firms in attracting users.]
- Collett, Stacy. "Amid turf battle, some middlemen call for truce with online rivals," *Computerworld*, April 16, 2001. [Discussion of role of middlemen and disintermediation in e-commerce.]
- Fireswick, Kris. "The e-files," *CFO*, February 2001. [Comments and analysis of some lead managers of failed dot-coms.]
- Matthews, Robert Guy. "Web Firm Lures Steel Giants," *The Wall Street Journal*, September 2, 1999. [Early auction site for the steel industry.]
- Moss Kanter, Rosabeth, "The Ten Deadly Mistakes of Wanna-Dots," *Harvard Business Review*, January 2001. [Discussion of the e-Commerce failures.]
- National Mail Order Association, 1998 Mail Order Sales Results, 1999, <http://www.nmoa.com/Library/1998sale.htm>. [Statistics on mail order sales.]
- Regan, Keith. "Study: Era of E-Commerce Profits Underway," *EcommerceTimes*, June 20, 2001, <http://www.newsfactor.com/perl/story/11381.html>. [Summary of McKinsey study on e-commerce profits.]
- "Shopping around the web," *The Economist*, February 26, 2000. [Special section on e-commerce.]

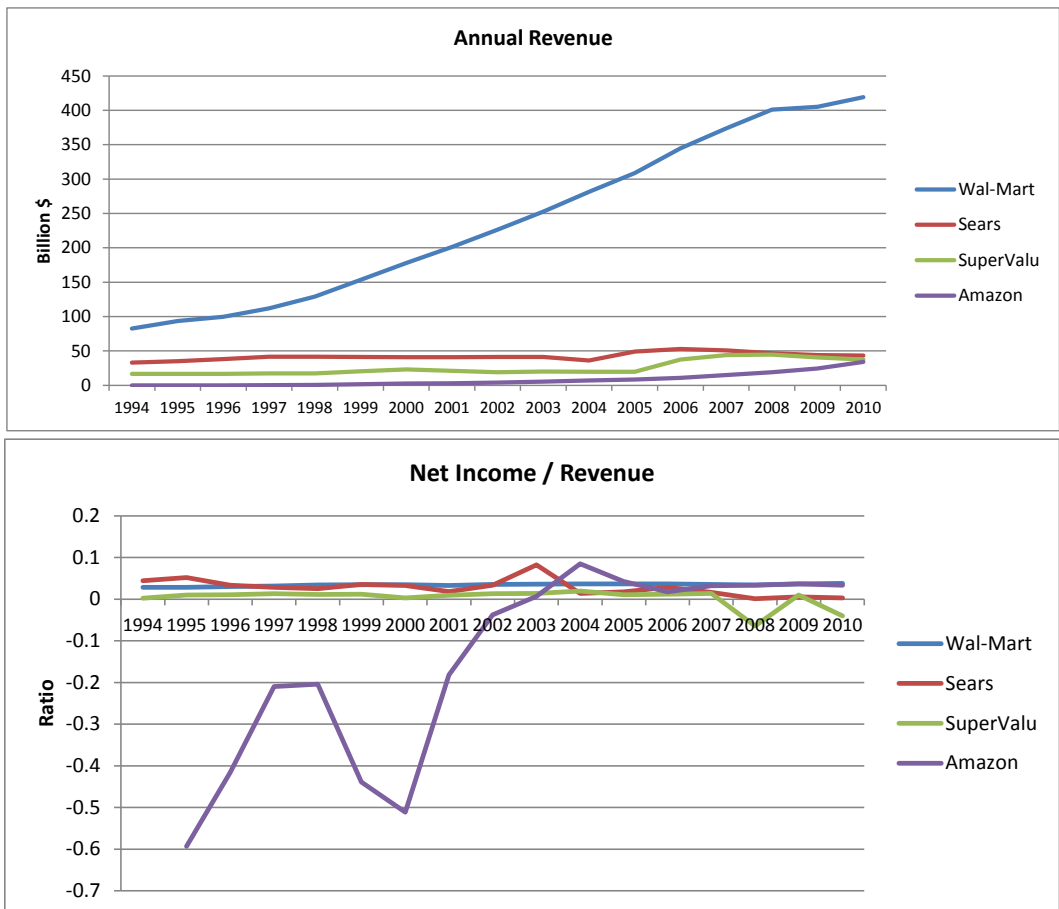
Stone, Martha L., U.S. cell phone technology lags Japan, Europe, mediainfo, June 7, 2000,

<http://www.mediainfo.com/ephome/news/newshtm/stories/060700n2.htm>. [Statistics on cell phone usage in several nations.]

Swisher, Kara. Web Retailers Faced Death; Now Can They Handle Taxes? *The Wall Street Journal*, April 9, 2001. [Summary of issues on e-commerce sales taxes.]

Cases: Retail Sales

The Industry



The retail sales industry includes a broad variety of products, but regardless of the product, several fundamental issues apply. You need to remember that retailers play three critical roles in selling products. The first is location—retail stores succeed by displaying and delivering products where the customers are located. The second is customer service. Many customers need help choosing products and need reassurance—particularly when buying large items. Retail stores also

handle returns and take care of any problems that might arise with a product. The third major role played by retailers is to spread the sales risk. Generally, retailers purchase items in bulk. If the items do not sell, the retailer marks down the prices until they are sold. But, the retailer decides which items to carry and what final price to charge, so the retailer takes the loss if products do not sell well. These three services are important to manufacturers. As part of the economics of specialization, manufacturers can concentrate on building products, retailers can focus on customer service, and both firms come out ahead.

Transactions

Tracking sales of individual items and recording transactions are critical factors in retail sales. Originally, retail firms tracked final sales only for themselves. They used the information to help decide when to reorder and when to cut prices. Since the retailer sits in the middle between suppliers and customers, the retailer participates in several types of transactions. Consequently, retailers built important accounting and inventory systems. Recording transactions with customers is relatively easy in theory. The challenge is to keep the costs as low as possible, which is why retailers continually experiment with technology at the checkouts. The retail sales transactions also have to be accurate and secure. Because retailers are generally responsible for collecting sales taxes, the systems also have to maintain adequate audit trails for the state examiners. Retailers also have to track purchases from suppliers. The actual purchase is not that difficult to track, but they also have to monitor shipping and financing costs. Moreover, there are always special orders, and someone has to match received items to orders, monitor quality, and often track down missing or incorrect orders. Increasingly, retail stores also have to build transaction systems to handle the financial aspects as well. As more customers switch to digital payment systems (debit cards), retailers have to work with banks to validate card numbers, verify account balances, and transfer the transaction totals. The detailed financial system must also be able to go back and provide documentation for possible fraudulent transactions.

Supply Chain Management

Today, led by Wal-Mart, the emphasis is on the entire supply chain. A key aspect to reducing costs and improving the profit margin is to minimize the items held in inventory. Or, in retailer accounting language, maximizing inventory turn (over). The ultimate goal might be a just-in-time replenishment system: just as a customer buys an item from the shelf, a new one shows up at the loading dock. Of course, this perfect system is almost impossible. But the profitable stores get closer every year. One key is the ability to forecast exactly which products customers are going to buy, and then build a supply chain so that the right products are delivered on time. Transaction information is a key element in supply chain management. Retailers share their daily sales data with manufacturers, so manufacturers can forecast demand and fine-tune their delivery times.

Supply chains often suffer from what is called the bullwhip effect. A small increase in sales causes retailers to forecast an increase in demand and bulk order more of the product from their distributors. If the increase arises from several stores, the distributor also sees an increase in demand and orders more products. In the meantime, the stores perceive a shortage that is not being filled by the distributor, so they increase their orders even further—to hoard the product and ensure deliveries. The manufacturer sees a giant increase in demand and starts

cranking up capacity. The initial small increase in demand has been magnified as it moves up the supply chain. Ultimately, the manufacturer over-compensates and the supply increases too far, raising costs for everyone and depressing prices as the retailers mark down the item to get rid of it. Of course, the fluctuating prices send the wrong signal to customers and can start the cycle all over again. One way to minimize the bullwhip effect is to make sure that all participants have access to the original data on customer demand and that everyone uses the same forecast. Retailers generally support this approach and share their sales data with manufacturers (Hugos 2003).

Of course, a large retail store carries tens of thousands of products and has a few thousand suppliers. So, the retail store needs to be able to integrate with thousands of different systems, or at least provide data in some common format. The massive volume of data also presents problems for storage, access, and transportation across networks. Ultimately, the stores that succeed in handling these data volumes at the least cost are the ones that have prospered.

Additional Reading

Hugos, Michael, "Essentials of Supply Chain Management [book excerpt]," *Computerworld*, March 24, 2003.

Case: Wal-Mart

Wal-Mart (ticker: WMT) represents a classic business technology case. Emphasizing customer service and low prices, the company pushes its suppliers hard. Founder Sam Walton realized early that computers would play an important role in these goals. In the mid-1960s, computers were used to handle basic accounting functions. Counting inventory was still painful because the tools were not available. It was not until 1983 that item-level bar codes were available on the majority of products. Each product was assigned an identifier or stockkeeping unit (SKU) and a standardized bar code. At that point, Wal-Mart installed point-of-sale terminals and was able to track inventory based on the sales. In 1987, the company used a satellite system to link all of the stores to company headquarters. The system enabled the company to compile real-time inventory data ("Dateline" 2002). To reduce the inventory levels, Wal-Mart knew it needed to enlist the cooperation of its suppliers, so the company instituted the collaborative planning, forecasting, and replenishment (CPFR) program to share data with its suppliers. Pete Abell, retail research director at the AMR Research consulting firm, notes that Wal-Mart's "margins can be far lower than other retailers' because they have such an efficient supply chain." He estimates that the company pays 5 to 10 percent less than its competitors for products (Johnson 2002). The suppliers are willing to offer better prices to Wal-Mart because sharing the supply chain management reduces their costs as well. And it does not hurt that Wal-Mart is the biggest company in the world with almost \$250 billion in annual sales and more than 1.2 million employees (www.fortune.com global 500).

As America's biggest employer and driven to be a price-leader, Wal-Mart seeks new ways to reduce labor costs. In 2007, the company implemented a new computer scheduling system that evaluates historical patterns and slots employees to cover the busy times and then sends them home during periods with fewer customers in the store. In the process, employees no longer have set schedule shifts.

Instead, they pick up a few hours each day. The system will also improve compliance with federal wage and hour laws—perhaps reducing the lawsuits against Wal-Mart. (Maher 2007).

Supply Chain Management

Wal-Mart led the industry in improving its supply chain to reduce costs. Its incredibly efficient distribution centers are one part of the story. Bulk shipments arrive from vendors at one side of the distribution center. For example, a large truck might be full of identical boxes of laundry detergent. The contents of the truck are unloaded and placed on a conveyor belt. The products are routed through the distribution center to the other side where a mixed load of multiple items is placed into another truck. This load might contain some laundry detergent, toys, and clothes. The mixed load is then taken to a specific store. The computer-controlled distribution center knows exactly which items need to be shipped to each store and loads the trucks accordingly. The system runs by reading the individual bar codes and shifting products to different belts.

In 2003, Wal-Mart shocked many people when it announced that its top 100 suppliers would have to switch to radio frequency identification (RFID) chips in 2005. Initially, the RFID tags would apply only to pallet loads of products. The tags provide some significant advantages over bar codes in the warehouse. They can be read from farther away and do not require perfect line of sight. Multiple tags can be read at the same time (if boxes are stacked together). They are less susceptible to damage. An important issue is that they can contain more data. This last factor is important because it would enable Wal-Mart to electronically record and track the receipt of individual shipments. Bar codes allow it to track only the specific product. A person has to manually match the shipment with the specific order. The main drawback to the RFID approach is cost. Bar codes are essentially free, since they can simply be printed on the box or a label. RFID tags in 2003 cost around 50 cents each. Wal-Mart is hoping that by forcing suppliers to adopt the tags, the bulk demand will convince manufacturers to expand capacity and reduce prices through economies of scale. Wal-Mart's target is 5 cents per tag, and it anticipates that about 1 billion tags will be needed initially (Vijayan 2003).

It is risky to be on the leading edge of technology. Standards are not yet in place and costs are relatively high. The lack of standards is a substantial problem in the international marketplace. As of mid-2004, many Chinese manufacturers were waiting for an RFID standard to be approved before agreeing to use RFID tags. Consequently, some companies might end up having to add the RFID tags after the product reaches the United States (Sullivan June 2004). Several groups have also raised concerns about privacy issues if RFID tags are moved to individual products. Although the tags can be read from only a limited range of a few feet, some people expressed concerns about stores being able to track people by tags placed in their clothes. And if not enough suppliers and distributors install the hardware and software to take advantage of the tags, the entire experiment could be an expensive trial. Some "experts" were suggesting that as many as 50 percent of these trials would fail. Nonetheless, Linda Dillman, CIO of Wal-Mart, observed that the retailer believed it needed to stay on the leading edge of technology. It was important to try technologies that might help, even though the technology eventually might not be useful (Sullivan July 2004). Initial trials with Kimberly-Clark were successful. In April 2004, the company shipped pallets of its Scott paper towels with RFID tags through Wal-Mart's scanners. But Kimberly-Clark has been working toward the RFID system since 2001 (Bachelder 2004).

By early 2006, more than 300 suppliers were using RFID tags on products shipped through five distribution centers to 500 Wal-Mart stores. Carolyn Walton, VP of information systems noted that out-of-stock items with RFID tags were replenished three times faster than before and the amount of out-of-stock items requiring manual intervention dropped by 10 percent. “We see this as a continual process in an effort to focus on bringing our customers what they want” (Songini 2006). The company intends to push the use of RFID tags through all of its processes. A typical truck delivery carries 7,000 boxes that have to be unpacked and organized. Wal-Mart plans to provide employees with wearable devices that can identify high-priority boxes that need to be unloaded immediately.

Collecting RFID data internally solves some problems, but Wal-Mart is pushing for tighter integration of the supply chain by asking suppliers to share data on the Global Data Synchronization Network (GDSN). The GDSN system builds pools of XML-based data for specific industries and stores. Suppliers and merchants upload data and synchronize their own systems so everyone has the current data (Songini 2007 and www.gs1.org).

In 2010, Wal-Mart rolled out RFID tags to track individual clothing items. Initially, the clothing items will contain removable smart tags. Raul Vazquez, the Wal-Mart executive for the Western U.S. noted that “This ability to wave the wand and have a sense of all the products that are on the floor or in the back room in seconds is something that we feel can really transform our business.” Wal-Mart also expects the technology to cut down on employee theft because it will be easier to see which items are missing. Wal-Mart subsidized some of the costs to the suppliers to ensure adoption by its major suppliers (Bustillo 2010).

Tighter Integration with Manufacturers

Procter & Gamble sells \$40 billion of household products every year. You know most of their brand names. Despite the use of information technology and electronic ordering systems, Steve David, the CIO, pointed out that returns from retail stores cost P&G \$50 million a year. Problems arise from incorrect orders, damaged products, and inaccurate shipments (Stahl 2003).

How can so many problems exist in an electronic system? One of the problems is that every company has a different description and ID number for every product. For example, P&G might have an internal ItemID for a tube of Crest toothpaste. But Wal-Mart will assign a different SKU to each specific size and flavor. The Wal-Mart database might even have a different description for the product than that used by Crest. Both companies probably have even more numbers to describe bulk orders or boxes of toothpaste. Relying on people to match the descriptions or to find items in a catalog or Web site is time consuming and easily causes errors. And manufacturers tend to continually introduce variations or new products and change the numbers. The consulting firm A.T. Kearney estimates that 30 percent of the information in catalogs is incorrect at any point in time (Konicki 2002). P&G alone sells around 60,000 different items.

One answer is to ensure that everyone uses a single standard description and ID of every product. But you have to get all of the manufacturers and retailers to agree to use the system, and someone has to pay for its maintenance. The current answer is the UCCnet registry. It is a not-for-profit subsidiary of the Uniform Code Council (UCC). Ultimately, it makes money by charging manufacturers and retailers an annual fee to use the system (www.uccnet.org). Each item listing contains 62 pieces of product data. By placing it in a single location, all merchants

can synchronize their databases to the manufacturer's standard. Errors are reduced when everyone works from the same clean database (Meehan 2002).

With more accurate data, Wal-Mart can rely on EDI to place most of its orders—reducing the costs and time of having employees manually enter each order. EDI has been around since the 1980s, but it carried a high cost because most of the transactions were on private VAN networks that are expensive. In 2003, Wal-Mart began encouraging suppliers to switch to an Internet-based EDI system. To ensure security, most merchants are using the electronic data interchange Internet integration applicability statement 2 (AS2) standard. AS2 provides security through certificate-based encryption. Merchants and producers can use the system either through a Web browser or through low-cost client tools that will connect to their ERP systems (Scheier 2003).

Competition

Competition in discount retail is stiff. Wal-Mart has literally grabbed most of the market from other retailers. For comparison, look to Kmart—which was dominant through much of the nation before Wal-Mart. Because the company did not have the supply chain management systems, and because it did not have the data to forecast customer demand, its stores rarely had the products in stock that customers wanted. Ultimately, it filed for bankruptcy protection because it could not compete against Wal-Mart and Target. In 2000, the Kmart CEO announced that he would spend \$1.4 billion on technology—more than the company had spent in an entire decade. The company burned through five CIOs in seven years and went without one for almost two years. The company also had to take a \$130 million write-off of supply chain software and hardware that did not work properly. Although spending the money earlier on technology might not have saved Kmart, it is clear that it has provided a competitive advantage to Wal-Mart (Sliwa 2002).

Smaller stores have found ways to use technology to compete with Wal-Mart. Smart & Final, a California-based chain with 225 stores has installed in-store technology to display prices and handle all data processing. The system analyzes demand and can adjust product prices on-the-fly without the need to print new labels or reprogram POS terminals. It also provides immediate sales data to suppliers with real-time access to inventory. Bob Graham, vice president of stores technology noted that “using technology like this is the best way to go up against a particular big company [Wal-Mart] that is taking over the world” (Hall 2004).

In 2010, Wal-Mart began experimenting with a new technology within its Sam's Club—personalized discounts for individual customers. The eValues program runs primarily from a kiosk inside the store. Customers log into the kiosk and the system prints a set of coupons specifically aimed at that customer with discounts on individual products. The members can also get e-mails and view coupons on the Web site. The system analyzes prior member purchases to predict what products each customer might buy and how much discount should be offered (Martin 2010).

Privacy

Wal-Mart collects a huge amount of transaction data, data that includes detailed information on everything customers purchase. Unless payment is made in cash, the Wal-Mart databases also identify the individual purchaser. This data can provide useful insights to manufacturers and marketing companies. In 2001, three retailers (CVS, Kmart, and Wal-Mart) decided to pool their pharmacy sales data

and sell up-to-the-minute numbers to drug manufacturers—in exchange for a few million dollars in fees. However, Wal-Mart also made a decision to stop selling general sales data to market research companies. A Wal-Mart spokesman notes that “our competitors were getting more out of the third-party aggregation than we were, so it made more sense for us to stop” (Rendleman 2001).

Financial Transactions

On March 31, 2004, Wal-Mart spotted a problem: 800,000 shoppers were overcharged on their credit and debit cards. The transactions were double- or triple-billed due to a hardware error. First Data Corporation, which clears financial transactions for Wal-Mart, noticed the problem when reviewing one of its quality control logs. The company reversed the duplicate transactions, but Wal-Mart put up notices to customers to double-check their statements (D’Ambrosio 2004). First Data blamed the error on a computer glitch, but did not provide details.

In 2010, Wal-Mart announced that it would replace all of its payment terminals in the U.S. with a version that supports smartcard technology. Smartcards contain a chip to provide additional information, including a PIN; and they are commonly used in Europe. To date, U.S. banks and other vendors have resisted switching to the smartcards; largely because of the costs (Vijayan 2010). It is not known if the terminals will also support near-field communications (NFC); which are likely to be the primary method adopted for cell phone payments.

Online

Wal-Mart has several online systems in place, but they provide only a tiny fraction of sales. Yet the site does get traffic. A test of the site for the 2003 holiday season showed that it was being used somewhat over its capacity—making it sluggish. The site was ranked 19th of 20 Web sites. Consumers had to wait an average of 54 seconds to complete an online transaction (Rosencrance 2003).

Somewhat surprisingly, in 2003, Wal-Mart introduced an online music service that charges 88 cents per song—11 cents less than the leading site by Apple. Songs are being provided by Anderson Merchandisers, which acquired Liquid Audio, one of the innovators in digital music. With a somewhat limited selection of songs, it remains to be seen whether customers will use the service (Bartels 2003). Wal-Mart also tried to compete with NetFlix and offer DVD rentals by mail for a monthly fee. That operation was folded after a year of weak demand.

Over time, Wal-Mart recognized that its Web site was not an effective method of selling products. Linda Dillman, executive vice president, stated at the end of 2005 that “we’ve changed our dot-com presence.” The company now views the Web site as a marketing tool. Eventually, the retailer hopes to add online software to help customers organize their data and prepare for trips to the store, particularly in terms of the pharmacy and health care areas (King 2005).

Moving in a slightly different direction for Wal-Mart, it’s Sam’s Club division started selling a digital health records system to physicians in 2010. The package deal bundled Dell computers with software from eClinicalWorks. The package includes software, maintenance and training and is priced based on the number of doctors in a practice (Lohr 2009).

IT Development

Unlike many of today’s large companies, Wal-Mart tends to develop most of its own software. The company is leery of commercial packages because it does not want to be held hostage by the software vendor. The CIO of Wal-Mart also em-

phasizes that developers have to understand the user's tasks before creating software. Just developing something does not mean it will actually be used. Consequently, before the IT staff creates and deploys an application, developers have to work in the real job. For example, if someone is going to rewrite a point-of-sale application, he or she has to work for a couple of days as a cashier. That way, developers learn what issues are important and what problems need to be solved (Schrage 2003).

Questions

1. Why are some people upset about RFID tags? Are their fears justified?
2. What does the UCCnet project do and why is it so important to retailers?
3. Why did Wal-Mart stop selling some transaction data and will it affect the company in the future?
4. What is the role of Wal-Mart's Web site? Is it a useful tool?
5. Should Wal-Mart continue to rely on developing its own software?
6. What are the benefits and costs to having developers work in a functional area before creating new applications?

Additional Reading

- Bacheldor, Beth, "Kimberly-Clark On RFID Trial: So Far, So Good," *Information Week*, May 17, 2004.
- Bartels, Chuck, "Wal-Mart Begins Testing Online Music Service," *Information Week*, December 18, 2003.
- Computerworld*, "Dateline: A Timeline Of Technology Advances At Wal-Mart," September 30, 2002.
- Bustillo, Miguel, "Wal-Mart Radio Tags to Track Clothing," *The Wall Street Journal*, July 23, 2010.
- D'Ambrosio, Dan, "800,000 Cards Overcharged At Wal-Mart," *Information Week*, April 5, 2004.
- Hall, Mark, "Retailer uses Technology to Defend Against Wal-Mart," *Computerworld*, March 9, 2004.
- Johnson, Amy Helen, "A New Supply Chain Forged," *Computerworld*, September 30, 2002.
- King, Julia, "Wal-Mart to Add 250 IT Jobs, Expand Online Presence," *Computerworld*, December 2005.
- Konicki, Steve, "Shopping For Savings," *Information Week*, July 1, 2002.
- Lohr, Steve, "Wal-Mart Plans to Market Digital Health Records System," *The New York Times*, March 10, 2009.
- Maher, Kris, "Wal-Mart Seeks New Flexibility in Worker Shifts," *The Wall Street Journal*, January 3, 2007.
- Martin, Andrew, "Sam's Club Personalizes Discounts for Buyers," *The New York Times*, May 31, 2010.

- Meehan, Michael, "UCCnet's Promise: Synchronized Product Data," *Computerworld*, June 10, 2002.
- Rendleman, John, "Customer Data Means Money," *Information Week*, August 20, 2001.
- Rosencrance, Linda, "Report: Some Retail Sites Strained By Online Shopping Surge," *Computerworld*, December 3, 2003.
- Scheier, Robert L., "Internet EDI Grows Up," *Computerworld*, January 20, 2003.
- Schrage, Michael, "Don't Trust Your Code To Strangers," *Computerworld*, September 18, 2003.
- Sliwa, Carol, "IT Difficulties Help Take Kmart Down," *Computerworld*, January 28, 2002.
- Songini, Marc, "Wal-Mart Details its RFID Journey," *Computerworld*, March 2, 2006.
- Songini, Marc, "Wal-Mart Pushing Data Synchronization Network," *Computerworld*, January 2, 2007.
- Stahl, Stephanie, "Editor's Note: Efficiency Leads To Lower Costs," *Information Week*, June 16, 2003.
- Sullivan, Laurie, "China RFID Standards Are Eagerly Awaited By U.S. Manufacturers," *Information Week*, June 21, 2004.
- Sullivan, Laurie, "RFID Will Go Through Growing Pains," *Information Week*, July 2, 2004.
- Vijayan, Jaikumar and Bob Brewin, "Wal-Mart To Deploy Radio ID Tags For Supply Tracking," *Computerworld*, June 12, 2003.
- Vijayan, Jaikumar, "Wal-Mart to Support Smartcard Payments," *Computerworld*, May 21, 2010.

Case: Sears, Roebuck and Co. and Lands' End

As one of the earliest mass merchandise stores, Sears (ticker: S) has a major place in the history of business in the United States. Richard Sears opened his first store in Chicago in 1887 selling watches and jewelry. In 1896, he began shipping the general catalog that made the company famous. In 1993, the company stopped distributing the general catalog because of the production and mailing costs. Its Craftsman tools and Kenmore kitchen appliances are household icons. In the 1980s and 1990s, Sears acquired several firms that were unrelated to its primary mission. For example, in 1981 it acquired the brokerage firm Dean Witter as well as the Coldwell Banker real estate company. By 2003, the company had divested all of those firms to concentrate on sales (www.searsarchive.com).

Gary Comer founded Lands' End in Chicago in 1963 with a couple of friends to sell yachting hardware. Over time, the company expanded into luggage, moved to rural Dodgeville, Wisconsin, and took off with direct sales of clothing through its catalogs, telephone operators, and the best guarantee in the business (www.landsend.com). In 2001, Lands' End had revenues of about \$1.6 billion compared with

\$41 billion for Sears (Weiss 2002). In 2002, Sears purchased Land's End for \$1.9 billion. However, as a wholly-owned subsidiary, the company remains relatively independent—even down to its information technology systems. The merger has had some interesting effects—partly of the success of Lands' End and the number of Lands' End executives who gained power at Sears.

Lands' End used technology to boost sales. In 2001, the company noticed that it was losing sales because products were not in stock. So, in 2002, the company built an inventory-management workbench. The data warehouse system uses an analytic engine to monitor sales and create reports. It automatically alerts sales managers when popular items need to be restocked. The system links to seven-year sales histories in the Lands' End IBM DB2 database. It even contains regional weather data so it can determine why sales of raincoats or parkas increased in an area. With its success, the company created another workbench to help with business-to-business sales, and a third one to help schedule workers in the warehouses (Whiting 2003). In addition, the Lands' End Web site introduced several innovative features.

Online

As a direct merchant, Lands' End presented several innovations. One of its more powerful tools is its virtual model. Customers enter some basic measurement data into the Web site and the system draws a 3-D model to match their body type. From that point, customers can have the model display combinations of the clothes to see how they might fit. Extending on its telephone-based personal services, the Web site also has a personal shopper service. When new styles are released, the personal shoppers recommend combinations to shoppers based on their preferences and prior purchases.

Lands' End built its company by establishing strong relationships with suppliers around the world. These ties enabled the company to offer custom clothing through its Web site. In 2001, the company began offering custom Chino pants for \$54 online, compared with standard prices of \$30-\$40. By 2004, the company was offering custom dress shirts or blouses, dress pants, and jeans as well. In addition to basic measurements, the Web site asks customers to choose among basic body types. The company then has the shirts or pants built to the specifications in a few days. The customization feature is useful because the top reason for returns is that clothing does not fit properly (Swanson 2001).

Land's End quickly learned an important lesson about Internet sales: you still have to provide good customer service, so the Web interface does not necessarily save money. On the other hand, the level of service provided by Lands' End is amazing and generally exceeds that provided by most merchants. For example, a customer called to buy clothes for his wife for Christmas. He had already ordered a charcoal-gray blazer and slacks. He wanted to know if a skirt on a different page would match. The customer service representative put him on hold and quickly called a "personal shopper," who pulled both garments from a rack and compared them to see that they did not match. In 96 seconds, the service representative was back on the phone with the caller with a suggestion for a different skirt that did match and a decision to ship the skirt at no extra shipping costs, since the first items were ordered a scant 12 hours earlier. Although the order was placed over the phone, the same level of service is available online. Bill Bass, vice president of electronic commerce, notes that "one of the great fallacies of the Internet is [that] you'll save on customer service costs because customers [will] serve themselves."

But reducing service costs is not really an important issue to Lands' End. Instead, the company would like to reduce the cost of printing and mailing its 250 million catalogs—which accounts for 41 percent of its operating costs (King 1999).

The site also offers the ability to “shop with a friend.” A customer shares a Web site with a friend in a different location. The two see the same products and can communicate via a chat session. To Lands' End, it is all part of customer service.

One of the tools that Lands' End needed help with is the search engine. Actually, few Web sites have had good search engines. Although companies like Google make their search engines available to commercial sites, they are designed to search static Web pages and not product databases. Specialty search companies such as EasyAsk and Endeca have created search engines that enable customers to ask questions in natural languages (e.g., English). The system then searches the database for the best matches (Sliwa 2002).

In 1999, Lands' End launched a global Web site, building the site on IBM's Websphere platform and partnering with Berlitz to handle the initial translations. By 2001, 14 percent of the total sales were outside of the United States. The first sites they added were Japan, the UK, and Germany. A few months later, they added Ireland, France, and Italy by cloning the UK site. Sam Taylor, vice president of international operations, notes that “to launch the French site, it cost us 12 times less than the UK site, and to launch Italy, it cost us 16 times less. That's the beauty of the Internet. It's so scalable” (Sliwa 2001). He also observed that it is considerably cheaper to reach customers via the Internet than through printing and mailing catalogs. However, he also pointed out that the company should not have created the Japanese site first. “There's nothing worse than when your programmers are making changes, and they look at the site to see if it works and they can't read it” [Sliwa 2001].

In 2009, watching sales shrink at traditional stores, Sears began pushing new Web sites and new ways of purchasing products. For instance, the MyGofer.com site lets customers order items and pick them up at a local store on the same day. Common products include groceries, prescriptions, pet food, and some electronic items (Bustillo and Fowler 2010). A similar process can be used to order items and pick them up at a local Sears store. Executives say that online sales have increased by double-digits, reaching \$2.7 billion in 2008. Edward S. Lampert who purchased and merged K-Mart and Sears is reportedly more willing to spend money for online ventures than trying to save the local stores.

The Merger

Sears knew that its clothing division was in trouble, even though they sold \$4.7 billion of apparel a year. And with the divestiture of its credit card and other unrelated operations, the executives knew that clothing sales had to be turned around. The merger with Lands' End, one of the most successful direct clothing merchants, gave them the opportunity to fix the problem. The Lands' End executives were given control over the Sears clothing department.

Although it was expected, trouble began brewing between the two cultures. The Lands' End group was used to making fast decisions informally. The Sears bureaucracy had multiple levels of red tape. Sid Mashburn, Lands' End's vice president of design and now design chief at Sears as well, refers to the main headquarters as “the Battlestar Galactica” and suggests giving out machetes at the door to cut through the ingrained procedures. He might have been referring to the 29,000 pages of company guidelines that Sears once had (Merrick 2004).

When the Lands' End merchandise was first brought into the 870 stores, sales were weak. Placing \$139 cashmere sweaters next to \$17 sweatshirts did not help sales of either item. Customers were confused about where to find items. Also, Lands' End executives did not have data on what items would sell, or characteristics of the shoppers. Several items had to be marked down at the end of the season to clear out the inventory.

Jeff Jones, originally chief operating officer at Lands' End, asked if he could purchase data mining software to analyze customer purchases. Executives said that Sears did not use those tools. After some behind-the-scenes negotiations, Jones was finally able to get the tools. Using the software, he was able to learn that the store needed to target more upscale customers—those with incomes of \$50,000 to \$100,000 or more. Other merchandising experts from Lands' End have been brought in to retarget all of the clothing lines and identify the primary customers. Mindy Meads led groups to picture an image of a representative customer for each of five brands of women's clothing sold at Sears. This routine exercise and the data mining were things that Sears had neglected for years (Merrick 2004).

In March 2005, Kmart purchased Sears. The combined companies are run under the Sears Holdings Corp. name. Karen Austin, the CIO from Kmart was made CIO of the new company (Sliwa 2005).

Technology

In 2002, Sears purchased a huge storage area network from EM to handle a new customer relationship management database. The system will include 95 terabytes of new storage. It will be used to combine data from several inventory databases and existing data warehouses. The system is designed to give the company the ability to examine purchases by customers within the store and over time. As Jonathan Rand, director of merchandise planning and reporting, commented, the company needs to make sure "customers find the merchandise and service they want in our stores, while eliminating what they don't want faster than the competition" (Mearian 2002).

Because the Lands' End division continues to run as a separate subsidiary, Sears did not attempt to merge their information systems. Their Web site and internal systems remain as separate units. This decision minimizes interruptions and avoids causing problems with a system that has been successful.

At the same time, Sears realized that it needed to overhaul its own information systems. In 2003, Alan Lacy, the CEO of Sears, observed that "we've got too many point-of-sale systems, too many inventory systems, too many this, that, and the other thing, because we basically allowed for many, many years each business to do its own thing, which we're not going to do anymore" (Sliwa 2003). However, he also recognizes the importance of keeping the successful Land's End systems separate. In early 2004, Sears announced that it was installing 37,000 Internet-enabled IBM cashier terminals. The connected systems will enable Sears to provide additional types of customer service (McDougall 2004).

In 2004, Sears signed a \$1.6 billion 10-year outsourcing contract with Computer Sciences Corporation (CSC). The main elements of the contract cover desktop services, servers, networks, and system management of the Sears.com Web sites. Management of the servers running the financial reporting and sales systems remains outsourced to IBM. The Lands' End operations remain completely independent (Weiss 2004). Less than a year after signing the contract, the company terminated the contract—although Sears and CSC fought over the cancellation fees.

Sales reports for 2007 indicated substantial declines for both Sears and Kmart stores.

Sears also made a decision to recentralize its IT staff. Up until 2003, the staff was split into the various business units such as human resources or credit. The company also moved to standardize its choice of hardware and software vendors. The overall goal was to reduce the number of disparate systems. Cheryl Murphy, vice president of IT operations and engineering, observed that “we’re pulling the IT staffs together to get operational excellence and to drive that into the company. We want to find one way of doing things” (Rosencrance 2003).

Suppliers

Sears has been successful in its automotive division in building a relationship with Michelin. In a pilot test with GlobalNetXchange, Sears provides detailed real-time sales data to Michelin. Sears had planned a sale on Michelin tires in June 2002, but even before the sale began, Michelin spotted a problem. Sales earlier in the year had been higher than expected, and the sale would push even more tires out the door. Michelin was forecasting that it would be short 5,000 tires. Since Michelin had direct access to the sales and inventory data, and knew which sizes were selling, the company was able to increase production before the sale began. Hank Steermann, senior manager of supply chain for Sears, commented that “this is a way to manage the supply chain that is good for Sears, because we’re fulfilling our commitment to customers, and it’s good for the supplier, because they’re selling more units than we’d planned” (Konicki 2002).

Questions

1. How can Sears use information technology to improve the sales of clothing—particularly the Lands’ End items?
2. What are the benefits to centralizing the information systems and the IT staff at Sears?
3. Given the benefits of centralization, why does every Sears executive keep saying that they will not integrate the Lands’ End systems with the Sears systems?
4. If Sears wanted to combine data from the Lands’ End financial system with the main systems at Sears, how could they do it without actually merging the systems?

Additional Reading

- Bustillo, Miguel and Geoffrey Fowler, “Sears Scrambles Online for a Lifeline,” *The Wall Street Journal*, January 15, 2010.
- King, Julia, “Service Needs Drive Tech Decisions at Lands’ End,” *Computerworld*, December 20, 1999.
- Konicki, Steve, “Sears, Michelin Test Supply Chain,” *Information Week*, July 1, 2002.
- McDougall, Paul, “Ordering IT,” *Information Week*, March 22, 2004.
- Mearian, Lucas, “Sears To Build Huge Storage Network For CRM,” *Computerworld*, January 24, 2002.

- Merrick, Amy, "Sears Orders Fashion Makeover From the Lands' End Catalog," *The Wall Street Journal*, January 28, 2004.
- Rosencrance, Linda, "New Sears VP Of IT Operations Wants To Simplify IT Environment," *Computerworld*, May 16, 2003.
- Sliwa, Carol, "Clothing Retailer Finds Worldwide Business on the Web," *Computerworld*, April 30, 2001.
- Sliwa, Carol, "E-Retailers Seek Improved Search Engines," *Computerworld*, August 12, 2002.
- Sliwa, Carol, "Sears CEO Says Company Will Standardize Technology," *Computerworld*, January 20, 2003
- Sliwa, Carol, "Kmart CIO gains top IT job at Sears Holdings," *Computerworld*, April 4, 2005.
- Swanson, Sandra, "Lands' End Brings Custom-Made Pants Online," *Information Week*, November 6, 2001.
- Weiss, Todd R., "Sears Buying Lands' End," *Computerworld*, May 13, 2002.
- Weiss, Todd R., "Sears Inks \$1.6B IT Outsourcing Services Deal With CSC," *Computerworld*, June 2, 2004.
- Whiting, Rick, "The Data-Warehouse Advantage," *Information Week*, July 28, 2003.

Case: Super Valu and Albertson's

SuperValu (ticker: SVU) began as the Winston and Newell grocery warehouse serving Minneapolis, MN in 1924. Over the years, the company developed a distribution chain, largely supplying independent and affiliated grocers in the region. Buying other regional distribution chains, the store hit \$1 billion in sales in 1971 under the SuperValu name. In 1980, the company moved into the retail trade by purchasing Minnesota-based Cub Foods, operating five stores. From 1990 forward, the company acquired increasingly larger retail-store chains; yet continued to distribute food to unaffiliated stores. By 1998, SuperValu handled 15 percent of the nation's food distribution. In 2006, the retail side expanded massively with the purchase of approximately half of the retail stores (1,100) and distribution network of Albertsons, making SuperValu the third-largest national grocery chain (www.supervalu.com).

Albertsons was a regional grocery chain that grew into the third largest grocery chain in America. Founded in 1939 by Joe Albertson, the company maintains its headquarters in Boise, Idaho. Until its 1999 merger with American Stores, Albertsons expanded through internal growth and creating new stores. The merger with American Stores gave it wider access in California and the Midwest. Some of the acquired stores maintain the original name, such as the Jewel-Osco grocery/drug-stores in the Chicago area. In 2003, the company had around 2,300 retail stores and total revenue of \$35 billion. The stores were supported by 17 distribution centers [annual report]. Despite the mergers, Albertsons has seen total revenue decline since the 1999 fiscal year. In 2001, the company replaced the CEO by hir-

ing Larry Johnston—who lost out in the GE competition to replace Jack Welch. Johnston quickly replaced most of the executive team. His stated emphasis was to reduce costs and streamline the company, but operating/administrative costs in FY 2003 were higher than they were in FY 1999. Johnston also closed several hundred stores—deciding to focus only on markets where the chain held the number one or two position. In 2006, Johnston sold half the company to SuperValu and the other half to private equity firm Cerberus for eventual liquidation. Johnston walked away with over \$100 million in cash for driving a business into the ground.

Competitive Threats

The biggest threat to SuperValu (and Kroger and Safeway and the other big grocers) is Wal-Mart. Wal-Mart now sells more groceries than any other chain in America. Its SuperCenter stores provide a one-stop market for customers, and the company is rolling out more of them every day (Gose 2002). With Wal-Mart's supply chain efficiencies and heavily advertised low-price strategy, customers flock to the stores. Oh yes, and Wal-Mart employees are not unionized. The big grocery chains in California have unionized workers who not only demand high wages, but have gone on strike several times to try and force the wage and benefit policies. With the collapse and sale of Albertsons, it will be interesting to see if the unions can maintain their power to command higher wages (Peltz 2004). Grocery chains gained some breathing room in 2007 when Wal-Mart announced that it was slowing its expansion into the grocery field. In 2006, Wal-Mart accounted for 21.1 percent of U.S. food sales, giving it more than twice the market of Kroger, its nearest competitor. Wal-Mart decided to scale back its expansion plans to avoid market saturation in rural areas and because of stiff competition in cities (Jargon 2007). On the other hand, British supermarket giant Tesco PLC announced plans to place stores in Southern California and Las Vegas—key markets for the new SuperValu.

By 2011, SuperValu operated 1,114 retail food stores and 381 discount food stores, plus handled distribution to 899 discount stores and 1,900 independent retail stores. The company runs 21 national distribution centers. The company distributes and sells all standard grocery and drug-store items including national brands and private labels. The company had about 142,000 employees, with 88,000 of them members of unions. In 2009, SuperValu hired a new CEO; then a new chief marketing officer in 2010 and a new CIO in late 2010. The company experienced a decline in sales for 2010-2011. Even same-store sales declined in many markets—which was primarily blamed on competitors with lower prices (2011 Annual Report).

In February 2007, SuperValu almost got scammed out of \$10 million. Two e-mail messages purporting to be from American Greetings Corp and Frito-Lay tried to get SuperValu to change the bank accounts for future payments to these companies. In early March, SuperValu said it transferred \$3.6 million to one of the bank accounts, but then double-checked the changes and notified federal law enforcement on March 6. The FBI office was able to shut down the fake accounts and retrieve most of the money. It is not clear if the scammers were eventually caught (Vijayan 2007).

Technology

Transactions processing is a key element to holding down costs in grocery stores—particularly when labor is expensive. Grocery stores were the first to implement bar codes and checkout scanners in the 1980s. Although bar codes provide better data, they do not significantly increase the speed of the checkout process. Someone still has to unpack the cart, move each item by hand over the scanner (sometimes multiple times to get it to read), and then pack the items into bags. Albertsons, like other chains, has experimented with self-service checkouts. Customers with a small number of items run them over the scanner or weigh them and place them into bags. Usually one clerk oversees four checkout stations. To reduce theft, the station weighs the bags as items are added and compares the weight to a known value. But the stations do not really change the checkout process, merely shift some of the work to the customers.

Payment mechanisms are a challenge for grocers. Profit margins are extremely tight and retailers make only a few cents on any item. Customers no longer like to carry cash, but the fees to process credit and debit cards cuts into margins. Check-processing costs at one time ran as high as 75 cents per check. Jacki Snyder, manager of electronic payments at SuperValu observed that “in some cases, the fees on one grocery order exceed \$1, more than the supermarket profit on the same order” (Thibodeau 2000). Supermarkets including SuperValu are testing new systems that use fingerprints to identify customers. The Pay By Touch system links the identity to the customer’s credit or debit card and also verifies age for purchases of alcohol or tobacco (Sullivan 2006).

Albertson’s had just completed an installation of Oracle’s ERP system to run operations before the sale to SuperValu. The company was also using PeopleSoft to handle HRM tasks, so Oracle’s purchase of PeopleSoft will ultimately benefit the company. Because of the number of stores, SuperValu at least initially is keeping the chains on their existing IT systems. This approach minimizes the problems of integrating data systems and keeps the stores running efficiently, but it makes it more difficult to manage the divisions as an integrated organization.

By 2011, new CIO Wayne Shurts said the IT organization was changing focus from cost-cutting to concentrating on strategic investments. His plans included moving to Microsoft Office 365, the cloud-based applications from Microsoft priced at \$10 per user per month. The bundle includes SharePoint and Web conferencing in addition to standard office tools (Nash 2011). The goal is to make it easier for corporate directors to retrieve and share information and comments with other directors and store managers.

Questions

1. Will enough customers use the handheld scanners to make them profitable?
2. If there are 150,000 different items in a store, and LCD tags cost \$5 each, how long will it take to recoup the cost of outfitting an entire store with the LCD tags? Remember that all employees are unionized, so assume average wages are at least \$10 per hour. Write down any other assumptions.
3. Will new checkout technologies be enough to help Albertsons stay competitive against Wal-Mart? What can Albertsons do to stay alive?

Additional Reading

- Gose, Joe, "Supercenter Showdown," *National Real Estate Investor*, December 2002, Vol 44(12), p. 14.
- Jargon, Julie, "Wal-Mart Slowdown to Hit Food Sector," *The Wall Street Journal*, June 5, 2007.
- Nash, Kim S., "2011 State of the CIO: IT Departments Are Fueling Company Growth Through Strategic Technology Investments," *CIO*, January 1, 2011.
- Peltz, James F., "How the Supermarket Strike Was Settled," *The Los Angeles Times*, March 8, 2004.
- Sullivan, Laurie, "Touch Once For Groceries," *Computerworld*, February 13, 2006.
- Thibodeau, Patrick, "Older Systems Hinder E-payments," *Computerworld*, September 25, 2000.
- Vijayan, Jaikumar, "Phishers Nearly Pull Off \$10M Scam of Grocer," *Computerworld*, October 29, 2007.

Case: Amazon

In 1994, with a handful of programmers and a few thousand dollars in workstations and servers, Jeff Bezos set out to change the retail world when he created Amazon.com (ticker: AMZN). Shel Kaphan, Amazon's first programmer, assisted by others, including Paul Barton-Davis, used a collection of tools to create Web pages based on a database of 1 million book titles compiled from the Library of Congress and Books in Print databases. Kaphan notes that "Amazon was dependent on commercial and free database systems, as well as HTTP server software from commercial and free sources. Many of the programming tools were free software" (Collett 2002). In July 1995, Amazon opened its Web site for sales. Using heavily discounted book prices (20 to 30 percent below common retail prices); Amazon advertised heavily and became the leading celebrity of the Internet and e-commerce.

Amazon was often held up as the darling of the dot-com era. Anyone could sell books online, but Amazon showed that you had to be first (or close to first with more money), to capture name recognition and market share. But, looking at Amazon's sales and losses, it is clear that Amazon never made any profits selling books. By the mid-2000s, Amazon altered its strategies on book sales—increasing the price of mass-market books and reducing its inventories to focus on the best-sellers. With the release of the Kindle e-book reader, Amazon significantly jump-started the sale of e-books. By 2010, Amazon was selling 15 percent more e-books than even paperback books (Hamblen 2011).

Amazon sales continue to grow—accounting for a significant portion of online sales. Some of the sales come from partnerships with other sellers—Amazon simply handles the Web site and payment methods. Although sales were increasing rapidly through at least 2011, costs were increasing faster. Most of the costs were investments in new technologies and expanding data centers (Woo 2011). Amazon also continues to sell digital music and in 2011, it expanded its offerings of digital video. Customers who join the Prime club who pay an annual fee to get

reduced shipping costs will also get online access to thousands of videos. But, in both music and movies, Amazon remains a small player compared to the Apple and Netflix.

Selling Relationships

As a premier site on the Web, Amazon realized that it could leverage its huge name recognition and trust. The company gradually signed deals with both large companies and small retailers. Customers go to the Amazon site and search for a product. The Amazon database retrieves the product descriptions and prices and displays them in a consistent format. Amazon handles the payment details and sends the order to the partners for fulfillment. Some customers never know they are dealing with a third party. By 2004, 25 percent of Amazon's sales were for its partners. But some of the deals did not go as well as others. In 2004, Toys 'R' Us sued Amazon and Amazon countersued. The primary complaint was that Amazon had promised Toys 'R' Us an exclusive right to sell toys on the Amazon site. But, Amazon signed on many small companies that also sold toys. David Schwartz, senior VP and general counsel for Toys 'R' Us stated that "We don't intend to pay for exclusivity we're not getting." Amazon's initial response was that "We believe we can have multiple sellers in the toy category, increase selection, and offer products that (Toys 'R' Us) doesn't have" (Claburn May 2004). By 2007, Amazon was simply the largest marketplace on the Web.

Small merchants accelerated a shift to Amazon's marketplace technology. For example, John Wieber was selling \$1 million a year in refurbished computers through eBay. But increased competition and eBay's rising prices convinced him to switch to direct sales through Amazon. Similar small merchants noted that although the fees on Amazon are hefty, they do not have to pay a listing fee. Plus, eBay shoppers only want to buy things at bargain-basement prices (Mangalindan 2005).

Information Technology

Initially, Amazon built its Web site separately from its order-fulfillment system. The separation existed partly for security reasons and partly because the technology to connect them was in its infancy. One of the most important features offered by Amazon was the affinity program—where customers are shown lists of other items they might want to purchase—based on an analysis of purchases by other customers. It proved to be a useful technology for books, music, and movies—identifying related products that customers might otherwise miss.

In 2000, Amazon decided to overhaul its entire system. The company spent \$200 million on new applications, including analysis software from E.piphany, logistics from Manugistics, and a new DBMS from Oracle. The company also signed deals with SAS for data mining and analysis (Collett 2002). But, one of its biggest deals was with Excelon for business-to-business integration systems. The system enables suppliers to communicate in real time, even if they do not have sophisticated IT departments. It provides a direct connection to Amazon's ERP system either through programming connections or through a Web browser (Konicki 2000).

The technology and sales did not come cheaply. In 2003, Bezos noted that \$900 million went to business technology; \$300 million was spent on the fulfillment centers; and \$700 million on marketing and customer acquisition (Murphy 2003). That last part largely represents selling books at a loss or offering free shipping

while trying to attract customers. Those numbers add up to the \$1.9 billion debt, but the company also lost another \$1 billion.

New Services

Amazon requires huge data centers and high-speed Internet connections to run its systems. Through vast economies of scale, Amazon is able to achieve incredibly low prices for data storage and bandwidth. Around 2005, the company decided that it could leverage those low costs into a new business selling Internet-based services. The company offers an online data storage service called S3. For a monthly fee of 15 cents per gigabyte stored plus 20 cents per gigabyte of data transferred, any person or company can transfer and store data on Amazon servers (Markoff 2006). Through a similar service (EC2), any company can use the company's Web servers to deliver digital content to customers. Microsoft reportedly uses the system to handle some large files for downloads. The company essentially serves as a Web host, but instead of paying fixed costs, you pay 10 cents per virtual server per hour plus bandwidth costs. Amazon's network can handle bursts up to 1 gigabit per second. The system creates virtual servers, running the Linux kernel, and you can run any software you want (Gralla 2006).

Amazon also runs the A9 search engine, so it began selling keyword advertising. Similar to Google, A9 provides advertising links to other Web sites and shares the revenue. The company also provides mapping and other services that can be integrated into your Web site.

Perhaps the most unusual service is Mturk. The name derives from an 18-century joke where a "mechanical" chess-playing machine surprised European leaders and royalty by beating many expert players. The trick was that a human was hidden under the board and moved the pieces with magnets. Amazon's trick is to use human power to solve problems. Companies post projects on the Mturk site and offer to pay a price for piecemeal work. Any individual can sign up and perform a task and get paid based on the amount of work completed. Amazon takes a 10 percent commission above the fee. For example, the company Casting Words places audio files on the site and pays people 42 cents to transcribe one minute of audio files into text (Markoff 2006).

Adam Selipsky, vice president of product management and developer relations at Amazon Web Services observed that "Amazon is fundamentally a technology company; we've spent more than one and a half billion dollars investing in technology and content. We began by retailing books, but it was never in our business plan to stay with that" (Gralla 2006).

Amazon has been increasing its online cloud-based services. The main offerings include the S3 service to store files, but also the Elastic Compute Cloud (EC2) and Amazon Web Services (AWS) which enable anyone to buy Web services or any type of computer server and pay just by the amount of processing time used and the data transferred. The company also offers the Relational Database Service (RDS) which provides a cloud-based relational query system. In an interesting twist, Netflix moved some of its main IT operations to Amazon's EC2 and AWS services. Netflix noted that it reduced costs by moving off expensive IBM hardware and they were growing so quickly that it was easier to use Amazon to configure and manage the servers and network bandwidth (Kananacus 2010).

Questions

1. Who are Amazon's competitors?
2. Why did Amazon create most of its own technology from scratch?
3. Will Amazon ever become profitable enough to recoup its initial investments?

Additional Reading

- Claburn, Thomas, "Amazon.com And Toys 'R' Us Are On The Outs," *Information Week*, May 31, 2004.
- Collett, Stacy, "The Web's Best-seller," *Computerworld*, September 30, 2002.
- Gralla, Preston, "Computing in the Cloud," *Computerworld*, December 21, 2006.
- Hamblen, Matt, "Amazon.com Touts More e-Book Sales than Paperbacks," *Computerworld*, January 28, 2011.
- Kanaracus, Chris, "Netflix Turns From Oracle, IBM to Amazon to Save Cash," *Computerworld*, November 24, 2010.
- Konicki, Steve, "Amazon Taps Excelon To Redo Supply-Chain System," *Information Week*, October 30, 2000.
- Mangalindan, Mylene, "Threatening eBay's Dominance, More Online Sellers Go It Alone," *The Wall Street Journal*, June 22, 2005.
- Markoff, John, "Software Out There," *The New York Times*, April 5, 2006.
- Murphy, Chris, "Amazon, The Services Firm," *Information Week*, June 10, 2003.
- Woo, Stu, "Expenses Eat at Amazon's Profit," *The Wall Street Journal*, January 28, 2011.

Summary Industry Questions

1. What information technologies have helped this industry?
2. Did the technologies provide a competitive advantage or were they quickly adopted by rivals?
3. Which technologies could this industry use that were developed in other sectors?
4. Is the level of competition increasing or decreasing in this industry? Is it dominated by a few firms, or are they fairly balanced?
5. What problems have been created from the use of information technology and how did the firms solve the problems?