## Electronic and Mobile Commerce and Enterprise Systems

### Learning Objectives

- **Electronic and mobile commerce** are evolving, providing new ways of conducting business that present both potential benefits and problems.

- **E-commerce and m-commerce** require the careful planning and integration of a number of technology infrastructure components.

- An organization must have information systems that support the routine, day-to-day activities that occur in the normal course of business and help a company add value to its products and services.

- A company that implements an enterprise resource planning system is creating a highly integrated set of systems, which can lead to many business benefits.

- A company that implements a customer relationship management system is building a source of information about customers that can improve sales, marketing, and customer service.

- There are many potential international issues associated with the operation of enterprise systems.

- Describe the current status of various forms of e-commerce, including B2B, B2C, C2C, and m-commerce.

- Identify several e-commerce and m-commerce applications.

- Identify several advantages associated with the use of e-commerce and m-commerce.

- Identify the key components of technology infrastructure that must be in place for e-commerce and m-commerce to work.

- Identify the basic activities and business objectives common to all transaction processing systems.

- Discuss the advantages and disadvantages associated with the implementation of an enterprise resource planning system.

- State the objective of a customer relationship management system and describe several of its basic functions.

- Identify the challenges that multinational corporations face in planning, building, and operating enterprise systems.

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Tommy Hilfiger is one of the world’s leading brands of premium lifestyle clothing. Hilfiger clothing reflects “Classic American Cool” styling that is popular around the world. Hilfiger clothing is distributed in more than 65 countries through high-class fashion shops, department stores, and more than 900 of its own retail stores.

In 2009, Hilfiger decided it was time to focus on improving its online sales. Its Web store sales had been respectable but had not implemented any of the latest e-commerce tools for driving sales.

Executives at Hilfiger recognize that the company’s core competencies lie in fashion, marketing, and merchandising. Hilfiger has no interest in becoming an IT company, building an IT department, or investing in servers and computing equipment. It didn’t take long for the company to decide that its e-commerce systems should be outsourced. Whatever system Hilfiger used would have to be powerful and yet easy for customers to interact with.

Hilfiger director of e-commerce, Tom Davis, reviewed several popular e-commerce hosting services. E-commerce hosts provide everything needed for an e-commerce site, including hardware, software, databases, networking, and support, for an annual fee. Of all the companies Davis evaluated, ATG struck him as being the best fit for Hilfiger’s needs. ATG’s Commerce OnDemand platform is a fully hosted e-commerce system that includes the latest and most advanced e-commerce tools and techniques. The ATG Business Control Center is an easy-to-use interface that allows companies to enter products into an online catalog. It is also used to set price points, arrange products within the site, build promotions, and set shipping fees.

Tom Davis worked with engineers at ATG to implement the new Hilfiger site within 120 days. During the first months of operation, Hilfiger merchandising staff experimented with the site, introducing more products each week and working to improve conversion rates (the percentage of visitors that purchase products). In order to boost cross-sales, the staff manually entered one-to-one product relationships so that when a customer views an item or checks out, another related item is recommended.

The process of hand-coding the related item recommendations required a significant time investment. After three months, Davis discovered that the recommendations had no significant impact on sales and so he gave up the effort. ATG came to the rescue with an e-commerce tool called ATG Recommendations. ATG Recommendations works dynamically to recommend products that a customer is likely to find appealing, using a sophisticated predictive algorithm that combines data from the merchandise catalog, the site structure, historical and current shopper behavior, and aggregate shopper behavior.

Implementing the new ATG Recommendations system took less than four weeks and required minimal changes to the site. Hilfiger found that the software was well worth the investment. After only one month, the Recommendations system increased online sales by 16 percent. You can view the Recommendations system at the bottom of every product page as a series of merchandise photos that “people who viewed this also viewed.”

Hilfiger learned that its approach to manually adding recommendations failed because it was primarily recommending products that it was keen to sell. ATG Recommendations was successful because it recommends items that it calculates a customer would want, without regard to Hilfiger’s priorities. The only business rule that governs the Recommendations system is that recommendations are not made that might reduce an order’s value.
Over time, Hilfiger expanded its use of ATG Recommendations, tying it to e-mail campaigns, a Top Sellers page, and a Gift Guide feature; integrating it into higher level pages; and offering Last Chance Recommendations at checkout. Through ATG Recommendations, Hilfiger can expose customers to a wider breadth of products on each page as well as products that the customer is likely to find appealing.

Hilfiger’s new e-commerce site has been incredibly successful. In its first holiday season, the new site doubled the company’s online revenue. Davis says that “the likelihood of checkout is three times higher for those shoppers who interacted with Recommendations than those who did not.”

Outsourcing the e-commerce business to an experienced e-commerce company has freed Hilfiger employees to concentrate on what they do best: planning promotions and strategies to optimize their products’ exposure and further increase sales.

As you read this chapter, consider the following:

• What advantages do e-commerce and m-commerce offer sellers and vendors over traditional shopping venues?
• What types of information systems are critical to the success of a business and how are the systems related to one another?

Electronic and mobile commerce and enterprise systems have transformed many areas of our lives and careers. One fundamental change has been the manner in which companies interact with their suppliers, customers, government agencies, and other business partners. As a result, most organizations today have or are considering setting up business on the Internet and implementing integrated enterprise systems. To be successful, all members of the organization need to participate in that effort. As a sales or marketing manager, you will be expected to help define your firm’s e-commerce business model. Customer service employees can expect to use enterprise systems to provide improved customer service. As a human resource or public relations manager, you will likely be asked to provide content for a Web site directed to potential employees and investors. Analysts in finance need to know how to use enterprise systems to capture and report the data needed to manage and control the firm’s operations. Clearly, as an employee in today’s organization, you must understand the potential role of e-commerce and enterprise systems, how to capitalize on their many opportunities, and how to avoid their pitfalls. The emergence of m-commerce adds an exciting new dimension to these opportunities and challenges. This chapter begins by providing a brief overview of the dynamic world of e-commerce and defines its various components.
Business-to-Business (B2B) E-Commerce

Business-to-business (B2B) e-commerce is a subset of e-commerce in which all the participants are organizations. B2B e-commerce is a useful tool for connecting business partners in a virtual supply chain to cut resupply times and reduce costs. Although the business-to-consumer market grabs more of the news headlines, the B2B market is considerably larger and is growing more rapidly.

B2B Computer Products is a nationwide B2B reseller of computer hardware and software from hundreds of manufacturers. It also sells complete phone solutions for voice, data, and Internet service from leading providers. Its engineers configure, install, and manage the products it sells.2

Business-to-Consumer (B2C) E-Commerce

Business-to-consumer (B2C) e-commerce organizations sell their products directly to consumers. More than just a tool for placing orders, the Internet is an extremely useful way to compare prices, features, value, and other customers’ opinions. Internet shoppers can, for example, unleash shopping bots or access sites such as eBay Shopping.com, Google Froogle, Shopzilla, PriceGrabber, Yahoo! Shopping, or Excite to browse the Internet and obtain lists of items, prices, and merchants. Many B2C merchants have added what is called “social commerce” to their Web sites by creating a section where shoppers can go to see only those products that have been reviewed and listed by other shoppers.

By using B2C e-commerce to sell directly to consumers, producers or providers of consumer products can eliminate the middlemen, or intermediaries, between them and the consumer. In many cases, this squeezes costs and inefficiencies out of the supply chain and can lead to higher profits and lower prices. The elimination of intermediate organizations between the producer and the consumer is called disintermediation.

Dell is an example of a manufacturer that has successfully embraced this model to achieve a strong competitive advantage. People can specify a unique computer online, and Dell assembles the components and ships the computer directly to the consumer within five days.

Dell sells its products through the Dell.com Web site.
(Source: www.dell.com.)
as well as build stronger consumer relationships. On the other hand, the Web site has generated some ill will between P&G and the major retailers, as it reduces their in-store sales of P&G products. The site is owned and operated by PFSWeb and will sell exclusively P&G products to U.S. consumers.3

**Consumer-to-Consumer (C2C) E-Commerce**

Consumer-to-consumer (C2C) e-commerce is a subset of e-commerce that involves electronic transactions between consumers using a third party to facilitate the process. eBay is an example of a C2C e-commerce site; customers buy and sell items to each other through the site. Other examples of C2C sites include Bidzcom, Craigslist, eBid, ePier, Ibidfree, Kijiji, Ubid, and Tradus. Etsy is a C2C Web site that specializes in the buying and selling of handmade and vintage items, including art, bath and beauty products, craft supplies, clothing, jewelry, quilts, and toys. The site allows sellers to set up personal storefronts where they display the items they have for sale. Etsy facilitates sales worth around $10 to $13 million each month. It earns revenue by charging a listing fee of $.20 and receiving a 3.5 percent commission on each sale.4

Table 5.1 summarizes the key factors that differentiate among B2B, B2C, and C2C e-commerce.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Value of sale</td>
<td>Thousands or millions of dollars</td>
<td>Tens or hundreds of dollars</td>
<td>Tens of dollars</td>
</tr>
<tr>
<td>Length of sales process</td>
<td>Days to months</td>
<td>Days to weeks</td>
<td>Hours to days</td>
</tr>
<tr>
<td>Number of decision makers involved</td>
<td>Several people to a dozen or more</td>
<td>One or two</td>
<td>One or two</td>
</tr>
<tr>
<td>Uniformity of offer</td>
<td>Typically a uniform product offering</td>
<td>More customized product offering</td>
<td>Single product offering, one of a kind</td>
</tr>
<tr>
<td>Complexity of buying process</td>
<td>Extremely complex, much room for negotiation on price, payment and delivery options, quantity, quality, options and features</td>
<td>Relatively simple, limited discussion over price and payment and delivery options</td>
<td>Relatively simple, limited discussion over payment and delivery options; negotiation over price</td>
</tr>
<tr>
<td>Motivation for sale</td>
<td>Driven by a business decision or need</td>
<td>Driven by an individual consumer’s need or emotion</td>
<td>Driven by an individual consumer’s need or emotion</td>
</tr>
</tbody>
</table>

**e-Government**

e-Government is the use of information and communications technology to simplify the sharing of information, speed formerly paper-based processes, and improve the relationship between citizens and government. Government-to-citizen (G2C), government-to-business (G2B), and government-to-government (G2G) are all forms of e-Government, each with different applications.

Citizens can use G2C applications to submit their state and federal tax returns online, renew auto licenses, apply for student loans, and make campaign contributions. At the Recovery.gov Web site, citizens can view where federal stimulus money is being allocated by state, county, zip code, and congressional district.5 New York City created a health and human services multilingual Web portal to enable its 8 million residents to determine their

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eligibility for 35 city, state, and federal human service benefit programs, print application forms, search for office locations, and create an account to access their information.\textsuperscript{6}

G2B applications support the purchase of materials and services from private industry by government procurement offices, enable firms to bid on government contracts, and help businesses receive current government regulations related to their operations. Business.gov allows businesses to access information about laws and regulations and relevant forms needed to comply with federal requirements for their business.

G2G applications are designed to improve communications among the various levels of government. For example, the E-Vital initiative establishes common electronic processes for federal and state agencies to collect, process, analyze, verify, and share death record information.\textsuperscript{7} Geospatial One-Stop’s Web portal, GeoData.gov, makes it easier, faster, and less expensive to find, create, share, and access geographic data and maps among all levels of government.\textsuperscript{8}

\section*{MOBILE COMMERCE}

As discussed briefly in Chapter 1, mobile commerce (m-commerce) relies on the use of mobile, wireless devices, such as cell phones and smartphones, to place orders and conduct business. Handset manufacturers such as Ericsson, Motorola, Nokia, and Qualcomm are working with communications carriers such as AT&T, Cingular, Sprint/Nextel, and Verizon to develop such wireless devices, related technology, and services. The Internet Corporation for Assigned Names and Numbers (ICANN) created a .mobi domain to help attract mobile users to the Web. mTLD Top Level Domain Ltd of Dublin, Ireland, administers this domain and helps to ensure that the .mobi destinations work quickly, efficiently, and effectively with user handsets.

\subsection*{Mobile Commerce in Perspective}

The market for m-commerce in North America is maturing much later than in Western Europe and Japan for several reasons. In North America, responsibility for network infrastructure is fragmented among many providers, consumer payments are usually made by credit card, and many Americans are unfamiliar with mobile data services. In most Western European countries, communicating via wireless devices is common, and consumers are much more willing to use m-commerce. Japanese consumers are generally enthusiastic about new technology and are much more likely to use mobile technologies for making purchases.

Nearly 450 million users worldwide accessed the Internet via mobile devices in 2009. It is estimated that the number of mobile devices accessing the Internet will exceed 1 billion by 2013.\textsuperscript{9}

According to ABI Research, m-commerce spending in the United States grew from $369 million in sales in 2008 to $1.2 billion in 2009. The firm projects m-commerce sales for 2010 of $2.4 billion.\textsuperscript{10} The number of mobile Web sites is expected to grow rapidly because of advances in wireless broadband technologies, the development of new and useful applications, and the availability of less costly but more powerful handsets. Indeed, the Web site Mobil Mammoth highlights a new mobile Web site every day.\textsuperscript{11} Experts point out that the relative clumsiness of mobile browsers and security concerns must be overcome to ensure rapid m-commerce growth.

As with any new technology, m-commerce will succeed only if it provides users with real benefits. Companies involved in m-commerce must think through their strategies carefully and ensure that they provide services that truly meet customers’ needs.
E-commerce and m-commerce are being used in innovative and exciting ways. This section examines a few of the many B2B, B2C, C2C, and m-commerce applications in retail and wholesale, manufacturing, marketing, advertising, price comparison, couponing, investment and finance, banking, and e-boutiques.

**Retail and Wholesale**

E-commerce is being used extensively in retailing and wholesaling. Electronic retailing, sometimes called e-tailing, is the direct sale of products or services by businesses to consumers through electronic storefronts, which are typically designed around the familiar electronic catalog and shopping cart model. Companies such as Office Depot, Wal-Mart, and many others have used the same model to sell wholesale goods to employees of corporations. Tens of thousands of electronic retail Web sites sell everything from soup to nuts. Table 5.2 lists the top-rated B2C Web sites according to the Top 100 Online Retail Satisfaction Index from ForeSee Results and FGI Research. The measurement results are based on the American Consumer Satisfaction Index methodology developed by the University of Michigan.

<table>
<thead>
<tr>
<th>Web Site</th>
<th>ACSI Index</th>
<th>Products Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netflix.com</td>
<td>85</td>
<td>DVDs by mail</td>
</tr>
<tr>
<td>Amazon.com</td>
<td>84</td>
<td>Books, music, DVDs, and more</td>
</tr>
<tr>
<td>Avon.com</td>
<td>81</td>
<td>Beauty, health, and fitness products</td>
</tr>
<tr>
<td>DrsFosterSmith.com</td>
<td>81</td>
<td>Pet supplies</td>
</tr>
<tr>
<td>Newegg.com</td>
<td>81</td>
<td>Computers and computer-related products</td>
</tr>
<tr>
<td>QVC.com</td>
<td>81</td>
<td>Fashion, beauty, jewelry, and home products</td>
</tr>
<tr>
<td>TigerDirect.com</td>
<td>79</td>
<td>Computers and computer-related products</td>
</tr>
<tr>
<td>HPShopping.com</td>
<td>78</td>
<td>Computers and computer-related products</td>
</tr>
<tr>
<td>LLBean.com</td>
<td>78</td>
<td>Men’s and women’s clothing</td>
</tr>
<tr>
<td>Shutterfly.com</td>
<td>78</td>
<td>Photo sharing</td>
</tr>
<tr>
<td>VictoriaSecret.com</td>
<td>78</td>
<td>Lingerie and women’s clothing</td>
</tr>
</tbody>
</table>

Cybermalls are another means to support retail shopping. A cybermall is a single Web site that offers many products and services at one Internet location—similar to a regular shopping mall. An Internet cybermall pulls multiple buyers and sellers into one virtual place, easily reachable through a Web browser. For example, 1StopTireShop allows Internet shoppers to compare and select tires from some 18 different tire manufacturers. Etaulers Mall allows shoppers to shop at dozens of bath, body, candle, cosmetics, and jewelry e-tailers on the Internet.

A key sector of wholesale e-commerce is spending on manufacturing, repair, and operations (MRO) goods and services—from simple office supplies to mission-critical equipment, such as the motors, pumps, compressors, and instruments that keep manufacturing facilities running smoothly. MRO purchases often approach 40 percent of a manufacturing company’s total revenues, but the purchasing system can be haphazard, without automated controls. In
addition to these external purchase costs, companies face significant internal costs resulting from outdated and cumbersome MRO management processes. For example, studies show that a high percentage of manufacturing downtime is often caused by not having the right part at the right time in the right place. The result is lost productivity and capacity. E-commerce software for plant operations provides powerful comparative searching capabilities to enable managers to identify functionally equivalent items, helping them spot opportunities to combine purchases for cost savings. Comparing various suppliers, coupled with consolidating more spending with fewer suppliers, leads to decreased costs. In addition, automated workflows are typically based on industry best practices, which can streamline processes.

McMaster-Carr is a supplier of products used to maintain industrial and commercial facilities specializing in the next day delivery of MRO materials and supplies. Its Web site offers more than 480,000 items for sale. Customers can use its search feature to quickly find the items they need.

Manufacturing
One approach taken by many manufacturers to raise profitability and improve customer service is to move their supply chain operations onto the Internet. Here, they can form an electronic exchange to join with competitors and suppliers alike to buy and sell goods, trade market information, and run back-office operations, such as inventory control, as shown in Figure 5.1. This approach has greatly speeded up the movement of raw materials and finished products among all members of the business community and has reduced the amount of inventory that must be maintained. It has also led to a much more competitive marketplace and lower prices. Private exchanges are owned and operated by a single company. The owner uses the exchange to trade exclusively with established business partners. Public exchanges are owned and operated by industry groups. They provide services and a common technology platform to their members and are open, usually for a fee, to any company that wants to use them.

**Figure 5.1**
Model of an Electronic Exchange

**electronic exchange**
An electronic forum where manufacturers, suppliers, and competitors buy and sell goods, trade market information, and run back-office operations.
Avendra is a private exchange that provides access to a $3 billion supply chain of goods and services from more than 900 suppliers to about 4,500 customers in the hospitality industry. The exchange was formed by ClubCorp, Fairmont Hotels, Hyatt, Intercontinental Hotels Group, and Marriott International in 2001. Not only do customers benefit from cost savings generated by Avendra’s volume purchasing, they can draw on Avendra’s extensive hospitality expertise to select those products that best meet their needs and budgets.

Several strategic and competitive issues are associated with the use of exchanges. Many companies distrust their corporate rivals and fear they might lose trade secrets through participation in such exchanges. Suppliers worry that online marketplaces will drive down the prices of goods and favor buyers. Suppliers also can spend a great deal of money in the setup to participate in multiple exchanges. For example, more than a dozen new exchanges have appeared in the oil industry, and the printing industry is up to more than 20 online marketplaces. Until a clear winner emerges in particular industries, suppliers are more or less forced to sign on to several or all of them. Yet another issue is potential government scrutiny of exchange participants—when competitors get together to share information, it raises questions of collusion or antitrust behavior.

Marketing

The nature of the Web enables firms to gather more information about customer behavior and preferences as customers and potential customers gather information and make their purchase decisions. Analysis of this data is complicated because of the Web’s interactivity and because each visitor voluntarily provides or refuses to provide personal data such as name, address, e-mail address, telephone number, and demographic data. Internet advertisers use the data to identify specific portions of their markets and target them with tailored advertising messages. This practice, called market segmentation, divides the pool of potential customers into subgroups usually defined in terms of demographic characteristics, such as age, gender, marital status, income level, and geographic location.

In the past, market segmentation has been difficult for B2B marketers because firmographic data (addresses, financials, number of employees, industry classification code) was difficult to obtain. Now, however, Nielsen, the marketing and media information company, has developed its Business-Facts database that provides this information for more than 13 million businesses. Using this data, analysts can estimate potential sales for each business and rank it against all other prospects and customers. Windstream Communications, a telecommunications company with 3 million customers, worked with Nielsen to perform a market segmentation and used the results to drive its marketing strategy. As a result, direct mail response rates have risen more than 50 percent, and telemarketing sales increased almost 500 percent.

Advertising

Mobile ad networks distribute mobile ads to publishers such as mobile Web sites, application developers, and mobile operators. Mobile ad impressions are generally bought at a cost per thousand (CPM), cost per click (CPC), or cost per action (CPA, in which the advertiser pays only if the customer clicks through and then buys the product or service). The main measures of success are the number of users reached, click through rate (CTR), and the number of actions users take, such as the number of downloads prompted by the ad. The advertiser is keenly interested in this data to measure the effectiveness of its advertising spending and may pay extra to purchase the data from the mobile ad network or a third party.

AdMob is a mobile advertising provider that serves up ads for display on mobile devices and in applications like those that run on the Android and iPhone. With AdMob, smartphone application developers can distribute their apps for free and recover their costs over time by payments from advertisers. With Google’s acquisition of AdMob and Apple’s new iAd mobile advertising product, lots of innovation and change can be expected in mobile advertising.

Because m-commerce devices usually have a single user, they are ideal for accessing personal information and receiving targeted messages for a particular consumer. Through m-commerce, companies can reach individual consumers to establish one-to-one marketing
relationships and communicate whenever it is convenient—in short, anytime and anywhere. According to one recent study, 51 percent of the consumers in 11 countries during the 2009 holiday season used their mobile phones to perform in-store activities, including shopping, seeking peer feedback on products, obtaining product information, and capturing coupons.¹⁷

Nielsen is a major marketing company that measures and analyzes how consumers acquire information, consume media, and buy goods and services.

(Source: http://en-us.nielsen.com.)

Consumers are increasingly using mobile phones to purchase goods and perform other transactions online.

(Source: © ICP / Alamy.)
Price Comparison
A growing number of companies provide a mobile phone service that enables shoppers to compare prices and products on the Web. Google Product Search works for iPhone and Android handsets. The shopper enters the name of the product into the Google search field and clicks “See Shopping Results” to display a list of suppliers and prices. You can also request consumer reviews and technical specifications for a specific choice. Frucall allows users to enter the bar code of a product, and then it finds and displays the best online prices for any product with that bar code. You can also read reviews or purchase the item immediately by clicking a button.

Couponing
Shoppers can sign up with individual retailers to request that their coupons are sent directly to their cell phone. Shoppers can also subscribe to mobile coupon aggregators such as 8coupons, Cellfire, Yowza, and Zavers to receive promotions from many retailers. Mobile coupons are more likely to be redeemed (15–20 percent) than paper coupons (less than 1 percent).

Target was the first national retailer to offer a scannable mobile coupon program. After opting into this program (via m.target.com), shoppers receive a text message with a link to a mobile Web page that contains multiple offers, all accessible under a single bar code. They redeem the coupons by scanning the bar code displayed on their Web-enabled phones at the checkout. Target customers can also use their mobile phones to access their Target Mobile GiftCards, check product availability at various Target store locations, administer their Target gift registries and lists, browse Target weekly ads, and receive text and e-mail notifications of deals.

Valpak has launched a free mobile coupon application for smartphone users that delivers more than 17,000 offers. The application allows users to search for coupons by categories such as auto, beauty, dining, and health. It uses the phone’s GPS to identify stores near you with offers, sorts the stores by distance from your current location, and provides directions to any selected store.

Investment and Finance
The Internet has revolutionized the world of investment and finance. Perhaps the changes have been so significant because this industry had so many built-in inefficiencies and so much opportunity for improvement.

The brokerage business adapted to the Internet faster than any other arm of finance. The allure of online trading that enables investors to do quick, thorough research and then buy shares in any company in a few seconds and at a fraction of the cost of a full-commission firm has brought many investors to the Web.

Banking
Online banking customers can check balances of their savings, checking, and loan accounts; transfer money among accounts; and pay their bills. These customers enjoy the convenience of not writing checks by hand, tracking their current balances, and reducing expenditures on envelopes and stamps. In addition, paying bills online is good for the environment because it reduces the amount of paper used, thus saving trees and reducing greenhouse gases.

All of the major banks and many of the smaller banks in the U.S. enable their customers to pay bills online; many support bill payment via cell phone or other wireless device. Banks are eager to gain more customers who pay bills online because such customers tend to stay with the bank longer, have higher cash balances, and use more of the bank’s products and services. To encourage the use of this service, many banks have eliminated all fees associated with online bill payment.

Consumers who have enrolled in mobile banking and downloaded the mobile application to their cell phones can check their credit card balances before making major purchases and can avoid credit rejections. They can also transfer funds from savings to checking accounts to avoid an overdraft.
Bank of America offers mobile banking via an application download. The application is custom designed for the unique features and capabilities of the iPhone, Blackberry, and Android smartphones. The user can check balances, transfer funds, pay bills, and use the geolocator feature to find the nearest ATM or banking center. The application uses advanced encryption technology to protect against unauthorized access. 23

E-Boutiques

An increasing number of Web sites offer personalized shopping consultations for shoppers interested in upscale, contemporary clothing—dresses, sportswear, denim, handbags, jewelry, shoes, and gifts. Key to the success of Web sites such as Charm Boutique and ShopLaTiDa is a philosophy of high customer service and strong, personal client relationships. Online boutique shoppers complete a personal shopping profile by answering questions about body measurements, profession, interests, preferred designers, and areas of shopping where they would welcome assistance. Shoppers are then given suggestions on what styles and designers might work best and where they can be found—online or in brick-and-mortar shops.

Gilt is a private (invited members only), limited-time sales Web site where shoppers compete against each other for exclusive designer apparel and accessories. Items on the Web site typically sell out within 36 hours. The exclusive membership helps Gilt know who its customers are and what they like and don’t like. The Web site has 1.6 million members. Those who use an iPad can see all the key information on one screen and then quickly tap through the sales process and drag items from the screen to their cart. 24 Although the Web site can be accessed by multiple mobile devices, an iPad with its larger screen size, along with its ability to zoom and flip through images with the swipe of a finger, makes Gilt look more like a magazine. 25
Advantages of Electronic and Mobile Commerce

Conversion to an e-commerce or m-commerce system enables organizations to reduce the cost of doing business, speed the flow of goods and information, increase the accuracy of order processing and order fulfillment, and improve the level of customer service. These advantages are summarized in Table 5.3.

![Table 5.3 Advantages of Electronic and Mobile Commerce](image)

Now that we’ve examined several e-commerce and m-commerce applications, let’s look at the key components of technology infrastructure that must be in place to make this all work.
Virtual Models Sell Clothes at Sears.com

Sears & Roebuck was one of first businesses to develop a mail-order catalog business. For decades, the Sears catalog has been a popular method of ordering products for those unable or unwilling to travel to a department store. There isn’t much difference between ordering from a catalog and ordering from many e-commerce sites. Customers peruse a catalog filled with photos and descriptions of products, then phone in or enter their order and await delivery. More recently, however, digital technologies have been developed that provide e-commerce sites with powerful tools to drive sales—especially for products that have traditionally been difficult to sell online.

While books, music, and airline tickets are relatively easy to sell online, physical merchandise—especially clothing—is much more challenging. Shoppers like to try on clothing and see how outfit components look together. Tying on clothes and experimenting with clothing combinations has been impossible to do online, so most shoppers prefer to shop in stores for their clothes.

Recently, 3D technologies have provided online shoppers with the next best thing to being there. IBM and a company named My Virtual Model have partnered to provide powerful e-commerce tools for online clothing stores such as Sears.

My Virtual Model provides a custom-designed 3D virtual model for shoppers to use to see how clothes look when tried on. Each customer uses online tools to create a custom virtual model that closely resembles his or her own physical characteristics. Body size and shape, skin color, hair color and style, and facial features can be customized to look like the customer. You can even upload a photo of your face to create an exact virtual twin. Once created, the virtual model can be used to try on clothing from the online catalog. Mix and match shirts, pants, shoes, skirts, hats, and all kinds of apparel to find a combination that suits your tastes and appearance. The model can be rotated to view the clothes from all angles.

Sears combined My Virtual Model with IBM’s WebSphere Commerce software to provide a visual catalog of apparel that can be dragged onto a virtual model. The system provides additional social networking features that allow shoppers to share images of themselves in various outfits with friends online to solicit their feedback and suggestions. Sears and other retailers have found that shoppers are more likely to feel confident about a purchase when friends offer encouragement. Retailers that use My Virtual Model with social networking functionality have seen a 30 to 40 percent increase in sales conversion rates.

Some analysts believe that the use of social networking and 3D technologies will propel the next generation of e-commerce and assist retailers in invigorating sales after the economic downturn. One study found that 81 percent of consumers who use social networks seek shopping advice from friends and followers. 74 percent of social network users say that their social network influences their buying decisions. It is only logical for businesses to pursue social networks for e-commerce.

The impact of social networks on sales is sometimes referred to as the “Twitter effect.” Bad publicity for a product on Twitter can have a devastating effect on sales. Increasing numbers of shoppers rely on social networks for advice while shopping online and in stores. It is not unusual to find shoppers in store aisles consulting their social network via an iPhone or other smartphone prior to tossing an item into their shopping cart.

Companies such as CrossView specialize in what they call cross-channel enablement: developing strategies for improving the shopping experience across all shopping environments and covering brand reputation across all online influences. Businesses are realizing that consumers are drawing information that shapes their shopping decisions from numerous sources, including social networks, television and newspaper ads, in-store promotions, and elsewhere. Businesses are responding to this by taking a holistic approach to advertising and marketing. Companies such as Sears are combining the latest technologies like 3D virtual models with social networking tools and traditional marketing techniques to create new and powerful ways to influence and win over consumers.

Discussion Questions
1. What recent technologies are being harnessed to invigorate e-commerce sales?
2. Why is it important for retailers to turn to social networking as a tool for building positive brand recognition?

Critical Thinking Questions
1. How might a company respond to negative publicity on social networks like Twitter?
2. What other types of products might benefit from the integration of virtual 3D technologies within e-commerce sites?

Successful implementation of e-commerce requires significant changes to existing business processes and substantial investment in IS technology. These technology components must be chosen carefully and be integrated to support a large volume of transactions with customers, suppliers, and other business partners worldwide. Online consumers complain that poor Web site performance (e.g., slow response time, inadequate customer support, and lost orders) drives them to abandon some e-commerce sites in favor of those with better, more reliable performance. This section provides a brief overview of the key technology infrastructure components. See Figure 5.2.

**Figure 5.2**
Key Technology Infrastructure Components

![Diagram of e-commerce infrastructure]

- **Network**
  - Internet
  - Value-added network
  - Virtual private network
- **High-speed connection to network**
- **E-commerce software**
- **Server software**
- **Server operating system**
- **Web server hardware**

**Hardware**
A Web server hardware platform complete with the appropriate software is a key e-commerce infrastructure ingredient. The amount of storage capacity and computing power required of the Web server depends primarily on two things: the software that must run on the server and the volume of e-commerce transactions that must be processed. Although IS staff can sometimes define the software to be used, they can only estimate how much traffic the site will generate. As a result, the most successful e-commerce solutions are designed to be highly scalable so that they can be upgraded to meet unexpected growth in user traffic.

A key decision facing new e-commerce companies is whether to host their own Web site or to let someone else do it. Many companies decide that using a third-party Web service provider is the best way to meet initial e-commerce needs. The third-party company rents space on its computer system and provides a high-speed connection to the Internet, which minimizes the initial out-of-pocket costs for e-commerce start-up. The third party can also provide personnel trained to operate, troubleshoot, and manage the Web server. Of course, many companies decide to take full responsibility for acquiring, operating, and supporting the Web server hardware and software themselves, but this approach requires considerable...
up-front capital and a set of skilled and trained workers. No matter which approach a company takes, it must have adequate hardware backup to avoid a major business disruption in case of a failure of the primary Web server.

**Web Server Software**

In addition to the Web server operating system, each e-commerce Web site must have Web server software to perform fundamental services, including security and identification, retrieval and sending of Web pages, Web site tracking, Web site development, and Web page development. The two most widely used Web server software packages are Apache HTTP Server (51 percent market share) and Microsoft Internet Information Services (35 percent market share).26

**E-Commerce Software**

After you have located or built a host server, including the hardware, operating system, and Web server software, you can begin to investigate and install e-commerce software to support five core tasks: catalog management to create and update the product catalog, product configuration to help customers select the necessary components and options, shopping cart facilities to track the items selected for purchase, e-commerce transaction processing, and Web traffic data analysis to provide details to adjust the operations of the Web site. See Figure 5.3.

![Electronic Shopping Cart](https://www.llbean.com/)

An electronic shopping cart (or bag) allows online shoppers to view their selections and add or remove items. [Source: www.llbean.com]
Mobile Commerce Hardware and Software
For m-commerce to work effectively, the interface between the wireless, handheld device and its user must improve to the point that it is nearly as easy to purchase an item on a wireless device as it is to purchase it on a PC. In addition, network speed must improve so that users do not become frustrated. Security is also a major concern, particularly in two areas: the security of the transmission itself and the trust that the transaction is being made with the intended party. Encryption can provide secure transmission. Digital certificates, discussed later in this chapter, can ensure that transactions are made between the intended parties.

The handheld devices used for m-commerce have several limitations that complicate their use. Their screens are small, perhaps no more than a few square inches, and might be able to display only a few lines of text. Their input capabilities are limited to a few buttons, so entering data can be tedious and error prone. They also have less processing power and less bandwidth than desktop computers, which are usually hardwired to a high-speed LAN. They also operate on limited-life batteries. For these reasons, it is currently impossible to directly access many Web sites with a handheld device. Web developers must rewrite Web applications so that users with handheld devices can access them.

To address the limitations of wireless devices, the industry has undertaken a standardization effort for their Internet communications. The Wireless Application Protocol (WAP) is a standard set of specifications for Internet applications that run on handheld, wireless devices. It effectively serves as a Web browser for such devices.

Electronic Payment Systems
Electronic payment systems are a key component of the e-commerce infrastructure. Current e-commerce technology relies on user identification and encryption to safeguard business transactions. Actual payments are made in a variety of ways, including electronic cash, electronic wallets, and smart, credit, charge, and debit cards. Web sites that accept multiple payment types convert more visitors to purchasing customers than merchants who offer only a single payment method.

Authentication technologies are used by many organizations to confirm the identity of a user requesting access to information or assets. A digital certificate is an attachment to an e-mail message or data embedded in a Web site that verifies the identity of a sender or Web site. A certificate authority (CA) is a trusted third-party organization or company that issues digital certificates. The CA is responsible for guaranteeing that the people or organizations granted these unique certificates are, in fact, who they claim to be. Digital certificates thus create a trust chain throughout the transaction, verifying both purchaser and supplier identities.

Secure Sockets Layer
All online shoppers fear the theft of credit card numbers and banking information. To help prevent this type of identity theft, the Secure Sockets Layer (SSL) communications protocol is used to secure sensitive data. The SSL communications protocol includes a handshake stage, which authenticates the server (and the client, if needed), determines the encryption and hashing algorithms to be used, and exchanges encryption keys. Following the handshake stage, data might be transferred. The data is always encrypted, ensuring that your transactions are not subject to interception or “sniffing” by a third party. Although SSL handles the encryption part of a secure e-commerce transaction, a digital certificate is necessary to provide server identification.

Electronic Cash
Electronic cash is an amount of money that is computerized, stored, and used as cash for e-commerce transactions. Typically, consumers must open an account with an electronic cash service provider by providing identification information. When the consumers want to withdraw electronic cash to make a purchase, they access the service provider via the Internet and present proof of identity—a digital certificate issued by a certification authority or a username and password. After verifying a consumer’s identity, the system debits the consumer’s account and credits the seller’s account with the amount of the purchase. PayPal, BillMeLater, MoneyZap, and TeleCheck are four popular forms of electronic cash.
The PayPal service of eBay enables any person or business with an e-mail address to securely, easily, and quickly send and receive payments online. To send money, you enter the recipient’s e-mail address and the amount you want to send. You can pay with a credit card, debit card, or funds from a checking account. The recipient gets an e-mail that says, “You’ve Got Cash!” Recipients can then collect their money by clicking a link in the e-mail that takes them to www.paypal.com. To receive the money, the user also must have a credit card or checking account to accept fund transfers. To request money for an auction, invoice a customer, or send a personal bill, you enter the recipient’s e-mail address and the amount you are requesting. The recipient gets an e-mail and instructions on how to pay you using PayPal. PayPal has 78 million active accounts in 190 markets and makes payments in 19 currencies around the world.27

Credit, Charge, Debit, p- , and Smart Cards
Many online shoppers use credit and charge cards for most of their Internet purchases. A credit card, such as Visa or MasterCard, has a preset spending limit based on the user’s credit history, and each month the user can pay all or part of the amount owed. Interest is charged on the unpaid amount. A charge card, such as American Express, carries no preset spending limit, and the entire amount charged to the card is due at the end of the billing period. Charge cards do not involve lines of credit and do not accumulate interest charges. American Express became the first company to offer disposable credit card numbers in 2000. Other banks, such as Citibank, protect the consumer by providing a unique number for each transaction. Debit cards look like credit cards, but they operate like cash or a personal check. Credit, charge, and debit cards currently store limited information about you on a magnetic strip. This information is read each time the card is swiped to make a purchase. All credit card customers are protected by law from paying more than $50 for fraudulent transactions.

A p-card (procurement card or purchasing card) is a credit card used to streamline the traditional purchase order and invoice payment processes. The p-card is typically issued to selected employees who must follow company rules and guidelines that may include a single purchase limit, a monthly spending limit, or merchant category code restrictions. Due to an increased risk of unauthorized purchases, each p-card holder’s spending activity is reviewed periodically by someone independent of the cardholder to ensure adherence to the guidelines.

The smart card is a credit card–sized device with an embedded microchip to provide electronic memory and processing capability. Smart cards can be used for a variety of purposes, including storing a user’s financial facts, health insurance data, credit card numbers, and network identification codes and passwords. They can also store monetary values for spending.

Smart cards are better protected from misuse than conventional credit, charge, and debit cards because the smart-card information is encrypted. Conventional credit, charge, and debit cards clearly show your account number on the face of the card. The card number, along with a forged signature, is all that a thief needs to purchase items and charge them against your card. A smart card makes credit theft practically impossible because a key to unlock the encrypted information is required, and there is no external number that a thief can identify and no physical signature a thief can forge. Table 5.4 compares various types of payment systems.

<table>
<thead>
<tr>
<th>p-card (procurement card or purchasing card)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A credit card used to streamline the traditional purchase order and invoice payment processes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>smart card</th>
</tr>
</thead>
<tbody>
<tr>
<td>A credit card–sized device with an embedded microchip to provide electronic memory and processing capability.</td>
</tr>
</tbody>
</table>
### Table 5.4
Comparison of Payment Systems

<table>
<thead>
<tr>
<th>Payment System</th>
<th>Description</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit card</td>
<td>Carries preset spending limit based on the user’s credit history</td>
<td>Each month the user can pay all or part of the amount owed</td>
<td>Unpaid balance accumulates interest charges—often at a high rate of interest</td>
</tr>
<tr>
<td>Charge card</td>
<td>Looks like a credit card but carries no preset spending limit</td>
<td>Does not involve lines of credit and does not accumulate interest charges</td>
<td>The entire amount charged to the card is due at the end of the billing period</td>
</tr>
<tr>
<td>Debit card</td>
<td>Looks like a credit card or automated teller machine (ATM) card</td>
<td>Operates like cash or a personal check</td>
<td>Money is immediately deducted from user’s account balance</td>
</tr>
<tr>
<td>Smart card</td>
<td>Is a credit card device with embedded microchip capable of storing facts about cardholder</td>
<td>Better protected from misuse than conventional credit, charge, and debit cards because the smart-card information is encrypted</td>
<td>Not widely used in the U.S.</td>
</tr>
</tbody>
</table>

The Dragon Hotel is a four-star, 527-room facility located in a scenic and tourist-friendly portion of Hangzhou, China. The hotel invested US $150 million to provide its clientele with a unique, personalized experience in its effort to become the first five-star hotel in the province of Zhejiang. It installed a smart card system "to automatically register visitors upon their arrival, direct them to their rooms, customize temperature settings to established preferences, and even record their attendance at conference events.”

**Payments Using Cell Phones**

A number of companies are exploring more convenient ways to enable payments by cell phones by converting cell phones into virtual checkbooks or credit cards so that users can simply use the touch pad to send payments. Two options are available: payments linked to your bank account and payments added to your phone bill. The goals are to make the payment process as simple and secure as possible and for it to work on many different phones and through many different cell phone service providers—not simple tasks. Fortunately, the intelligence built into the iPhone, BlackBerry, and other smartphones can make this all possible.

Obopay is developing a service that enables people to transmit money from one another via text messaging. The MasterCard MoneySend service (currently in use in India) builds upon the Obopay technology. With MoneySend, funds transferred to a Maestro or MasterCard card can be available within one or two banking days. Users get an immediate confirmation that the funds have been successfully transferred. The recipient can access the transferred funds by making a purchase anywhere Maestro or MasterCard cards are accepted or by withdrawing cash at a participating ATM that accepts MasterCard cards and offers cash.

Boku is attempting to start up a cell phone payment system based on the use of cell phone numbers rather than credit card numbers. The advantage is that while most people know their cell phone numbers, few remember their credit card numbers. The system sends a text message to the buyers asking them to authorize the purchase with a texted response. If authorized, a charge for the purchase then appears on the buyer’s mobile phone bill.
An Overview of Transaction Processing Systems

Every organization has many transaction processing systems (TPSs), which capture and process the detailed data necessary to update records about the fundamental business operations of the organization. These systems include order entry, inventory control, payroll, accounts payable, accounts receivable, and the general ledger, to name just a few. The input to these systems includes basic business transactions, such as customer orders, purchase orders, receipts, time cards, invoices, and customer payments. The processing activities include data collection, data editing, data correction, data manipulation, data storage, and document production. The result of processing business transactions is that the organization’s records are updated to reflect the status of the operation at the time of the last processed transaction.

A TPS also provides employees involved in other business processes—via management information system/decision support system (MIS/DSS) and the special-purpose information systems—with data to help them achieve their goals. (MIS/DSS systems are discussed in Chapter 6.) A transaction processing system serves as the foundation for these other systems. See Figure 5.4.

Transaction processing systems support routine operations associated with customer ordering and billing, employee payroll, purchasing, and accounts payable. The amount of support for decision making that a TPS directly provides managers and workers is low. TPSs work with a large amount of input and output data and use this data to update the official records of the company about such things as orders, sales, and customers. As systems move from transaction processing to management information/decision support and special-purpose information systems, they involve less routine, more decision support, less input and output, and more sophisticated and complex analysis. These higher-level systems require the basic business transaction data captured by the TPS.

Newcastle Permanent Building Association is an Australian financial services organization that provides personal and business banking services and whose total assets exceed $6 billion. It operates a widespread network of branch offices and ATMs and also provides electronic banking services to its customers. Its transaction processing banking application manages all member account information and transactions and provides a master reference for other downstream systems, including ATMs and electronic banking services. The TPS also captures key data that produces daily and monthly reports to provide managers with information on the financial position of the firm.31
Traditional Transaction Processing Methods and Objectives

With batch processing systems, business transactions are accumulated over a period of time and prepared for processing as a single unit or batch. See Figure 5.5a. Transactions are accumulated for the length of time needed to meet the needs of the users of that system. For example, it might be important to process invoices and customer payments for the accounts receivable system daily. On the other hand, the payroll system might receive time cards and process them biweekly to create checks, update employee earnings records, and distribute labor costs. The essential characteristic of a batch processing system is that there is some delay between an event and the eventual processing of the related transaction to update the organization’s records.

Dean Health Plan (DHP) is a health maintenance organization offering its customers a network of more than 2,000 practitioners, 80 clinic sites, and 26 hospitals. DHP recently implemented a healthcare claims batch processing system to help it process claims more efficiently while meeting strict HIPAA (Health Insurance Portability and Accountability Act) standards for data privacy and portability. With online transaction processing (OLTP), each transaction is processed immediately, without the delay of accumulating transactions into a batch. See Figure 5.5b. Consequently, at any time, the data in an online system reflects the current status. This type of processing is essential for businesses that require access to current data such as airlines, ticket agencies, and stock investment firms. Many companies find that OLTP helps them provide faster, more efficient service—one way to add value to their activities in the eyes of the customer. Increasingly, companies are using the Internet to capture and process transaction data such as customer orders and shipping information from e-commerce applications.
Trimac Corporation is a trucking firm and uses an OLTP system to perform all tasks associated with order entry, dispatching, trip planning, and driver payment. [Source: www.trimac.com.]

Trimac Corporation located in Calgary, Alberta in Canada is a bulk hauling carrier with 140 branch offices and some 3,000 tractors and 6,000 trailers driving 220 million miles per year. The firm uses an OLTP system to perform all tasks associated with order entry, dispatching, trip planning, and driver payment. TPS applications do not always run using online processing. For many applications, batch processing is more appropriate and cost effective. Payroll transactions and billing are typically done via batch processing. Specific goals of the organization define the method of transaction processing best suited for the various applications of the company.

Figure 5.6 shows the flow of key pieces of information from one TPS to another for a typical manufacturing organization. TPSs can be designed so that the flow of information from one system to another is automatic and requires no manual intervention or reentering of data. Such a set of systems is called an integrated information system. Many organizations have limited or no integration among their TPSs. In this case, data input to one TPS must be printed out and manually reentered into other systems. Of course, this increases the amount of effort required and introduces the likelihood of processing delays and errors.
Because of the importance of transaction processing, organizations expect their TPSs to accomplish a number of specific objectives including:

- Process data generated by and about transactions
- Maintain a high degree of accuracy and integrity
- Avoid processing fraudulent transactions
- Produce timely user responses and reports
- Increase labor efficiency
- Help improve customer service and/or loyalty

Depending on the specific nature and goals of the organization, any of these objectives might be more important than others. By meeting these objectives, TPSs can support corporate goals such as reducing costs; increasing productivity, quality, and customer satisfaction; and running more efficient and effective operations. For example, overnight delivery companies such as FedEx expect their TPSs to increase customer service. These systems can locate a client’s package at any time—from initial pickup to final delivery. This improved customer information allows companies to produce timely information and be more responsive to customer needs and queries.

**TRANSACTION PROCESSING ACTIVITIES**

Along with having common characteristics, all TPSs perform a common set of basic data-processing activities. TPSs capture and process data that describes fundamental business transactions. This data is used to update databases and to produce a variety of reports for people both within and outside the enterprise. The business data goes through a **transaction processing cycle** that includes data collection, data editing, data correction, data manipulation, data storage, and document production. See Figure 5.7.

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**Figure 5.7**

Data Processing Activities Common to Transaction Processing Systems

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**transaction processing cycle**

The process of data collection, data editing, data correction, data manipulation, data storage, and document production.
**Data Collection**

Capturing and gathering all data necessary to complete the processing of transactions is called **data collection**. In some cases it can be done manually, such as by collecting handwritten sales orders or changes to inventory. In other cases, data collection is automated via special input devices such as scanners, point-of-sale devices, and terminals.

Data collection begins with a transaction (e.g., taking a customer order) and results in data that serves as input to the TPS. Data should be captured at its source and recorded accurately in a timely fashion, with minimal manual effort, and in an electronic or digital form that can be directly entered into the computer. This approach is called **source data automation**. An example of source data automation is an automated device at a retail store that speeds the checkout process—either UPC codes read by a scanner or RFID signals picked up when the items approach the checkout stand. Using both UPC bar codes and RFID tags is quicker and more accurate than having a clerk enter codes manually at the cash register. The product ID for each item is determined automatically, and its price retrieved from the item database. The point-of-sale TPS uses the price data to determine the customer’s bill. The store’s inventory and purchase databases record the number of units of an item purchased, the date, the time, and the price. The inventory database generates a management report notifying the store manager to reorder items that have fallen below the reorder quantity. The detailed purchases database can be used by the store or sold to marketing research firms or manufacturers for detailed sales analysis. See Figure 5.8.

Many grocery stores combine point-of-sale scanners and coupon printers. The systems are programmed so that each time a specific product—for example, a box of cereal—crosses a checkout scanner, an appropriate coupon—perhaps a milk coupon—is printed. Companies can pay to be promoted through the system, which is then reprogrammed to print those companies’ coupons if the customer buys a competitive brand. These TPSs help grocery stores increase profits by improving their repeat sales and bringing in revenue from other businesses.

**Data Editing**

An important step in processing transaction data is to perform **data editing** for validity and completeness to detect any problems. For example, quantity and cost data must be numeric, and names must be alphabetic; otherwise, the data is not valid. Often, the codes associated with an individual transaction are edited against a database containing valid codes. If any code entered (or scanned) is not present in the database, the transaction is rejected.
Data Correction

It is not enough simply to reject invalid data. The system should also provide error messages that alert those responsible for editing the data. Error messages must specify the problem so proper corrections can be made. A data correction involves reentering data that was not typed or scanned properly. For example, a scanned UPC code must match a code in a master table of valid UPCs. If the code is misread or does not exist in the table, the checkout clerk is given an instruction to rescan the item or type the information manually.

Data Manipulation

Another major activity of a TPS is data manipulation, the process of performing calculations and other data transformations related to business transactions. Data manipulation can include classifying data, sorting data into categories, performing calculations, summarizing results, and storing data in the organization’s database for further processing. In a payroll TPS, for example, data manipulation includes multiplying an employee’s hours worked by the hourly pay rate. Overtime pay, federal and state tax withholdings, and deductions are also calculated.

Data Storage

Data storage involves updating one or more databases with new transactions. After being updated, this data can be further processed and manipulated by other systems so that it is available for management reporting and decision making. Thus, although transaction databases can be considered a by-product of transaction processing, they have a pronounced effect on nearly all other information systems and decision-making processes in an organization.

Document Production and Reports

Document production involves generating output records, documents, and reports. These can be hard-copy paper reports or displays on computer screens (sometimes referred to as soft copy). Printed paychecks, for example, are hard-copy documents produced by a payroll TPS, while an outstanding balance report for invoices might be a soft-copy report displayed by an accounts receivable TPS. Often, results from one TPS flow downstream to become input to other systems, which might use the results of updating the inventory database to create the stock exception report (a type of management report) of items whose inventory level is below the reorder point.

In addition to major documents such as checks and invoices, most TPSs provide other useful management information, such as printed or on-screen reports that help managers and employees perform various activities. A report showing current inventory is one example; another might be a document listing items ordered from a supplier to help a receiving clerk check the order for completeness when it arrives. A TPS can also produce reports required by local, state, and federal agencies, such as statements of tax withholding and quarterly income statements.
Google Pulls Out Of China

Companies that serve customers around the world often need to make adjustments so that the products and services that they provide adhere to local laws. Conforming to the local laws of the countries in which you do business is not typically a major issue, unless those laws contradict the company’s ethical values. Such was the case when Google decided to pull out of China.

The story begins in December of 2009 when Google and dozens of other companies and government organizations were the targets of a cyberattack based out of China. The purpose of the attacks was to gain access to the accounts of Chinese dissidents and journalists. For Google, the attack served as the final straw to building tensions between Google and the Chinese government. For years the Chinese government had required Google to filter search results served to Chinese citizens—a requirement that Google regards as unethical. China also occasionally required Google’s China office to provide account information of Chinese bloggers that had criticized the government. In some cases, the information provided by Google reportedly resulted in arrests, and torture.

After it was clear to Google that the December attack could not have occurred without government sponsorship, Google laid down an ultimatum: Google would continue operations in China only if it was allowed to provide unfettered search results. Google used the hacking incident as a lever to raise the ethical concerns it has with Chinese laws. China responded to the hacking allegation by downplaying the incident and reiterating that all businesses in China are bound to uphold China laws.

After months of closed-door negotiations, with China holding firm to its stance, Google closed the doors on its search engine in China, following through on its promise. But, rather than eliminating its filters on google.cn and risking the arrest of its China-based employees, Google redirected requests for google.cn to its Hong Kong search engine, google.com.hk, where it maintains unfettered Chinese-language search results. Shortly after the switch, China was quick to apply its own censoring filters to the Internet DNS servers that feed its country.

Google’s decision to close google.cn was shocking because of the large monetary sacrifice that Google has made. China has the world’s largest population and has one of the most rapidly growing economies. Google has given up a large competitive advantage in exchange for its cleaner conscience. Google’s move is causing many companies that do business in China to re-evaluate their own motivations and convictions.

So far, while many have applauded Google’s decision, only a few have followed suit. Popular Web hosting company GoDaddy stopped registering domain names for the .cn domain. That decision came after the Chinese government demanded personal information about people who had purchased domain names from GoDaddy. Microsoft has stated that it intends to continue growing its business in China. Even Google continues other operations in China and looks forward to robust sales of Google Android phones in China in coming years.

China isn’t the only country where Google censors content based on government-imposed policies. Google has posted the site www.google.com/governmentrequests that lists governments that require Google to censor content. Brazil, Germany, India, the UK, South Korea, and the U.S. rank high on the list. Granted, censorship is sometimes justified, such as in cases where it protects populations from physical harm. However, many feel that it is not justified when it is used to silence dissident opinions such as in China. Increasingly, technology companies such as Google and Internet service providers are assuming responsibility for policing Internet content. Google’s stance against China’s censorship has shown that the company is clearly uncomfortable with its role as a censor and causes some to wonder if it may not follow up with changes in policy elsewhere. Google’s chief legal officer wrote that the China issue “goes to the heart of a much bigger global debate about freedom of speech.”

Google’s experience in China provides an extreme example of the considerations faced by technology companies providing services abroad. Similar considerations are faced by all kinds of international companies, at varying levels of complexity every day. While most companies comply with local laws and customs in the countries in which they operate without complaint, Google chose to use its financial power and influence to make a statement about its company’s ethical position on political censorship.

Discussion Questions
1. What constraints imposed by China combined to cause Google to close its Chinese search engine?
2. What pressures might cause businesses to set aside ethical considerations to do business in China?

Critical Thinking Questions
1. Some have argued that Google’s exit from China might have actually harmed the growth of democracy around the world. How might Google have positively influenced democracy if it had stayed in China?
2. What constraints might China place on a business like Wal-Mart, or India place on a restaurant like McDonalds? How do those constraints differ from those placed on Google in China?

TRADITIONAL TRANSACTION PROCESSING APPLICATIONS

A TPS typically includes the following types of systems:

- **Order processing systems.** Running these systems efficiently and reliably is so critical that the order processing systems are sometimes referred to as the lifeblood of the organization. The processing flow begins with the receipt of a customer order. The finished product inventory is checked to see if sufficient inventory is on hand to fill the order. If sufficient inventory is available, the customer shipment is planned to meet the customer’s desired receipt date. A product pick list is printed at the warehouse from which the order is to be filled on the day the order is planned to be shipped. At the warehouse, workers gather the items needed to fill the order, and enter the item identifier and quantity for each item to update the finished product inventory. When the order is complete and sent on its way, a customer invoice is created with a copy included in the customer shipment.

- **Accounting systems.** The accounting systems must track the flow of data related to all the cash flows that affect the organization. As mentioned earlier, the order processing system generates an invoice for customer orders to include with the shipment. This information is also sent to the accounts receivable system to update the customer’s account. When the customer pays the invoice, the payment information is also used to update the customer’s account. The necessary accounting transactions are sent to the general ledger system to keep track of amounts owed and amounts paid. Similarly, as the purchasing systems generate purchase orders and those items are received, information is sent to the accounts payable system to manage the amounts owed by the company. Data about amounts owed and paid by customers to the company and from the company to vendors and others are sent to the general ledger system that records and reports all financial transactions for the company.

- **Purchasing systems.** The traditional transaction processing systems that support the purchasing business function include inventory control, purchase order processing, receiving, and accounts payable. Employees place purchase order requests in response to shortages identified in inventory control reports. Purchase order information flows to the receiving system and accounts payable systems. A record of receipt is created upon receipt of the items ordered. When the invoice arrives from the supplier, it is matched to the original order and the receiving report and a check is generated if all data is complete and consistent.

TRANSACTION PROCESSING SYSTEMS FOR SMALL AND MEDIUM-SIZE ENTERPRISES (SMES)

Many software packages provide integrated transaction processing system solutions for small and medium-size enterprises (SMEs), wherein small is an enterprise with fewer than 50 employees and medium is one with fewer than 250 employees. These systems are typically easy to install, easy to operate, and have a low total cost of ownership with an initial cost of a few hundred to a few thousand dollars. Such solutions are highly attractive to firms that have outgrown their current software but cannot afford a complex, high-end integrated system solution. Table 5.5 presents some of the dozens of such software solutions available.
<table>
<thead>
<tr>
<th>Vendor</th>
<th>Software</th>
<th>Type of TPS Offered</th>
<th>Target Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccuFund</td>
<td>AccuFund</td>
<td>Financial reporting and accounting</td>
<td>Nonprofit, municipal, and government organizations</td>
</tr>
<tr>
<td>OpenPro</td>
<td>OpenPro</td>
<td>Complete ERP solution, including financials, supply chain management, e-commerce, customer relationship management, and retail POS system</td>
<td>Manufacturers, distributors, and retailers</td>
</tr>
<tr>
<td>Intuit</td>
<td>QuickBooks</td>
<td>Financial reporting and accounting</td>
<td>Manufacturers, professional services, contractors, nonprofits, and retailers</td>
</tr>
<tr>
<td>Sage</td>
<td>Timberline</td>
<td>Financial reporting, accounting, and operations</td>
<td>Contractors, real estate developers, and residential builders</td>
</tr>
<tr>
<td>Redwing</td>
<td>TurningPoint</td>
<td>Financial reporting and accounting</td>
<td>Professional services, banks, and retailers</td>
</tr>
</tbody>
</table>

**Table 5.5**

Sample of Integrated TPS Solutions for SMEs

**ENTERPRISE RESOURCE PLANNING**

An **enterprise system** is central to an organization and ensures information can be shared across all business functions and all levels of management to support the running and managing of a business. Enterprise systems employ a database of key operational and planning data that can be shared by all (Figure 5.9). This eliminates the problems of lack of information and inconsistent information caused by multiple transaction processing systems that support only one business function or one department in an organization. Examples of enterprise systems include enterprise resource planning systems that support supply-chain processes, such as order processing, inventory management, and purchasing, and customer relationship management systems that support sales, marketing, and customer service-related processes.

Businesses rely on such systems to perform many of their daily activities in areas such as product supply, distribution, sales, marketing, human resources, manufacturing, accounting, and taxation so that work is performed quickly, while avoiding waste and mistakes. Without such systems, recording and processing business transactions would consume huge amounts of an organization’s resources. This collection of processed transactions also forms a storehouse of data invaluable to decision making. The ultimate goal is to satisfy customers and provide a competitive advantage by reducing costs and improving service. See Figure 5.9.
Microsoft Dynamics is an ERP solution that is very popular among small businesses. [Source: Courtesy of Microsoft Corporation]

An Overview of Enterprise Resource Planning

ERP systems evolved from materials requirement planning systems (MRP) that tied together the production planning, inventory control, and purchasing business functions for manufacturing organizations. Many organizations recognized that their legacy transaction processing systems lacked the integration needed to coordinate activities and share valuable information across all the business functions of the firm. As a result, costs were higher and customer service poorer than desired. As a result, firms are scrapping large parts of their existing information systems and converting to new ERP systems. Large organizations, specifically members of the Fortune 1000, were the first to take on the challenge of implementing ERP. As they did, they uncovered many advantages as well as some disadvantages summarized in the following sections.

Advantages of ERP

Increased global competition, new needs of executives for control over the total cost and product flow through their enterprises, and ever-more-numerous customer interactions drive the demand for enterprise-wide access to real-time information. ERP offers integrated software from a single vendor to help meet those needs. The primary benefits of implementing ERP include improved access to data for operational decision making, elimination of inefficient or outdated systems, improvement of work processes, and technology standardization. ERP vendors have also developed specialized systems for specific applications and market segments.

Improved Access to Data for Operational Decision Making

ERP systems operate via an integrated database, using one set of data to support all business functions. The systems can support decisions on optimal sourcing or cost accounting, for instance, for the entire enterprise or business units from the start, rather than gathering data from multiple business functions and then trying to coordinate that information manually or reconciling data with another application. The result is an organization that looks seamless, not only to the outside world but also to the decision makers who are deploying resources within the organization. The data is integrated to facilitate operational decision making and allows companies to provide greater customer service and support, strengthen customer and supplier relationships, and generate new business opportunities.
Flambeau produces a wide range of plastic products and employs thousands of workers in eight manufacturing locations worldwide. It has grown through acquisition, and out of necessity was running multiple, disparate legacy information systems that drew data from multiple databases. The firm had to resort to the use of spreadsheets to manually track critical business information used for cost and inventory control. This inevitably led to errors and poor decision making. Finally the company implemented an ERP system to deliver timely, consistent data for both production and financial management purposes. Flambeau has used the system to lower its inventory costs, better manage its production operations, and provide access to a single set of data used to run the business.34

Elimination of Costly, Inflexible Legacy Systems
Adoption of an ERP system enables an organization to eliminate dozens or even hundreds of separate systems and replace them with a single, integrated set of applications for the entire enterprise. In many cases, these systems are decades old, the original developers are long gone, and the systems are poorly documented. As a result, the systems are extremely difficult to fix when they break, and adapting them to meet new business needs takes too long. They become an anchor around the organization that keeps it from moving ahead and remaining competitive. An ERP system helps match the capabilities of an organization’s information systems to its business needs—even as these needs evolve.

Marin Municipal Water District provides drinking water to nearly 200,000 people residing in the 147 square mile area of Marin County, California, just north of San Francisco. The district relied on a combination of manual processes and antiquated information systems to manage the operation and maintenance of 925 miles of pipeline, 140 storage tanks, 94 pumping stations, and 3 water treatment plants. The Water District upgraded to an ERP system to meet this need as well as to integrate customer billing and Human Resources with its work order and maintenance operations. Now the Water District can perform maintenance on a preventative basis forecasting the work needed to keep everything operating smoothly without interruption. The ERP system has even been linked to a Geographic Information System (GIS) so that when maintenance is required, workers can generate maps to identify repair areas and get details on all Water District assets in the area.35

Improvement of Work Processes
Competition requires companies to structure their business processes to be as effective and customer oriented as possible. ERP vendors do considerable research to define the best business processes. They gather requirements of leading companies within the same industry and combine them with research findings from research institutions and consultants. The individual application modules included in the ERP system are then designed to support these best practices, the most efficient and effective ways to complete a business process. Thus, implementation of an ERP system ensures good work processes based on best practices. For example, for managing customer payments, the ERP system’s finance module can be configured to reflect the most efficient practices of leading companies in an industry. This increased efficiency ensures that everyday business operations follow the optimal chain of activities, with all users supplied the information and tools they need to complete each step.

With 22,000 employees serving 4.7 million customers and generating revenue of 14 billion Euros, Achmea is the largest insurance company in the Netherlands. The company had grown rapidly through acquisition and had evolved to using a mix of manual data collection and reporting processes. The company converted to an ERP system to standardize on a set of industry best practices, streamlined work processes, and sophisticated data analysis tools across all divisions and operating companies. As a result, the company could reduce staffing levels in some areas of the business by as much as 30 percent, thus improving productivity and cutting costs. In addition, the time required to complete month-end financial reporting was reduced by 30 percent, with an increase in the accuracy and reliability of the data.36
Upgrade of Technology Infrastructure
When implementing an ERP system, an organization has an opportunity to upgrade the information technology (hardware, operating systems, databases, etc.) that it uses. While centralizing and formalizing these decisions, the organization can eliminate the hodgepodge of multiple hardware platforms, operating systems, and databases it is currently using—most likely from a variety of vendors. Standardizing on fewer technologies and vendors reduces ongoing maintenance and support costs as well as the training load for those who must support the infrastructure.

Barloworld Handling UK is the United Kingdom distributor of Hyster forklifts. It also provides parts and service through 26 service locations that field customer service calls, schedule and dispatch field techs, and manage the ordering and delivery of parts. This highly decentralized service operation resulted in inefficient work processes, high costs, and inconsistent service levels. Barloworld reengineered its service operations to squeeze out waste and inefficiency. Service techs were issued handheld computers programmed to follow the new work processes. The handheld devices could also access work orders, equipment information, and inventory data held in the firm’s ERP database. By integrating mobile devices with improved work processes and access to ERP data, the firm achieved “paperless, real-time data entry; immediate parts lookup and availability checks with overnight delivery; time sheets completed as work progresses; and automatic dispatch of work orders,” according to Robert S. Tennant, the firm’s CIO. The number of service locations was reduced from 26 to 6, service tech efficiency was increased by 10 percent, and annual revenue increased by more than €500,000.37

Disadvantages of ERP Systems
Unfortunately, implementing ERP systems can be difficult and can disrupt current business practices. Some of the major disadvantages of ERP systems are the expense and time required for implementation, the difficulty in implementing the many business process changes that accompany the ERP system, the problems with integrating the ERP system with other systems, difficulty in loading data into the new system, the risks associated with making a major commitment to a single vendor, and the risk of implementation failure.

Expense and Time in Implementation
Getting the full benefits of ERP takes time and money. Although ERP offers many strategic advantages by streamlining a company’s TPSs, large firms typically need three to five years and spend tens of millions of dollars to implement a successful ERP system.

Difficulty Implementing Change
In some cases, a company has to radically change how it operates to conform to the ERP’s work processes—its best practices. These changes can be so drastic to long-time employees that they retire or quit rather than go through the change. This exodus can leave a firm short of experienced workers. Sometimes, the best practices simply are not appropriate for the firm and cause great work disruptions.

Difficulty Integrating with Other Systems
Most companies have other systems that must be integrated with the ERP system, such as financial analysis programs, e-commerce operations, and other applications. Many companies have experienced difficulties making these other systems operate with their ERP system. Other companies need additional software to create these links.

Difficulty in Loading Data into New ERP System
A major amount of work is required to load existing data from various sources into the new ERP database. The new ERP system may have the capability to store hundreds or even thousands of data items (e.g. customer name, bill to address, product description, etc.). The data items that will be required depend on the scope of ERP implementation. If certain processes or transactions are not included within the scope of implementation, there will be less data to load.
Data mapping is the examination of each data item required for the new ERP system and determining where that data item will come from. While most of the data for the new system will come from the files of existing legacy systems, some data items may need to be pulled from manual systems or may even need to be created for the new system.

Data cleanup is required because the legacy systems are likely to contain data that is inaccurate, incomplete, or inconsistent. For example, the same customer may be listed multiple times in existing customer files with varying bill to addresses or products may appear in the existing inventory files that have not been produced for years.

Data loading can be performed either by using data conversion software that reads the old data and converts it into a format for loading it into the database or by end users entering data via the input screens of the new system.

Risks in Using One Vendor

The high cost to switch to another vendor’s ERP system makes it extremely unlikely that a firm will do so. After a company has adopted an ERP system, the vendor has less incentive to listen and respond to customer concerns. The high cost to switch also increases risk—in the event the ERP vendor allows its product to become outdated or goes out of business. Selecting an ERP system involves not only choosing the best software product, but also the right long-term business partner. It was unsettling for many companies that had implemented PeopleSoft, J.D. Edwards, or Siebel Systems enterprise software when these firms were acquired by Oracle.

Risk of Implementation Failure

Implementing an ERP system for a large organization is extremely challenging and requires tremendous amounts of resources, the best IS and businesspeople, and plenty of management support. Unfortunately, large ERP installations occasionally fail, and problems with an ERP implementation can require expensive solutions.

The following list provides tips for avoiding many common causes for failed ERP implementations:

- Assign a full-time executive to manage the project.
- Appoint an experienced, independent resource to provide project oversight and to verify and validate system performance.
- Allow sufficient time for transition from the old way of doing things to the new system and new processes.
- Plan to spend a lot of time and money training people; many project managers recommend that $10,000-$20,000 per employee be budgeted for training of personnel.
- Define metrics to assess project progress and to identify project-related risks.
- Keep the scope of the project well defined and contained to essential business processes.
- Be wary of modifying the ERP software to conform to your firm’s business practices.

ERP for Small and Medium-Size Enterprises (SMEs)

It is not only large Fortune 1000 companies that are successful in implementing ERP. SMEs (both for-profit and not-for-profit) can achieve real business benefits from their ERP efforts. Many of the SMEs elected to implement open-source ERP systems. With open-source software, anyone can see and modify the source code to customize it to meet their needs. Such systems are much less costly to acquire and are relatively easy to modify to meet business needs. A wide range of organizations can perform the system development and maintenance. Table 5.6 lists some of the open-source ERP systems geared for SMEs.

The following sections outline how an ERP system can support supply chain management and accounting, two major business processes.
Supply Chain Management (SCM)

Supply chain management (SCM) includes the planning, execution, and control of all activities involved in raw material sourcing and procurement, conversion of raw materials to finished products, and warehousing and delivering finished product to customers. The goal of SCM is to reduce costs and improve customer service, while at the same time reducing the overall investment in inventory in the supply chain.

The ERP system for a manufacturing organization typically encompasses SCM activities and manages the flow of materials, information, and finances. Manufacturing ERP systems follow a systematic process for developing a production plan that draws on the information available in the ERP system database.

The process starts with sales forecasting to develop an estimate of future customer demand. This initial forecast is at a fairly high level, with estimates made by product group rather than by each individual product item. The sales forecast extends for months into the future. The sales forecast might be developed using an ERP software module or it might be produced by other means using specialized software and techniques. Many organizations are moving to a collaborative process with major customers to plan future inventory levels and production rather than relying on an internally generated sales forecast.

The sales and operations plan takes demand and current inventory levels into account and determines the specific product items that need to be produced and when to meet the forecast future demand. Production capacity and any seasonal variability in demand must also be considered. The result is a high-level production plan that balances market demand and production capacity.

Demand management refines the production plan by determining the amount of weekly or daily production needed to meet the demand for individual products. The output of the demand management process is the master production schedule which is a production plan for all finished goods.

Detailed scheduling uses the production plan defined by the demand management process to develop a detailed production schedule specifying details such as which item to produce first and when production should be switched from one item to another. A key decision is how long to make the production runs for each product. Longer production runs reduce the number of machine setups required, thus reducing production costs. Shorter production runs generate less finished product inventory and reduce inventory holding costs.

Materials requirement planning determines the amount and timing for placing raw material orders with suppliers. The types and amounts of raw materials required to support the planned production schedule are determined based on the existing raw material inventory and the bill of materials, or BOM, a sort of “recipe” of ingredients needed to make each product item. The quantity of raw materials to order also depends on the lead time and lot sizing. Lead time is the time it takes from the time a purchase order is placed until the raw materials arrive at the production facility. Lot size has to do with discrete quantities that the supplier will ship and the amount that is economical for the producer to receive and/or store. For example, a supplier might ship a certain raw material in units of 80,000-pound rail cars. The producer might need 95,000 pounds of the raw material. A decision must be made to order one or two rail cars of the raw material.

Purchasing uses the information from materials requirement planning to place purchase orders for raw materials and transmit them to qualified suppliers. Typically, the release of

<table>
<thead>
<tr>
<th>Vendor</th>
<th>ERP Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache</td>
<td>Open For Business ERP</td>
</tr>
<tr>
<td>Compiere</td>
<td>Compiere Open Source ERP</td>
</tr>
<tr>
<td>Openbravo</td>
<td>Openbravo Open Source ERP</td>
</tr>
<tr>
<td>WebERP</td>
<td>WebERP</td>
</tr>
</tbody>
</table>
these purchase orders is timed so that raw materials arrive just in time to be used in production and minimize warehouse and storage costs. Often, producers will allow suppliers to tap into data via an extranet that enables them to determine what raw materials the supplier needs thus minimizing the effort and lead time to place and fill purchase orders.

Production uses the detailed schedule to plan the details of running and staffing the production operation.

Financial and Managerial Accounting

The general ledger is the main accounting record of a business. It is often divided into different categories, including assets, liabilities, revenue, expenses, and equity. These categories, in turn, are subdivided into subledgers to capture details such as cash, accounts payable, accounts receivable, and so on. The business processes required to capture and report these accounting details are essential to the operation of any organization and are frequently included within the scope of an organization’s ERP system. In the ERP system, input to the general ledger occurs simultaneously with the input of a business transaction to a specific module. Here are several examples of how this occurs:

- An order clerk records a sale and the ERP system automatically creates an accounts receivable entry indicating that a customer owes money for goods received.
- A buyer enters a purchase order and the ERP system automatically creates an accounts payable entry in the general ledger registering that the company has an obligation to pay for goods that will be received at some time in the future.
- A dock worker enters a receipt of purchased materials from a supplier, and the ERP system automatically creates a general ledger entry to increase the value of inventory on hand.
- A production worker withdraws raw materials from inventory to support production, and the ERP system generates a record to reduce the value of inventory on hand.

Thus, the ERP system captures transactions entered by workers in all functional areas of the business. The ERP system then creates the associated general ledger record to track the financial impact of the transaction. This set of records is an extremely valuable resource that companies can use to support financial accounting and managerial accounting.

Financial accounting consists of capturing and recording all the transactions that affect a company’s financial state and then using these documented transactions to prepare financial statements to external decision makers, such as stockholders, suppliers, banks, and government agencies. These financial statements include the profit and loss statement, balance sheet, and cash flow statement. They must be prepared in strict accordance to rules and guidelines of agencies such as the Securities and Exchange Commission, the Internal Revenue Service, and the Financial Accounting Standards Board. Data gathered for financial accounting can also form the basis for tax accounting because this involves external reporting of a firm’s activities to the local, state, and federal tax agencies.

Managerial accounting involves using “both historical and estimated data in providing information that management uses in conducting daily operations, in planning future operations, and in developing overall business strategies.”38 Managerial accounting provides data to enable the firm’s managers to assess the profitability of a given product line or specific product, identify underperforming sales regions, establish budgets, make profit forecasts, and measure the effectiveness of marketing campaigns.

All transactions that affect the financial state of the firm are captured and recorded in the database of the ERP system. This data is used in the financial accounting module of the ERP system to prepare the statements required by various constituencies. The data can also be used in the managerial accounting module of the ERP system along with various assumptions and forecasts to perform various analyses such as generating a forecasted profit and loss statement to assess the firm’s future profitability.

Using an ERP with financial and managerial accounting systems can contribute significantly to a company’s success. Spartan Foods of America produces and distributes breakfast sandwiches, pancakes, and pizzas to retail grocers and food service suppliers. The firm implemented a complete end-to-end ERP system including accounting modules to provide the vital accounting data it needed to accurately price and manage the inventory of its perishable
products. Now the firm can make improved pricing decisions, which have enhanced its profitability and improved earnings.39

We will now cover customer relationship management, another form of enterprise system.

**Customer Relationship Management**

Customer relationship management (CRM) software automates and integrates the functions of sales, marketing, and service in an organization. The objective is to capture data about every contact a company has with a customer through every channel and store it in the CRM system so the company can truly understand customer actions. CRM software helps a organization build a database about its customers that describes relationships in sufficient detail so that management, salespeople, customer service providers—and even customers—can access information to match customer needs with product plans and offerings, remind them of service requirements, and know what other products they have purchased.

The key features of a CRM system include the following:

- **Contact management**: The ability to track data on individual customers and sales leads and access that data from any part of the organization.
- **Sales management**: The ability to organize data about customers and sales leads and then to prioritize the potential sales opportunities and identify appropriate next steps.
- **Customer support**: The ability to support customer service reps so that they can quickly, thoroughly, and appropriately address customer requests and resolve customers’ issues while at the same time collecting and storing data about those interactions.
- **Marketing automation**: The ability to capture and analyze all customer interactions, generate appropriate responses, and gather data to create and build effective and efficient marketing campaigns.
- **Analysis**: The ability to analyze customer data to identify ways to increase revenue and decrease costs, identify the firm’s “best customers,” and determine how to retain them and find even more of them.
- **Social networking**: The ability to create and join groups like Facebook where salespeople can make contacts with potential customers.
- **Access by smartphones**: The ability to access Web-based customer relationship management software by devices such as the BlackBerry or Apple iPhone.
- **Import contact data**: The ability for users to import contact data from various data service providers such as Jigsaw, which offers company-level contact data that can be downloaded for free directly into the CRM application.

Figure 5.10 shows the SAP Contact Manager.

ACME is a flatbed trucking company with a fleet of 1,400 trucks handling some 4,000 loads per week. Data about each shipment for each customer is captured and entered into the CRM to provide a consolidated view of all customer activities. Every employee involved with customers, including sales staff, dispatchers, customer service, and the credit/collections department can use this data to enhance their interactions with customers. For example, before a national accounts manager visits a customer, the manager can obtain up-to-the-minute information about issues that may have occurred at any of the customers’ multiple sites served by ACME, and be prepared to address them directly with the customer. The CRM also enables sales managers to track and analyze each phase of the field sales effort and share data with the national account management staff. According to Mike Coatney, president of ACME, “By giving our managers, sales staff, and dispatchers the information they need to address all customer issues, this solution is letting us streamline operational overhead and strengthen customer relationships with outstanding service.”40

Organizations choose to implement CRM for a variety of reasons depending on their needs. ITSM Academy is an accredited provider of IT Service Management education, instructing companies on how to deliver IT services at reasonable costs. The Academy implemented a CRM to effectively manage its multistep, multiperson process to deliver training by tracking, linking, and coordinating everyone’s activities.41 Sovereign Bank is a large financial institution with $40 billion in assets, 525 offices, and 1,000 ATMs. The bank
implemented a CRM to standardize and streamline its processes for finding, assigning, and managing new prospects, thus greatly increasing the efficiency of its Relationship Managers. \(^{42}\) Jubilations Cheesecake makes gourmet cheesecakes for mail-order consumer gifts, business gifts, and fundraising. The firm implemented a CRM system to automate its 29-step process so its salesforce can maintain contact with prospects and customers as well as send and track outbound e-mails that are an essential part of its sales and marketing efforts. \(^{43}\) Goodwill is a nonprofit organization that “enhances the dignity and quality of life of individuals, families and communities by eliminating barriers to opportunity and helping people in need reach their fullest potential through the power of work.” \(^{44}\) The organization implemented a CRM system to capture and use data about its donors and shoppers for use in cross-selling to customers, soliciting donors, and planning corporate donation drives. \(^{45}\)

**Hosted Software Model for Enterprise Software**

Many business application software vendors are pushing the use of the hosted software model for SMEs. The goal is to help customers acquire, use, and benefit from the new technology while avoiding much of the associated complexity and high start-up costs. SAP, Microsoft, NetSuite, Intacct, Oracle, BizAutomation.com, Salesforce.com, NetBooks, and Workday are among the software vendors who offer hosted versions of their ERP or CRM software at a cost of $50-$200 per month per user.

This pay-as-you-go approach is appealing to SMEs because they can experiment with powerful software capabilities without making a major financial investment. Organizations can then dispose of the software without large investments if the software fails to provide value or otherwise misses expectations. Also, using the hosted software model means the small business firm does not need to employ a full-time IT person to maintain key business applications. The small business firm can expect additional savings from reduced hardware costs.
and costs associated with maintaining an appropriate computer environment (such as air conditioning, power, and an uninterruptible power supply).

Drugstore.com is open 24 hours a day, 7 days a week enabling online shoppers to select from among 40,000 beauty, health, and wellness products—more than four times the number of items carried in a typical brick-and-mortar drugstore. The firm employs 150 customer service reps to handle 90,000 inquiries a month from its online shoppers. Drugstore.com must provide fast and accurate answers to customer questions and not keep them hold. The service reps rely on a specially tailored CRM system to manage the call load and provide prompts to frequently asked questions. The CRM system runs as a hosted or Software as a Service application.46

Table 5.7 lists the advantages and disadvantages of hosted software.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased total cost of ownership</td>
<td>Potential availability and reliability issues</td>
</tr>
<tr>
<td>Faster system startup</td>
<td>Potential data security issues</td>
</tr>
<tr>
<td>Lower implementation risk</td>
<td>Potential problems integrating the hosted products of different vendors</td>
</tr>
<tr>
<td>Management of systems outsourced to experts</td>
<td>Savings anticipated from outsourcing may be offset by increased effort to manage vendor</td>
</tr>
</tbody>
</table>

INTERNATIONAL ISSUES ASSOCIATED WITH ENTERPRISE SYSTEMS

Enterprise systems must support businesses that interoperate with customers, suppliers, business partners, shareholders, and government agencies in multiple countries. Different languages and cultures, disparities in IS infrastructure, varying laws and customs rules, and multiple currencies are among the challenges that must be met by an enterprise system of a multinational company.
Principle
Electronic and mobile commerce are evolving, providing new ways of conducting business that present both potential benefits and problems.

E-commerce is the conducting of business activities electronically over networks. Business-to-business (B2B) e-commerce allows manufacturers to buy at a low cost worldwide, and it offers enterprises the chance to sell to a global market. B2B e-commerce is currently the largest type of e-commerce. Business-to-consumer (B2C) e-commerce enables organizations to sell directly to consumers, eliminating intermediaries. In many cases, this squeezes costs and inefficiencies out of the supply chain and can lead to higher profits and lower prices for consumers. Consumer-to-consumer (C2C) e-commerce involves consumers selling directly to other consumers. Online auctions are the chief method by which C2C e-commerce is currently conducted. E-commerce is the use of information and communications technology to simplify the sharing of information, speed formerly paper-based processes, and improve the relationship between citizens and government.

Mobile commerce is the use of wireless devices such as cell phones and smartphones to facilitate the sale of goods or services—anytime, anywhere. The market for m-commerce in North America is expected to mature much later than in Western Europe and Japan. Although some industry experts predict great growth in this arena, several hurdles must be overcome, including improving the ease of use of wireless devices, addressing the security of wireless transactions, and improving network speed.

Electronic retailing (e-tailing) is the direct sale from a business to consumers through electronic storefronts designed around an electronic catalog and shopping cart model.

A cybermall is a single Web site that offers many products and services at one Internet location.

Manufacturers are joining electronic exchanges, where they can work with competitors and suppliers to use computers and Web sites to buy and sell goods, trade market information, and run back-office operations such as inventory control. They are also using e-commerce to improve the efficiency of the selling process by moving customer queries about product availability and prices online.

The Web allows firms to gather much more information about customer behavior and preferences than they could using other marketing approaches. This new technology has greatly enhanced the practice of market segmentation and enabled companies to establish closer relationships with their customers. Detailed information about a customer’s behavior, preferences, needs, and buying patterns allows companies to set prices, negotiate terms, tailor promotions, add product features, and otherwise customize a relationship with a customer.

The Internet has also revolutionized the world of investment and finance, especially online stock trading and online banking.

The Internet has also created many options for electronic auctions, where geographically dispersed buyers and sellers can come together.

M-commerce provides a unique opportunity to establish one-on-one marketing relationships and support communications anytime and anywhere. M-commerce transactions are being used in many application arenas, including mobile banking, mobile price comparison, mobile advertising, and mobile coupons.

Businesses and people use e-commerce to reduce transaction costs, speed the flow of goods and information, improve the level of customer service, and enable the close coordination of actions among manufacturers, suppliers, and customers. E-commerce also enables consumers and companies to gain access to worldwide markets. E-commerce offers great promise for developing countries, helping them to enter the prosperous global marketplace, and hence helping to reduce the gap between rich and poor countries.

Principle
E-commerce and m-commerce require the careful planning and integration of a number of technology infrastructure components.

A number of infrastructure components must be chosen and integrated to support a large volume of transactions with customers, suppliers, and other business partners worldwide. These components include hardware, Web server software, security and identification services, Web site development tools, e-commerce software, and Web services.

The Wireless Application Protocol (WAP) is a standard set of specifications to enable development of m-commerce software for wireless devices. The development of the Wireless Application Protocol (WAP) and its derivatives addresses many m-commerce issues.

Electronic payment systems are a key component of the e-commerce infrastructure. A digital certificate is an attachment to an e-mail message or data embedded in a Web page that verifies the identity of a sender or a Web site. To help prevent the theft of credit card numbers and banking information, the Secure Sockets Layer (SSL) communications protocol is used to secure all sensitive data. There are several electronic cash alternatives that require the purchaser to open an account with an electronic cash service provider and to present proof of identity whenever payments are to be made. Payments can also be made by credit, charge, debit, and smart cards.
Principle
An organization must have information systems that support the routine, day-to-day activities that occur in the normal course of business and help a company add value to its products and services.

Transaction processing systems (TPSs) are at the heart of most information systems in businesses today. ATPS is an organized collection of people, procedures, software, databases, and devices used to capture fundamental data about events that affect the organization (transactions) and use that data to update the official records of the organization.

The methods of transaction processing systems include batch and online. Batch processing involves the collection of transactions into batches, which are entered into the system at regular intervals as a group. Online transaction processing (OLTP) allows transactions to be entered as they occur.

Organizations expect TPSs to accomplish a number of specific objectives, including processing data generated by and about transactions, maintaining a high degree of accuracy and information integrity, compiling accurate and timely reports and documents, increasing labor efficiency, helping provide increased and enhanced service, and building and maintaining customer loyalty. In some situations, an effective TPS can help an organization gain a competitive advantage.

All TPSs perform the following basic activities: data collection, which involves the capture of source data to complete a set of transactions; data editing, which checks for data validity and completeness; data correction, which involves providing feedback of a potential problem and enabling users to change the data; data manipulation, which is the performance of calculations, sorting, categorizing, summarizing, and storing data for further processing; data storage, which involves placing transaction data into one or more databases; and document production, which involves outputting records and reports.

Traditional TPS systems include the following types of systems: order processing, accounting, and purchasing systems.

The traditional TPSs that support the purchasing function include inventory control, purchase order processing, accounts payable, and receiving.

Many software packages provide integrated transaction processing solutions for SMEs.

Principle
A company that implements an enterprise resource planning system is creating a highly integrated set of systems, which can lead to many business benefits.

Enterprise resource planning (ERP) software supports the efficient operation of business processes by integrating activities throughout a business, including sales, marketing, manufacturing, logistics, accounting, and staffing.

Implementation of an ERP system can provide many advantages, including providing access to data for operational decision making; elimination of costly, inflexible legacy systems; providing improved work processes; and creating the opportunity to upgrade technology infrastructure.

Some of the disadvantages associated with ERP systems are that they are expensive and time consuming to implement; they may require the organization to change radically the way it operates; it is difficult to implement them with other systems; there can be difficulty in loading data into them; there are risks associated with using one vendor; and there is a risk of implementation failure.

Many SMEs have found open-source ERP systems to be effective solutions to their transaction processing and management reporting needs.

The production and supply chain management process starts with sales forecasting to develop an estimate of future customer demand. This initial forecast is at a fairly high level with estimates made by product group rather than by each individual product item. The sales and operations plan takes demand and current inventory levels into account and determines the specific product items that need to be produced and when to meet the forecast future demand. Demand management refines the production plan by determining the amount of weekly or daily production needed to meet the demand for individual products. Detailed scheduling uses the production plan defined by the demand management process to develop a detailed production schedule specifying details such as which item to produce first and when production should be switched from one item to another. Materials requirement planning determines the amount and timing for placing raw material orders with suppliers. Purchasing uses the information from materials requirement planning to place purchase orders for raw materials and transmit them to qualified suppliers. Production uses the detailed schedule to plan the details of running and staffing the production operation.

The business processes required to capture and report accounting details are often included within the scope of an organization’s ERP system.

Principle
A company that implements a customer relationship management system is building a source of information about customers that can improve sales, marketing, and customer service.

A CRM helps an organization build a database about its customers that describes relationships in sufficient detail so that manage management, salespeople, customer service providers, and even customers can access information to match customer needs.

Business application software vendors are experimenting with the hosted software model to see if the approach meets customer needs and is likely to generate significant revenue.
Principle

There are many potential international issues associated with the operation of enterprise systems.

Numerous complications arise that multinational corporations must address in planning, building, and operating their TPSs. These challenges include dealing with different languages and cultures, disparities in IS infrastructure, varying laws and customs rules, and multiple currencies.

CHAPTER 5: SELF-ASSESSMENT TEST

Electronic and mobile commerce are evolving, providing new ways of conducting business that present both potential benefits and problems.

1. The market for m-commerce in North America is maturing much later than in Western Europe and Japan. True or False?
2. A form of e-commerce in which customers deal directly with an organization and avoid intermediaries is called ____. 
3. Which form of e-commerce is the largest in terms of dollar volume?

E-commerce and m-commerce require the careful planning and integration of a number of technology infrastructure components.

4. The practice of ____________ divides the pool of potential customers into subgroups, which are usually defined in terms of demographic characteristics.
5. An attachment to an e-mail message or data embedded in a Web site that verifies the identity of a sender or Web site is called a(n) ___.

An organization must have information systems that support the routine, day-to-day activities that occur in the normal course of business and help a company add value to its products and services.

6. Identify the missing TPS basic activity: data collection, data editing, data ____, data manipulation, data storage, and document production.
7. A form of TPS whereby business transactions are accumulated over a period of time and processed all at once is called ___.

A company that implements an enterprise resource planning system is creating a highly integrated set of systems, which can lead to many business benefits.

8. Which of the following is a primary benefit of implementing an ERP system?
   a. elimination of inefficient systems
   b. easing adoption of improved work processes
   c. improving access to data for operational decision making
   d. all of the above

9. Because it is so critical to the operation of an organization, most companies can implement an ERP system without major difficulty. True or False?
10. Only large, multinational companies can justify the implementation of ERP systems. True or False?

A company that implements a customer relationship management system is building a source of information about customers that can improve sales, marketing, and customer service.

11. The objective of a CRM is to capture data about every ____ a company has with its customers through every channel and store it.
12. CRM systems cannot provide support for the access of data via a BlackBerry or Apple iPhone device. True or False?

There are many potential international issues associated with the operation of enterprise systems.

13. Many multinational companies roll out standard IS applications for all to use. However, standard applications often don’t account for all the differences among business partners and employees operating in other parts of the world. Which of the following is a frequent modification that is needed for standard software?
   a. Software might need to be designed with local language interfaces to ensure the successful implementation of a new IS.
   b. Customization might be needed to handle date fields correctly.
   c. Users might also have to implement manual processes and overrides to enable systems to function correctly.
   d. all of the above

CHAPTER 5: SELF-ASSESSMENT TEST ANSWERS

(1) True (2) B2C (3) B2B (4) market segmentation (5) digital certificate (6) correction (7) batch processing (8) d (9) False (10) False (11) contact (12) False (13) d.
REVIEW QUESTIONS

1. Define the term e-Government. Identify three forms of e-Government and give an example of each.
2. Identify and briefly describe three limitations that complicate the use of handheld devices used for m-commerce.
3. What role do digital certificates and certificate authorities play in e-commerce?
4. What is mobile commerce? How big is the mobile commerce market in the U.S.?
5. Briefly explain the differences among smart, credit, charge, and debit cards.
6. Identify the key elements of the technology infrastructure required to successfully implement e-commerce within an organization.
7. What is the Secure Sockets Layer and how does it support e-commerce?
8. What problems can arise when an organization’s TPS systems are not integrated?
9. An ERP system follows a systematic process for developing a production plan that draws on the information available in the ERP system database. Outline this process and identify the software modules that are used to support it.
10. Identify four complications that multinational corporations must address in planning, building, and operating their ERP systems.
11. What are the business processes included within the scope of supply chain management?
12. What is the role of a CRM system? What sort of business benefits can such a system produce?
13. Identify three characteristics of integrated processing software package solutions that make them attractive to SMEs.
14. What is the difference between managerial and financial accounting?

DISCUSSION QUESTIONS

1. You are a member of the organization’s finance organization. The firm is considering the implementation of an ERP system. Make a convincing argument for finance and accounting to be included within the scope of the ERP implementation.
2. What do you think are the biggest barriers to wide-scale adoption of m-commerce by consumers? Who do you think is working on solutions to these problems and what might the solutions entail?
3. Identify and briefly describe three m-commerce applications you have used.
4. Discuss the use of e-commerce to improve spending on manufacturing, repair, and operations (MRO) of goods and services.
5. Identify three kinds of business organizations that would have difficulty in becoming a successful e-commerce organization.
6. Assume that you are the owner of a landscaping firm serving hundreds of customers in your area. Identify the kinds of customer information you would like your firm’s CRM system to capture. How might this information be used to provide better service or increase revenue? Identify where or how you might capture this data.
7. Do you think that an SME would have less or more difficulty implementing an ERP system than a large, multinational corporation? Defend your position.
8. Your friend has been appointed the project manager of your firm’s ERP implementation system. What advice would you offer to help ensure the success of the project?
9. What sort of benefits should the suppliers and customers of a firm that has successfully implemented an ERP system see? What sort of issues might arise for suppliers and customers during an ERP implementation?
10. Many organizations are moving to a collaborative process with their major customers to get their input on planning future inventory levels and production rather than relying on an internally generated demand forecast. Explain how such a process might work. What issues and concerns might a customer have in entering into an agreement to do this?

PROBLEM-SOLVING EXERCISES

1. Imagine that you are the new IS manager for a Fortune 1000 company. Surprisingly, the firm still operates with a hodgepodge of transaction processing systems—some are software packages from various vendors and some are in-house developed systems. Use a graphics package (e.g. PowerPoint) to prepare a slide presentation you will make to
senior company managers to convince them that it is time to implement a comprehensive ERP system. What sort of resistance and objections do you expect to encounter? How would you overcome these? Include appropriate slides to cover this as well.

2. Research the growth of B2B and B2C e-commerce and retail sales for the period 2000 to present. Use the graphics capability of your spreadsheet software to plot the growth of all three. Using current growth rates, predict the year that B2C e-commerce will exceed 10 percent of retail sales.

3. Your washing machine just gave out and must be replaced within the week! Use your Web-enabled smartphone (or borrow a friend’s) to perform a price and product comparison to identify the manufacturer and model that best meets your needs and the retailer with the lowest delivered cost. Obtain peer input to validate your choice. Write a brief summary of your experience and identify the Web sites you found most useful.

TEAM ACTIVITIES

1. Imagine that your team has been hired as consultants to provide recommendations to boost the traffic to a Web site that sells environmentally friendly (“green”) household cleaning products. Identify as many ideas as possible for how you can increase traffic to this Web site. Next, rank your ideas from best to worst.

2. Your team members should interview several business managers at a firm that has implemented a CRM system. Try to define the scope and a schedule for the major tasks of the overall project. Make a list of what they see as the primary benefits of the implementation. What were the biggest hurdles they had to overcome? Did the firm need to retrain its employees to place greater emphasis on putting the customer first?

WEB EXERCISES

1. Do research on the Web to find out more about the American Consumer Satisfaction Index methodology developed by the University of Michigan. Write a brief report about this methodology and explain how it was applied to rate B2C Web sites. Using this information, develop a list of at least six recommendations for someone developing a B2C Web site.

2. Do research on the Web and find a Web site that offers a demo of an ERP or CRM system. View the demo, perhaps more than once. Write a review of the software based on the demo. What are its strengths and weaknesses? What additional questions about the software do you have? E-mail your questions to the vendor and document their response to your questions.

CAREER EXERCISES

1. For your chosen career field, describe how you might use or be involved with e-commerce. If you have not chosen a career yet, answer this question for someone in marketing, finance, or human resources.

2. Imagine that you are a prescription drug salesperson for a large pharmaceutical firm and that you make frequent sales calls on physicians and other primary care people in doctor’s offices. The purpose of these sales calls is to acquaint them with your firm’s products and get them to begin prescribing your products to their patients. Describe the basic functionality you would want in your organization’s CRM system for it to support you in preparing and making presentations to these people.
CASE STUDIES

Case One
Wrangler Sells Direct Online

The Wrangler Jeans story begins in 1904, when C.C. Hudson bought several sewing machines from his previous employer, leased space over a grocery store, and started the Hudson Overall Company. Fifteen years later, the name of the business was changed to Blue Bell Overall Company. Over decades of growth and acquisitions, Blue Bell become Wrangler and expanded to produce and sell western style clothing for men, women, and children around the world. Today, one in every five pairs of jeans sold globally is made by Wrangler.

In 2009, Wrangler decided to open its first B2C e-commerce site. Wrangler had several goals for the new site. It needed to provide visitors with a view into the spirit behind the Wrangler brand. Wrangler wanted to use the site to feature and promote various products as the market dictated. They also wanted the site to use the latest technologies to show that Wrangler is tech savvy and to empower Wrangler’s marketing department with new ways to present its products.

One Wrangler slogan is “Enduring American freedom; it’s in the spirit of people who work hard, have fun, and recognize courageous individuality.” Wrangler’s Web site design expresses this concept with large, bold photos of down-home American scenes featuring country music and rodeo stars alongside hard-working individuals and people just hanging out.

Wrangler’s new site uses background image fade-ins with rotating product image overlays that allow Wrangler to feature different products as needed. Behind the scenes, the site is delivered in a Flash version and a pure HTML version, both fully integrated to support all browser requirements. Although this approach requires additional development time, it allows the site to “garner better natural search rankings.”

Wrangler included additional database functionality to provide different views of products. For example, a visitor can click Jeans to go directly to the Jeans page or browse through product collections listed under themes that include Rodeo & Riding, Workwear & Safety, Music & Dancing, and Hanging Out. Each theme opens with a large splash screen that Wrangler Marketing uses to promote its brand in the selected environment. For example, clicking Music & Dancing opens a large photo of country music legend George Strait, with a paragraph on Wrangler’s importance to those involved in country music and dancing.

The site uses the latest technologies to provide interesting page and page element presentations and site navigation. The latest technologies are also used on the back end to make sure that pages are loaded and refreshed extremely quickly. It features a single-page checkout system that makes the checkout process quick and efficient. It also features a powerful search utility that provides an alternative to the traditional drill-down approach to navigation.

Wrangler’s new site took four months to develop and was completed on time and on budget. Wrangler has benefited from additional sales provided by its new B2C e-commerce site. Equally as valuable is the insight the company gains about customer interests and the platform it provides for Wrangler marketing to experiment with product and brand promotions.

Discussion Questions
1. How does Wrangler’s new B2C e-commerce site assist Wrangler’s brand recognition and marketing efforts?
2. What goals did Wrangler set for its e-commerce site? Visit www.wrangler.com. Do you think its new site meets those goals?

Critical Thinking Questions
1. Wrangler targets a very specific type of person with its marketing and Web site. How would you describe that group? What risks and benefits do companies assume when they target specific types of individuals? Do you think it pays off for Wrangler? Why?
2. The Wrangler site incorporates a lot of dynamic visual elements. How do these elements affect a shopper? What types of products are best suited for this type of marketing approach?


Case Two
Dubai Bank Improves Customer Satisfaction with CRM

Dubai Bank is one of the top Islamic banks based in Dubai, United Arab Emirates, with 25 branches across the UAE and total assets of AED 14.4 billion. Banking is a highly competitive business in Dubai, a city of glass-and-steel skyscrapers and state-of-the-art massive engineering projects, rooted in oil money, and growing in leaps and bounds. Banks work hard to win over customers with lavish lobbies, financial incentives, and impeccable customer service.

As Dubai Bank grew over time, adding services and customers, it became apparent that the bank needed a way to easily gather customer information. Dubai Bank customers often had data spread across three separate databases—one for account information, another for credit card information,
and yet another for investments and loans. If customers held multiple bank accounts, separate database records were created and even more information was duplicated.

The complexity of customer information systems caused Dubai Bank agents frustration in finding information and setting up new accounts. Even worse was the aggravation it caused valuable customers. If a customer phoned customer service with a question, the agent might have had to access eight systems to collect customer information, leaving the customer waiting on the line. If the customer followed up the next day with a visit to the bank, the teller would have had no knowledge of the previous discussion with customer service, further aggravating the customer.

When customers set up a new account, agents were required to fill out multiple applications. Credit checks needed to be performed manually. With this level of customer service, Dubai Bank was having a difficult time keeping customers.

Faizal Eledath, chief information officer at Dubai Bank, recognized the need for an enterprise-wide customer relationship management (CRM) system. He sought a system that would integrate all customer records into one cohesive system, providing agents and managers detailed information about each customer through a single interface.

Dubai Bank is recognized as an Islamic institution that strictly adheres to the Shari’a principles—that is, the sacred law of Islam. These principles include conducting business with the highest level of transparency, integrity, fairness, respect, and care. Dubai Bank’s information systems would need to support its Islamic principles.

Dubai Bank hired information systems consultant Veripark to assist in building the ideal CRM for the bank. Dubai made its choice based on positive past experiences it shared with Veripark and the Microsoft products it represents. Veripark selected Microsoft Dynamics CRM package that integrates all critical operational banking systems, including credit cards, data warehouse, wealth management, and risk systems, into the CRM.

The new CRM provides bank representatives with a 360-degree view of the customer, whereby information can be entered and accessed through a single interface. Veripark customized the package to comply with Islamic banking regulations. Business process automation is programmed into the system to further assist the bank in its strict adherence to Shari’a principles.

The new CRM system records information from all customer interactions with the bank. If a customer makes a withdrawal from an ATM, it is recorded in the CRM. When a customer phones customer service, notes are recorded in the system as well. Whenever a customer has a need, a bank representative can easily review the customer's history and quickly recommend a course of action.

Since the installation of its new CRM system, both customers and bank agents are much happier. Customer service agents can now provide speedy service because information is provided in one interface rather than eight. New accounts are created in a quarter of the time previously required. Compliance with Islamic banking requirements is assured and automated, without involving additional effort on the part of bank officials or agents. Most importantly, Dubai Bank knows and understands its customers more deeply and can use that information to provide services and implement programs that increase customer satisfaction.

Discussion Questions
1. What conditions brought Dubai Bank to the realization that it could benefit from a CRM system?
2. How did the CRM system make life easier for Dubai Bank agents and customers?

Critical Thinking Questions
1. Dubai Bank had regulation imposed on it by the Islamic faith that affected its information systems. What types of regulations are imposed on U.S. banks that have a similar impact?
2. How can the information collected by a CRM system be used to gain insight and boost a business’ profits? Provide some examples.


Questions for Web Cases

See the Web site for this book to read about the Altitude Online case for this chapter. The following are questions concerning this Web case.

Altitude Online: E-Commerce Considerations

Discussion Questions
1. How does Altitude Online’s Web site contribute to the company’s commerce?
2. How will the new ERP system impact Altitude Online’s Web presence?

Critical Thinking Questions
1. How can companies like Altitude Online, which sell services rather than physical products, use e-commerce to attract customers and streamline operations?
2. Consider a company like Fluid by reviewing its site: www.fluid.com. Fluid is similar to Altitude Online in the services it offers. What site features do you think are effective for e-commerce? How might you design the site differently?
Altitude Online: Enterprise System Considerations

Discussion Questions

1. Judging from the ERP features, how important is an ERP to the functioning of a business? Explain.
2. What consideration do you think led Altitude Online to decide to host the ERP on its own servers rather than using SaaS? What are the benefits and drawbacks of both approaches?

Critical Thinking Questions

1. What challenges lay ahead for Altitude Online as it rolls out its new ERP system?
2. How might the ERP affect Altitude Online’s future growth and success?


Success Stories Spartan Foods of America


