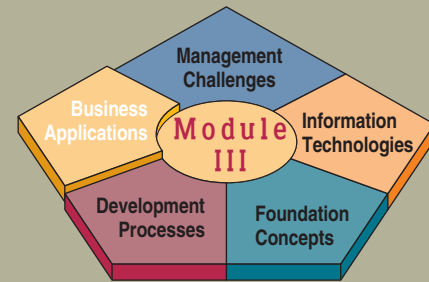


MODULE III



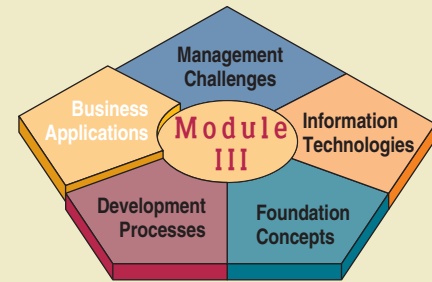
BUSINESS APPLICATIONS

How do internet technologies and other forms of IT support business processes, e-commerce, and business decision making? The four chapters of this module show you how such business applications of information systems are accomplished in today's networked enterprises.

- **Chapter 7: e-Business Systems** describes how information systems integrate and support enterprisewide business processes, as well as the business functions of marketing, manufacturing, human resource management, accounting, and finance.
- **Chapter 8: Enterprise Business Systems** outlines the goals and components of customer relationship management, enterprise resource planning, and supply chain management, and discusses the benefits and challenges of these major enterprise applications.
- **Chapter 9: e-Commerce Systems** introduces the basic process components of e-commerce systems, and discusses important trends, applications, and issues in e-commerce.
- **Chapter 10: Supporting Decision Making** shows how management information systems, decision support systems, executive information systems, expert systems, and artificial intelligence technologies can be applied to decision-making situations faced by business managers and professionals in today's dynamic business environment.

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CHAPTER 7



e-BUSINESS SYSTEMS

Chapter Highlights

Section I e-Business Systems

Introduction

Cross-Functional Enterprise Applications

Real World Case: Toyota Europe, Campbell Soup Company, Sony Pictures, and W. W. Grainger: Making the Case for Enterprise Architects

Enterprise Application Integration

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Enterprise Collaboration Systems

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Marketing Systems

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Real World Case: Cisco Systems: Telepresence and the Future of Collaboration

Real World Case: OHSU, Sony, Novartis, and Others: Strategic Information Systems—It’s HR’s Turn

Learning Objectives

After reading and studying this chapter, you should be able to:

1. Identify the following cross-functional enterprise systems, and give examples of how they can provide significant business value to a company:
 - a. Enterprise application integration
 - b. Transaction processing systems
 - c. Enterprise collaboration systems
2. Give examples of how Internet and other information technologies support business processes within the business functions of accounting, finance, human resource management, marketing, and production and operations management.

REYNOLDS,
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SECTION I

e-Business Systems

Introduction

Contrary to popular opinion, e-business is not synonymous with e-commerce. E-business is much broader in scope, going beyond transactions to signify use of the Internet, in combination with other technologies and forms of electronic communication, to enable any type of business activity.

This chapter introduces the fast-changing world of business applications of information technology, which increasingly consists of what is popularly called *e-business* applications. Remember that **e-business**, a term originally coined by Lou Gerstner, CEO of IBM, is the use of the Internet and other networks and information technologies to support e-commerce, enterprise communications and collaboration, and Web-enabled business processes, both within a networked enterprise and with its customers and business partners. E-business includes *e-commerce*, which involves the buying and selling and marketing and servicing of products, services, and information over the Internet and other networks. We will cover e-commerce in Chapter 9.

In this chapter, we will explore some of the major concepts and applications of e-business. We will begin by focusing in Section I on examples of cross-functional enterprise systems, which serve as a foundation for more in-depth coverage of enterprisewide business systems such as customer relationship management, enterprise resource planning, and supply chain management in Chapter 8. In Section II, we will explore examples of information systems that support essential processes in the functional areas of business.

Read the Real World Case on the next page. We can learn a lot from this case about the challenging work of enterprise architects. See Figure 7.1.

Cross-Functional Enterprise Applications

Many companies today are using information technology to develop integrated **cross-functional enterprise systems** that cross the boundaries of traditional business functions in order to reengineer and improve vital business processes all across the enterprise. These organizations view cross-functional enterprise systems as a strategic way to use IT to share information resources and improve the efficiency and effectiveness of business processes, and develop strategic relationships with customers, suppliers, and business partners. See Figure 7.2, which illustrates a cross-functional business process.

Companies first moved from functional mainframe-based *legacy systems* to integrated cross-functional *client/server* applications. This typically involved installing *enterprise resource planning*, *supply chain management*, or *customer relationship management* software from SAP America, PeopleSoft, Oracle, and others. Instead of focusing on the information processing requirements of business functions, such enterprise software focuses on supporting integrated clusters of business processes involved in the operations of a business.

Now, as we see continually in the Real World Cases in this text, business firms are using Internet technologies to help them reengineer and integrate the flow of information among their internal business processes and their customers and suppliers. Companies all across the globe are using the World Wide Web and their intranets and extranets as a technology platform for their cross-functional and interenterprise information systems.

Figure 7.3 presents an **enterprise application architecture**, which illustrates the interrelationships of the major cross-functional enterprise applications that many companies have or are installing today. This architecture does not provide a detailed or exhaustive application blueprint, but it provides a conceptual framework to help you

Enterprise Application Architecture

Toyota Europe, Campbell Soup Company, Sony Pictures, and W.W. Grainger: Making the Case for Enterprise Architects

When technology infrastructure lines up with business projects like musicians in a marching band, you know you have a good enterprise architect on staff.

Enterprise architecture focuses on four crucial C's: connection, collaboration, communication, and customers. Imagine needing to manually log onto five different systems to create and track an order, or spending 20 hours to research a project because you didn't know that the information already existed in another department. These situations result from fragmentation and siloed thinking; the goal of enterprise architecture, on the other hand, is to create unity.

Enterprise architecture's goal is IT that enables business strategy today and tomorrow, says Peter Heinckens, chief enterprise architect at Toyota Europe. "The 'tomorrow' part is especially important," he says. The enterprise architect must map, define, and standardize technology, data, and business processes to make that possible.

This means that the architect must have both a macro and micro view: It is necessary to understand the business strategy and translate this into an architectural approach (macro view), but also be able to work with individual projects and deliver very concrete guidance to these projects that focus on the suc-

cessful delivery of the individual project within that macro view. "The enterprise architect transforms tech-speak into the language of business solutions, and he knows what technology is needed to enable business strategy," says Heinckens.

In other words, an architect knows how to bridge silos. An oft-used metaphor compares the enterprise architect's role to that of the city planner, who also provides the road maps, zoning, common requirements, regulations, and strategy—albeit for a company, rather than for a city. And this role is increasingly important as enterprise architecture itself becomes more important.

"Enterprise architecture's roots are in the desire to serve what is best for the enterprise versus the individual department or project," says Andy Croft, Campbell Soup Company's vice president of IT-shared services. Croft, who has the enterprise architect role at Campbell's, speaks of the days when incompatible e-mail systems made employees within the same company unable to share information via e-mail. Each department thought it needed its own brand of PC—even its own network or security system. Finally, Croft says, "People lifted their heads and thought, maybe it's more important to be able to work together rather than [sic] me having the 'best.'" Enterprise architecture gained traction from the bottom up.

That siloed view on projects may come in the form of "I want to use this package" or "I want to build this application," according to Heinckens. As an architect, he advises, it's important to take a step back: Try to understand what problem the proposed project will solve.

Is there already a solution that covers the proposed area being researched? Does the proposed project fit into the wider picture? "Structurally, business units are silos—and therefore often have a limited view—but the enterprise architect ensures that the pieces of the wider-picture puzzle fit together," says Heinckens.

As an illustration, some projects use data that nobody else in the company will be interested in, whereas other projects use data that are useful and relevant to everyone in the company. It is the enterprise architect's job to figure out how to make the latter type available to the rest of the company, and one part of that task is creating compliance standards. "It is important that this discussion takes place," says Heinckens.

"Then you see other discussions start to happen." For example, who owns this data? Who should receive permission to access this data? What is a customer? For the marketing department, after-sale department, and finance department, the definition of customer is totally different, even though they refer to the same person.

In many companies, this process is ultimately formalized. At Campbell's, it's called a blueprint. Before a new project can be started, each technology area must review a proposed project to ensure that it fits into the overall strategy.

Achieving that impressive lockstep between business and IT takes time and practice, of course. Not only that, but an

FIGURE 7.1



Enterprise architects create unity out of siloed thinking and disparate applications.

enterprise architect must be a voice that many kinds of people can understand, says Tim Ferrarell, CIO and senior vice president of enterprise systems at W. W. Grainger, a \$6.4 billion distributor of heavy equipment.

Ideally, Ferrarell says, this person “can think at a strategic level and all the way down to the operating level and understand how to move up and down that chain of abstraction,” he says. “And know how to deal with conflicts and trade-offs.”

Is that all? Actually, no. That person also has to gain the confidence of the senior leadership team, he says. Execs must believe that the enterprise architect understands how the company works, where it wants to go, and how technology helps or hinders, he says. Then, effective working relationships can bloom.

In 2006, Grainger went live with a companywide SAP project: 20 SAP modules and 30 additional applications that would touch 425 locations. To help guard against what could go wrong in a big-bang cutover, Ferrarell took his team of about 20 enterprise architects off their regular jobs and assigned them to design and integration roles on the SAP project. The SAP implementation was such an all-encompassing program that it made sense to repurpose the enterprise architects into key roles in the project. Their broad business and technical knowledge made them very valuable team members, says Ferrarell.

Grainger’s senior business-side managers knew these architects and their business savvy firsthand, he explains. The trust was there, which helped get IT the intense cooperation needed during and after the complicated launch. Their architects played a significant role, not only in shaping the need for completion of the ERP project, but in ensuring that its design would enable their business requirements. The SAP project succeeded, Ferrarell says, in part due to the institutional knowledge and business-IT translation skills the enterprise architects brought to it.

Other companies, though, have to be convinced of the enterprise architect’s criticality. Sony Pictures Entertainment launched an enterprise architect role modestly in 2002, focused at first on technology issues only, says David Buckholtz, vice president of planning, enterprise architecture and quality at the media company.

He had to start small: Sony Pictures Entertainment didn’t even have a corporatewide IT department until the late 1990s, Buckholtz says. The company grew from acquisitions and other deals that parent company Sony Corporation of America made in the 1980s and 1990s, such as the acquisition of Columbia TriStar movie studio (*The Karate*

Kid and *Ghost Busters*) and the acquisition of Merv Griffin Enterprises (*Wheel of Fortune* and *Jeopardy*).

“We’re in a creative industry and people made a lot of decisions on their own,” he says. Hence, no central IT until relatively recently and no strong belief in the importance of central IT, he says.

Buckholtz was hired from General Electric to start an enterprise architecture team because Sony Pictures wanted more efficiency and savings from IT, he says. At first, he concentrated on classifying existing and future technology investments. Categories include technologies in development where Sony is doing proofs of concept; technologies in pilot; current and supported; supported but older versions; those headed to retirement; and those that are obsolete and no longer supported except “under extreme duress,” Buckholtz says, laughing.

He began this way to demonstrate that IT could be businesslike: investing well, conscious of risk, and planning for the future.

“This is how you plan enterprise architecture when you don’t have business support yet. We had to build up to that.”

Once the architecture group has the enterprise IT house under control, it can look for ways to work with different business technology groups to build credibility beyond bits and bytes, he says. One technique Buckholtz used was to install architects in different business groups to work on projects on business turf but using IT’s budget. A free trial, in a sense.

By 2005, Buckholtz’s group had started a high-profile project with the digital media team to map out how Sony Pictures would digitize content for downloading to mobile phones and other devices. He counts it as a success that the digital media group continues to use that road map today. “We identified high-value work and we were all committed to it,” he says. “It was not a group off somewhere, passing down standards.”

As the economy tightens. Sony Pictures must make its distribution chain as efficient as possible, he adds. Movies, after all, are a discretionary expense for consumers, and if they pull back on luxuries, Sony Pictures will feel it. Enterprise architects continuously reinforce to business-side counterparts the expected returns on IT projects as the temptation to cut spending grows.

“We make sure we close the loop and quantify hard-dollar costs and benefits for the CFO,” Buckholtz says.

Source: Adapted from Diann Daniel, “The Rising Importance of the Enterprise Architect,” *CIO.com*, March 31, 2007; and Kim S. Nash, “The Case for Enterprise Architects,” *CIO.com*, December 23, 2008.

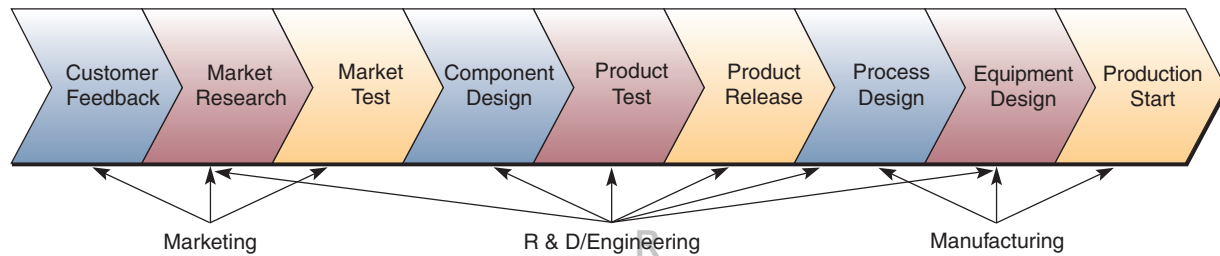
CASE STUDY QUESTIONS

1. What does the position of enterprise architect entail? What qualifications or experiences would you think a good enterprise architect should have? Support your answer with examples from the case.
2. Consider the different companies mentioned in the case and their experiences with enterprise architecture. Does this approach seem to work better in certain types of companies or industries than in others? Why or why not?
3. What is the value derived from companies with mature enterprise architectures? Can you see any disadvantages? Discuss.

REAL WORLD ACTIVITIES

1. Service-oriented architecture (SOA) is a recent approach to systems development and implementation that has much in common (and some differences, as well) with enterprise architecture. Go online and research the similarities and differences. Prepare a report to summarize your work.
2. Have you considered a career as an enterprise architect? What bundle of courses would you put together to design a major or a track in enterprise architecture? Break into small groups with your classmates to outline the major areas that should be covered.

FIGURE 7.2 The new product development process in a manufacturing company. This is an example of a business process that must be supported by cross-functional systems that cross the boundaries of several business functions.



Source: Adapted from Mohan Sawhney and Jeff Zabin, *Seven Steps to Nirvana: Strategic Insights into e-Business Transformation* (New York: McGraw-Hill, 2001), p. 175.

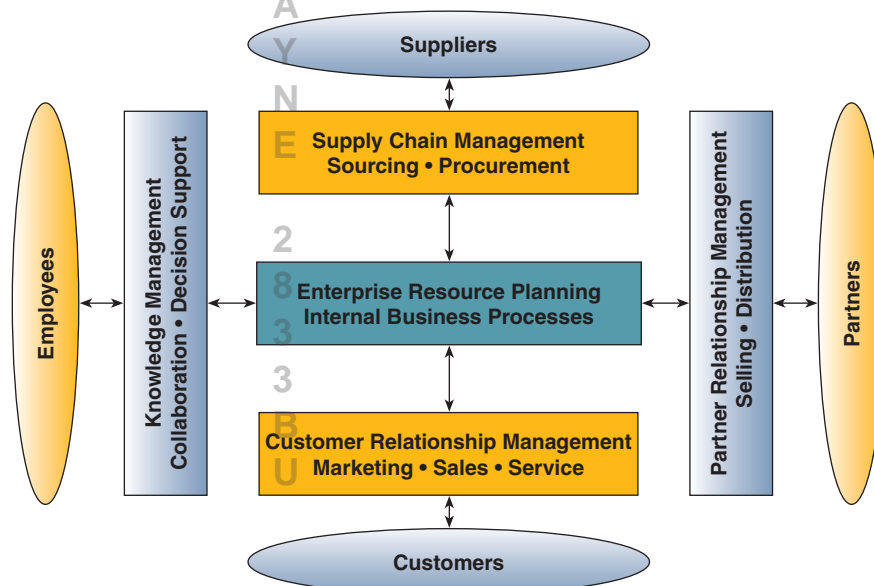
visualize the basic components, processes, and interfaces of these major e-business applications, and their interrelationships to each other. This application architecture also spotlights the roles these business systems play in supporting the customers, suppliers, partners, and employees of a business.

Notice that instead of concentrating on traditional business functions or supporting only the internal business processes of a company, enterprise applications focus on accomplishing fundamental business processes in concert with a company's customer, supplier, partner, and employee stakeholders. Thus, enterprise resource planning (ERP) concentrates on the efficiency of a firm's internal production, distribution, and financial processes. Customer relationship management (CRM) focuses on acquiring and retaining profitable customers via marketing, sales, and service processes. Partner relationship management (PRM) aims to acquire and retain partners who can enhance the sale and distribution of a firm's products and services. Supply chain management (SCM) focuses on developing the most efficient and effective sourcing and procurement processes with suppliers for the products and services that a business needs. Knowledge management (KM) applications provide a firm's employees with tools that support group collaboration and decision support.

We will discuss CRM, ERP, and SCM applications in detail in Chapter 8 and cover KM applications in Chapter 10. Now let's look at a real-world example of some of the challenges involved in rolling out global, cross-functional systems.

FIGURE 7.3

This enterprise application architecture presents an overview of the major cross-functional enterprise applications and their interrelationships.



Ogilvy & Mather and MetLife: The Interpersonal Challenges of Implementing Global Applications



Atefeh Riazi's quarter-million frequent-flier miles are testament to the fact that it's not such a small planet after all. As CIO at Ogilvy & Mather Worldwide, Riazi has spent the past years rolling out global applications, such as collaborative workflow systems, creative asset management, knowledge management, messaging, and security for the New York City-based marketing giant. Most recently, Riazi has been trying to convince the Asian, European, and Latin American offices to replace their legacy systems with North America's SAP enterprise resource planning system for finance, human resources, and production. A common enterprise system, she says, would provide Ogilvy's 400 offices in more than 100 countries with access to real-time information so they can make quick decisions, better respond to market changes, and cut costs.

The fact is that globalization adds new dynamics to the workplace, and CIOs who stick to the true-blue American business formula will fail. They must abandon the idea of force-fitting their visions into worldwide offices and move toward a global infrastructure built collaboratively by staff from around the world.

Take the company that rolls out a global system with high-bandwidth requirements. That system might not be feasible for IT directors in the Middle East or parts of Asia, where the cost of bandwidth is higher than in New York. Is the standardized system multilingual? Can it convert different currencies? Can it accommodate complex national tax laws?

For global projects, working virtually is critical, but it's also one of the biggest challenges. "You're dealing with different languages, different cultures, different time zones," says George Savarese, vice president of operations and technology services at New York City-based MetLife. His 6 p.m. Monday meeting, for instance, falls at 8 a.m. in South Korea and 9 p.m. in Brazil. Savarese adds, however, that telephone and e-mail alone won't cut it. "You really have to be there, in their space, understanding where it's at," he says, adding that he spends about half of each month abroad.

"Globalization challenges your people skills every day," says Ogilvy's Riazi. For example, workers in the United Kingdom often rely heavily on qualitative research; they take their time in making decisions, as opposed to Americans, who tend to be action-oriented. So, in a recent attempt to get offices in the United States and the United Kingdom to collaborate on a common system rollout, Riazi hit a wall of resistance because she didn't spend enough time going over analytical arguments with the people in the U.K. office.

Having international teams run global projects goes a long way toward mending fences. Ogilvy, for instance, manages a financial reporting project out of Ireland. "The IT director there has a European point of view, so we're not going to be blindsided by something that isn't a workable solution," she says.

"We have let control go," she says of Ogilvy's New York headquarters. "A lot of global companies cannot let go of that control. They're holding so tight. It's destructive."

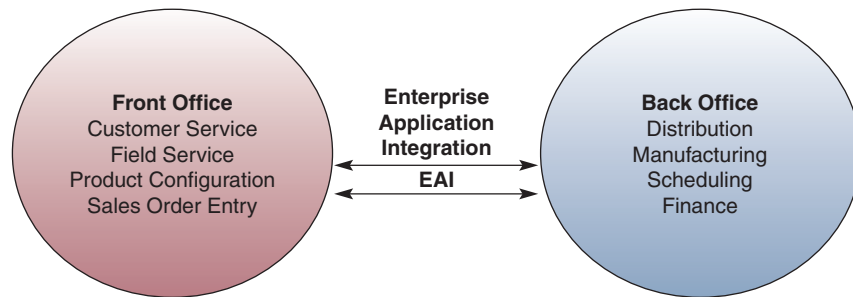
Source: Adapted from Melissa Solomon, "Collaboratively Building a Global Infrastructure," *CIO Magazine*, June 1, 2003.

Enterprise Application Integration

How does a business interconnect some of the cross-functional enterprise systems? **Enterprise application integration** (EAI) software is being used by many companies to connect their major e-business applications. See Figure 7.4. EAI software enables users to model the business processes involved in the interactions that should occur between business applications. EAI also provides *middleware* that performs data conversion and coordination, application communication and messaging services, and access to the application interfaces involved. Recall from Chapter 6 that middleware is any software that serves to glue together or mediate between two separate pieces of

FIGURE 7.4

Enterprise application integration software interconnects front-office and back-office applications.

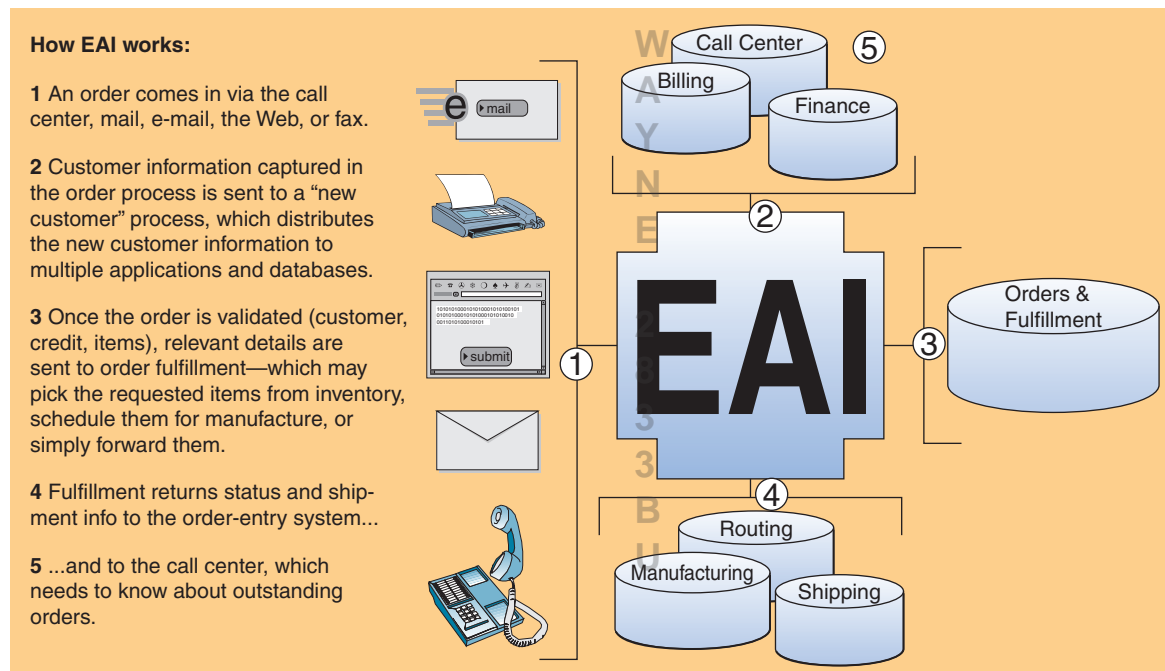


software. Thus, EAI software can integrate a variety of enterprise application clusters by letting them exchange data according to rules derived from the business process models developed by users. For example, a typical rule might be:

When an order is complete, have the order application tell the accounting system to send a bill and alert shipping to send out the product.

Thus, as Figure 7.4 illustrates, EAI software can integrate the front-office and back-office applications of a business so they work together in a seamless, integrated way. This is a vital capability that provides real business value to a business enterprise that must respond quickly and effectively to business events and customer demands. For example, the integration of enterprise application clusters has been shown to dramatically improve customer call center responsiveness and effectiveness. That's because EAI integrates access to all of the customer and product data that customer representatives need to quickly serve customers. EAI also streamlines sales order processing so products and services can be delivered faster. Thus, EAI improves customer and supplier experience with the business because of its responsiveness. See Figure 7.5.

FIGURE 7.5 An example of a new customer order process showing how EAI middleware connects several business information systems within a company.



Coty, Unilever, and iWay: Dealing with Integration Challenges



It's one thing to integrate data across applications in an IT infrastructure. The methods and practices are tried and true. But implementing data integration across a service-oriented architecture poses new challenges.

Coty, the fragrance and personal-care products company, found that the iWay approach was just what it needed to integrate Unilever's cosmetics business, which it acquired in late 2005, in just six months.

Failure to meet that goal would delay the benefits to customers of dealing with one company and product line, and would force Coty to maintain two sales forces, supply chains, and software infrastructures.

Soon after the acquisition, CIO David Berry heard complaints from big customers such as Federated Department Stores that its buyers had to talk to two sales reps after the acquisition or deal with three systems to push one order through.

Orders of Unilever's Chloe or Calvin Klein fragrances had to be sent through a JD Edwards system in Lille, France. Coty's hot-selling Celine Dion or Jennifer Lopez fragrances had to be ordered through its homegrown warehouse management system in Kassel, Germany. Orders for other products went through Oracle Cash-to-Order systems in Coty's North Carolina distribution center.

But connecting JD Edwards to Oracle applications or Oracle apps to SAP is what iWay connectors and adapters do. Berry realized he needed to identify the processes that led to the customer getting, for example, two invoices from Coty, and force them into a single process.

They got iWay's Service Manager to understand the differences between Coty's order entry systems and perform the data transformations between them once a business analyst drew process flow lines on Service Manager's graphical map of the JD Edwards and SAP systems. The Coty order entry system worked in tandem with the Unilever order entry system until their results could be combined to yield one invoice.

The implementation had its share of rough spots. Coty discovered at one point that a day's orders, sent into the iWay system, never emerged at the distribution center. The orders had been improperly formatted so they couldn't be translated into the right destination format, but iWay neglected to inform anyone of the hang-up.

"It was like looking for a needle in a haystack. We needed to improve the visibility into the system," says Gary Gallant, vice president of information management for the Americas at Coty. He found a way to get the system to send a message to administrators when orders were hung up in a "retry" queue.

Berry used this approach to identify customer-facing services, isolate them, and use iWay to translate between them. The result was what appeared to customers to be a fully integrated Unilever/Coty by the six-month deadline.

Source: Adapted from Charles Babcock, "Two Ways to Deal with SOAs Data Integration Challenge," *InformationWeek*, July 9, 2007.

Transaction Processing Systems

Transaction processing systems (TPS) are cross-functional information systems that process data resulting from the occurrence of business transactions. We introduced transaction processing systems in Chapter 1 as one of the major application categories of information systems in business.

Transactions are events that occur as part of doing business, such as sales, purchases, deposits, withdrawals, refunds, and payments. Think, for example, of the data generated whenever a business sells something to a customer on credit, whether in a retail store or at an e-commerce site on the Web. Data about the customer, product, salesperson, store, and so on, must be captured and processed. This need prompts additional transactions, such as credit checks, customer billing, inventory changes, and increases in accounts receivable balances, which generate even more data. Thus, transaction

processing activities are needed to capture and process such data, or the operations of a business would grind to a halt. Therefore, transaction processing systems play a vital role in supporting the operations of most companies today.

Online transaction processing systems play a strategic role in Web-enabled businesses. Many firms are using the Internet and other networks that tie them electronically to their customers or suppliers for online transaction processing (OLTP). Such *real-time* systems, which capture and process transactions immediately, can help firms provide superior service to customers and other trading partners. This capability adds value to their products and services, and thus gives them an important way to differentiate themselves from their competitors.

Syntellect's Online Transaction Processing

For example, Figure 7.6 illustrates an online transaction processing system for cable pay-per-view systems developed by Syntellect Interactive Services. Cable TV viewers can select pay-per-view events offered by their cable companies using the phone or the World Wide Web. The pay-per-view order is captured by Syntellect's interactive voice response system or Web server, then transported to Syntellect database application servers. There the order is processed, customer and sales databases are updated, and the approved order is relayed back to the cable company's video server, which transmits the video of the pay-per-view event to the customer. Thus, Syntellect teams with more than 700 cable companies to offer a very popular and very profitable service.

FIGURE 7.6 The Syntellect pay-per-view online transaction processing system.

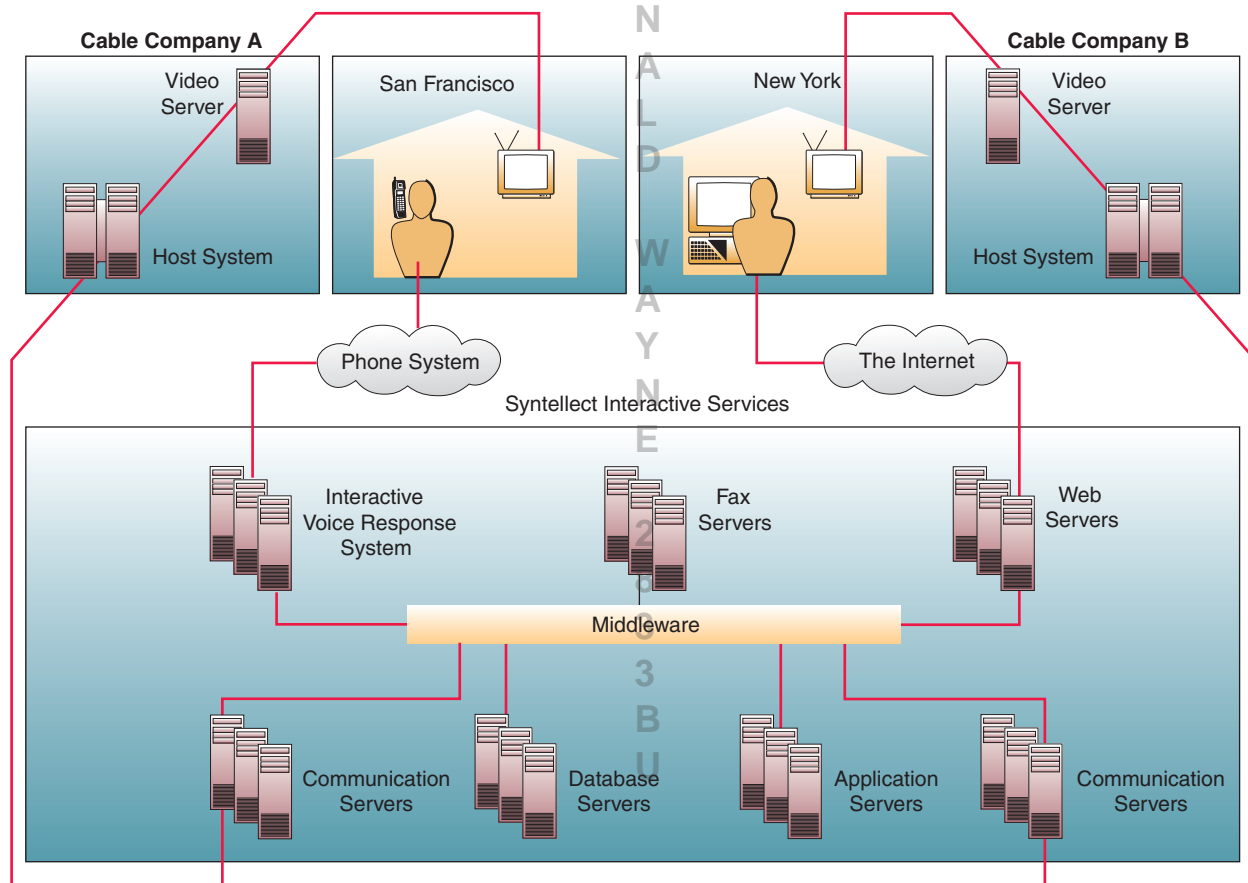
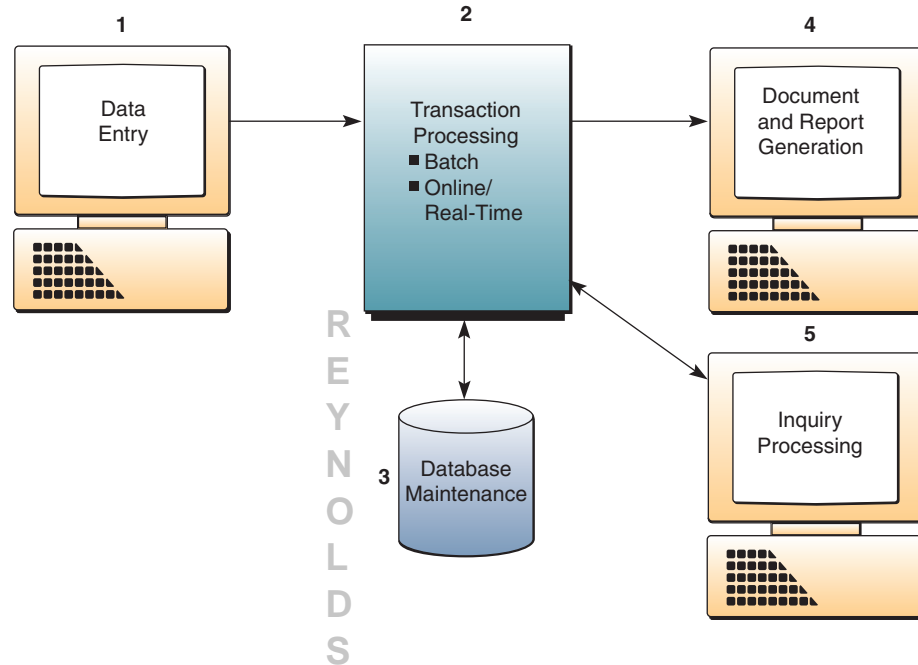


FIGURE 7.7

The transaction processing cycle. Note that transaction processing systems use a five-stage cycle of data entry, transaction processing, database maintenance, document and report generation, and inquiry processing activities



The Transaction Processing Cycle

Transaction processing systems, such as Syntellect's, capture and process data describing business transactions, update organizational databases, and produce a variety of information products. You should understand this as a **transaction processing cycle** of several basic activities, as illustrated in Figure 7.7.

- **Data Entry.** The first step of the transaction processing cycle is the capture of business data. For example, transaction data may be collected by point-of-sale terminals using optical scanning of bar codes and credit card readers at a retail store or other business. Transaction data can also be captured at an e-commerce Web site on the Internet. The proper recording and editing of data so they are quickly and correctly captured for processing is one of the major design challenges of information systems discussed in Chapter 12.
- **Transaction Processing.** Transaction processing systems process data in two basic ways: (1) **batch processing**, where transaction data are accumulated over a period of time and processed periodically, and (2) **real-time processing** (also called online processing), where data are processed immediately after a transaction occurs. All online transaction processing systems incorporate real-time processing capabilities. Many online systems also depend on the capabilities of *fault tolerant* computer systems that can continue to operate even if parts of the system fail. We will discuss this fault tolerant concept in Chapter 13.
- **Database Maintenance.** An organization's databases must be updated by its transaction processing systems so that they are always correct and up-to-date. Therefore, transaction processing systems serve to assist in maintaining the corporate databases of an organization to reflect changes resulting from day-to-day business transactions. For example, credit sales made to customers will cause customer account balances to be increased and the amount of inventory on hand to be decreased. Database maintenance ensures that these and other changes are reflected in the data records stored in the company's databases.
- **Document and Report Generation.** Transaction processing systems produce a variety of documents and reports. Examples of transaction documents include purchase orders, paychecks, sales receipts, invoices, and customer statements. Transaction reports might take the form of a transaction listing such as a payroll register, or edit reports that describe errors detected during processing.

Enterprise Collaboration Systems

- **Inquiry Processing.** Many transaction processing systems allow you to use the Internet, intranets, extranets, and Web browsers or database management query languages to make inquiries and receive responses concerning the results of transaction processing activity. Typically, responses are displayed in a variety of pre-specified formats or screens. For example, you might check on the status of a sales order, the balance in an account, or the amount of stock in inventory and receive immediate responses at your PC.

Really difficult business problems always have many aspects. Often a major decision depends on an impromptu search for one or two key pieces of auxiliary information and a quick ad hoc analysis of several possible scenarios. You need software tools that easily combine and recombine data from many sources. You need Internet access for all kinds of research. Widely scattered people need to be able to collaborate and work the data in different ways.

Enterprise collaboration systems (ECS) are cross-functional information systems that enhance communication, coordination, and collaboration among the members of business teams and workgroups. Information technology, especially Internet technologies, provides tools to help us collaborate—to communicate ideas, share resources, and coordinate our cooperative work efforts as members of the many formal and informal process and project teams and workgroups that make up many of today's organizations. Thus, the goal of **enterprise collaboration systems** is to enable us to work together more easily and effectively by helping us to:

- **Communicate:** Share information with each other.
- **Coordinate:** Organize our individual work efforts and use of resources.
- **Collaborate:** Work together cooperatively on joint projects and assignments.

For example, engineers, business specialists, and external consultants may form a virtual team for a project. The team may rely on intranets and extranets to collaborate via e-mail, videoconferencing, discussion forums, and a multimedia database of work-in-progress information at a project Web site. The enterprise collaboration system may use PC workstations networked to a variety of servers on which project, corporate, and other databases are stored. In addition, network servers may provide a variety of software resources, such as Web browsers, groupware, and application packages, to assist the team's collaboration until the project is completed.

Tools for Enterprise Collaboration

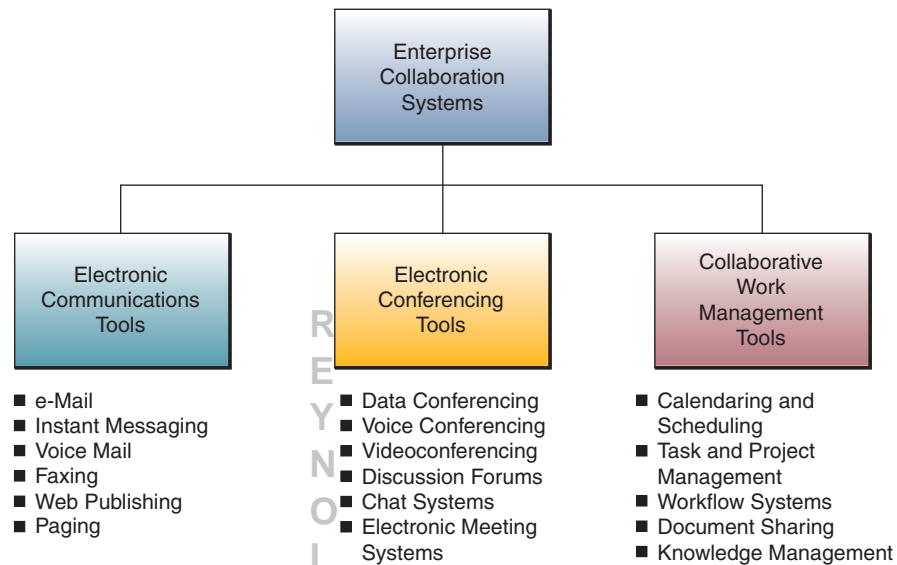
The capabilities and potential of the Internet, as well as intranets and extranets, are driving the demand for better enterprise collaboration tools in business. However, Internet technologies like Web browsers and servers, hypermedia documents and databases, and intranets and extranets provide the hardware, software, data, and network platforms for many of the groupware tools for enterprise collaboration that business users want. Figure 7.8 provides an overview of some of the software tools for electronic communication, electronic conferencing, and collaborative work management.

Electronic communication tools include e-mail, voice mail, faxing, Web publishing, bulletin board systems, paging, and Internet phone systems. These tools enable you to send electronically messages, documents, and files in data, text, voice, or multimedia over computer networks. This helps you share everything from voice and text messages to copies of project documents and data files with your team members, wherever they may be. The ease and efficiency of such communications are major contributors to the collaboration process.

Electronic conferencing tools help people communicate and collaborate as they work together. A variety of conferencing methods enable the members of teams and workgroups at different locations to exchange ideas interactively at the same time, or at different times at their convenience. These include data and voice conferencing,

FIGURE 7.8

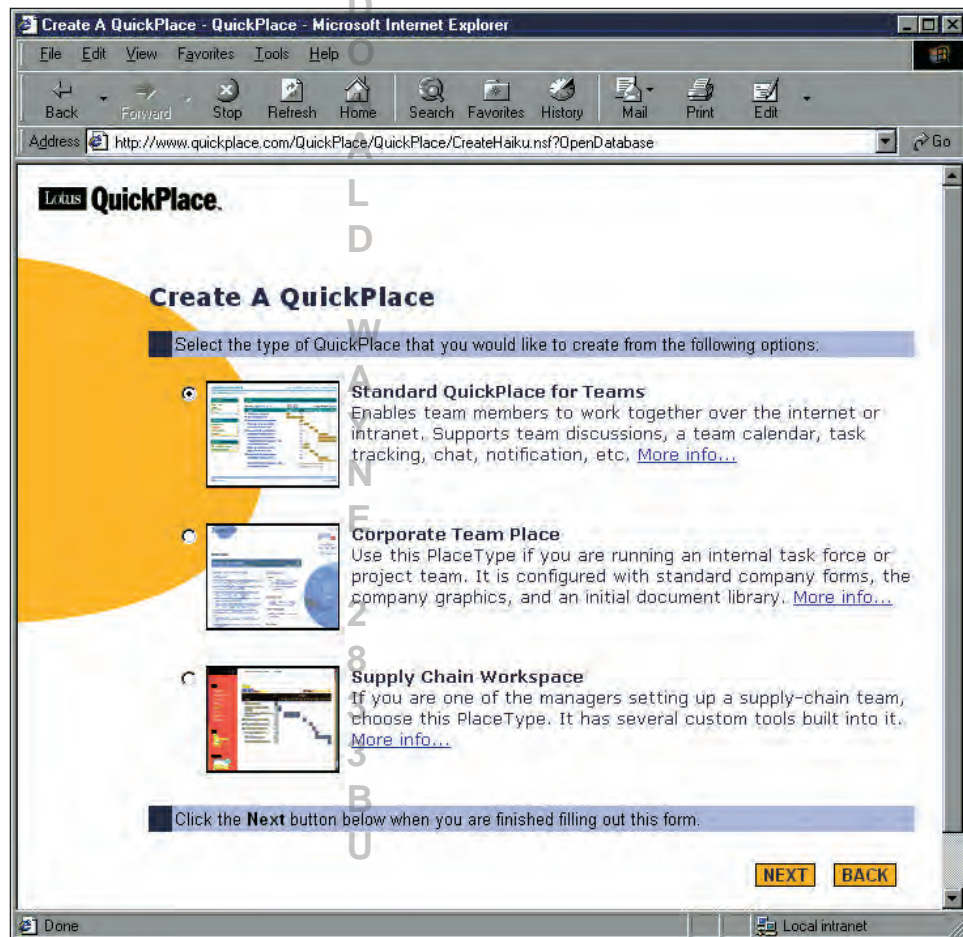
Electronic communications, conferencing, and collaborative work software tools enhance enterprise collaboration.



videoconferencing, chat systems, and discussion forums. Electronic conferencing options also include *electronic meeting systems* and other *group support systems* where team members can meet at the same time and place in a *decision room* setting, or use the Internet to work collaboratively anywhere in the world. See Figure 7.9.

FIGURE 7.9

QuickPlace by Lotus Development helps virtual workgroups set up Web-based work spaces for collaborative work assignments.



Source: Courtesy of International Business Machines Corporation.

Collaborative work management tools help people accomplish or manage group work activities. This category of software includes calendaring and scheduling tools, task and project management, workflow systems, and knowledge management tools. Other tools for joint work, such as joint document creation, editing, and revision, are found in the software suites discussed in Chapter 4.

Exploring Virtual Worlds as Collaboration Tools



For emergency responders working along Interstate 95, accidents aren't a game; they're a way of life (and death). So it seemed odd to a group of firefighters, cops, and medics when researchers from the University of Maryland suggested that they use a virtual world to collaborate on training for rollovers, multicar pileups, and life-threatening injuries.

The phrase *virtual world* is often associated with Second Life, the much-hyped 3-D environment hosted by Linden Lab that allows users to talk to friends, sell T-shirts, fly around on carpets, and even build amusement parks—in other words, to play. “It wasn’t until we started to do elaborate demos that the first responders started to realize the true potential,” says Michael Pack, director of research with the University of Maryland’s Center for Advanced Transportation Technology, who has since begun rolling out a virtual world pilot project that could accommodate training for hundreds of emergency workers.

Industry analysts and developers of virtual worlds believe that by immersing users in an interactive environment that allows for social interactions, virtual worlds have the potential to succeed where other collaborative technologies, like teleconferencing, have failed. Phone-based meetings begin and end abruptly, at the mercy of the person or service administering it. In a virtual world, conversations between employees can continue within the virtual space—just as they do in company hallways after a meeting ends.

However, businesses must overcome many technical and cultural obstacles before they adopt virtual worlds on a major scale. Perhaps even more important than the technical challenges, companies must tackle the issue of workers’ online identities. People’s 3-D representations, known as avatars, must be constructed in such a way that allows users of virtual worlds to have faith that they’re talking to the right colleague. Security challenges abound; most companies using virtual worlds today do so on a public or externally hosted platform with limited options to protect corporate data.

Pack says training in a virtual world presents a desirable alternative to real-life exercises, which can be pricey and inefficient. “You’d go out in a field and flip a car over and have people act as victims,” he says. Trainers couldn’t introduce many variables (such as mounting traffic). “It’s supposed to be as human as possible, so anything goes,” he says. “We’ve put together lots of scenarios, from fender benders to 20-car pileups. We put [the participants] in dangerous situations to see how they will respond.” In virtual worlds, Pack and his team can program multiple scenarios into the software. For example, if a first responder gets out of his car and fails to put on a reflective jacket, the system might respond with a car hitting that person’s avatar.

“You want people to be so comfortable in the virtual world that they’re not concentrating on how to use them,” Pack says. “They can’t be worried about how to turn left or talk to someone. They need to be worried about how to do their jobs, just like they would in the real world.”

Source: Adapted from C. G. Lynch, “Companies Explore Virtual Worlds as Collaboration Tools,” *CIO Magazine*, February 6, 2008.

SECTION II

Functional Business Systems

Introduction

Business managers are moving from a tradition where they could avoid, delegate, or ignore decisions about IT to one where they cannot create a marketing, product, international, organization, or financial plan that does not involve such decisions.

There are as many ways to use information technology in business as there are business activities to be performed, business problems to be solved, and business opportunities to be pursued. As a business professional, you should have a basic understanding and appreciation of the major ways information systems are used to support each of the functions of business that must be accomplished in any company that wants to succeed. Thus, in this section, we will discuss **functional business systems**, that is, a variety of types of information systems (transaction processing, management information, decision support, and so on) that support the business functions of accounting, finance, marketing, operations management, and human resource management.

Read the Real World Case on the next page. We can learn a lot about the many IT issues involved in unified financial reporting from this case. See Figure 7.10.

IT in Business

As a business professional, it is also important that you have a specific understanding of how information systems affect a particular business function (e.g., marketing) or a particular industry (e.g., banking) that is directly related to your career objectives. For example, someone whose career objective is a marketing position in banking should have a basic understanding of how information systems are used in banking and how they support the marketing activities of banks and other firms.

Figure 7.11 illustrates how information systems can be grouped into business function categories. Thus, information systems in this section will be analyzed according to the business function they support by looking at a few key examples in each functional area. This should give you an appreciation of the variety of functional business systems that both small and large business firms may use.

Marketing Systems

The business function of marketing is concerned with the planning, promotion, and sale of existing products in existing markets, and the development of new products and new markets to better attract and serve present and potential customers. Thus, marketing performs an essential function in the operation of a business enterprise. Business firms have increasingly turned to information technology to help them perform vital marketing functions in the face of the rapid changes of today's environment.

Figure 7.12 illustrates how **marketing information systems** provide information technologies that support major components of the marketing function. For example, Internet/intranet Web sites and services make an *interactive marketing* process possible where customers can become partners in creating, marketing, purchasing, and improving products and services. *Sales force automation* systems use mobile computing and Internet technologies to automate many information processing activities for sales support and management. Other marketing information systems assist marketing managers in product planning, pricing, and other product management decisions; advertising, sales promotion, and targeted marketing strategies; and market research and forecasting. Finally, enterprisewide systems like customer relationship management (discussed in Chapter 8) link to the portfolio of marketing information systems to provide and obtain data essential to the marketing function. Let's take a closer look at three of these marketing applications.

Interactive Marketing

The term **interactive marketing** has been coined to describe a customer-focused marketing process that is based on using the Internet, intranets, and extranets to establish two-way transactions between a business and its customers or potential customers.

REAL WORLD

CASE

2

Nationwide Insurance: Unified Financial Reporting and “One Version of the Truth”

In a span of three short years, between 2000 and 2002, Nationwide Insurance got a new CEO, CIO, and CFO.

Jerry Jurgensen, elected by Nationwide's board in 2000 to replace the retiring CEO, was hired for his financial acumen and his ability to transform a business's culture. Michael Keller was named the company's first enterprisewide CIO the following year. He had 25 years of IT experience managing big infrastructure and systems integration projects. In 2002, Robert Rosholt replaced the retiring CFO and joined the others in Nationwide's Columbus, Ohio headquarters, bringing along deep experience in all things financial.

The three were old buddies who had worked together at financial giant Bank One. Now they held the reins at Nationwide and their goal was to take its dozens of business units, selling a diverse set of insurance and financial products, to a higher level.

But to get there, Jurgensen needed financial snapshots of how Nationwide was doing at any given moment. And getting them wasn't so easy; in fact, it was almost impossible.

FIGURE 7.10



Companies are deploying technology and reengineering processes in search of “one source of the truth” across the enterprise.

Source: © Ryan McVay/Getty Images.

“When you're dealing with 14 general ledger platforms and over 50 applications,” Rosholt says, “it was enormous work to get the financials out.”

The problem lay knotted in a tangle of systems and applications, and some 240 sources of financial data flowing in and around Nationwide's business units. The units had always run independently, and that's how financial reporting was handled. “There was a variety of [financial reporting] languages,” Rosholt says, which affected Nationwide's ability to forecast, budget, and report. “It was difficult,” says Rosholt, “to ask ‘How are we doing?’” Keller's situation was no better.

“One of the first questions I was asked when I joined was, How much money do we spend, total, on IT?” Keller recalls. “The answer was, we didn't know. It took weeks to put that answer together.”

Jurgensen wanted to be able to run Nationwide as if it were one unified enterprise. He wanted, in Rosholt's words, “to do things that are common, and respect the things that are different. And that was a big change.”

Indeed, the transformation the company embarked upon in early 2004 was daunting—a master data management makeover that would alter how every Nationwide business reported its financials, how accounting personnel did their jobs, how data were governed and by whom, and how the company's information systems would pull all that together. The goal was simple: one platform; one version of the financial truth. Simple goal, but a difficult challenge.

Good master data governance can happen only when the various constituencies that own the data sources agree on a common set of definitions, rules, and synchronized procedures, all of which requires a degree of political maneuvering that's not for the faint of heart.

Nationwide began its finance transformation program, called Focus, with its eyes wide open. The executive troika of Jurgensen, Rosholt, and Keller had pulled off a similar project at Bank One and thought it knew how to avoid the big mistakes. That, in part, is why Rosholt, who had ultimate say on the project, would not budge on its 24-month time line. “The most important aspect was sticking to discipline and not wavering,” he recalls. And that's why the technology piece was, from the outset, the last question to be addressed.

“It wasn't a technology project,” insists Lynda Butler, whose position as vice president of performance management was created to oversee Focus (which stands for Faster, Online, Customer-driven, User-friendly, Streamlined). She says that Nationwide approached Focus first and foremost as a business and financial project.

Nationwide considers the project, which made its deadline, a success, although everyone emphasizes that there's more work to be done. Says Keller, “There's a foundation to build on where there wasn't one before.”

“Fourteen general ledgers, 12 reporting tools, 17 financial data repositories and 300,000 spreadsheets were used in

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finance,” says Butler. “That’s not real conducive to ‘one version of the truth.’”

Early in his tenure as CEO, Jurgensen’s concerns about the company’s financials weren’t limited to the timeliness of the data; he was also worried about its integrity and accuracy.

For example, because Nationwide had such a variety of businesses, the company carried a lot of risk—some easily visible, some not. “So, if equity markets went down, we were exposed,” notes Butler. “But we didn’t realize that until the markets actually went down. We needed some enterprise view of the world.”

Executives also knew that common data definitions among all the business units would provide comparable financial data for analysis—which was difficult, if not impossible, without those definitions. “We needed consistent data across the organization,” Rosholt says.

“We were looking for one book of record.” CFO Rosholt went back to his Bank One roots and recruited Vikas Gopal, who had proven his mettle on similar projects, to lead the IT team.

With no wiggle room on the time line, the team, with Rosholt’s encouragement, followed what it refers to as the “80/20” rule. It knew that it wasn’t going to get 100 percent of the desired functionality of the new system, so the team decided that if it could get roughly 80 percent of the project up and running in 24 months, it could fix the remaining 20 percent later. “If we went after perfection,” says Rosholt, “we’d still be at it.”

Keeping in mind that no one would get everything he wanted, the Focus team interviewed key stakeholders in Nationwide’s business units to understand where their pain points were. “We went back to basics,” says Gopal. “We said, ‘Let’s talk about your financial systems, how they help your decision making.’”

In other words, people were introduced to the concept of making trade-offs, which allowed the Focus team to target the system’s core functionalities and keep control over the project’s scope.

It was only after the requirements, definitions, and parameters were mapped out that Gopal’s group began to look at technologies. Gopal had two rules to guide them: First, all financial-related systems had to be subscribers to the central book of record. Second, none of the master data in any of

the financial applications could ever be out of sync. So the Focus team’s final step was to evaluate technologies that would follow and enforce those rules.

His team sought out best-of-breed toolsets from vendors such as Kalido and Teradata that would be able to tie into their existing systems. Gopal wasn’t overly “worried about [technology] execution” because he had assembled this type of system before and knew that the technology solutions on the market, even in the most vanilla forms, were robust enough for Nationwide’s needs.

What did worry him was Nationwide’s legion of financial employees who didn’t relish the idea of changing the way they went about their work. At the beginning of the program, Nationwide formed a “One Finance Family” program that tried to unify all the finance folks around Focus. Executives were also able to identify those employees who were most affected through weekly “change meetings” and provide support.

The Focus team had to remain resolute. The overarching theme, that there would be no compromise in data quality and integrity, was repeated early and often, and executives made sure that the gravity of the change was communicated before anyone saw any new software.

Finally, in March 2005, with three waves of planned deployments ahead of it, the team started rolling out the new Focus system. By fall 2005, there was light at the end of the tunnel. The team could see the new business processes and financial data governance mechanisms actually being used by Nationwide employees, and it all was working. “They saw the value they were creating,” recalls Butler. “The ‘aha’ moment came when we finally got a chance to look in the rear-view mirror.”

The first benefit of the transformation that Rosholt mentions is something that didn’t happen. “You go through a project such as this, in a period of extreme regulatory and accounting oversight, and these things can cough up more issues, such as earnings restatements. We’ve avoided that,” he says. “That doesn’t mean we’re perfect, but that’s one thing everyone’s amazed at. We went through all this change and nothing coughed up. Our balance sheet was right.”

Source: Adapted from Thomas Wailgum, “How Master Data Management Unified Financial Reporting at Nationwide Insurance,” *CIO.com*, December 21, 2007.

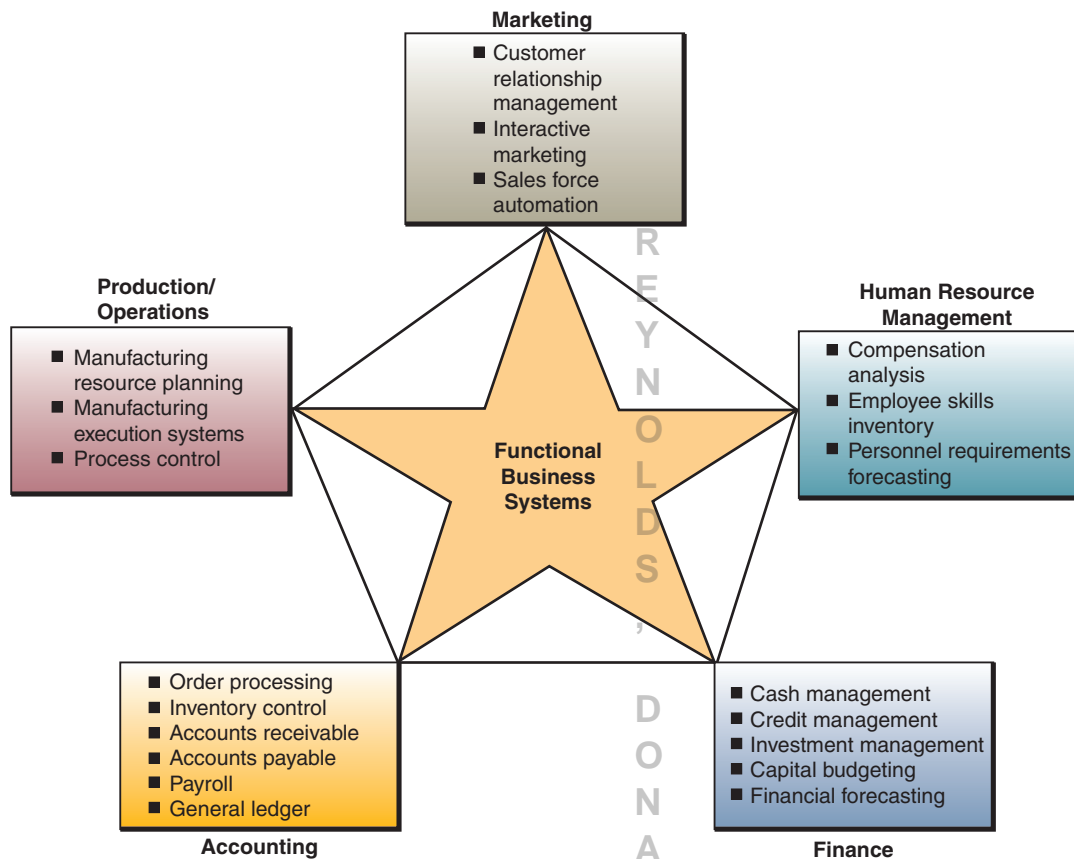
CASE STUDY QUESTIONS

1. The project that Nationwide undertook was quite clearly a success. What made this possible? Discuss three different practices that helped Nationwide pull this off. Use examples from the case where necessary.
2. The case notes that Nationwide had in mind a simple goal, but faced a difficult challenge. Why was this so difficult?
3. What is the business value derived from the successful completion of this project? What can executives at Nationwide do now that could not before? Provide some examples.

REAL WORLD ACTIVITIES

1. Technologies and systems involved in financial reporting have received a great deal of attention in the last few years due to renewed regulatory focus on the integrity and reliability of financial information. Go online and research how companies are deploying technology to deal with these issues. Prepare a report to summarize your findings.
2. A number of political and cultural issues were involved in the implementation of the “one source of the truth” approach at Nationwide. Can these obstacles be overcome simply by mandating compliance from top management? What else should companies do to help ease these transitions? Break into small groups with your classmates and brainstorm some possible actions.

FIGURE 7.11 Examples of functional business information systems. Note how they support the major functional areas of business.



The goal of interactive marketing is to enable a company to use those networks profitably to attract and keep customers who will become partners with the business in creating, purchasing, and improving products and services.

In interactive marketing, customers are not just passive participants who receive media advertising prior to purchase; they are actively engaged in network-enabled proactive and interactive processes. Interactive marketing encourages customers to become involved in product development, delivery, and service issues. This is enabled by various Internet technologies, including chat and discussion groups, Web forms and questionnaires, instant messaging, and e-mail correspondence. Finally, the expected

FIGURE 7.12 Marketing information systems provide information technologies to support major components of the marketing function.

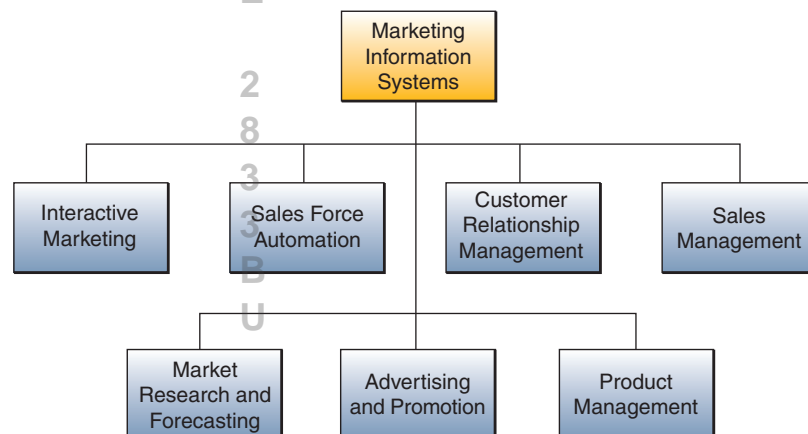
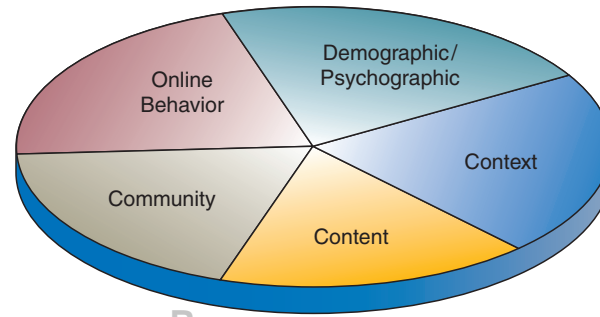


FIGURE 7.13

The five major components of targeted marketing for electronic commerce.



outcomes of interactive marketing are a rich mixture of vital marketing data, new product ideas, volume sales, and strong customer relationships.

Targeted Marketing

Targeted marketing has become an important tool in developing advertising and promotion strategies to strengthen a company's e-commerce initiatives, as well as its traditional business venues. As illustrated in Figure 7.13, targeted marketing is an advertising and promotion management concept that includes five targeting components:

- **Community.** Companies can customize their Web advertising messages and promotion methods to appeal to people in specific communities. They can be *communities of interest*, such as *virtual communities* of online sporting enthusiasts, or arts and crafts hobbyists, or geographic communities formed by the Web sites of a city or other local organization.
- **Content.** Advertising, such as electronic billboards or banners, can be placed on a variety of selected Web sites, in addition to a company's Web site. The content of these messages is aimed at the targeted audience. An ad for a product campaign on the opening page of an Internet search engine is a typical example.
- **Context.** Advertising appears only in Web pages that are relevant to the content of a product or service. So, advertising is targeted only at people who are already looking for information about a subject matter (e.g., vacation travel) that is related to a company's products (e.g., car rental services).
- **Demographic/Psychographic.** Web marketing efforts can be aimed only at specific types or classes of people: for example, unmarried, twenty-something, middle income, male college graduates.
- **Online Behavior.** Advertising and promotion efforts can be tailored to each visit to a site by an individual. This strategy is based on a variety of tracking techniques, such as Web "cookie" files recorded on the visitor's disk drive from previous visits. This enables a company to track a person's online behavior at its Web site so marketing efforts (such as coupons redeemable at retail stores or e-commerce Web sites) can be targeted to that individual at each visit to its Web site.

An interesting and effective marriage between e-business and target marketing is the emergence of the digital billboard. It is estimated that about 450,000 billboard faces exist in the United States. While only a tiny fraction of them are digital, the new billboards are making a huge impact on markets all over the country.

The concept behind the digital billboard is elegantly simple. A billboard is constructed using hundreds of thousands of small LEDs, which are controlled via a computer interface that can be accessed via the Web. Advertisers can change their messages quickly, including multiple times in one day. For example, a restaurant can feature breakfast specials in the morning and dinner specials in the evening. A realtor can feature individual houses for sale and change the creative content when the house sells. Print and broadcast news media alike use digital billboards to deliver headlines, weather updates, and programming information. WCPO-TV credits its meteoric rise in the ratings to the use of digital billboards to deliver breaking news and updates to the nightly newscast.

The television station went from the bottom of the ratings in 2002 to the third largest ABC affiliate in the nation. When the I-35 bridge collapsed in Minneapolis in 2007, a dangerous situation for unsuspecting drivers existed. Within minutes, a digital billboard network in the area switched from showing advertising copy to informing drivers about the collapse. Later that evening, the digital billboards advised motorists to take alternate routes. Target marketing is in the digital arena, with a new way of doing something old.

Sales Force Automation

Increasingly, computers and the Internet are providing the basis for **sales force automation**. In many companies, the sales force is being outfitted with notebook computers, Web browsers, and sales contact management software that connect them to marketing Web sites on the Internet, extranets, and their company intranets. This not only increases the personal productivity of salespeople, but it dramatically speeds up the capture and analysis of sales data from the field to marketing managers at company headquarters. In return, it allows marketing and sales management to improve the delivery of information and the support they provide to their salespeople. Therefore, many companies are viewing sales force automation as a way to gain a strategic advantage in sales productivity and marketing responsiveness. See Figure 7.14.

For example, salespeople use their PCs to record sales data as they make their calls on customers and prospects during the day. Then each night, sales reps in the field can connect their computers by modem and telephone links to the Internet and extranets, which can access intranet or other network servers at their company. Then, they can upload information on sales orders, sales calls, and other sales statistics, as well as send e-mail messages and access Web site sales support information. In return, the network servers may download product availability data, prospect lists of information on good sales prospects, and e-mail messages.

FIGURE 7.14

This Web-based sales force automation package supports sales lead management of qualified prospects, and management of current customer accounts.

The screenshot displays the Salesforce.com web interface. The navigation bar includes tabs for Home, Leads, Accounts, Contacts, Opportunities, Forecasts, Cases, Solutions, Reports, and Campaigns. The main content area is titled "Terry Powers at Harper Media" and includes a "Site Search" box, a "Recent Items" list, and a "Messages and Alerts" section. On the right, there is a "Calendar" for February 2002 and a "Tasks" table.

Complete	Date	Subject	Contact/Lead	Related To
X	1/11/02	Call about Demo	Jim Brandelsky	
X	1/12/02	Call	Neil Young	Crazy Horse
X	1/12/02	Email	Sandy Sullivan	Trimble Ridge
X	1/12/02	Call		Times Mirror
X	1/12/02	Call		Boise Cascade Corporation
X	1/12/02	Email	Cheryl Causey	Burger King
X	1/12/02	Send Quote		3-page Summer Spread
X	1/15/02	Call	Wendy Phelps	Lucky Streak Inc.
X	1/15/02	Call to close deal		1/4 Page Ad - Summer
X	1/15/02	Send Letter	Edgar Donehower	
X	1/15/02	Call	Jerry Garcia	
X	1/16/02	Call	Gary Fox	
X	1/16/02	Call	Harry Guglielmi	
X	1/16/02	Call about lift deal	Micheal Gross	
X	1/17/02	Email	Darren Campbell	

Source: Courtesy of Salesforce.com.

Wireless Sales Force Automation Drives Sales for adidas America

Located in Portland, Oregon, with more than 1,000 employees, adidas America produces athletic footwear, apparel, accessories and equipment products. With roots reaching back to 1949, adidas America is part of a larger organization that strives to be the global leader in the sporting goods industry. Adidas products are available in virtually every country.

A leader in its industry, adidas America recognized that it could increase its sales potential by automating many components of the sales process. Its team of 200 sales representatives had been using BlackBerry handheld devices for email. Before implementing its wireless sales force automation solution, the company's sales representatives were required to borrow a customer's phone or use their personal mobile phones to check warehouse inventory. The company realized that this slowed sales momentum.

"We wanted to strike while the iron is hot, while the enthusiasm is there for the product," says Tim Oligmueller, sales force automation manager for adidas America. "Real-time wireless access is important because we want the customer to see that we have immediate access to data to meet their needs." Lacking wireless capability, some sales representatives would prepare for a meeting with a customer by checking inventory before they left the office. However, if an item wasn't available when the sales representative returned to the office, the rep would have to contact the customer to change the order.

At the foundation of adidas America's wireless solution is Atlas2Go, an internally developed sales force automation application. The custom wireless application runs on the sales representatives' BlackBerry devices and performs real-time inventory queries into the company's SAP application data over AT&T's wireless network. Sales reps can view up-to-date inventory information, and can choose to receive an email with inventory status, which they can then forward to their customer.

The wireless sales force automation solution has provided adidas America with valuable benefits. Sales representatives can more quickly and easily check inventory from the field while providing improved customer service.

Back-office staff work more efficiently with fewer interruptions from sales representatives. Oligmueller notes that the adidas inventory system receives nearly 120 wireless queries each day, saving time otherwise spent by phone calls between sales and back-office staff.

The application was pushed out over the air to the sales representatives' BlackBerry devices during a regularly scheduled sales meeting. Training was done on the spot at the same meeting. Oligmueller estimates that the company spent less than \$10,000 to develop the software application. "It was so inexpensive to do that just one order paid for it," said Oligmueller. "Our return on investment is going to grow and grow."

Source: Adapted from "Sales Force Automation Case Study—Wireless Sales Force Automation Drives Sales for adidas America," *AT&T Wireless Case Study*, June 30, 2008.

Manufacturing Systems

Manufacturing information systems support the *production/operations* function that includes all activities concerned with the planning and control of the processes producing goods or services. Thus, the production/operations function is concerned with the management of the operational processes and systems of all business firms. Information systems used for operations management and transaction processing support all firms that must plan, monitor, and control inventories, purchases, and the flow of goods and services. Therefore, firms such as transportation companies, wholesalers, retailers, financial institutions, and service companies must use production/operations information systems to plan and control their operations. In this section, we will concentrate on computer-based manufacturing applications to illustrate information systems that support the production/operations function.

Computer-Integrated Manufacturing

Once upon a time, manufacturers operated on a simple build-to-stock model. They built 100 or 100,000 of an item and sold them via distribution networks. They kept track of the stock of inventory and made more of the item once inventory levels dipped below a threshold. Rush jobs were both rare and expensive, and configuration options limited. Things have changed. Concepts like just-in-time inventory, build-to-order (BTO) manufacturing, end-to-end supply chain visibility, the explosion in contract manufacturing, and the development of Web-based e-business tools for collaborative manufacturing have revolutionized plant management.

A variety of manufacturing information systems, many of them Web-enabled, are used to support **computer-integrated manufacturing** (CIM). See Figure 7.15. CIM is an overall concept that emphasizes that the objectives of computer-based systems in manufacturing must be to:

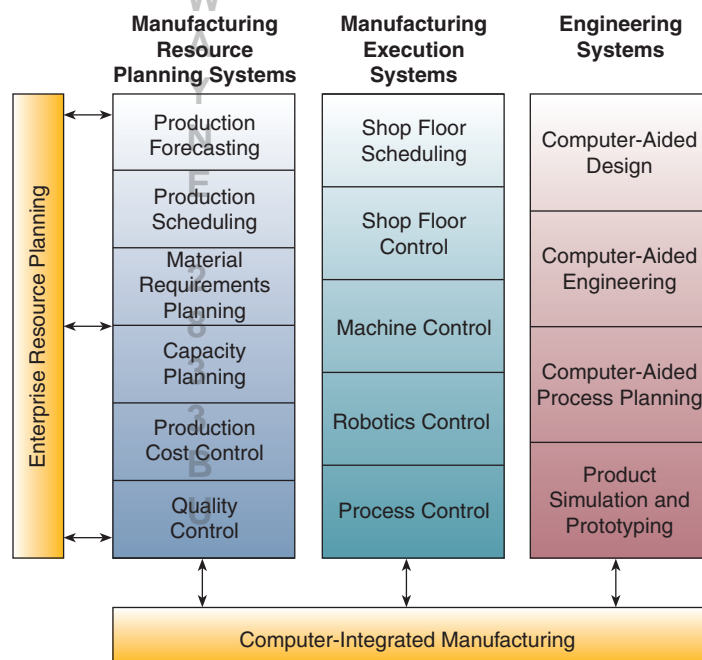
- **Simplify** (reengineer) production processes, product designs, and factory organization as a vital foundation to automation and integration.
- **Automate** production processes and the business functions that support them with computers, machines, and robots.
- **Integrate** all production and support processes using computer networks, cross-functional business software, and other information technologies.

The overall goal of CIM and such manufacturing information systems is to create flexible, agile, manufacturing processes that efficiently produce products of the highest quality. Thus, CIM supports the concepts of *flexible manufacturing systems*, *agile manufacturing*, and *total quality management*. Implementing such manufacturing concepts enables a company to respond to and fulfill customer requirements quickly with high-quality products and services.

Manufacturing information systems help companies simplify, automate, and integrate many of the activities needed to produce products of all kinds. For example, computers are used to help engineers design better products using both *computer-aided engineering* (CAE) and *computer-aided design* (CAD) systems, and better production processes with *computer-aided process planning*. They are also used to help plan the types of material needed in the production process, which is called *material requirements planning* (MRP), and to integrate MRP with production scheduling and shop floor operations, which is known as *manufacturing resource planning*. Many of the processes within manufacturing

FIGURE 7.15

Manufacturing information systems support computer-integrated manufacturing. Note that manufacturing resource planning systems are one of the application clusters in an ERP system.



resource planning systems are included in the manufacturing module of enterprise resource planning (ERP) software, which will be discussed in Chapter 8.

Computer-aided manufacturing (CAM) systems are those that automate the production process. For example, this could be accomplished by monitoring and controlling the production process in a factory (manufacturing execution systems) or by directly controlling a physical process (process control), a machine tool (machine control), or machines with some humanlike work capabilities (robots).

Manufacturing execution systems (MES) are performance-monitoring information systems for factory floor operations. They monitor, track, and control the five essential components involved in a production process: materials, equipment, personnel, instructions and specifications, and production facilities. MES includes shop floor scheduling and control, machine control, robotics control, and process control systems. These manufacturing systems monitor, report, and adjust the status and performance of production components to help a company achieve a flexible, high-quality manufacturing process.

Process control is the use of computers to control an ongoing physical process. Process control computers control physical processes in petroleum refineries, cement plants, steel mills, chemical plants, food product manufacturing plants, pulp and paper mills, electric power plants, and so on. A process control computer system requires the use of special sensing devices that measure physical phenomena such as temperature or pressure changes. These continuous physical measurements are converted to digital form by analog-to-digital converters and relayed to computers for processing.

Machine control is the use of computers to control the actions of machines. This is also popularly called *numerical control*. The computer-based control of machine tools to manufacture products of all kinds is a typical numerical control application used by many factories throughout the world.

Human Resource Systems

The human resource management (HRM) function involves the recruitment, placement, evaluation, compensation, and development of the employees of an organization. The goal of human resource management is the effective and efficient use of the human resources of a company. Thus, **human resource information systems** (HRIS) are designed to support (1) planning to meet the personnel needs of the business, (2) development of employees to their full potential, and (3) control of all personnel policies and programs. Originally, businesses used computer-based information systems to (1) produce paychecks and payroll reports, (2) maintain personnel records, and (3) analyze the use of personnel in business operations. Many firms have gone beyond these traditional *personnel management* functions and have developed human resource information systems that also support (1) recruitment, selection, and hiring; (2) job placement; (3) performance appraisals; (4) employee benefits analysis; (5) training and development; and (6) health, safety, and security. See Figure 7.16.

HRM and the Internet

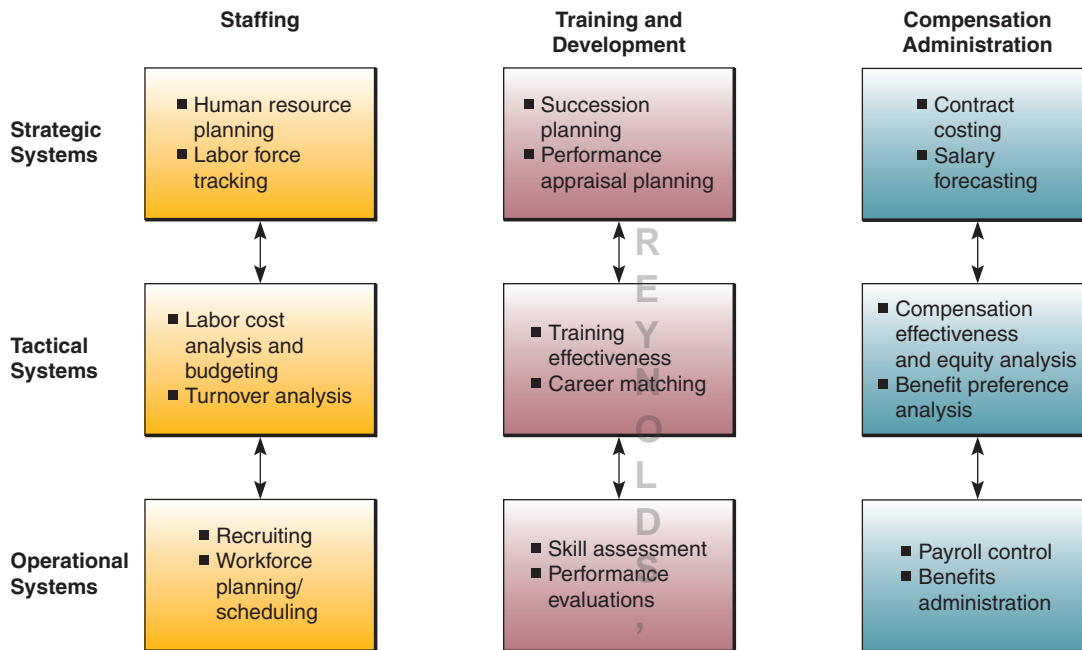
The Internet has become a major force for change in human resource management. For example, **online HRM systems** may involve recruiting for employees through recruitment sections of corporate Web sites. Companies are also using commercial recruiting services and databases on the World Wide Web, posting messages in selected Internet newsgroups, and communicating with job applicants via e-mail.

The Internet has a wealth of information and contacts for both employers and job hunters. Top Web sites for job hunters and employers on the World Wide Web include Monster.com, HotJobs.com, and CareerBuilder.com. These Web sites are full of reports, statistics, and other useful HRM information, such as job reports by industry, or listings of the top recruiting markets by industry and profession.

HRM and Corporate Intranets

Intranet technologies allow companies to process most common HRM applications over their corporate intranets. Intranets allow the HRM department to provide around-the-clock services to their customers: the employees. They can also disseminate valuable information faster than through previous company channels. Intranets can

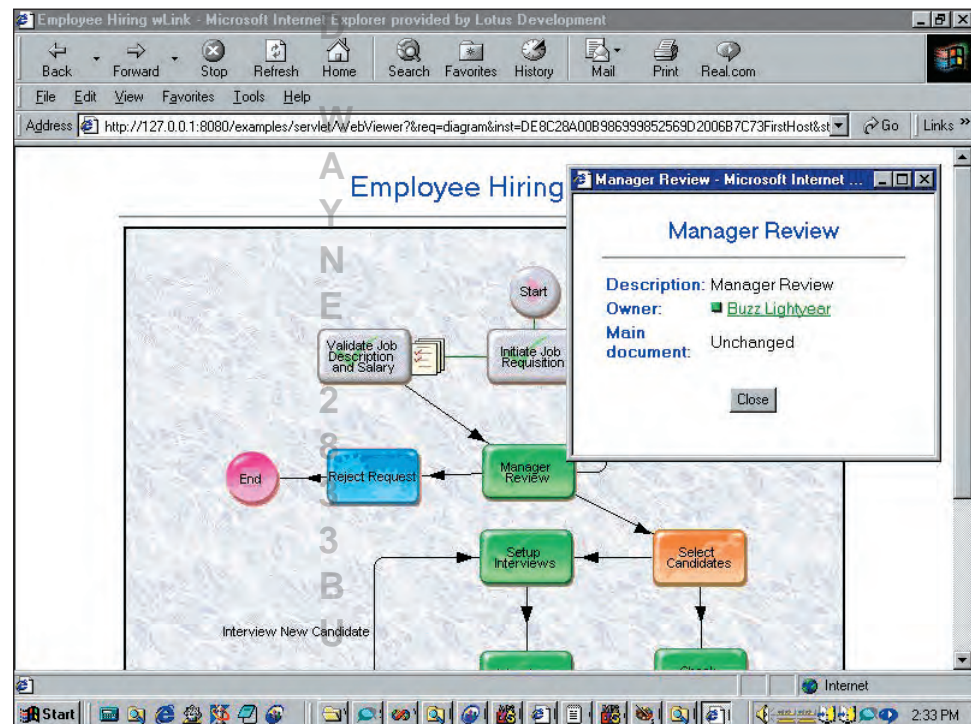
FIGURE 7.16 Human resource information systems support the strategic, tactical, and operational use of the human resources of an organization.



collect information online from employees for input to their HRM files, and they can enable managers and other employees to perform HRM tasks with little intervention by the HRM department. See Figure 7.17.

For example, *employee self-service* (ESS) intranet applications allow employees to view benefits, enter travel and expense reports, verify employment and salary information,

FIGURE 7.17
An example of an employee hiring review system.



Source: Courtesy of IBM.

access and update their personal information, and enter time-sensitive data. Through this completely electronic process, employees can use their Web browsers to look up individual payroll and benefits information online, right from their desktop PCs, mobile computers, or intranet kiosks located around a work site.

Another benefit of the intranet is that it can serve as a superior training tool. Employees can easily download instructions and processes to get the information or education they need. In addition, employees using new technology can view training videos over the intranet on demand. Thus, the intranet eliminates the need to loan out and track training videos. Employees can also use their corporate intranets to produce automated paysheets, the online alternative to time cards. These electronic forms have made viewing, entering, and adjusting payroll information easy for both employees and HRM professionals.

Chiquita Brands: Finding Out How Many Employees They Have



It seems like a straightforward and simple question that your typical HR application and corporate ERP system should be able to answer: How many employees are working for our company today?

At Chiquita Brands, the Fortune 500 company best known for its blue-stickered bananas, “We couldn’t answer that question,” recalls Manjit Singh, Chiquita’s CIO since September 2006.

“It would take us a couple of weeks to get the answer pulled together and by that time, of course, it was all incorrect.”

Chiquita boasts a global workforce of 23,000 employees in 70 countries on six continents, although most of the workers are predominantly in Central America. Until 2008, the Cincinnati-based food manufacturer had employed a hodgepodge of legacy HR systems that were inadequate at managing the complex demands of its decentralized workforce. Manual, inefficient workarounds (Excel spreadsheets and paper-based processes) were frequently used.

When Chiquita hired a new employee, for instance, the HR paper-trail process could contain 20 to 30 steps, Singh notes.

“At any point, if that paper gets lost, things are going to fall through the cracks,” he says. “Many times new employees have shown up and haven’t had an office, a PC or a phone. Obviously that causes pain to the employee, it doesn’t make the employer look good and you’ve lost productivity from the moment the employee walks through the door.”

In October 2008, Chiquita went live on Workday HCM with 5,000 U.S.-based employees and 500 managers across 42 countries. Singh took advantage of customization options Workday offered when necessary. But he and his team tried to minimize customization as much as possible, so that they could shorten implementation time lines as they continue phased rollouts to 18,000 Latin America-based employees and nearly 3,000 employees throughout Europe.

Today, Chiquita’s North American operations enjoy the fruits of the new system, including core HR functions such as employee hiring, job changes, compensation tracking and more. “We can see exactly where in the process the employee is, or how the hiring is going, who is holding it up and why it’s being held up, so that we can guarantee when an employee walks through the door, they have an office, a phone, a PC, and they’ve been given access to all of the systems they need to have access to,” says Singh.

“That’s big, when you talk about the number of employees we hire in a given month,” Singh continues. “That drops dollars back down to the bottom line.”

Lastly, the new HR system has freed up many of Chiquita’s 200 IT staffers to focus on higher-value projects. “I want my folks sitting arm and arm with business folks, talking about process transformation and trying to figure out how to bring products to market even quicker,” Singh says, “not keeping the lights on running a system.”

Source: Adapted from Thomas Wailgum, “Why Chiquita Said ‘No’ to Tier 1 ERP Providers and ‘Yes’ to SaaS Apps from Upstart Workday,” *CIO Magazine*, April 7, 2009.

Accounting Systems

Accounting information systems are the oldest and most widely used information systems in business. They record and report business transactions and other economic events. Computer-based accounting systems record and report the flow of funds through an organization on a historical basis and produce important financial statements such as balance sheets and income statements. Such systems also produce forecasts of future conditions such as projected financial statements and financial budgets. A firm's financial performance is measured against such forecasts by other analytical accounting reports.

Operational accounting systems emphasize legal and historical record-keeping and the production of accurate financial statements. Typically, these systems include transaction processing systems such as **order processing**, **inventory control**, **accounts receivable**, **accounts payable**, **payroll**, and **general ledger** systems. Management accounting systems focus on the planning and control of business operations. They emphasize cost accounting reports, the development of financial budgets and projected financial statements, and analytical reports comparing actual to forecasted performance.

Figure 7.18 illustrates the interrelationships of several important accounting information systems commonly computerized by both large and small businesses. Many accounting software packages are available for these applications. Figure 7.19 provides a good summary of the essential purpose of six common, but important, accounting information systems used by both large and small business firms.

Online Accounting Systems

It should come as no surprise that the accounting information systems illustrated in Figures 7.18 and 7.19 are being transformed by Internet technologies. Using the Internet and other networks changes how accounting information systems monitor and track business activity. The interactive nature of **online accounting systems** calls for new forms of transaction documents, procedures, and controls. This particularly applies to systems like order processing, inventory control, accounts receivable, and accounts payable. As outlined in Figure 7.18, these systems are directly involved in the processing of transactions between a business and its customers and suppliers. So

FIGURE 7.18 Important accounting information systems for transaction processing and financial reporting. Note how they are related to each other in terms of input and output flows.

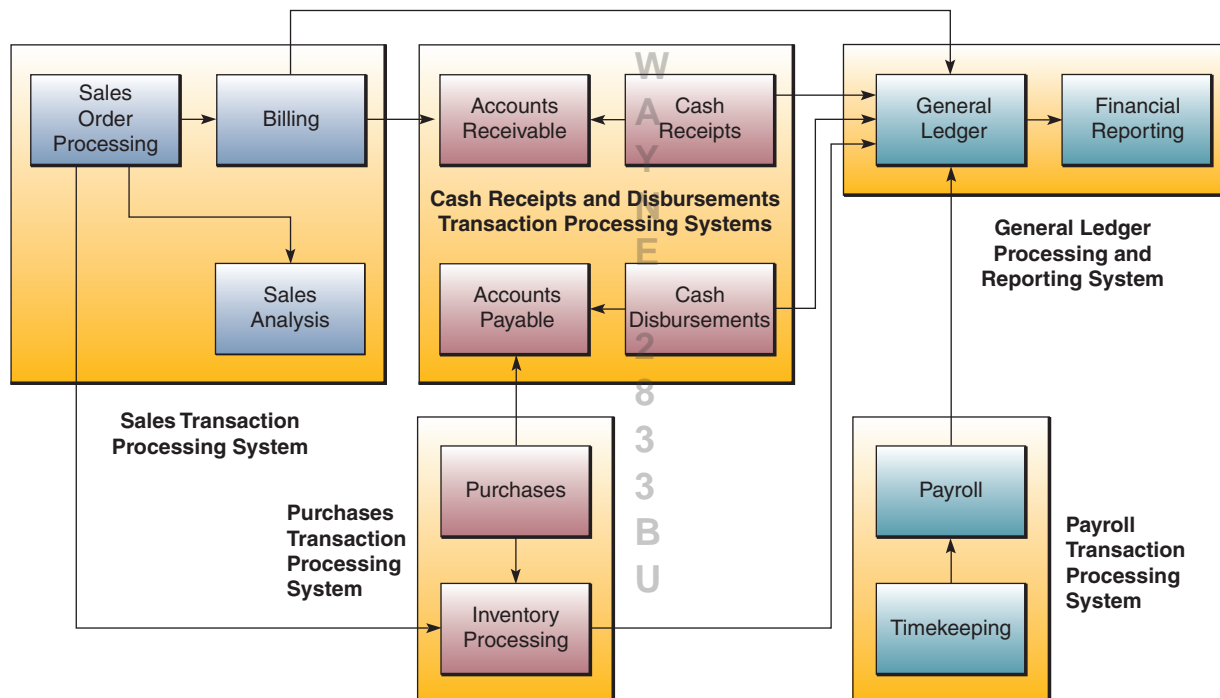
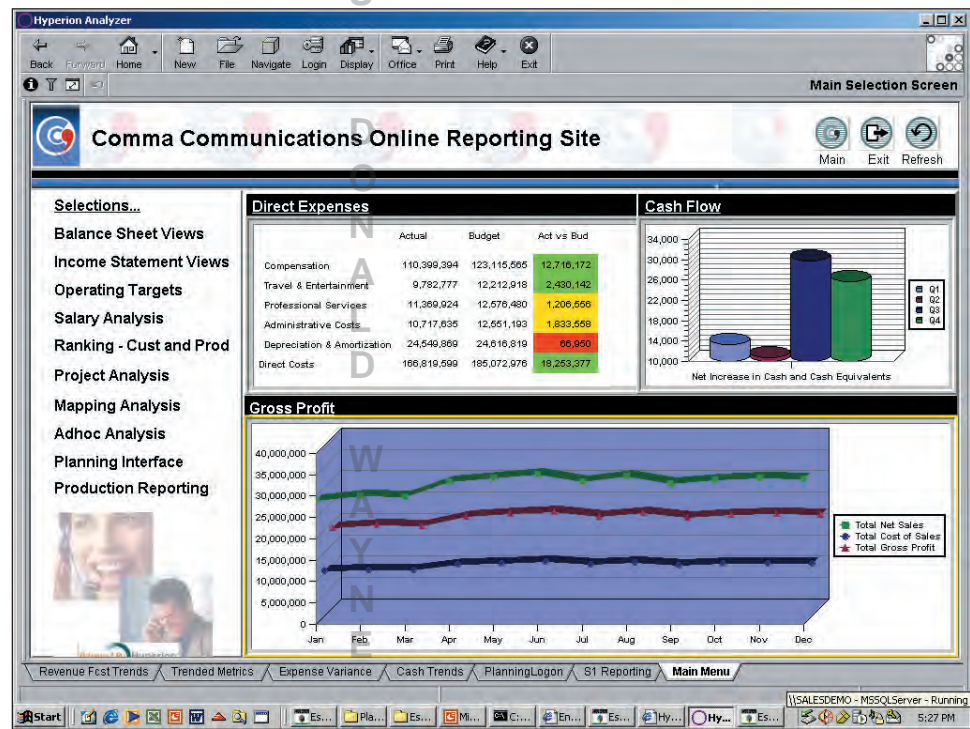


FIGURE 7.19 A summary of six essential accounting information systems used in business.

Common Business Accounting Systems	
• Order Processing	Captures and processes customer orders and produces data for inventory control and accounts receivable.
• Inventory Control	Processes data reflecting changes in inventory and provides shipping and reorder information.
• Accounts Receivable	Records amounts owed by customers and produces customer invoices, monthly customer statements, and credit management reports.
• Accounts Payable	Records purchases from, amounts owed to, and payments to suppliers, and produces cash management reports.
• Payroll	Records employee work and compensation data and produces paychecks and other payroll documents and reports.
• General Ledger	Consolidates data from other accounting systems and produces the periodic financial statements and reports of the business.

FIGURE 7.20
An example of an online
accounting report.



Source: Courtesy of Hyperion.

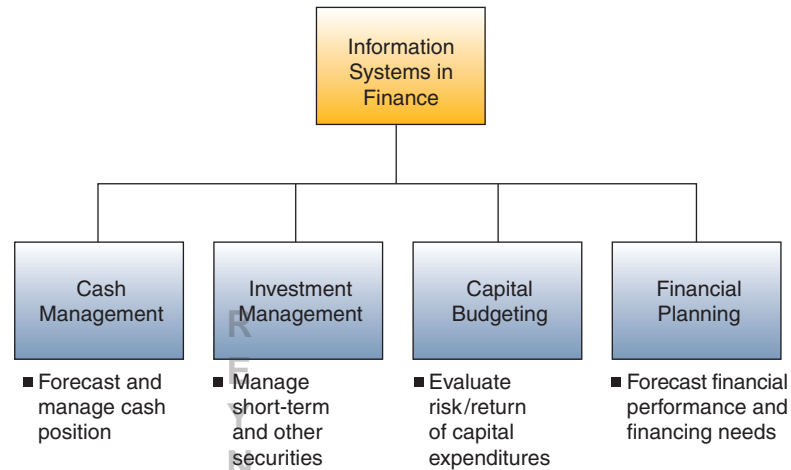
naturally, many companies are using Internet and other network links to these trading partners for such online transaction processing systems, as discussed in Section I. Figure 7.20 is an example of an online accounting report.

Financial Management Systems

Computer-based **financial management systems** support business managers and professionals in decisions concerning (1) the financing of a business and (2) the allocation and control of financial resources within a business. Major financial management system categories include cash and investment management, capital budgeting, financial forecasting, and financial planning. See Figure 7.21.

FIGURE 7.21

Examples of important financial management systems.



For example, the **capital budgeting** process involves evaluating the profitability and financial impact of proposed capital expenditures. Long-term expenditure proposals for facilities and equipment can be analyzed using a variety of return on investment (ROI) evaluation techniques. This application makes heavy use of spreadsheet models that incorporate present value analysis of expected cash flows and probability analysis of risk to determine the optimum mix of capital projects for a business.

Financial analysts also typically use electronic spreadsheets and other **financial planning** software to evaluate the present and projected financial performance of a business. They also help determine the financing needs of a business and analyze alternative methods of financing. Financial analysts use financial forecasts concerning the economic situation, business operations, types of financing available, interest rates, and stock and bond prices to develop an optimal financing plan for the business. Electronic spreadsheet packages, DSS software, and Web-based groupware can be used to build and manipulate financial models. Answers to what-if and goal-seeking questions can be explored as financial analysts and managers evaluate their financing and investment alternatives. We will discuss such applications further in Chapter 10. See Figure 7.22.

FIGURE 7.22

An example of strategic financial planning using a multiple scenario approach. Note the effect on earnings per share.

	2001	2002	2003	2004	2005	2006
Scenario 1						
Total Revenue	1,350,000	1,350,000	1,440,000	1,440,000	1,440,000	1,440,000
Cost of Goods Sold	405,000	405,000	432,000	432,000	432,000	432,000
Gross Profit	945,000	945,000	1,008,000	1,008,000	1,008,000	1,008,000
Total Direct Costs	882,813	897,646	894,885	895,069	893,304	889,791
Tax Provision	21,144	16,100	38,459	38,397	38,997	40,191
Net Income	41,043	31,253	74,656	74,534	75,699	78,016
Earnings per Share	0.41	0.31	0.75	0.75	0.76	0.76
Scenario 2						
Total Revenue	1,350,000	1,350,000	1,440,000	1,440,000	1,440,000	1,440,000
Cost of Goods Sold	405,000	405,000	432,000	432,000	432,000	432,000
Gross Profit	945,000	945,000	1,008,000	1,008,000	1,008,000	1,008,000
Total Direct Costs	882,813	897,646	894,885	895,069	893,304	889,791
Tax Provision	21,144	16,100	38,459	38,397	38,997	40,191
Net Income	41,043	31,253	74,656	74,534	75,699	78,016
Earnings per Share	0.41	0.31	0.75	0.75	0.76	0.76
Scenario 3						
Total Revenue	1,350,000	1,350,000	1,440,000	1,440,000	1,440,000	1,440,000
Cost of Goods Sold	405,000	405,000	432,000	432,000	432,000	432,000

Source: Courtesy of Comshare.

Summary

- **Cross-Functional Enterprise Systems.** Major e-business applications and their interrelationships are summarized in the enterprise application architecture of Figure 7.2. These applications are integrated cross-functional enterprise systems such as enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM). These applications may be interconnected by enterprise application integration (EAI) systems so that business professionals can more easily access the information resources they need to support the needs of customers, suppliers, and business partners. Enterprise collaboration systems (ECS) are cross-functional systems that support and enhance communication and collaboration among the teams and workgroups in an organization. Refer to Figures 7.4 and 7.8 for summary views of the e-business applications in EAI systems and enterprise collaboration systems.
- **Transaction Processing Systems.** Online transaction processing systems play a vital role in business. Transaction processing involves the basic activities of (1) data entry, (2) transaction processing, (3) database maintenance, (4) document and report generation, and (5) inquiry processing. Many firms are using the Internet, intranets, extranets, and other networks for online transaction processing to provide superior service to their customers and suppliers. Figure 7.6 illustrates the basic activities of transaction processing systems.
- **Functional Business Systems.** Functional business information systems support the business functions of marketing, production/operations, accounting, finance, and human resource management through a variety of e-business operational and management information systems summarized in Figure 7.11.
- **Marketing.** Marketing information systems support traditional and e-commerce processes and management of the marketing function. Major types of marketing information systems include interactive marketing at e-commerce Web sites, sales force automation, customer relationship management, sales management, product management, targeted marketing, advertising and promotion, and market research. Thus, marketing information

systems assist marketing managers in e-commerce product development and customer relationship decisions, as well as in planning advertising and sales promotion strategies and developing the e-commerce potential of new and present products and new channels of distribution.

- **Manufacturing.** Computer-based manufacturing information systems help a company achieve computer-integrated manufacturing (CIM), and thus simplify, automate, and integrate many of the activities needed to quickly produce high-quality products to meet changing customer demands. For example, computer-aided design using collaborative manufacturing networks helps engineers collaborate on the design of new products and processes. Then manufacturing resource planning systems help plan the types of resources needed in the production process. Finally, manufacturing execution systems monitor and control the manufacture of products on the factory floor through shop floor scheduling and control systems, controlling a physical process (process control), a machine tool (numerical control), or machines with some humanlike work capabilities (robotics).
- **Human Resource Management.** Human resource information systems support human resource management in organizations. They include information systems for staffing the organization, training and development, and compensation administration. HRM Web sites on the Internet or corporate intranets have become important tools for providing HR services to present and prospective employees.
- **Accounting and Finance.** Accounting information systems record, report, and analyze business transactions and events for the management of the business enterprise. Figure 7.19 summarizes six essential accounting systems including order processing, inventory control, accounts receivable, accounts payable, payroll, and general ledger. Information systems in finance support managers in decisions regarding the financing of a business and the allocation of financial resources within a business. Financial information systems include cash management, online investment management, capital budgeting, and financial forecasting and planning.

Key Terms and Concepts

These are the key terms and concepts of this chapter. The page number of their first explanation is in parentheses.

- | | | |
|-----------------------------------------|----------------------------------------------|----------------------------------------------|
| 1. Accounting information systems (295) | 6. Computer-integrated manufacturing (291) | 10. Enterprise application integration (276) |
| 2. Accounts payable (295) | 7. Cross-functional enterprise systems (272) | 11. Enterprise collaboration systems (281) |
| 3. Accounts receivable (295) | 8. E-business (272) | 12. Financial management systems (296) |
| 4. Batch processing (280) | 9. Enterprise application architecture (272) | 13. Functional business systems (284) |
| 5. Computer-aided manufacturing (292) | | |

- | | | |
|----------------------------------------------|-------------------------------------------------|----------------------------------------|
| 14. General ledger (295) | 20. Manufacturing information systems (290) | 25. Order processing (295) |
| 15. Human resource information systems (292) | 21. Marketing information systems (284) | 26. Payroll (295) |
| 16. Interactive marketing (284) | 22. Online accounting systems (295) | 27. Process control (292) |
| 17. Inventory control (295) | 23. Online HRM systems (292) | 28. Real-time processing (280) |
| 18. Machine control (292) | 24. Online transaction processing systems (279) | 29. Sales force automation (289) |
| 19. Manufacturing execution systems (292) | | 30. Targeted marketing (288) |
| | | 31. Transaction processing cycle (280) |

Review Quiz

Match one of the key terms and concepts listed previously with one of the brief examples or definitions that follow. Try to find the best fit for the answers that seem to fit more than one term or concept. Defend your choices.

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| ___ 1. Using the Internet and other networks for e-commerce, enterprise collaboration, and Web-enabled business processes. | ___ 15. Information systems to support staffing, training and development, and compensation administration. |
| ___ 2. Information systems that cross the boundaries of the functional areas of a business in order to integrate and automate business processes. | ___ 16. Using the Internet for recruitment and job hunting is an example. |
| ___ 3. Information systems that support marketing, production, accounting, finance, and human resource management. | ___ 17. Accomplishes legal and historical record-keeping and gathers information for the planning and control of business operations. |
| ___ 4. E-business applications fit into a framework of interrelated cross-functional enterprise applications. | ___ 18. An example is using the Internet and extranets to do accounts receivable and accounts payable activities. |
| ___ 5. Software that interconnects enterprise application systems. | ___ 19. Handles sales orders from customers. |
| ___ 6. Information systems for customer relationship management, sales management, and promotion management. | ___ 20. Keeps track of items in stock. |
| ___ 7. Collaborating interactively with customers in creating, purchasing, servicing, and improving products and services. | ___ 21. Keeps track of amounts owed by customers. |
| ___ 8. Using mobile computing networks to support salespeople in the field. | ___ 22. Keeps track of purchases from suppliers. |
| ___ 9. Information systems that support manufacturing operations and management. | ___ 23. Produces employee paychecks. |
| ___ 10. A conceptual framework for simplifying and integrating all aspects of manufacturing automation. | ___ 24. Produces the financial statements of a firm. |
| ___ 11. Using computers in a variety of ways to help manufacture products. | ___ 25. Information systems for cash management, investment management, capital budgeting, and financial forecasting. |
| ___ 12. Use electronic communications, conferencing, and collaborative work tools to support and enhance collaboration among teams and workgroups. | ___ 26. Performance monitoring and control systems for factory floor operations. |
| ___ 13. Using computers to operate a petroleum refinery. | ___ 27. Customizing advertising and promotion methods to fit their intended audience. |
| ___ 14. Using computers to help operate machine tools. | ___ 28. Data entry, transaction processing, database maintenance, document and report generation, and inquiry processing. |
| | ___ 29. Collecting and periodically processing transaction data. |
| | ___ 30. Processing transaction data immediately after they are captured. |
| | ___ 31. Systems that immediately capture and process transaction data and update corporate databases. |

Discussion Questions

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Refer to Real World Case 1 on enterprise architecture. What are the advantages of a centralized enterprise architecture? What are the advantages of a decentralized approach that leaves these decisions to the operating units? How do you balance both? Discuss. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

2. Why is there a trend toward cross-functional integrated enterprise systems in business?
3. Which of the 13 tools for accounting information systems summarized in Figure 7.18 do you feel are essential for any business to have today? Which of them do you feel are optional, depending on the type of business or other factor? Explain.
4. What other solutions could there be for the problem of information systems incompatibility in business besides EAI systems?
5. What are the most important HR applications a company should offer to its employees via a Web-based system? Why?
6. How could sales force automation affect salesperson productivity, marketing management, and competitive advantage?
7. How can Internet technologies be involved in improving a process in one of the functions of business? Choose one example and evaluate its business value.
8. Refer to the Real World Case on Nationwide Insurance in the chapter. Senior management was emphatic about maintaining a 24-month deadline at all cost. Should the scope of the project be adapted to reflect a deadline, or should deadlines reflect the scope of a project? Discuss.
9. What are several e-business applications that you might recommend to a small company to help it survive and succeed in challenging economic times? Why?
10. Refer to the example on virtual worlds in the chapter. How do enterprise collaboration systems contribute to bottom-line profits for a business?

Analysis Exercises

1. Hybrid Application Service Providers

ASP Integrated Applications

Revenue from desktop application sales ends with the sale. Or does it? Companies like Microsoft provide updates, fixes, and security patches to their software while developing the next revenue-generating edition. However, they don't make another dime until they release the next edition. But that isn't the only model.

McAfee charges an annual maintenance fee that includes daily application and virus definition updates. McAfee provides this service free for one year as part of its license. After the first year, license holders may continue to use the software, but they must pay a subscription fee if they want updates. Customers tend to pay for this subscription service in order to protect themselves from new virus threats. Thus, McAfee generates revenue long after the initial sale. In this way, McAfee behaves like an application service provider.

The following questions will help you explore the many ASP-related services that relocate applications, maintenance, and data off your systems and allow you to focus on your mission.

- a. AOL offers instant messaging tools for organizations (www.aimatwork.com). Compare business-oriented tools with AIM, AOL's free consumer product.
- b. Yahoo and Google are in a heated competition for the same user base. Look up the latest developments for Yahoo at developer.yahoo.com and for Google at labs.google.com. Prepare a table in Word to compare current and beta features for Yahoo and Google. Place "Feature," "Google," and "Yahoo" as column headers. List individual features under "Feature" in the left-hand column. Place the symbol "•" in the cell if it's a current feature for each competitor and the symbol "o" in the cell if it's a beta feature. Leave the cell blank if it isn't available at all. Give the table a professional appearance.

2. In Search of Talent

Online Job Matching and Auctions

Many opportunities await those who troll the big job boards, the free-agent sites, the reverse auction services, and the niche sites for specialized jobs and skills. Presented below are a diverse sample of employment-related Web sites.

- eLance.com (www.elance.com)
 - Guru.com (www.guru.com)
 - Monster.com (www.monster.com)
 - vworker (vworker.com)
- a. Prepare a review for each job site listed above. Include target employers, target employees, and notable Web site features.
 - b. Which site did you find most useful? Why?

3. Integrating Data Capture

Keys to Better Information

Business systems have long served to automate tasks, facilitate data capture, and enable new opportunities. These processes have crept into virtually all businesses and business processes. RE/MAX real estate agent Rosemary Chiaverini remembers well business 20 years ago and the rather cumbersome process of coordinating key exchanges with fellow agents. "It really limited the number of houses we could show in a day."

A key safe increased productivity by allowing real estate agents to open a key safe at each property. The key locked inside the key safe then provided access to the residence. Showing agents would then leave a business card behind to indicate that they had shown a property, but the listing agent would have to retrieve these cards personally. "I just didn't know for certain who was seeing my homes or what they thought of them."

GE Security's Supra iBox has changed that. Rosemary now uses an electronic, infrared key to open GE's

new key safe, and the key records the transaction. When she synchronizes her key online to update her key's codes, this information goes up to GE's database and is shared with the listing agent. With most agents in her area subscribing to this system, Rosemary has Internet access information about who visited one of her listed homes and when. She uses this information to follow up on each visit and gain valuable insights. "Before, I would waste a lot of time calling busy agents who had arranged to show a home but hadn't."

- a. Use a search engine to look up the Supra iBox. Describe the product's capabilities.
- b. Use a search engine to look up Sprint and the Supra iBox. How has Sprint taken GE's product one step further?
- c. Describe the next-generation product you might sell Rosemary once keyless locks become commonplace.

4. **Word's Mail Merge**

Partner Name Tags

Ms. Sapper, this year's annual partner meeting coordinator for a global accounting firm, faced an interesting challenge. She wanted to provide the 400 partners attending the meeting the opportunity to mix, mingle, and network. Most partners only knew a handful of their peers, and

Ms. Sapper wanted to make everyone feel as comfortable as possible. With a list of partners in hand, she decided to prepare name tags for each participant. Each tag would include the partner's first name, last name, practice area, and region. Arranging the tags alphabetically by last name at the event's welcome desk would allow each partner to quickly find and use his or her name tag.

Complete the following steps to prepare partner name badges.

- a. Download and save "partners.xls" from the MIS 10e OLC.
- b. Use Microsoft Word's mail merge feature to generate name tags sorted by last name and then first name. Use a suitable name tag template, and format the name tag as illustrated below. Be sure to include first name, last name, industry, and region. Turn in either the first two pages of the merged names or the merged file, depending on your professor's preference.

Example:

Christoph Aarns
Audit
Asia Pacific

REYNOLDS,
DONALD
WAYNE
2833BU

REAL WORLD

CASE

3

Cisco Systems: Telepresence and the Future of Collaboration

If you want to catch a glimpse of the future of knowledge work in the twenty-first century, a good place to start is a small family homestead outside Germantown, Illinois, 40 miles east of St. Louis. That's where Craig Huegens, director of architecture for networks, data centers, and unified communication services at Cisco Systems, lives and works. When Huegens moved there from northern California in December 2000, it was for the most basic of reasons: He wanted his newborn son to grow up around family, who now live just five miles down the road. Nevertheless, it was something of a revolutionary concept because Huegens was Cisco's first full-time IT telecommuter.

Back then, he got by using e-mail and Internet Relay Chat, a primordial form of instant messaging. It took some accommodation on the part of both Huegens and his colleagues back in San Jose, but they made it work. Over the last seven years, Huegens has become the spearpoint for the philosophy and technology at the center of Cisco's biggest strategic shift since the tech bubble burst in 2001—"Cisco 3.0," as CEO and chairman John Chambers likes to call it.

Cisco 1.0 was all about getting people connected by selling truckloads of routers and switches, and it made the company, founded in 1984 by a small group of computer scientists out of Stanford University, one of the fastest-growing in American business history. Cisco 2.0, Chambers says, was centered on business process change—using all that hardware and, of course, a few truckloads of new gear, like information processing telephones—to drive innovation and productivity gains.

Cisco 3.0 employs even more hardware and software to transform business models, and Chambers, with characteristic evangelical fervor, says it will fundamentally change the nature of work, enabling productivity growth to soar back into the realms last seen in the economic surge of the late 1990s. "We believe that productivity can grow not at 1 percent or 2 percent, but 3 percent to 5 percent for the sustainable future," says Chambers in an interview in his office in Cisco's San Jose headquarters.

That's an audacious vision, and it will be driven, Chambers maintains, by the type of collaborative, Web 2.0 technology that now keeps Huegens in touch with his team in San Jose: interactive Web forums like wikis and blogs; IM; interactive "teamspace" mounted on WebEx (which Cisco acquired in March for \$3.2 billion); and above all, videoconferencing and its big brother, telepresence, which is a life-size, high-def, multiple-screen system for face-to-face meetings among users in multiple locations. The question is: Is Cisco's latest initiative just Videoconferencing 2.0, or is it really something revolutionary?

The new emphasis on intensely collaborative technologies at Cisco, a company that epitomizes the catchphrase "eating our own dog food," ups the ante for CIO Rebecca Jacoby. She assumed that post just over a year ago and has

been the point person for rolling out telepresence and other new-age tools to the demanding in-house customers at Cisco.

Jacoby, who's been at Cisco for 13 years but is a self-described nontechie (she came up through the manufacturing ranks), takes over at an interesting time. Not only is she Cisco's first female CIO, succeeding the semilegendary Brad Boston, now senior vice president of the Global Government Solutions Group, she is also helping to lead Cisco through a transformation as radical as any in the company's 24-year history. To do so, Jacoby says, Cisco is making itself the test bed for the next generation of collaboration tools. Like many Cisco executives today, Jacoby has a single-screen telepresence unit in a small back room off her office in San Jose. Since it began to roll out the immersive conferencing technology in late 2006, Cisco has deployed telepresence rooms in 160 of its offices worldwide.

When Chambers first talked to Jacoby about taking on the CIO job, she wasn't sure she really wanted the spotlight that goes with being the chief IT executive for one of the world's most powerful and venerated IT companies. The prospect of transforming the entire company, however, "was irresistible to me," she says. Jacoby realized that the conventional role of IT—acquiring and deploying new technologies and educating employees on using them—was now, at least in part, flipped. "When you talk about the collaboration tools out there, they're not necessarily initiated by IT," she says.

Much of what Jacoby talks about is hardly earth-shattering—she has become an enthusiastic user of video blogs, or vlogs, she says—but its pervasive use at a company of Cisco's size and age is probably unusual. With a globalized workforce of highly connected, tech-savvy users, the adoption and learning flow both ways, to and from Cisco's IT group. Jacoby calls it "creating an environment of directed participation," in which the tools already being used by Cisco employees are adapted, refined, and sharpened to drive innovation and growth. "Our biggest challenge," she says, "is just keeping up with where these ideas are going and seeing how we can participate in how they are shaped and focused."

One of the initiatives Jacoby and her team have undertaken is to create an online "communications center of excellence," where new collaboration tools—from wikis to vlogs to telepresence—can be deployed, tested, and refined. Video, she says, is "phenomenally effective," particularly when communicating with employees outside the United States.

Equally powerful has been Cisco's I-Zone wiki, a company-wide forum for new business ideas launched not by IT but by the Emerging Technologies Group, headed by Marthin DeBeer. Live for 18 months, the wiki has produced 600 ideas for potential one-billion-dollar-per-annum-size ventures (the minimum level for Cisco to get behind a new business), suggested by the company's more than 61,000 employees.

Reflecting Chambers's mantra that to lead the next phase of the Internet Cisco must constantly reinvent its own

processes, the focus on collaboration has also spurred a reorganization of the company's hierarchy. Beginning in the painful 2001 meltdown, when Cisco posted a net loss of \$1 billion, Chambers led a shift from the usual product, sales and marketing, and other functional groups toward a more horizontal, less command-and-control structure of "councils, boards, and task forces."

"The councils focus on \$10 billion-plus opportunities, the boards on \$1 billion opportunities, and the task forces are the implementation of any of the above," Chambers says. It sounds like a somewhat communistic way of reshaping a \$35 billion-a-year company, but for Chambers this new structure is key to the company's regeneration. "The first few years were pretty painful," Chambers admits. "It's like anything you do—usually it's not the technology that's your limiting factor, it's people, and getting them to change from, instead of command and control, to collaboration." Cisco, however, makes its living leading technology changes, and the key to Cisco 3.0 will be the most sophisticated and expensive: telepresence.

DeBeer's executive assistant, Margaret Hooshmand, can be found almost every day outside his office in San Jose. Only she's not really there; she's at the Cisco office in Richardson, Texas, and she bilocates via telepresence to the cubicle adjoining DeBeer's office. You can walk by (in San Jose) and chat with her any time, and if you don't remind yourself, you'll forget to ask her how the weather is in central Texas.

Telepresence was the first new product to emerge from DeBeer's Emerging Technologies Group, and it ramped up in record time, from hiring the first engineer in February 2005 to shipping the first external system in December 2006. Among the design principles, or "Telepresence Rules,"

DeBeer's team devised were: "People will always appear life-size" and "To initiate a meeting you have to do just one thing," for example, press a button on the handset.

If you look behind the curtain, as it were, you'll see that the whole thing runs through a single Ethernet cable. It's a superb piece of technology.

"Cisco is betting on a proprietary approach," says Michelle Damrow, head of product marketing for competitor Polycom's telepresence group. "We think standards-based communications will win eventually." Indeed, Cisco faces strong competition in this nascent market from the likes of HP, which introduced its Halo telepresence system before the Cisco product launched, and from videoconferencing leader Polycom, which offers a high-end telepresence system with merged, seamless displays, as opposed to Cisco's three-separate-screens approach. Damrow notes Polycom is betting on a standards-based system that will interoperate with any standards-based video codec on the market today.

The answer, as you might expect, is that Cisco believes its installed base, its brand power, and its marketing muscle will push enough TelePresence units into the market to allow it to become the de facto standard.

Telepresence itself, says Chambers, will be offered as an on-demand managed service at off-site locations for companies that can't or don't want to invest in their own systems. When interoperability among multiple vendors does come, it will be on Cisco's terms, not industry-imposed.

If that's not quite Web 2.0 enough for you, well, welcome to John Chambers's world. *Cisco 3.0: Coming soon* to a three-screen, high-definition, surround-sound theater near you.

Source: Adapted from Richard Martin, "Cisco's Emerging Collaboration Strategy," *InformationWeek*, January 28, 2008.

CASE STUDY QUESTIONS

1. What are the main business benefits of the collaboration technologies described in the case?
2. How do these go beyond saving on corporate travel? Provide several specific examples.
3. Michelle Damrow of Polycom notes Cisco is betting on a proprietary standard for its TelePresence product, while competitors are going with interoperability. Do you agree with Cisco's strategy? Why or why not? Defend your answer.
4. Think about the I-Zone wiki described in the case, Cisco's forum for new business ideas, and its seeming success in that regard. Why do you think that is the case? Do these technologies foster creativity, provide an opportunity to communicate already existing ideas, or both? Defend your answer.

REAL WORLD ACTIVITIES

1. Go online and search the Internet for commercial offerings that compete with Cisco's TelePresence products, such as those noted in the case. Prepare a report comparing and contrasting their features and specifications, and justify your selection. Would it matter whether the purchasing company was large or small?
2. Put yourself in the place of a newly hired Cisco employee. How comfortable would you feel working on a team distributed across the globe, using the technologies described in the case? What would be the major challenges you would face? Break into small groups with your classmates to discuss these issues, and explore the reasons behind any conflicting viewpoints.

REAL WORLD

CASE

4

OHSU, Sony, Novartis, and Others:
Strategic Information Systems—
It's HR's Turn

"Our people are our most valuable asset." How many times have you heard that company slogan? In recent years, HR departments have focused their technology efforts on driving down costs by automating or outsourcing nonstrategic, transaction-oriented processes such as benefits enrollment and payroll. As a result, many employees can now do a number of things online that used to require the intervention of HR staff, such as viewing pay stubs, changing personal information, or enrolling for benefits.

Increasingly, however, HR is being urged not only to reduce the cost of hiring, retaining, and compensating employees but also to optimize the corporate talent pool. After all, if your workforce is your biggest expense, shouldn't you shape it to support the strategic goals of the business in the best way possible?

Imagine placing an electronic order to hire an employee the same way a factory manager uses ERP software to order more parts for the assembly line. That's roughly what's happening at Oregon Health & Science University (OHSU). "More and more, HR is being called upon to be a strategic partner," says Joe Tonn, manager of HR management systems at OHSU in Portland.

The payoff is significant: The university is filling job openings two weeks faster than it once did and saving at least \$1,500 per job now that it's using Oracle Corp.'s iRecruitment software. The iRecruitment application, part of Oracle's e-Business Human Resources Management System (HRMS) suite, enables managers to request a new employee and process applications electronically. The software handles most of the time-consuming administrative work, including routing requisition forms to the appropriate managers and posting the job on the Web site. "We wanted to be able to open a job requisition in the morning and have qualified candidates in the afternoon," says Tonn.

In fact, OHSU now has access to applicants only minutes after a job opening is posted to the university's Web site, and it fills those jobs in just four weeks instead of six or more.

The university also recently added Oracle's Manager Self-Service module for logging changes to employee status (e.g., promotions or use of family leave) and uses the Oracle Employee Self-Service application for benefits management. Tonn expects to add software for performance reviews, succession planning, and learning management over the next couple of years.

Large and midsize organizations such as OHSU are increasingly turning to these new types of employee management applications—commonly called human capital management (HCM) or workforce optimization software—to automate HR processes that used to be done manually, on paper, or by e-mail.

"Human capital management covers the whole discipline of managing the workforce, bringing them in and

tracking them over time," says Christa Manning, an analyst at AMR Research Inc. in Boston. AMR forecasts a 10 percent compound annual growth rate through 2010 for the \$6 billion HCM market. Much of the market growth can be attributed to the upcoming retirement of baby boomers, which will shrink the pool of available workers. Companies need to automate their systems so they can better identify employees they want to retain and then provide a career path for them.

Sony Computer Entertainment America Inc. uses recruitment software from WorkforceLogic to automate its process for hiring contract workers. Sally Buchanan, director of human resources, says the software is particularly useful for ensuring that hiring managers understand and comply with the legal distinctions between contract and salaried employees.

"When they requisition a contractor, they must answer a series of questions through the WorkforceLogic interface, and the application renders a recommendation on whether the position is best filled by a contractor or by someone on the payroll," says Buchanan.

Employee performance management, career development, and succession planning are all functions that can be automated with HCM applications. For example, Tyco International Ltd. uses Kenexa's CareerTracker to track employee performance and promotions. The software, which is configured with Tyco's performance standards and rating system, can plot employee performance on a graph to identify the top performers, both in terms of job achievement and in meeting Tyco's leadership behavior standards.

Using the database of employee credentials and expertise, Tyco can also locate the best people to fill key job openings and analyze what type of training they'll need. "We can identify who we have and how they fit," says Shaun Zitting, director of organizational development at the Princeton, N.J.-based company.

According to AMR's Manning, most corporate executives like having a tool that helps them evaluate and promote people on purely objective criteria. "They know it's not based on, 'I like Joe because we go to lunch every day.' It brings some real science to the process and allows you to not only identify your top performers but also to know why they're top performers," she says. Career development and succession planning applications have also become more important as baby boomers retire and organizations have to find qualified replacements. Succession planning isn't just for CEOs and other top executives anymore. "It's starting to cascade down into the organization as the collecting and associating of employee information become easier," says Manning.

Managers can associate key characteristics with specific jobs and analyze the traits of successful employees. Employees themselves can use the data to see their most likely career paths in an organization. Compensation management, another function often found in HCM tools, enables organizations

to create incentive programs, tie compensation to performance goals, and analyze pay packages and trends.

Scheduling work shifts for 27,000 health care professionals in a wide range of specialties and at multiple locations is a formidable task. At Banner Health, a large hospital system based in Phoenix, however, the implementation of the Kronos scheduling application has automated much of the process. Banner uses the Kronos application to log hours worked and to plan schedules, says Kathy Schultz, director of IT at Banner Health.

Integrating data about hours worked with future scheduling helps to ensure that employees aren't expected to work if they've just put in a lot of overtime. "What hours you work isn't always what you were scheduled to work," notes Schultz. "Having scheduling integrated with live time-and-attendance information is extremely critical."

At pharmaceutical giant Novartis AG, sales and research and development professionals are expected to take various classes to keep them up to date on the latest products and trends. With about 550 Web-based and classroom-based courses available, the old paper- and Excel-based process for administering training had become cumbersome and time-consuming. Yet by using Saba Software Inc.'s Learning Suite, administrative work has been reduced by 50 percent, according to John Talanca, head of learning technologies at Novartis. "It's allowed the administrators to be more efficient and take on other work. In the past, they would spend hours and hours each day managing this," says Talanca.

HR applications often contain a variety of employee data, including salaries, experience, education, performance reviews, and benefits selections. Analysis tools can enable HR managers to leverage those data for strategic decision making. They can, for instance, track employee performance against company benchmarks, forecast the skills that will be needed for future projects, analyze salary increases by geographic region or professional field, or predict trends in benefits selection and costs.

For example, OHSU's Tonn hopes eventually to use analysis tools to evaluate recruiting practices more efficiently.

Honing the school's recruiting campaigns could produce better candidates as well as lower costs. "We can see how many applications a particular source gives us, and whether we ever hire applicants from that source. If we do hire them, do they become successful employees? Running an ad in *The Oregonian* might produce a thousand applications. But if we didn't hire any of them, then that was a whole lot of administrative work that didn't bear any fruit."

Organizations such as Tyco are increasingly viewing employees as assets, to be acquired, cultivated, and deployed strategically—not unlike product inventory or IT systems. The very name of the software category, human capital management, conveys the notion that a worker is an investment that should be optimized. "Managers want to see how the people they hired are doing," says Manning. "It's taking the organization's people assets and leveraging them to reach business goals, such as increased sales, profitability, and customer satisfaction."

Individually, the various HCM tools are helpful, but to get optimal value, they need to be integrated, with the data stored in a common repository.

Organizational issues may be in the way, such as if the various HCM functions are split between different corporate departments, or if the HCM suite has to be implemented across multiple business units running disparate ERP and HR applications. Changing your HR system from transactional to strategic can take three to five years, but the important thing is to get started. As we move from an industrial to a knowledge economy, it's not what you manufacture but what your people know that gives you competitive advantage.

Source: Adapted from Sue Hildreth, "HR Gets a Dose of Science," *Computerworld*, February 5, 2007; and Mary Brandel, "HR Gets Strategic," *Computerworld*, January 24, 2005.

CASE STUDY QUESTIONS

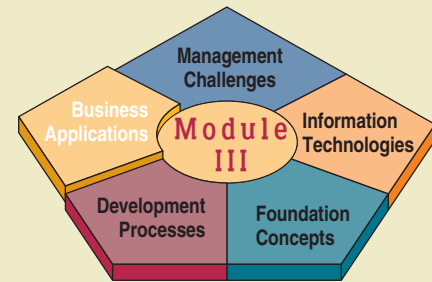
1. What are some of the business benefits of the technologies described in the case? Provide several examples beyond the mere automation of transaction-oriented processes.
2. Do you think the business value of these strategic HRM applications depends on the type of business a company is in, for instance, consulting, manufacturing, or professional services? Why or why not? Explain.
3. What are some of the challenges and obstacles in developing and implementing HRM systems? Are these unique to this type of system? What strategies would you recommend for companies to meet those challenges? Provide several specific recommendations.

REAL WORLD ACTIVITIES

1. The case refers to a view of employees as "assets, to be acquired, cultivated, and deployed strategically—not unlike product inventory or IT systems." It also mentions that these systems allow managers to evaluate and promote people on objective criteria. Do you believe extensive adoption of these technologies may lead to a depersonalization of the employment relationship? Why or why not? Break into small groups to discuss these issues and then summarize your ideas.
2. What are some of the HR trends that seem to be operating behind this renewed emphasis on strategic applications of technology to this functional area? What new developments have recently arisen in this domain? Search the Internet for innovative applications of IT in HRM, and write a report to summarize your findings.

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CHAPTER 8



ENTERPRISE BUSINESS SYSTEMS

Chapter Highlights

Section I

Getting All the Geese Lined Up: Managing at the Enterprise Level

Customer Relationship Management: The Business Focus

Introduction

What Is CRM?

Real World Case: Dow Corning and DirecTV: CRM Goes Mobile

The Three Phases of CRM

Benefits and Challenges of CRM

Trends in CRM

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Enterprise Resource Planning: The Business Backbone

Introduction

What Is ERP?

Real World Case: Kennametal, Haworth, Dana Holding, and Others: ERPs Get a Second Lease on Life

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Introduction

What Is SCM?

Real World Case: Cisco Systems, Black & Decker, and O'Reilly Auto Parts: Adapting Supply Chains to Tough Times

The Role of SCM

Benefits and Challenges of SCM

Trends in SCM

Real World Case: NetSuite Inc., Berlin Packaging, Churchill Downs, and Others: The Secret to CRM Is in the Data

Learning Objectives

After reading and studying this chapter, you should be able to:

1. Identify and give examples to illustrate the following aspects of customer relationship management, enterprise resource management, and supply chain management systems:
 - a. Business processes supported
 - b. Customer and business value provided
 - c. Potential challenges and trends
2. Understand the importance of managing at the enterprise level to achieve maximum efficiencies and benefits.

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SECTION I

Getting All the Geese Lined Up: Managing at the Enterprise Level

Here's a question you probably never expected to find in your information system text: Have you ever noticed how geese fly? They start out as a seemingly chaotic flock of birds but very quickly end up flying in a V-shape or echelon pattern like that shown in Figure 8.1. As you might imagine, this consistency in flying formation is not an accident. By flying in this manner, each bird receives a slight, but measurable, benefit in reduced drag from the bird in front. This makes it easier for all of the birds to fly long distances than if they just took up whatever portion of the sky they happened to find. Of course, the lead bird has the toughest job, but geese have figured out a way to help there, as well. Systematically, one of the birds from the formation will fly up to relieve the current lead bird. In this way, the entire flock shares the load as they all head in the same direction.

Okay, so what does this have to do with information systems? This chapter will focus on systems that span the enterprise and that are intended to support three enterprisewide operations: *customer relationships*, *resource planning*, and *supply chain*. Each operation requires a unique focus and, thus, a unique system to support it, but they all share one common goal: to get the entire organization to line up and head in the same direction, just as the geese do.

We could cover these important enterprise systems in any order, and if we asked three people how to do it, we would likely get three different approaches. For our purposes, we will start with the focus of every business: *the customer*. From there, we will expand our view to the back-office operations and, finally, to systems that manage the movement of raw materials and finished goods. The end result, of course, is that we get all the “geese” in the business to fly in the same direction in as efficient a manner as possible.

FIGURE 8.1

Geese fly in a highly organized and efficient V-shaped formation—much like a well-run business.



Source: © Royalty-Free/Corbis.

Customer Relationship Management: The Business Focus

Introduction

Today, customers are in charge. It is easier than ever for customers to comparison shop and, with a click of the mouse, to switch companies. As a result, customer relationships have become a company's most valued asset. These relationships are worth more than the company's products, stores, factories, Web addresses, and even employees. Every company's strategy should address how to find and retain the most profitable customers possible.

The primary business value of customer relationships today is indisputable. That's why we emphasized in Chapter 2 that becoming a *customer-focused business* was one of the top business strategies that can be supported by information technology. Thus, many companies are implementing *customer relationship management* (CRM) business initiatives and information systems as part of a customer-focused or *customer-centric* strategy to improve their chances for success in today's competitive business environment. In this section, we will explore basic CRM concepts and technologies, as well as examples of the benefits and challenges faced by companies that have implemented CRM systems as part of their customer-focused business strategy. See Figure 8.2.

Let's start with a real-world example. Read the Real World Case on the next page. We can learn a lot about the business benefits (and challenges) of mobile CRM from this example.

What Is CRM?

Managing the full range of the customer relationship involves two related objectives: one, to provide the organization and all of its customer-facing employees with a single, complete view of every customer at every touchpoint and across all channels; and, two, to provide the customer with a single, complete view of the company and its extended channels.

That's why companies are turning to **customer relationship management** to improve their customer focus. CRM uses information technology to create a cross-functional enterprise system that integrates and automates many of the *customer-serving* processes in sales, marketing, and customer services that interact with a company's customers. CRM systems also create an IT framework of Web-enabled software and databases that integrates these processes with the rest of a company's business operations. CRM systems include a family of software modules that provides the tools that enable a business and its employees to deliver fast, convenient, dependable, and consistent service to its customers. Siebel Systems, Oracle, PeopleSoft, SAP AG, and Epiphany are some of the leading vendors of CRM software. Figure 8.3 illustrates some of the major application components of a CRM system. Let's take a look at each of them.

Contact and Account Management

CRM software helps sales, marketing, and service professionals capture and track relevant data about every past and planned contact with prospects and customers, as well as other business and life cycle events of customers. Information is captured from all customer touchpoints, such as telephone, fax, e-mail, the company's Web site, retail stores, kiosks, and personal contact. CRM systems store the data in a common customer database that integrates all customer account information and makes it available throughout the company via Internet, intranet, or other network links for sales, marketing, service, and other CRM applications.

Sales

A CRM system provides sales representatives with the software tools and company data sources they need to support and manage their sales activities and optimize cross-selling and up-selling. Cross-selling is an approach in which a customer of one product or service, say, auto insurance, might also be interested in purchasing a related product or service, say, homeowner's insurance. By using a cross-selling technique, sales representatives can better serve their customers while simultaneously improving their sales. Up-selling

REAL WORLD

CASE

1

Dow Corning and DirecTV:
CRM Goes Mobile

Chip Reeves knows all about the life of a sales guy. That's because during his nearly 20 years at Dow Corning, a global manufacturer of silicon-based products, he was one. He knows all too well that salespeople ignore any new administrative process or technology unless it allows them to make more sales or use their time more efficiently.

Now, as Dow Corning's director of marketing and sales processes, Reeves is leading the company's convergence of its CRM and e-business efforts, as well as streamlining its compliance and reporting functions. The goal, naturally, is to provide excellent customer service—and to make it easy for Dow Corning sales and marketing staff to use the expansive CRM system. *Real easy.*

Reeves also served as the chairman for the Americas SAP User Group's customer management group, so he knows both the power and limitations of enterprise technologies and the reality of how salespeople use CRM tools on mobile devices such as laptops and smart phones.

Both topics are important if you're to bring mobility to corporate applications. Many companies and CIOs are struggling to determine exactly how best to mobilize critical applications that can bring a measurable payback to the company but also limit the disruption to and administrative headaches in their users' lives. "Salespeople don't want to get on their devices for 30 minutes after a sales call," says Christopher Fletcher, a research director who specializes in mobile applications at AMR Research. "Salespeople by nature are independent, autonomous, and don't always play by corporate rules. It's sometimes tough to get them to use what

seems like administrative functions so that management can have better control."

Reeves says he is always balancing the pushback from the sales folks with the CRM demands of the business. "Heavy involvement with the salespeople has been key, and we're trying to be responsive to them," he notes. "But by no means do we have that balance perfected yet."

A huge part of Reeves' task has been to ensure that Dow Corning's core enterprise applications, which rest on SAP's suite of products, are intact and can be used by all users in Dow Corning's sales and marketing group. "A lot of what we've done in the CRM space has been putting a foundation in to help our people work more effectively and give them more access to information," Reeves says.

While Dow Corning had been smoothing out the back-office infrastructure, however, Reeves and his team also had to ensure that salespeople were being listened to and would want to use the mobile devices and applications. His team approached that by "looking at a day in the life of a salesperson," he says. "Thinking through their information and task needs, what were their priorities, what were their common tasks, what were the process pain points."

One thing became immediately clear to Reeves: When equipping mobile teams (such as the sales force), less is always more. He says that he has preached a "low input, high output" strategy that has guided the entire mobile deployment. Adding dozens and dozens of input fields to salespeople's BlackBerry screens, which forces them to do a ton of extra work, is a recipe for disaster. "We've tried to weed out and simplify the processes: What are we going to need to know and how do we need that information," he says. "There's always a logical explanation for why a field is there. But then the question is: Do we really need it? We're constantly trying to move toward a simpler set of questions."

Since first piloting the devices, Reeves says the mobile team has been working with the salespeople to tweak capabilities and address their ongoing concerns. "We are constantly in change-management mode," he says.

For example, there used to be more than a dozen classifications of customer sales opportunities and two screens full of data to input for each sales opportunity. Now there is one opportunity type that can be filled out—on just one screen. Salespeople can get what Reeves calls "quick links" on SAP CRM data on their BlackBerrys simply by clicking an icon. These quick links show critical data, such as each salesperson's sales by customer, open order statuses, and customer complaints (which is important for a salesperson dropping in on a customer). Before the mobile deployment, when a customer asked to check on order status, the Dow Corning sales rep had to call into Dow Corning customer service operations, Reeves notes. Now the sales rep gets that in seconds on his BlackBerry. For Reeves, it all comes back to: "How much quicker can we get that responsiveness?"

FIGURE 8.2



Mobile CRM increases sales productivity and improves relationships with customers.

In addition, the sales lead-generation process has been streamlined for salespeople on the BlackBerrys. Again, the quick links allow them to view critical lead information and input data that's tailored specifically to the mobile device's screen size, Reeves says.

Using the SAP Portal technology that lead generation data flows back into Dow Corning's CRM system "without a salesperson having to open up the CRM application," Reeves notes. So far, he estimates that the simplified lead follow-up via the mobile SAP application saves 15 to 30 minutes per lead and increases the likelihood for follow-up.

Satellite TV provider DirecTV ran into similar challenges when implementing their mobile CRM solution. DirecTV works with more than 6,000 independent dealers who resell its service to residential customers.

Directly serving those distributors is a team of nearly 700 area sales managers, who need critical information, such as financial data, active service requests, and activation and cancellation rates, while in the field. For several years, DirecTV has been a satisfied user of Siebel's CRM On Demand system, but it didn't work for field sales managers who couldn't carry around a laptop, says Erik Walters, a program manager for DirecTV's sales and operations arm. "For our guys, that's not mobile enough."

Walters' team faced an increasingly common problem in companies with mobile sales and field employees, such as Dow Corning and many others: *how to mobilize an existing enterprise application.*

DirecTV coupled the back-end CRM application with mobile middleware from Antenna Software. Antenna creates front-end systems that tap into popular enterprise mobility platforms like BlackBerry and Windows Mobile, providing data to mobile users from various databases via a single integrated interface. "DirecTV has 675 employees using Antenna, vastly increasing the productivity of sales managers," Walters says. In the past, an industrious area sales manager would be lucky to see three or four customers a day; now it's closer to 10 or 12.

The move to a mobilized CRM platform is part of a broader shift in the way DirecTV sales managers interact with dealers. The company is changing how it handles calls

and requests from dealers, Walters says. "Everybody is looking for that 360-degree view of the dealer customer." To get that view, DirecTV will implement the hosted Call Center On Demand product from Siebel parent Oracle for incoming phone queries from dealers. The success of the mobilized CRM On Demand has given the company confidence to move to a more hosted model for its overall relationship with this critical group of resellers.

Enterprise vendors have certainly realized the importance of mobility and have increased their capabilities and offerings, says Fletcher. Shailesh Rao, vice president of product management at SAP, says, "Customers are demanding that every application vendor provide mobile access." Rao uses Dow Corning's situation as an example of the overall trend that CIOs need to realize. "It's not application-centric anymore; it's more scenario-based information access for mobile workers," he says. "We're not so much talking about the applications. I just want to provide the information the business users want and need the most—irrespective of where the information is coming from."

For any CIO starting out on a mobile endeavor right now, AMR's Fletcher offers these pieces of advice. First, before CIOs start any project, figure out what you want to happen at the end of the project, such as exactly what salespeople will get out of the new system and how long it will take to get payback on the rollout. "Know what your business case is and stick to it," he says.

And second, don't forget the carrot with the stick: "You have to tell salespeople, 'You're going to start using this new CRM system, and you're going to be able to give better quotes to customers.' Or 'we promise to give you 40 new qualified leads every month—but you have to put that critical information into the system,'" he says.

At Dow Corning, Reeves says, his salespeople now have a competitive advantage, but it's still early on in the transformation. "I have a lot of excitement at where we're at today and what's possible looking ahead," Reeves says. "But there's more work to do."

Source: Adapted from Thomas Wailgum, "Mobile CRM: Why Less Is More," *CIO.com*, October 19, 2007; and Richard Martin, "DirecTV Gets Truly Mobile CRM," *InformationWeek*, August 11, 2008.

CASE STUDY QUESTIONS

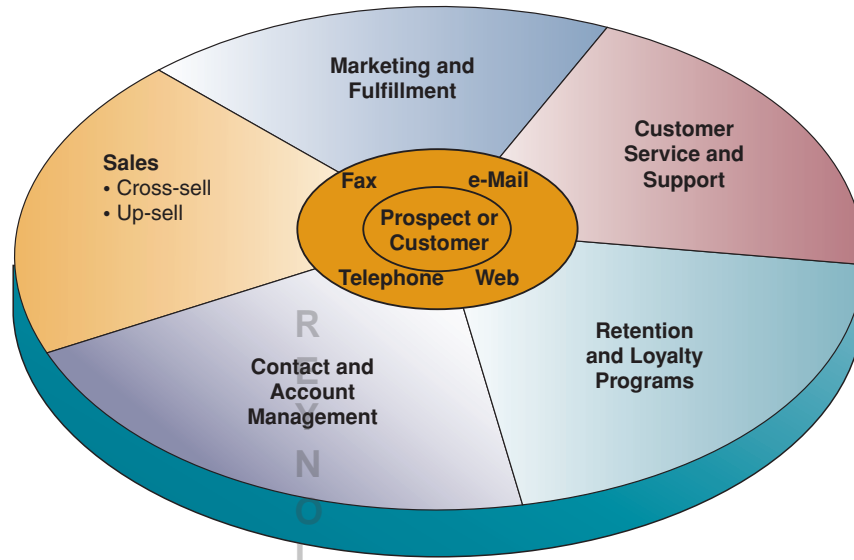
1. Think about the business benefits of the mobile CRM deployments discussed in the case. How did Dow Corning and DirecTV benefit from these applications? What can they do that was not possible before? What were the effects on productivity?
2. Use examples from the case to illustrate your answer.
3. What are some of the reasons that make it so challenging to mobilize an existing enterprise application? How did the companies featured in the case tackle that challenge?
4. Salespeople are generally known for their independence and emphasis on efficient time management, and not always for their willingness to adopt new technologies pushed by management. What were some of the approaches mentioned in the case that were used to foster adoption? What other alternatives can you think of?

REAL WORLD ACTIVITIES

1. Erik Walters of DirecTV notes that a mobile CRM platform is part of the effort in search of the "360-degree view of the customer." What does he mean by that? Go online and research this concept, other companies that are embracing it, and what technologies they employ. Prepare a report to summarize your findings.
2. Both companies emphasize the many benefits accrued from their mobile CRM deployments. Chip Reeves of Dow Corning states that the application provides their salespeople with a competitive advantage. Do you agree with this statement? Why or why not? Break into small groups with your classmates to discuss whether mobile CRM can provide a lasting competitive advantage.

FIGURE 8.3

The major application clusters in customer relationship management.



refers to the process of finding ways to sell a new or existing customer a better product than they are currently seeking. Additional examples include sales prospect and product information, product configuration, and sales quote generation capabilities. CRM also provides real-time access to a single common view of the customer, enabling sales representatives to check on all aspects of a customer's account status and history before scheduling their sales calls. For example, a CRM system would alert a bank sales representative to call customers who make large deposits to sell them premier credit or investment services. Or it would alert a salesperson of unresolved service, delivery, or payment problems that could be resolved through a personal contact with a customer.

Marketing and Fulfillment

CRM systems help marketing professionals accomplish direct marketing campaigns by automating such tasks as qualifying leads for targeted marketing, and scheduling and tracking direct marketing mailings. Then the CRM software helps marketing professionals capture and manage prospect and customer response data in the CRM database, and analyze the customer and business value of a company's direct marketing campaigns. CRM also assists in the fulfillment of prospect and customer responses and requests by quickly scheduling sales contacts and providing appropriate information on products and services to them, while capturing relevant information for the CRM database.

Customer Service and Support

A CRM system provides service reps with software tools and real-time access to the common customer database shared by sales and marketing professionals. CRM helps customer service managers create, assign, and manage requests for service by customers. *Call center* software routes calls to customer support agents based on their skills and authority to handle specific kinds of service requests. *Help desk* software helps customer service reps assist customers who are having problems with a product or service by providing relevant service data and suggestions for resolving problems. Web-based self-service enables customers to access personalized support information easily at the company Web site, while it gives them an option to receive further assistance online or by phone from customer service personnel.

Retention and Loyalty Programs

Consider the following:

- It costs six times more to sell to a new customer than to sell to an existing one.
- A typical dissatisfied customer will tell 8 to 10 people about his or her experience.
- A company can boost its profits 85 percent by increasing its annual customer retention by only 5 percent.

FIGURE 8.4 A proposed report format for evaluating the customer retention performance of Charles Schwab & Co.

	Navigation	Performance	Operations	Environment
Customer Retention	Customer retention rate	Retention rate by customer cohort	Percentage of customers who are active Web users	Competitors' offers
	Household retention rate	Retention rate by customer segment	Percentage of customers who interact via e-mail	Share of portfolio
	Average customer tenure	Customer loyalty rating	Decline in customer activity Propensity to defect	Comparative retention Comparative customer tenure
Customer Experience	Satisfaction by customer segment	Customer satisfaction by:	Elapsed time for commonly performed tasks	Comparative satisfaction:
	Satisfaction by cohort	• Task	Accuracy of Web search results	Competitors:
	Satisfaction by customer scenario	• Touchpoint	Percentage of trades executed with price improvement	• Other online brokers
		• Channel partner	Percentage of e-mails answered accurately in one hour	• Other financial service firms
Customer Spending		End-to-end performance by scenario		• All products and services
		Customer satisfaction with quality of information provided		
	Average revenue per customer	Revenues per customer segment	Daily log-ins at market opening	Total brokerage assets
	Average profitability per customer	Profits per customer segment	Revenue trades per day	Growth in brokerage assets
	Growth in customer assets	Growth in customer assets per segment	Percentage increase in customer assets	
	Customer lifetime value		Cost to serve by touchpoint	

- The odds of selling a product to a new customer are 15 percent, whereas the odds of selling a product to an existing customer are 50 percent.
- Seventy percent of complaining customers will do business with the company again if it takes care of a service problem quickly.

That's why enhancing and optimizing customer retention and loyalty is a major business strategy and primary objective of customer relationship management. CRM systems try to help a company identify, reward, and market to their most loyal and profitable customers. CRM analytical software includes data mining tools and other analytical marketing software, while CRM databases may consist of a customer data warehouse and CRM data marts. These tools are used to identify profitable and loyal customers and to direct and evaluate a company's targeted marketing and relationship marketing programs toward them. Figure 8.4 is an example of part of a proposed Web-based report format for evaluating Charles Schwab & Co.'s customer retention performance.

Zip Realty: E-Mail and CRM Integration with Open-Source Zimbra

Back in 2005, Joe Trifoglio, CIO of Zip Realty, needed a new e-mail system for his 2,500 real estate agents spread out across 14 major metropolitan areas. His home-grown, open-source e-mail client worked well, but he needed something that would work on top of his custom-built CRM system, known internally as ZAP, the Zip Agent Platform. Prior to shopping for a new messaging system, Trifoglio's real estate agents toggled between their e-mail and CRM app, and had to manually input a lot of information (such as appointments) between the two.

There were a variety of Web-based e-mail clients for Trifoglio to choose from, including Google and its Google Apps. But because Zip Realty built its CRM system completely from scratch and on Java and open-source components, Trifoglio needed a messaging system built on similar principles. He picked the open-source, Yahoo-owned Zimbra, an e-mail, calendar, and chat (instant messaging) client.

Trifoglio noted that other vendors offered the same features, such as e-mail and instant messaging, “but they had little ability to integrate with our internal systems [mainly ZAP].” After what he describes as moderate development work, Trifoglio says the e-mail system now is embedded on top of his customized CRM, allowing his real estate agents to book showings with better efficiency than ever before.

For example, at the front end of Zip’s Web site, people can book appointments with realtors to look at residential properties. That information is fed from the front end of the Web site into Zip’s CRM system. Typically, agents had to do a lot of the data input between the CRM app and their calendar app. Now, with Zimbra on top of ZAP, it happens more easily.

When agents come in, they now have a single sign-on that logs them onto both CRM and e-mail at once. With Zimbra, they can also add Zimlets—which are essentially plug-ins, such as one for easy calendaring—that get embedded on top of the application.

“The agents are much happier because it’s more feature rich,” Trifoglio says. “The system allows end-users to use Web 2.0 features, like tagging emails and searching mail.”

He says Zimbra also works well on Windows mobile phones, which will be critical for the agents on the move. Currently, agents are testing the Zimbra app on their mobile, and they have given Trifoglio only positive feedback.

Another upside to a Zimbra implementation?

“As far as the cost of purchasing the software, it’s a fraction of what it would cost to do Exchange or Lotus Notes or something like that,” Trifoglio says.

Source: Adapted from C.G. Lynch, “CRM Collaboration: Real Estate Firm Implements Zimbra for All Its Agents,” *CIO.com*, June 27, 2008.

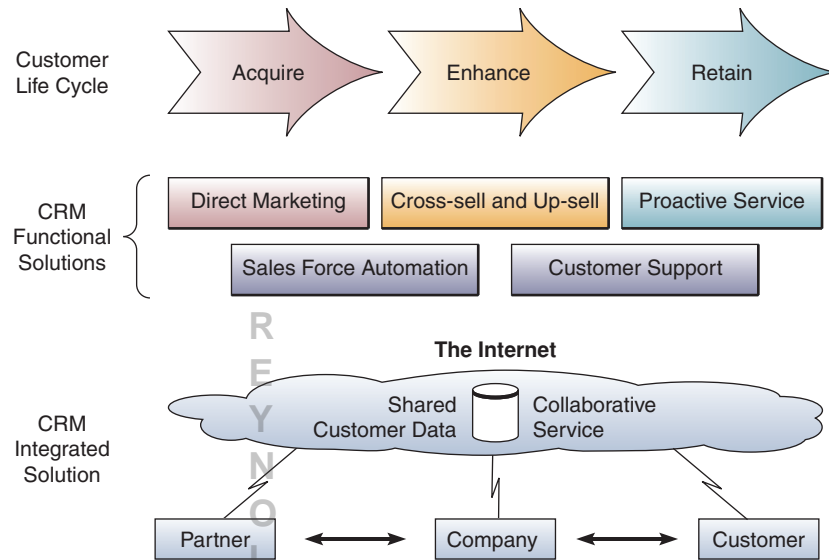
The Three Phases of CRM

Figure 8.5 illustrates another way to think about the customer and business value and components of customer relationship management. We can view CRM as an integrated system of Web-enabled software tools and databases accomplishing a variety of customer-focused business processes that support the three phases of the relationship between a business and its customers.

- **Acquire.** A business relies on CRM software tools and databases to help it acquire new customers by doing a superior job of contact management, sales prospecting, selling, direct marketing, and fulfillment. The goal of these CRM functions is to help customers perceive the value of a superior product offered by an outstanding company.
- **Enhance.** Web-enabled CRM account management and customer service and support tools help keep customers happy by supporting superior service from a responsive networked team of sales and service specialists and business partners. In addition, CRM sales force automation and direct marketing and fulfillment tools help companies cross-sell and up-sell to their customers, thus increasing their profitability to the business. The value the customers perceive is the convenience of one-stop shopping at attractive prices.

FIGURE 8.5

How CRM supports the three phases of the relationship between a business and its customers.



- **Retain.** CRM analytical software and databases help a company proactively identify and reward its most loyal and profitable customers to retain and expand their business via targeted marketing and relationship marketing programs. The value the customers perceive is of a rewarding personalized business relationship with “their company.”

Benefits and Challenges of CRM

The potential business benefits of customer relationship management are many. For example, CRM allows a business to identify and target its best customers—those who are the most profitable to the business—so they can be retained as lifelong customers for greater and more profitable services. It makes possible real-time customization and personalization of products and services based on customer wants, needs, buying habits, and life cycles. CRM can also keep track of when a customer contacts the company, regardless of the contact point. In addition, CRM systems can enable a company to provide a consistent customer experience and superior service and support across all the contact points a customer chooses. All of these benefits would provide strategic business value to a company and major customer value to its customers.

Continental Airlines: Getting to Know Your Customers

Wouldn't it be nice if just once, one of those surly airline employees offered a sincere and unequivocal apology for losing your luggage or for a delayed flight? If you fly first class with Continental Airlines, you may finally get that apology.

Since 2001, the Houston-based carrier has been enhancing the in-flight reports it provides to flight attendants just before takeoff with more detailed information on passengers. For example, in addition to indicating which passengers ordered special meals, the expanded reports flag the airline's high-value customers and detail such things as whether they've had their luggage lost in the recent past or experienced a delayed flight. Armed with this information, flight attendants can now approach these customers during the flight to apologize for the inconveniences.

Such high-touch, personalized service increases customer loyalty, particularly among Continental's most valuable patrons, and that loyalty in turn drives revenue.

Continental breaks customers into different levels of profitability: Since building its new system, the airline reports earning an average of \$200 in revenue from each of its 400,000 valuable customers, and an additional \$800 in revenue from each of

the 35,000 customers it places in its most profitable tier—all because it accords them better service.

Continental's desire to improve its ranking in a competitive industry drove it to build a real-time enterprise data warehouse (EDW). When the EDW was first being developed in 1998, its initial purpose was to bring data from some 27 systems together so that the company could more accurately forecast revenue. Since then, the company has used it to determine whether customer loyalty initiatives really affect revenue. By testing a sample of 30,000 customers who experienced delays, Continental found that those individuals to whom the airline sent a letter of apology and some sort of compensation (either in the form of a free cocktail on their next flight or extra frequent flier miles) forgot the event and didn't hold a grudge. In fact, Continental says that revenue from those passengers who received letters jumped 8 percent.

Using operational and customer data in the EDW, the data warehousing team developed a solution to one of the biggest headaches gate agents face: accommodating passengers inconvenienced by a cancellation or delay. The team created a program that automates the rebooking process. Before the program was developed, gate agents had to figure out on their own how to reroute passengers. Now, when a cancellation or delay occurs, the system does the work for them. For example, when the system identifies a high-value customer whose flight has been cancelled, the gate agent may decide to put that traveler on a competitor's flight just to make the individual happy and to get him on his way as fast as possible.

"Before the data warehouse, the person who yelled the loudest got the best service. Now our most valuable customers get the best service," says Alicia Acebo, Continental's data warehousing director.

Source: Adapted from Meridith Levinson, "Getting to Know Them," *CIO Magazine*, May 9, 2007.

CRM Failures

The business benefits of customer relationship management are not guaranteed and, instead, have proven elusive at many companies. Surveys by industry research groups include a report that more than 50 percent of CRM projects did not produce the results that were promised. In another research report, 20 percent of businesses surveyed reported that CRM implementations had actually damaged long-standing customer relationships. Furthermore, in a survey of senior management satisfaction with 25 management tools, CRM ranked near the bottom in user satisfaction, even though 72 percent expected to have CRM systems implemented shortly.

The common wisdom of why CRM systems fail includes:

- Lack of senior management sponsorship
- Improper change management
- Elongated projects that take on too much, too fast
- Lack of or poor integration between CRM and core business systems
- Lack of end-user incentives leading to poor user adoption rates

Despite the above, research shows that the major reason for CRM failure is a familiar one: lack of understanding and preparation. Too often, business managers rely on a major new application of information technology (like CRM) to solve a business problem without first developing the business process changes and change management programs that are required. For example, in many cases, failed CRM projects were implemented without the participation of the business stakeholders involved. Therefore, employees and customers were not prepared for the new processes or challenges that were part of the new CRM implementation. We will discuss the topic of failures in information technology management, system implementation, and change management further in later chapters.

Unum Group: The Long Road to CRM

The multiple mergers that formed insurer Unum Group in the late 1990s aggregated billions in revenue, assembled thousands of employees, and created a quagmire of customer data systems that couldn't talk to each other. In all, with Provident, Colonial, Paul Revere, and Unum, there were 34 disconnected policy and claims back-office systems, all loaded with critical customer data. As a result, "it was very difficult to get your hands around the information," understates Bob Dolmovich, Unum Group's vice president of business integration and data architecture. One Unum Group customer's account, for instance, might exist in multiple places within the newly combined company, leading, of course, to a great deal of waste.

For the first couple of years after the mergers, Unum Group used a homegrown data-store solution as a quick fix. But by 2004, the \$10 billion disability insurer felt compelled to embark on a new master data management strategy aimed at uniting the company's disparate pockets of customer data, including account activity, premiums, and payments.

Integral to Unum Group's strategy would be a customer data integration (CDI) hub, built on service-oriented architecture, using a standard set of protocols for connecting applications via the Web (in effect, Web services). The project, begun in early 2005, has already improved data quality, soothed the multiple customer records headaches, and created the possibility for a companywide, in-depth customer analysis. But as Dolmovich acknowledges, there's still a long way to go. Of those original 34 systems, he has been able to get rid of only four to date. But he's still optimistic.

Despite the long, slow slog, Dolmovich is hoping that the new CDI approach will ultimately give his company the 360-degree view of the customer that has been promised by vendors since the dawn of CRM. In the late 1990s, enterprise software vendors like Oracle, PeopleSoft, and Siebel sold the single-customer view as CRM's holy grail.

But implementation flameouts and legacy integration nightmares soured many CIOs on these expensive enterprisewide rollouts. A CDI hub differs from a traditional CRM solution in that a CDI hub allows a company to automatically integrate all of its customer data into one database, while ensuring the quality and accuracy of the data before they are sent to the hub's central store for safekeeping.

A stand-alone CRM system can't do that because it can't be integrated with the billing, marketing, ERP, and supply chain systems that house customer data, and it has no way to address inconsistent data across platforms.

Dolmovich says the first data loaded into the CDI hub in late 2005 came from business customers and brokers. With the new system, Dolmovich says, "We are now able to assimilate and display a broker's entire block of business and create some statistics and a profile of our relationship with that broker." Unum Group is now working to create individual profiles of employer customers so that every time a new customer account is created or accessed—perhaps to change an address or add new customer information—all employees of the insurance company, regardless of which system they are using, will see that change at the same time. "The desired end state is a CDI hub that has information about all customers across all products," he says.

Source: Adapted from Thomas Wailgum, "The Quest for Customer Data Integration," *CIO Magazine*, August 1, 2006.

Trends in CRM

Increasingly, enterprises must create tighter collaborative linkages with partners, suppliers, and customers, squeezing out time and costs while enhancing the customer experience and the total value proposition.

Figure 8.6 outlines four types or categories of CRM that are being implemented by many companies today and summarizes their benefits to a business. These categories may also be viewed as stages or trends in how many companies implement

FIGURE 8.6 Many companies are implementing CRM systems with some or all of these capabilities.

Types of CRM	Business Value
Operational CRM	<ul style="list-style-type: none"> • Supports customer interaction with greater convenience through a variety of channels, including phone, fax, e-mail, chat, and mobile devices • Synchronizes customer interactions consistently across all channels • Makes your company easier to do business with
Analytical CRM	<ul style="list-style-type: none"> • Extracts in-depth customer history, preferences, and profitability information from your data warehouse and other databases • Allows you to analyze, predict, and derive customer value and behavior and forecast demand • Lets you approach your customers with relevant information and offers that are tailored to their needs
Collaborative CRM	<ul style="list-style-type: none"> • Enables easy collaboration with customers, suppliers, and partners • Improves efficiency and integration throughout the supply chain • Allows greater responsiveness to customer needs through sourcing of products and services outside of your enterprise
Portal-Based CRM	<ul style="list-style-type: none"> • Provides all users with the tools and information that fit their individual roles and preferences • Empowers all employees to respond to customer demands more quickly and become truly customer-focused • Provides the capability to instantly access, link, and use all internal and external customer information

Source: Adapted from mySAP Customer Relationship Management, mySAP.com, 2001, p. 7; and Brian Caulfield, "Toward a More Perfect (and Realistic) e-Business," *Business 2.0*, January 2002, p. 80.

CRM applications, and the figure also outlines some of the capabilities of CRM software products. Most businesses start out with operational CRM systems such as sales force automation and customer service centers. Then analytical CRM applications are implemented using several analytical marketing tools, such as data mining, to extract vital data about customers and prospects for targeted marketing campaigns.

Increasingly, businesses are moving to *collaborative* CRM systems, to involve business partners and customers in collaborative customer services. This includes systems for customer self-service and feedback, as well as **partner relationship management** (PRM) systems. PRM applications apply many of the same tools used in CRM systems to enhance collaboration between a company and its business partners, such as distributors and dealers, to coordinate and optimize sales and service to customers across all marketing channels. Finally, many businesses are building Internet, intranet, and extranet Web-based CRM portals as a common gateway for various levels of access to all customer information, as well as operational, analytical, and collaborative CRM tools for customers, employees, and business partners. Let's look at a real-world example.

Integrated CRM: Hilton's Welcome Mat Starts on the Web

Consider this: A businessman is traveling to Chicago tomorrow. He logs on to Hilton's Web site and decides to stay at Homewood Suites, one of Hilton hotels' nine chains. Next, he goes to the hotel's digital floor plan, takes a look at the rooms available, picks one on the top floor, far from the pool but close to the elevator, and checks in online. When he gets to the hotel the next day, his key is at the front desk, and the desk clerk welcomes him by name. When he gets to his room, he finds feather pillows and the local newspaper, just as he prefers.

IT-facilitated customer service is what Hilton is all about. From a do-it-all customer information system to self-service kiosks in hotel lobbies to richly interactive Web sites, its singular goal is to keep customers coming back.

CIO Tim Harvey says Hilton's strong tech portfolio is part of the formula that lets the hotel chain charge more than competitors and still fill up rooms. Revenue per room across Hilton brands is more than 7 percent above the industry average, and as much as 28 percent more at Hampton Inn. "Customers are willing to pay more to stay in our hotels for some reason, and the technology enables that," Harvey says.

Hilton doesn't view technology as a cost center, but rather as an enabler of nearly all business processes. The tech team asks, "What value can I add above and beyond the traditional role of IT?" says Chuck Scoggins, vice president of distribution CRM and pricing technology. Hilton's signature IT project is OnQ, a (mostly) internally developed platform for property management, reservations, e-commerce, and CRM.

OnQ includes 3.5 terabytes of data on 22.5 million guests, and the company is spending \$20 million to expand it worldwide.

Harvey credits OnQ with letting Hilton build a reservation system to book large blocks of rooms and conference areas for \$10 million and roll it out ahead of schedule. It was Hilton's drive to make sites more interactive that led to the Homewood Suites feature to choose a room by floor plan, the way we can choose airline seats. Homewood, where guests typically stay longer, lagged in online and phone bookings. "People were doing research online, but they just weren't finding what they were looking for," says Scoggins.

Suite Selection lets guests select rooms from floor diagrams, view photos of rooms, and reserve a specific room up to 36 hours before arrival. More than half of those polled by Hilton said Suite Selection improved their travel experience. Homewood now ranks among the top two Hilton properties for online check-ins, with 22 percent of guests doing so.

Whatever the future holds, Hilton can count on one thing: IT will be expected to play a central role in keeping customers happy and coming back.

Source: Adapted from J. Nicholas Hoover, "Hilton's Welcome Mat Starts on the Web," *InformationWeek*, September 15, 2008.

SECTION II

Enterprise Resource Planning:
The Business Backbone

Introduction

What do Microsoft, Coca-Cola, Cisco, Eli Lilly, Alcoa, and Nokia have in common? Unlike most businesses, which operate on 25-year-old back-office systems, these market leaders reengineered their businesses to run at breakneck speed by implementing a transactional backbone called enterprise resource planning (ERP). These companies credit their ERP systems with having helped them reduce inventories, shorten cycle times, lower costs, and improve overall operations.

Businesses of all kinds have now implemented *enterprise resource planning* (ERP) systems. ERP serves as a cross-functional enterprise backbone that integrates and automates many internal business processes and information systems within the manufacturing, logistics, distribution, accounting, finance, and human resource functions of a company. Large companies throughout the world began to install ERP systems in the 1990s as a conceptual framework and catalyst for reengineering their business processes. ERP also served as the vital software engine needed to integrate and accomplish the cross-functional processes that resulted. Now, ERP is recognized as a necessary ingredient that many companies need in order to gain the efficiency, agility, and responsiveness required to succeed in today's dynamic business environment. See Figure 8.7.

Read the Real World Case on the next page. We can learn a lot about some of the challenges faced by ERP adopters from this case.

What Is ERP?

ERP is the technological backbone of e-business, an enterprisewide transaction framework with links into sales order processing, inventory management and control, production and distribution planning, and finance.

Enterprise resource planning is a cross-functional enterprise system driven by an integrated suite of software modules that supports the basic internal business processes of a company. For example, ERP software for a manufacturing company will typically process the data from and track the status of sales, inventory, shipping, and invoicing, as well as forecast raw material and human resource requirements. Figure 8.8 presents the major application components of an ERP system. Figure 8.9 illustrates some of the key cross-functional business processes and supplier and customer information flows supported by ERP systems.

ERP gives a company an integrated real-time view of its core business processes, such as production, order processing, and inventory management, tied together by the ERP application software and a common database maintained by a database management system. ERP systems track business resources (such as cash, raw materials, and production capacity), and the status of commitments made by the business (such as customer orders, purchase orders, and employee payroll), no matter which department (manufacturing, purchasing, sales, accounting, and so on) has entered the data into the system.

ERP software suites typically consist of integrated modules of manufacturing, distribution, sales, accounting, and human resource applications. Examples of manufacturing processes supported are material requirements planning, production planning, and capacity planning. Some of the sales and marketing processes supported by ERP are sales analysis, sales planning, and pricing analysis, while typical distribution applications include order management, purchasing, and logistics planning. ERP systems support many vital human resource processes, from personnel requirements planning to salary and benefits administration, and accomplish most required financial record-keeping and managerial accounting applications. Figure 8.10 illustrates the processes supported by the ERP system that the Colgate-Palmolive Company installed. Let's take a closer look at Colgate's experience with ERP.

REAL WORLD

CASE

2

Kennametal, Haworth, Dana Holding, and Others: ERPs Get a Second Lease on Life

Kennametal, a \$2 billion maker of construction tools, has spent \$10 million on ERP maintenance contracts during the past 13 years and not once could the company take advantage of upgrades, says CIO Steve Hanna. The company's implementation was too customized: The time and effort needed to tweak and test the upgrade outweighed any benefits, he says. But Hanna kept trying. Recently, he priced the cost of consultants to help with an ERP re-implementation and was shocked by estimates ranging from \$15 million up to \$54 million.

The major ERP suites are "old and not as flexible as some newer stuff, and they can't build flexibility in," Hanna says. "Modifying it takes our time and money and training." His ears practically steam from frustration. "You tell me: What am I missing here?"

Kennametal is like many companies when it comes to ERP. The software is essential but, unlike when it was new, it now offers scant opportunity for a business to set itself apart from its competition. It certainly doesn't help bring in new revenue, and running it eats up an increasing share of the IT budget. Yet longtime ERP users aren't pitching the technology.

Companies still need it for managing supply chain, financial, and employee data.

As Hanna and other CIOs are finding, however, behemoth ERP systems are inflexible. Meanwhile, high-priced maintenance plans and vendors' slowness to support new technologies such as mobile and cloud computing mean that, without careful management, the ERP technology woven through your company can become a liability.

Your ERP system probably won't collapse if you do nothing; it's not like legacy mainframe applications were a

decade ago. But just as you had to adapt your approach to managing mainframes in order to maintain their value in an age of faster, cheaper Web-based apps, you now need to do the same with ERP. So it's time to rethink business processes, drive a harder bargain on maintenance fees, and find ways to marry ERP to emerging technologies. Achieving an ERP system that delivers future value means managing it differently here and now.

New ERP license revenue dropped by about 24 percent, according to Forrester Research—one effect of the general decline in software spending during 2009. This means vendors are hungry for new business. They'll offer software deals to tempt CIOs who had put off upgrades or who want to install completely new systems to get the latest capabilities.

Yet CIOs need to tread carefully: What used to be a good deal may not be anymore. Steve Stanec is vice president of information systems at Piggly Wiggly Carolina, a privately held supermarket chain with 105 stores, most in the southeast United States. Stanec says he and other CIOs must depart from the traditional ERP script, where, after lengthy negotiations, vendors hand over software and charge hefty ongoing fees. CIOs must avoid falling into the same ERP traps they once did, he says.

Buying and installing ERP was never a cakewalk. Today, though, ERP is the Jack Nicholson of software: With a hackneyed repertoire, the old and expensive dog finds it hard to learn new tricks. It's become a legacy technology, and CIOs are now finding new ways to manage ERP projects and the ongoing upkeep. Their best advice: Draw a clear project map and modify the software only as a last resort.

Haworth, a \$1.7 billion office furniture manufacturer, will use tools from iRise to visually plan its rollouts of SAP systems in its major offices on four continents. To get employees accustomed to changes before rollout, the iRise tools simulate how the finished SAP system will look. The company also uses a sales compensation application from Vertex because SAP doesn't support the complicated, multitiered compensation model Haworth uses to pay its salespeople, says CIO Ann Harten. These choices stem from Harten's decision to make no custom changes to the core SAP code. The idea is to streamline the implementation project, which started in 2006, and to make future upgrades easier.

Modifying the core is expensive both when you do it and as you live with it, she says. "Next time the vendor does a version upgrade or a patch, your testing requirements are increased several fold," she says. "You want to avoid this at all costs."

ERP of the future is as plain-Jane as possible, agrees Hanna, the Kennametal CIO. The fact that it can take an army of developers to build new features into ERP suites slows the vendors down. But it's also an obstacle for customers. The 6,446 customizations—Hanna counted them—that Kennametal made to its ERP software over the years prevented the company from taking advantage of new technology

FIGURE 8.7



Companies are starting to question the value of ERP customization and maintenance fees.

Source: Patrice Latron/Corbis.

its vendor did build in. “We couldn’t implement one single enhancement pack ever,” he says.

So even if Hanna could pay up to \$54 million for integrators and consultants to help Kennametal move to the latest version of the ERP suite, he doesn’t want to. Instead, he plans to turn Kennametal’s old ERP management strategy on its head by putting in as vanilla a version of SAP as possible. Hanna and CEO Carlos Cardoso are willing to change Kennametal’s internal business processes to match the way SAP works, Hanna says, rather than the other way around.

Kennametal will also take on the implementation itself.

Hanna hired IBM to consult about requirements definitions and to identify business processes that must be revamped to conform to SAP’s procedures. Meanwhile, Kennametal staff will do the legwork. Hanna and Cardoso have committed to the board of directors to have the job done in eight months, he says, implementing at least 90 percent of the SAP software unmodified. The project is so important to Kennametal that it must succeed in order for the company’s leaders, including Hanna and Cardoso, to achieve their performance goals for the year. “I’m going to make it work,” says Hanna.

Because Kennametal’s ERP system has been unable to keep up with changing technologies, Hanna says the company never benefitted from the millions in maintenance fees it paid to cover upgrades. “We paid maintenance for nothing.”

Doug Tracy, CIO at Dana Holding, researched analyst firm estimates about where maintenance money actually goes and found that 90 percent of those fees are pure profit for the vendor. For Tracy, there is no more time or tolerance for vendor games.

The \$8.1 billion auto parts supplier has in recent years fought a hostile takeover attempt as well as been in, then emerged from, Chapter 11 bankruptcy protection. Then the auto market tanked, and Dana’s sales reflected the 30 percent to 70 percent decline. The company had to scale back some ERP projects, and Dana wanted its vendors to work with them to reduce fees. Tracy declines to name Dana’s main ERP vendor but says he wasn’t getting the deal he was looking for.

Dana’s vendor didn’t lie down. To try to persuade Tracy that maintenance fees are valuable, the vendor analyzed Dana’s use of its support, he says. The findings: Dana made 21,000 requests to the vendor between January and September 2009. About 98 percent of them didn’t involve human intervention; they were automated lookups on the vendor’s knowledge base. “We’re not getting much,” Tracy concluded.

So Tracy stopped making maintenance payments to his main ERP vendor as of December 31, 2009. “That’s a risky strategy, though not as risky as vendors would have you believe,” he says. One result of the move away from provider support is that Dana’s internal IT people have to be more savvy about the ERP systems the company relies on—and able to fix what may go wrong. But, he says, there have been no technological show-stoppers in years because ERP, like other legacy systems, is mature and reliable. Plus, there’s plenty of ERP talent.

Eliminating maintenance saves money, because Dana is no longer paying for a service of questionable value, and it sets a precedent with the company’s other ERP vendors. “You have to show value every step of the way,” Tracy tells his suppliers. “If you try to hold us hostage, I will call what I see as a bluff and just stop payment.”

CIOs have to take charge of what the future of ERP is going to be. Treating ERP as legacy IT may be hard for some who have invested so much time and energy in planning, implementing, and tweaking these systems.

But adopting this mindset will help CIOs move ERP—and their companies—ahead. Modifying the base applications judiciously, if at all, will minimize expense and time devoted to software that now provides the most basic functionality. Everyone does accounts payable, notes Stanec at Piggly Wiggly, so don’t waste time customizing it.

Further out, Stanec, for one, dreams of seeing ERP vendors develop packages that help companies generate revenue. “Then,” he says, “we’d have something interesting to negotiate.”

Source: Adapted from Kim S. Nash, “Reviving ERP,” *CIO Magazine*, February 1, 2010.

CASE STUDY QUESTIONS

1. Why does ERP customization lead to so many headaches when it is time to upgrade?
2. Why were the systems customized in the first place?
3. Cutting payments outright to ERP vendors may not be possible for smaller companies without the in-house resources that larger organizations have. Are they at the mercy of the software providers? What other alternatives do small companies have? Provide some recommendations.
4. Kennametal CIO complains that they “paid maintenance for nothing.” Who do you think is responsible for that state of affairs? Kennametal? The ERP vendor? Both? Justify your answer.

REAL WORLD ACTIVITIES

1. What offerings are available in the ERP marketplace today that were not available when the companies mentioned in the case first started investing in the technology? What new functionality do these offerings have? Research current ERP alternatives and prepare a report comparing their major features.
2. Should companies scrap their existing ERP implementations and start from scratch again, or should they keep trying to make their existing investments pay off? What are the advantages and disadvantages of each approach? Break into small groups to discuss these issues.

FIGURE 8.8

The major application components of enterprise resource planning demonstrate the cross-functional approach of ERP systems.

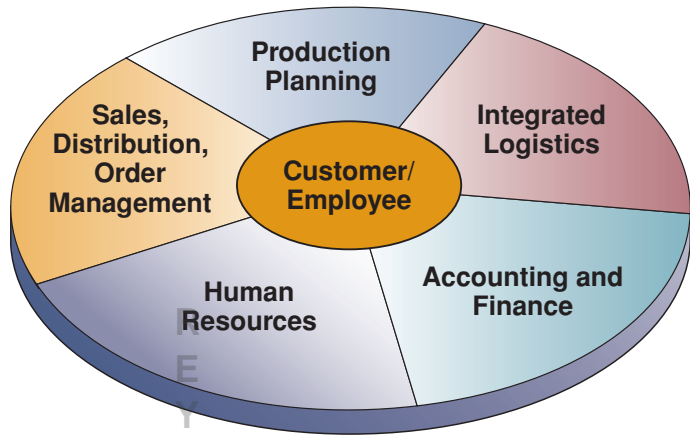


FIGURE 8.9

Some of the business process flows and customer and supplier information flows supported by ERP systems.

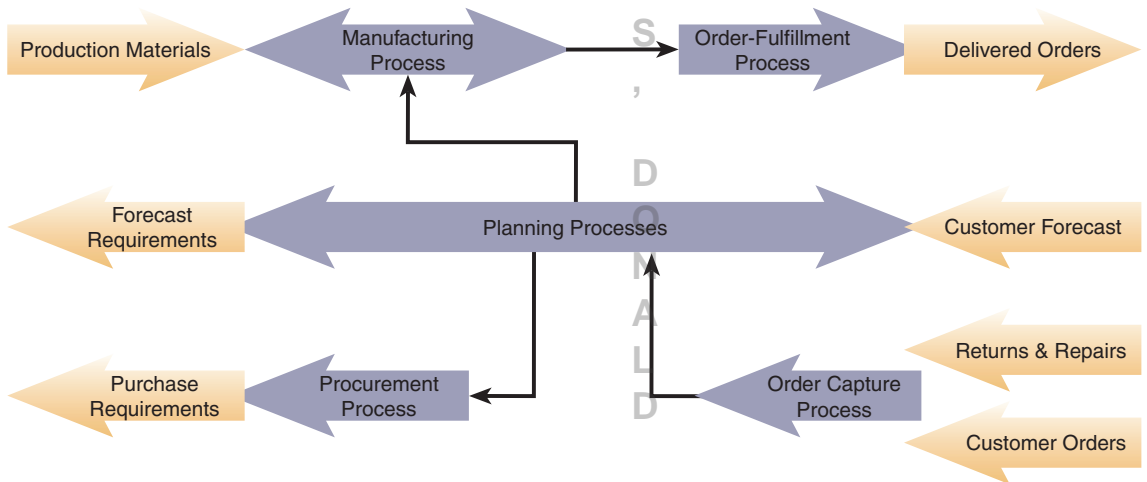
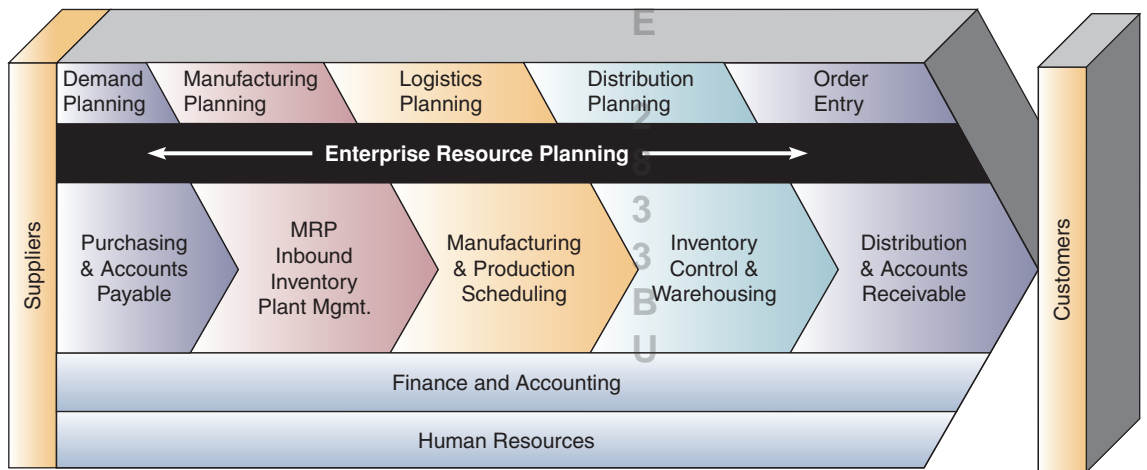


FIGURE 8.10

The business processes and functions supported by the ERP system implemented by the Colgate-Palmolive Company.



Colgate-Palmolive: The Business Value of ERP

Colgate-Palmolive is a global consumer products company that implemented the SAP R/3 enterprise resource planning system. Colgate embarked on an implementation of SAP R/3 to allow the company to access more timely and accurate data, get the most out of working capital, and reduce manufacturing costs. An important factor for Colgate was whether it could use the software across the entire spectrum of the business. Colgate needed the ability to coordinate globally and act locally. The implementation of SAP across the Colgate supply chain contributed to increased profitability. Now installed in operations that produce most of Colgate's worldwide sales, SAP was expanded to all Colgate divisions worldwide. Global efficiencies in purchasing—combined with product and packaging standardization—also produced large savings.

- Before ERP, it took Colgate U.S. anywhere from one to five days to acquire an order, and another one to two days to process the order. Now, order acquisition and processing combined take four hours, not up to seven days. Distribution planning and picking used to take up to four days; today, they take 14 hours. In total, the order-to-delivery time has been cut in half.
- Before ERP, on-time deliveries used to occur only 91.5 percent of the time, and cases ordered were delivered correctly 97.5 percent of the time. After R/3, the figures are 97.5 percent and 99.0 percent, respectively.
- After ERP, domestic inventories have dropped by one-third, and receivables outstanding have dropped to 22.4 days from 31.4. Working capital as a percentage of sales has plummeted to 6.3 percent from 11.3 percent. Total delivered cost per case has been reduced by nearly 10 percent.

Benefits and Challenges of ERP

As the example of Colgate-Palmolive has just shown, ERP systems can generate significant business benefits for a company. Many other companies have found major business value in their use of ERP in several basic ways:

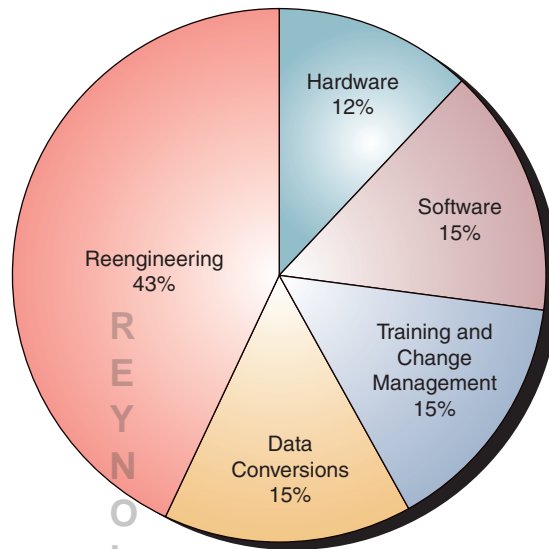
- **Quality and efficiency.** ERP creates a framework for integrating and improving a company's internal business processes that results in significant improvements in the quality and efficiency of customer service, production, and distribution.
- **Decreased costs.** Many companies report significant reductions in transaction processing costs and hardware, software, and IT support staff compared to the nonintegrated legacy systems that were replaced by their new ERP systems.
- **Decision support.** ERP provides vital cross-functional information on business performance to managers quickly to significantly improve their ability to make better decisions in a timely manner across the entire business enterprise.
- **Enterprise agility.** Implementing ERP systems breaks down many former departmental and functional walls or "silos" of business processes, information systems, and information resources. This results in more flexible organizational structures, managerial responsibilities, and work roles, and therefore a more agile and adaptive organization and workforce that can more easily capitalize on new business opportunities.

The Costs of ERP

An ERP implementation is like the corporate equivalent of a brain transplant. We pulled the plug on every company application and moved to PeopleSoft software. The risk was certainly disruption of business because if you do not do ERP properly, you can kill your company, guaranteed.

FIGURE 8.11

Typical costs of implementing a new ERP system.



So says Jim Prevo, CIO of Green Mountain Coffee of Vermont, commenting on their successful implementation of an ERP system. Though the benefits of ERP are many, the costs and risks are also considerable, as we will continue to see in some of the real-world cases and examples in the text. Figure 8.11 illustrates the relative size and types of costs of implementing an ERP system in a company. Notice that hardware and software costs are a small part of total costs, and that the costs of developing new business processes (reengineering) and preparing employees for the new system (training and change management) make up the bulk of implementing a new ERP system. Converting data from previous legacy systems to the new cross-functional ERP system is another major category of ERP implementation costs.

The costs and risks of failure in implementing a new ERP system are substantial. Most companies have had successful ERP implementations, but a sizable minority of firms experienced spectacular and costly failures that heavily damaged their overall business. Big losses in revenue, profits, and market share resulted when core business processes and information systems failed or did not work properly. In many cases, orders and shipments were lost, inventory changes were not recorded correctly, and unreliable inventory levels caused major stock-outs to occur for weeks or months. Companies like Hershey Foods, Nike, A-DEC, and Connecticut General sustained losses running into hundreds of millions of dollars in some instances. In the case of FoxMeyer Drugs, a \$5 billion pharmaceutical wholesaler, the company had to file for bankruptcy protection and then was bought out by its arch competitor, McKesson Drugs.

The most recent example of ERP failure is Shane Co., the family owned jewelry retailer and one of the 10 largest jewelry retailers in the world. In January 2009, Shane Co. sought bankruptcy protection, attributing the company's decline to delays and cost overruns in their \$36 million SAP AG inventory-management system. Shane Co. claimed SAP took almost three years to install and implement the system instead of one year, while costs "ballooned" to \$36 million from a projected maximum of \$10 million. Shane, based in Centennial, Colorado, became "substantially overstocked with inventory, and with the wrong mix of inventory" when Walldorf, Germany-based SAP finished the system in September 2007, according to the bankruptcy filing. The software "adversely affected sales" through the first nine months of 2008, it said.

American LaFrance: Botched ERP Implementation Leads to Failure (and Bankruptcy)

American LaFrance (ALF), a maker of emergency vehicles such as fire trucks and ambulances, filed for Chapter 11 bankruptcy protection on January 28, 2008; in court papers, it is claiming that their software vendor's work installing and transitioning to a new ERP system contributed to inventory and production problems. Officials at American LaFrance, which has been in business making fire and emergency response equipment since 1832, stated that "this is a legal 'reorganization' process to make the company stronger."

The bankruptcy filing was due to "operational disruptions caused by the installation of a new ERP system," as well as obsolete inventory that American LaFrance's previous owner, Freightliner, did not properly disclose. A New York-based investment company, Patriarch Partners, bought American LaFrance in late 2005 for an undisclosed sum.

"As a result of the unanticipated obsolescence of inventory and the ongoing ERP problems, American LaFrance has incurred approximately \$100 million in secured debt since it purchased its business," company officials said in a statement. "These problems have resulted in slowed production, a large unfulfilled backlog, and a lack of sufficient funds to continue operating."

ALF had purchased Freightliner's business in 2005. As part of the purchase agreement, Freightliner had managed inventory, payroll, and manufacturing processes until June 2007, according to news reports. "But American LaFrance, which was preparing to take over those functions by creating its own in-house system, fumbled the changeover," wrote *The Post and Courier* of Charleston, South Carolina.

Citing company statements, the newspaper added: "The two systems were not entirely compatible, and a wide range of financial information was lost in the changeover. Inventory was in disarray, and workers were unable to find the parts they needed." According to U.S. Bankruptcy Court documents, the new system ALF set up with the help of a software vendor had "serious deficiencies" that had "a crippling impact" on the company's operations.

The multitude of business and IT problems "forced American LaFrance to seek protection from its more than 1,000 creditors, who collectively are owed more than \$200 million," the paper reported. Results from a recent CIO survey on ERP systems and their importance to twenty-first-century businesses explain how and why technology disasters like American LaFrance's can happen. More than 85 percent of survey respondents agreed or strongly agreed that their ERP systems were essential to the core of their businesses, and that they "could not live without them."

Source: Adapted from Jennifer Zaino, "Modern Workforce: Capital One Puts ERP at Core of Work," *InformationWeek*, July 11, 2005.

Causes of ERP Failures

What have been the major causes of failure in ERP projects? In almost every case, the business managers and IT professionals of these companies underestimated the complexity of the planning, development, and training that were needed to prepare for a new ERP system that would radically change their business processes and information systems. Failure to involve affected employees in the planning and development phases and to change management programs, or trying to do too much too fast in the conversion process were typical causes of failed ERP projects. Insufficient training in the new work tasks required by the ERP system and failure to do enough data conversion and testing were other causes of failure. In many cases, ERP failures were also due to overreliance by company or IT management on the claims of ERP software vendors or on the assistance of prestigious consulting firms hired to lead the implementation. The following experience of a company that did it right gives us a helpful look at what is needed for a successful ERP implementation.

Capital One Financial: Success with ERP Systems

Just a few years ago at Capital One Financial Corp., it took 10 human-resources (HR) specialists to sign off on one change-of-address form. With thousands of employees worldwide, that's a lot of paper-pushing. Today, address changes are done via a self-service application that has freed HR to devote time to strategic staffing, program planning, and change management.

This example illustrates a big change that has taken place at the \$2.6 billion-a-year financial services company since it began to roll out PeopleSoft applications. "It's a cultural change that has freed people to not deal with minutiae but to deal with business value," says Gregor Bailar, executive vice president and CIO. "It really has been transformative." Bailar envisions more automation ahead, with financials following in the footsteps of HR's "lean-process" design to deal with the mountain of data requests the financials team receives and processes within the group.

The PeopleSoft ERP system, which serves as Capital One's backbone for financials, HR, asset-management, and supply-chain processes, supports about 18,000 users, including Capital One's 15,000 associates and some business partners. The applications are accessible via a Web portal based on BEA Systems Inc.'s technology.

Capital One is exploring the possibility of partnering with ERP application service providers, now that the hard work of correcting data and linking processes is done. Running the applications may be more of a commodity job at this point, but the applications themselves serve as a pillar for the company's future-of-work initiative. Bailar describes this as "a very mobile, interactive, collaborative environment" designed to support the requirements of the company's biggest asset, its knowledge workers. It's characterized not only by extensive Wi-Fi access, VoIP-enabled laptops, instant messaging, and BlackBerrys, but also by workflows that, for the most part, come to users electronically. Says Bailar, "Everyone's daily life is kind of drawn back to this suite of apps."

Source: Adapted from Jennifer Zaino, "Modern Workforce: Capital One Puts ERP at Core of Work," *InformationWeek*, July 11, 2005.

Trends in ERP

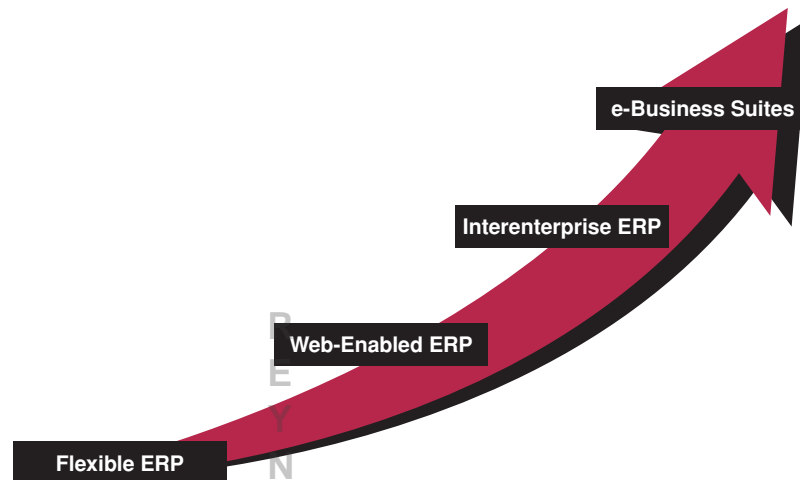
Today, ERP is still evolving—adapting to developments in technology and the demands of the market. Four important trends are shaping ERP's continuing evolution: improvements in integration and flexibility, extensions to e-business applications, a broader reach to new users, and the adoption of Internet technologies.

Figure 8.12 illustrates four major developments and trends that are evolving in ERP applications. First, the ERP software packages that were the mainstay of ERP implementations in the 1990s, and were often criticized for their inflexibility, have gradually been modified into more flexible products. Companies that installed ERP systems pressured software vendors to adopt more open, flexible, standards-based software architectures. This makes the software easier to integrate with other application programs of business users, as well as making it easier to make minor modifications to suit a company's business processes. An example is SAP R/3 Enterprise, released in 2002 by SAP AG as a successor to earlier versions of SAP R/3. Other leading ERP vendors, including Oracle, PeopleSoft, and J.D. Edwards, have also developed more flexible ERP products.

Web-enabling ERP software is a second development in the evolution of ERP. The growth of the Internet and corporate intranets and extranets prompted software companies to use Internet technologies to build Web interfaces and networking capabilities into ERP systems. These features make ERP systems easier to use and connect to other internal applications, as well as to the systems of a company's business partners. This Internet connectivity has led to the development of interenterprise ERP systems that provide Web-enabled links between key business systems (such as inventory

FIGURE 8.12

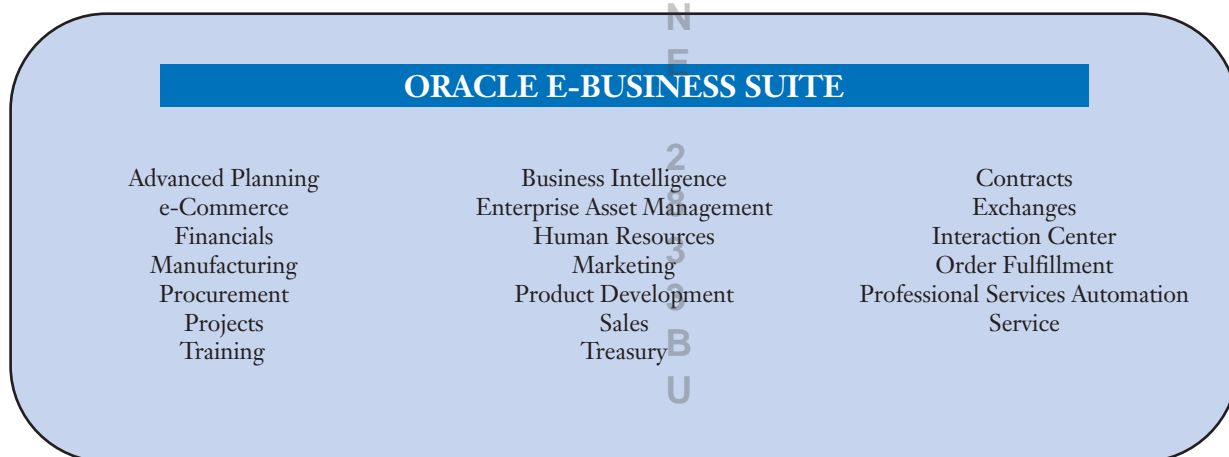
Trends in the evolution of ERP applications.



and production) of a company and its customers, suppliers, distributors, and others. These external links signaled a move toward the integration of internal-facing ERP applications with the external-focused applications of supply chain management (SCM) and a company's supply chain partners. We will discuss supply chain management in Section III.

All of these developments have provided the business and technological momentum for the integration of ERP functions into **e-business suites**. The major ERP software companies have developed modular, Web-enabled software suites that integrate ERP, customer relationship management, supply chain management, procurement, decision support, enterprise portals, health care functionality, and other business applications and functions. Examples include Oracle's e-Business Suite and SAP's mySAP. Some e-business suites disassemble ERP components and integrate them into other modules, while other products keep ERP as a distinct module in the software suite. Of course, the goal of these software suites is to enable companies to run most of their business processes using one Web-enabled system of integrated software and databases, instead of a variety of separate e-business applications. See Figure 8.13. Let's look at a real-world example.

FIGURE 8.13 The application components in Oracle's e-Business Suite software product.



Source: Adapted from Oracle Corporation, "E-Business Suite: Manage by Fact with Complete Automation and Complete Information," Oracle.com, 2002.

Visa International: Implementing the e-Business Suite



Despite the innovations brought to global commerce by Visa's sophisticated consumer payments processing system, Visa International had surprisingly outdated systems managing some of its most critical internal business processes. "KPMG did an analysis of our business and found that our internal systems were becoming a risk to our organization," said Gretchen McCoy, senior vice president of Visa International. "We were in the red zone."

McCoy found that Visa's internal systems were unnecessarily complex and utilized few of the advantages that technology can bring to an enterprise. The financial management infrastructure was fragmented, complex, and costly to maintain. Data were not standardized, resulting in many different databases making disparate interpretations of business data. Corporate purchasing, accounts payable, and asset management were managed manually, resulting in time-consuming delays and discrepancies. Fragmented internal systems are not unusual in a company that experiences rapid growth. Visa experienced double-digit growth for 11 consecutive years. Visa chose Oracle e-Business Suite to remedy the problems that come with a complex and inefficient back office.

The resulting implementation turned Visa's cumbersome, outdated desktop procedures into Web-based e-business solutions that met Visa's demands for all roles and processes. For example, Oracle Financials automated Visa's old organization and created a more agile system capable of accounting for the impact of financial activities on a global scale. Accounts payable was transformed from a cumbersome manual process into a streamlined system that automatically checks invoices against outgoing payments and requests review of any discrepancies via e-mail. And Oracle iProcurement helped automate Visa's requisitioning and purchasing system by streamlining the entire purchasing process and implementing a self-service model to increase processing efficiency, said McCoy.

SECTION III

Supply Chain Management: The Business Network

Introduction

Starting an e-business takes ideas, capital, and technical savvy. Operating one, however, takes supply chain management (SCM) skills. A successful SCM strategy is based on accurate order processing, just-in-time inventory management, and timely order fulfillment. SCM's increasing importance illustrates how a tool that was a theoretical process 10 years ago is now a hot competitive weapon.

That's why many companies today are making *supply chain management* (SCM) a top strategic objective and major e-business application development initiative. Fundamentally, supply chain management helps a company get the right products to the right place at the right time, in the proper quantity and at an acceptable cost. The goal of SCM is to manage this process efficiently by forecasting demand; controlling inventory; enhancing the network of business relationships a company has with customers, suppliers, distributors, and others; and receiving feedback on the status of every link in the supply chain. To achieve this goal, many companies today are turning to Internet technologies to Web-enable their supply chain processes, decision making, and information flows. Let's take a look at a real-world example.

Read the Real World Case on the next page. We can learn a lot about challenges in supply chain management from this case. See Figure 8.14.

What Is SCM?

Legacy supply chains are clogged with unnecessary steps and redundant stockpiles. For instance, a typical box of breakfast cereal spends an incredible 104 days getting from factory to supermarket, struggling its way through an unbelievable maze of wholesalers, distributors, brokers, and consolidators, each of which has a warehouse. The e-commerce opportunity lies in the fusing of each company's internal systems to those of its suppliers, partners, and customers. This fusion forces companies to better integrate interenterprise supply chain processes to improve manufacturing efficiency and distribution effectiveness.

So **supply chain management** is a cross-functional interenterprise system that uses information technology to help support and manage the links between some of a company's key business processes and those of its suppliers, customers, and business partners. The goal of SCM is to create a fast, efficient, and low-cost network of business relationships, or **supply chain**, to get a company's products from concept to market.

What exactly is a company's supply chain? Let's suppose a company wants to build and sell a product to other businesses. Then it must buy raw materials and a variety of contracted services from other companies. The interrelationships with suppliers, customers, distributors, and other businesses that are needed to design, build, and sell a product make up the network of business entities, relationships, and processes that is called a supply chain. Because each supply chain process should add value to the products or services a company produces, a supply chain is frequently called a *value chain*, a different but related concept that we discussed in Chapter 2. In any event, many companies today are using Internet technologies to create interenterprise e-business systems for supply chain management that help a company streamline its traditional supply chain processes.

Figure 8.15 illustrates the basic business processes in the supply chain life cycle and the functional SCM processes that support them. It also emphasizes how many companies today are reengineering their supply chain processes, aided by Internet technologies and supply chain management software. For example, the demands of today's competitive business environment are pushing manufacturers to use their

REAL WORLD CASE 3

Cisco Systems, Black & Decker, and O'Reilly Auto Parts: Adapting Supply Chains to Tough Times

Whether it's a truck, a tsunami, or an economic downturn, the same general rule applies: You're better off if you can see it coming from a safe distance.

There aren't many companies that understand this notion better than Cisco Systems Inc. White-hot during the 1990s, the company was pummeled after its vaunted inventory forecasting system could not—or did not—predict the dot-com bubble's collapse.

The result of this miscalculation was that sales were halved, the company lost 25 percent of its customers in a matter of weeks, and it ultimately wrote off more than \$2 billion in inventory. After that experience, Cisco's supply chain team vowed that it would never get blindsided again.

"There is a huge difference cutting head count between now and 2001," says Karl Braitberg, Cisco's vice president of customer value chain management.

Back then, Cisco's supply chain model was built on a "push" system, where products were made and inventory was built up in anticipation of market demand based on best-guess forecasts. "Then, when demand dropped, the supply chain froze. Nothing happened," Braitberg says. "We knew we had to build a new system that reacts better than just 'push.'"

Every company is tasked with matching its supply to consumer demand. In a normal business cycle, how well that job is accomplished determines whether the company is profitable. But this current economic downturn is anything but normal, and businesses are struggling to simply stay liquid.

There are various strategies to help preserve working capital, including cutting head count, outlets, and manufacturing lines. But for most companies, the key to capital

preservation will be how well they can reduce their inventory levels.

Largely, companies are in survival mode, and they're looking to their supply chain management team to free up precious capital to help them do that. While it may not fall directly on IT executives to make that happen, their role in the equation is very strategic.

With globalization, outsourcing, and increased compliance and security concerns, managing supply chain operations becomes increasingly complex. And shorter, more frequent product cycles targeting more-sophisticated markets create a need to manage more products and parts from remote locations. Add the pressure of shorter cash-to-cash cycles—the time from when a business extends credit to build inventory until the time it gets paid—into the equation, and the need for an intelligent, nimble, and timely flow of information becomes critical.

To have visibility as well as command and control, supply chain operations must be tightly integrated with the IT infrastructure. That isn't the case at many companies, and yet it may be the factor that determines success or failure as they endure and emerge from this downturn.

Like bloodletting, reducing inventory is a delicate matter that most people would prefer to avoid. Inventory can range from materials, to parts, to fully assembled products. Nobody wants to run out. If there's too little, customers won't get orders in a timely manner and market opportunities will be missed. Yet if a company carries too much and demand drops, then the inventory must be "bled down," or reduced in price, until it has a buyer.

During a strong economy and when cash flow is loosened, many companies can get by without rigorous inventory management practices, says Larry Lapide, director of demand management at the MIT Center for Transportation & Logistics in Cambridge, Massachusetts. But during a recession, he adds, "companies had better bleed down inventory to reflect the downturn in sales. If they don't, it just sits there."

Inventory optimization is so critical now because of its impact on available cash, Lapide says. In accounting terms, inventory is an asset. So inventory that is on the books through manufacturing, assembly, and distribution represents credit-funded inventory. With credit at a premium, it's in a company's best interest not only to keep inventory levels tight, but also to sell goods as soon as possible.

Reducing costs and squeezing maximum utility out of fixed assets is nothing new to Black & Decker Corp.'s Hardware and Home Improvement Group in Lake Forest, California. The unit supplies hardware to big-box retailers that have responded to the economic downturn with new low-price strategies. It now falls on Scott Strickland, vice president of IS, to help the group squeeze down its own costs and maintain profit margins.

"We had been loath to drive inventory down to this level," Strickland says.

FIGURE 8.14



Companies are freeing up cash by tightening their supply chain and reducing inventory.

Source: Getty Images.

However, the company had gained invaluable experience by deploying an integrated inventory management system prior to the downturn. The result was that the key decision makers throughout its supply chain were operating with the same information, planners focused only on exceptions, and supplier and material issues were quickly resolved. The system, Strickland says, does the heavy lifting, and as a result, the unit has cut planning cycles from weeks to days and improved forecast accuracy by 10.4 percent.

"If someone had told us nine months ago that we could lower inventory as fast as we could to address a sales decline, we would not have believed it was possible," Strickland says. However, "because of the impetus on freeing up working capital, we have been focused on lowering our inventory and levels. We figured we could do this, and it turned out to not be the bad experience we had imagined."

The effort to lower inventory levels to free up working capital has proved so effective that the Black & Decker unit and its partners are jointly considering making it standard practice even after the economy recovers, Strickland says.

O'Reilly Auto Parts Inc. in Springfield, Missouri, uses inventory as a competitive differentiator, says Greg Beck, vice president of purchasing. One of the largest specialty retailers of automotive aftermarket parts, tools, supplies, and accessories in the United States, O'Reilly is responding to the recession differently than many other companies.

"Business is increasing because of the downturn," Beck says. "People aren't buying new cars but instead are putting more money into fixing old cars."

This isn't to say that O'Reilly lacks supply chain challenges or that it can let down its guard. As the result of an acquisition last year, the company increased its total store count to more than 3,300 and now operates in 38 states. To bolster its competitive advantage, O'Reilly's strategy is to increase customer service levels and replenish inventory on a nightly basis, while at the same time managing an increasing number of products.

The partnership between the supply chain operation and IT was critical to O'Reilly's strategy. The company is using Manhattan Associates Inc.'s replenishment software to collect product data information on the half-hour, while updates from the distribution centers are transmitted nightly. The replenishment system uses this data to determine the forecast for these products. As a result, O'Reilly has increased inventory turns by 44 percent, and it still manages to fulfill 97 percent

of customer requests immediately, with 3 percent handled through separate channels. At the same time, the company reduced its inventory levels, freeing up \$60 million.

Companies say that driving costs out of the supply chain is an important goal, but the big question is whether—especially during a recession—they can afford to invest in their supply chain IT infrastructures to help make that happen.

Dwight Klappich, an analyst at Gartner Inc., calls that a short-sighted and, in the long term, costly approach. "If this trend continues," Klappich stated in a report, "this myopic focus on short-term tactical issues, while necessary for many businesses, could widen the gap between the best-performing organizations and lower-performing organizations."

Cisco understands this. After the 2001 downturn, it made major system investments to transform its "push-driven," siloed supply chain model into an integrated "pull system" that can extract timely data from suppliers and downstream partners.

This reorder data is sent to Cisco after being triggered by specified parameters and algorithms, to shape "demand signals."

The system doesn't operate in a vacuum. Cisco has optimized its forecasting algorithms by bringing together representatives from its marketing, finance, sales, supply chain, and IT departments, and from key customers. As part of its sales and operations planning process, this group collaborates to create a common view of demand signals. This input drives an agreed-upon plan of action to align manufacturing capacity and inventory deployment and meet customer service levels. In short, they work together with the same data to optimally match supply and demand.

"Now, if there are no pull signals, nothing gets brought into the system," says Cisco's Braitberg.

Manufacturers don't continue to source and build inventory that may sit in some warehouse waiting for customers who may never buy it. Cash is freed up for other purposes.

While Braitberg acknowledges that even past history can't be used as a template for this downturn, Cisco is confident that it has better visibility into market demand when it goes down, and that it will be ready when the green shoots emerge.

"We now have the techniques in place to be hypersensitive to demand changes," Braitberg says, "and we can manage our way through a downturn."

Source: Adapted from William Brandel, "Inventory Optimization Saves Working Capital in Tough Times," *Computerworld*, August 24, 2009.

CASE STUDY QUESTIONS

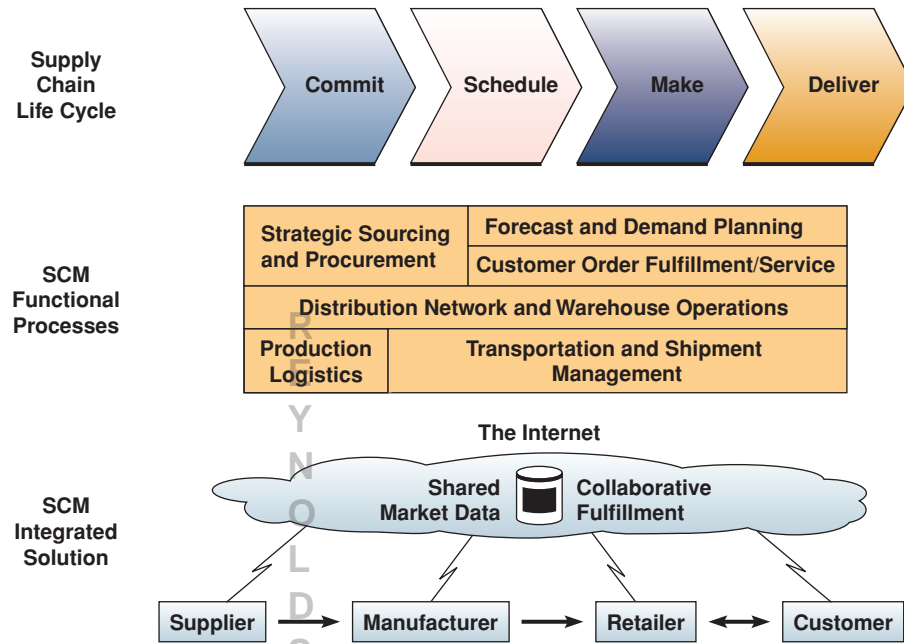
1. Cisco Systems went from a "push" to a "pull" approach to its supply chain after the dot-com debacle. How are these two approaches different? Does it depend on the state of the economy which one should be used? Why?
2. What are the different elements that need to come together to bring supply chains to the optimal levels needed by these companies? What role does IT play?
3. How are the approaches to inventory management taken by O'Reilly Auto Parts, on one hand, and Cisco Systems and Black & Decker, on the other, different?

REAL WORLD ACTIVITIES

1. The ability to accurately forecast demand is one of the major issues involved in the efforts discussed in the case. Go online and research which technologies companies are employing today to improve this aspect of their supply chains. Prepare a presentation to share your findings with the rest of your class.
2. The case compares short-term tactical needs with long-term strategic investments. How do you make the case, in an economic downturn, for the continued need to invest in technology? Break into small groups and brainstorm some alternatives.

FIGURE 8.15

Supply chain management software and Internet technologies can help companies reengineer and integrate the functional SCM processes that support the supply chain life cycle.



intranets, extranets, and e-commerce Web portals to help them reengineer their relationships with their suppliers, distributors, and retailers. The objective is to significantly reduce costs, increase efficiency, and improve their supply chain cycle times. SCM software can also help to improve interenterprise coordination among supply chain process players. The result is much more effective distribution and channel networks among business partners. The Web initiatives of PC Connection illustrate these developments.

PC Connection: Learning to Stop, Drop, and Ship

PC Connection has razor-thin margins. To stay healthy, the \$1.8 billion-a-year tech reseller has slashed inefficiencies wherever possible in recent years. Yet despite tight financial circumstances, PC Connection invested substantially to overhaul its supply chain, building Web services modules in front of its ERP system to more efficiently integrate with partners and suppliers. The upgrades will help the company take on new business opportunities, such as selling software licenses, that promise higher margins than hardware.

Although the company has grown significantly over the years, the growth hasn't been without pain. While PC Connection now offers goods and services from more than 1,400 manufacturers, its core ERP system hadn't changed much from the days when the company sold directly to customers. "It was built for the days of pick, pack, and ship," Jack Ferguson, PC Connection's treasurer and CFO, says of the company's Oracle JD Edwards ERP system. That became a growing problem as the company over the last several years expanded its catalog and extended its fulfillment network to include more than a dozen external partners to handle increasingly complex drop-ship orders. "We were faced with a growing number of products, and we also had a desire to cut inventory," Ferguson says.

It soon became apparent that the system wasn't built to handle such a multitiered fulfillment network. "Once you move to drop-ship it gets more complicated," says Ferguson, who notes that even basic requirements, like the calculation of sales tax on an order, were affected by the new drop-ship arrangements. Before long, managers

from various departments within PC Connection were requesting ad hoc changes to the company's ERP system to meet new requirements as they evolved. But the process was becoming unmanageable.

As a result, PC Connection last year decided to embark on a thorough overhaul of its fulfillment system.

IT staffers looked at numerous off-the-shelf e-commerce packages, but all were found lacking. Instead, the company launched a labor-intensive campaign to internally develop new front-end modules for the existing JD Edwards system. These modules were built using both Web services and traditional EDI to deal with the company's growing web of fulfillment partners.

The first set of enhancements to the JD Edwards system went online recently, and Ferguson says they're already paying off in terms of time and cost savings. "In the past, much of what our buyers did was very manual and time consuming, with lots of order entry across multiple systems," he says. "This takes 90 percent of the manual part out of their day."

Among other things, there are now modules that can automatically determine the quickest, most economical way to fulfill an order, whether directly from one of the company's warehouses or through a partner in a particular geographic location. Still, Ferguson says PC Connection is investing for future growth, and adds that the new system means customer orders will continue to be filled with greater speed and accuracy, even as business picks up.

"It's a customer satisfaction issue," he says. "To stay in the game you have to upgrade your system to handle increased requests."

Source: Adapted from Paul McDougall, "PC Connection Learns to Stop, Drop, and Ship," *InformationWeek*, September 15, 2008.

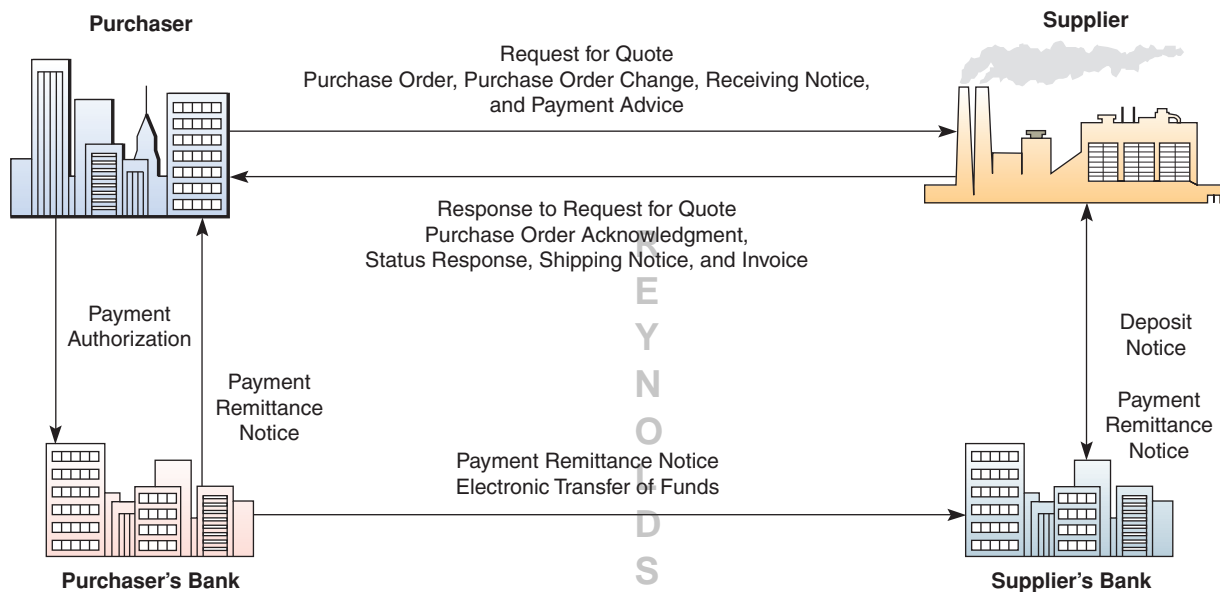
Electronic Data Interchange

Electronic data interchange (EDI) was one of the earliest uses of information technology for supply chain management. EDI involves the electronic exchange of business transaction documents over the Internet and other networks between supply chain trading partners (organizations and their customers and suppliers). Data representing a variety of business transaction documents (such as purchase orders, invoices, requests for quotations, and shipping notices) are automatically exchanged between computers using standard document message formats. Typically, EDI software is used to convert a company's own document formats into standardized EDI formats as specified by various industry and international protocols. Thus, EDI is an example of the almost complete automation of an e-commerce supply chain process. EDI over the Internet, using secure *virtual private networks*, is a growing B2B e-commerce application.

Formatted transaction data are transmitted over network links directly between computers without paper documents or human intervention. Besides direct network links between the computers of trading partners, third-party services are widely used. Value-added network companies like GE Global Exchange Services and Computer Associates offer a variety of EDI services for relatively high fees, but many EDI service providers now offer secure, lower-cost EDI services over the Internet. Figure 8.16 illustrates a typical EDI system.

EDI is still a popular data-transmission format among major trading partners, primarily to automate repetitive transactions, though it is slowly being replaced by XML-based Web services. EDI automatically tracks inventory changes; triggers orders, invoices, and other documents related to transactions; and schedules and confirms delivery and payment. By digitally integrating the supply chain, EDI streamlines processes, saves time, and increases accuracy. In addition, by using Internet technologies, lower-cost Internet-based EDI services are now available to smaller businesses.

FIGURE 8.16 A typical example of electronic data interchange activities, an important form of business-to-business electronic commerce. EDI over the Internet is a major B2B e-commerce application.



Telefonica TSAI: Internet EDI



Telefonica is Spain's largest supplier of telecommunications services, serving the Spanish-speaking and Portuguese-speaking world with affiliates in Latin America and the United States. Telefonica Servicios Avanzados de Informacion (TSAI) is a subsidiary of Telefonica that handles 60 percent of Spain's electronic data interchange (EDI) traffic. TSAI's customers are supply chain trading partners—merchants, suppliers, and others involved in business supply chains from design to delivery.

To tap into the sizable market of smaller businesses that can't afford standard EDI services, TSAI offers an Internet EDI service, InfoEDI, based on ECXpert electronic commerce software. InfoEDI allows transactions to be entered and processed on the Internet, so smaller trading partners no longer have to buy and install special connections, dedicated workstations, and proprietary software. Instead, they can access the EDI network through the Internet via TSAI's Web portal.

InfoEDI's forms-based interface lets businesses connect with the InfoEDI simply by using modems and Web browsers. They can then interact with the largest suppliers and retailers to send orders, issue invoices based on orders, send invoice summaries, track status of documents, and receive messages. InfoEDI also provides a product database that lists all details of trading partners' products. Once a trading relationship has been established, each partner has encrypted access to details of its own products. Because those details remain accessible on TSAI's Web server, users need enter only minimal information to create links to those data, which are then plugged in as needed.

The Role of SCM

Figure 8.17 helps us understand the role and activities of supply chain management in business more clearly. The top three levels of Figure 8.17 show the strategic, tactical, and operational objectives and outcomes of SCM planning, which are then accomplished by the business partners in a supply chain at the execution level of SCM. The role of information technology in SCM is to support these objectives with interenterprise information systems that produce many of the outcomes a business needs to manage its supply chain effectively. That's why many companies today are installing SCM software and developing Web-based SCM information systems.

FIGURE 8.17 The objectives and outcomes of supply chain management are accomplished for a business with the help of interenterprise SCM information systems.

SCM Objectives		SCM Outcomes
What? Establish objectives, policies, and operating footprint	Strategic	<ul style="list-style-type: none"> • Objectives • Supply policies (service levels) • Network design
How much? Deploy resources to match supply to demand	Tactical	<ul style="list-style-type: none"> • Demand forecast • Production, procurement, logistics plan • Inventory targets
When? Where? Schedule, monitor, control, and adjust production	Operational	<ul style="list-style-type: none"> • Work center scheduling • Order/inventory tracking
Do Build and transport	Execution	<ul style="list-style-type: none"> • Order cycle • Material movement

Source: Adapted from Keith Oliver, Anne Chung, and Nick Samanach, "Beyond Utopia: The Realist's Guide to Internet-Enabled Supply Chain Management," *Strategy and Business*, Second Quarter, 2001, p. 99.

Until recently, SCM software products have typically been developed for either supply chain planning or execution applications. SCM planning software from vendors such as I2 and Manugistics support a variety of applications for supply and demand forecasting. SCM execution software from vendors such as EXE Technologies and Manhattan Associates support applications like order management, logistics management, and warehouse management. However, big ERP vendors like Oracle and SAP are now offering Web-enabled software suites of e-business applications that include SCM modules. Examples include Oracle's e-Business Suite and SAP AG's mySAP.

Figure 8.18 gives you a good idea of the major planning and execution functions and outcomes that can be provided by SCM software as promised by mySAP's supply chain management module. Now let's look at a real-world example of an SCM system.

Imperial Sugar: Supply Chain Management to the Rescue

It was an otherwise ordinary Thursday night in February 2008 when Imperial Sugar CIO George Muller got the call. "There had been an accident. People were hurt," Muller remembers. Some died. "As more and more of the details started to come out, it was horrific."

In the days following the explosion at the company's Port Wentworth, Georgia, refinery, CEO John Sheptor implored his executives to lead with their hearts, not their heads; efforts focused on helping affected employees and their families. But the \$522 million sugar refiner—the third largest in the United States—had customer obligations as well. The disaster destroyed approximately 60 percent of its production capacity overnight. It wasn't clear when, or if, the plant would operate again.

Imperial Sugar had already weathered some major challenges: bankruptcy, divestiture, and new management. But the Port Wentworth tragedy was the hardest Muller had faced. "Not too many manufacturing companies can withstand that kind of impact to their business and survive," he says.

The Georgia refinery remained offline for twenty months. "We didn't have any safety stockpiles," says Muller. "We were scurrying to fulfill as many orders as we could." Some sugar was imported through its joint venture with Mexican refiner Ingenios Santos, but it wasn't enough. "We disappointed many customers," Muller says. He credits supply-chain systems—particularly demand-management software—with helping to make the best of available resources.

FIGURE 8.18 The supply chain management functions and potential benefits offered by the SCM module in the mySAP e-business software suite.

SCM Functions		SCM Outcomes
Planning		
Supply chain design	•	Optimize network of suppliers, plants, and distribution centers
Collaborative demand and supply planning	•	Develop an accurate forecast of customer demand by sharing demand and supply forecasts instantaneously across multiple tiers
	•	Internet-enable collaborative scenarios, such as collaborative planning, forecasting, and replenishment (CPFR), and vendor-managed inventory
Execution		
Materials management	•	Share accurate inventory and procurement order information
	•	Ensure materials required for production are available in the right place at the right time
	•	Reduce raw material spending, procurement costs, safety stocks, and raw material and finished goods inventory
Collaborative manufacturing	•	Optimize plans and schedules while considering resource, material, and dependency constraints
Collaborative fulfillment	•	Commit to delivery dates in real time
	•	Fulfill orders from all channels on time with order management, transportation planning, and vehicle scheduling
	•	Support the entire logistics process, including picking, packing, shipping, and delivery in foreign countries
Supply chain event management	•	Monitor every stage of the supply chain process, from price quotation to the moment the customer receives the product, and receive alerts when problems arise
Supply chain performance management	•	Report key measurements in the supply chain, such as filling rates, order cycle times, and capacity utilization

In 1998, Imperial Sugar implemented an all-in-one PeopleSoft ERP system, in lieu of best-of-breed software, to manage 20-odd business processes. After several upgrades, it was clear the demand-management module couldn't handle the complexities of the business. When large beverage and food manufacturers sign an annual contract, Imperial Sugar has to predict how that demand will play out based on seasonal and consumer cycles. "Supply chain is at the heart of our business," says Muller. "For us, it's a differentiator. It's why customers come back."

In 2006, the company added a bolt-on solution from Demand Foresight: Software that essentially learns how demand ebbs and flows over time. The tool allows Imperial Sugar to see the impact of a wide range of factors on demand, react to changes quickly, and track performance.

After the refinery catastrophe, Imperial Sugar needed immediate insight into how many customers it could serve with its available inventory. The software gave them that overview by product line, and its "available to promise" functionality allowed everyone from production to sales to see, in real time, what could be delivered.

Muller won't reveal how much he spent on Demand Foresight, saying only that it was a "drop in the bucket" compared to his last \$5.7 million PeopleSoft upgrade and implementation. "It was our saving grace," he says. "It took our demand, our inventory and capacity, and the number of new orders coming in and tied it all together. We couldn't fulfill every order, but we were able to fill more orders than we ever would have had we not had that tool."

Source: Adapted from Stephanie Overby, "Supply Chain Management to the Rescue," *CIO.com*, March 16, 2010.

Benefits and Challenges of SCM

Creating a real-time SCM infrastructure is a daunting and ongoing issue and quite often a point of failure for several reasons. The chief reason is that the planning, selection, and implementation of SCM solutions are becoming more complex as the pace of technological change accelerates and the number of a company's partners increases.

The real world experiences of companies like Cardinal Glass and the promised outcomes that are outlined in Figure 8.18 emphasize the major business benefits that are possible with effective supply chain management systems. Companies know that SCM systems can provide them with key business benefits such as faster, more accurate order processing; reductions in inventory levels; quicker times to market; lower transaction and materials costs; and strategic relationships with their suppliers. All of these benefits of SCM are aimed at helping a company achieve agility and responsiveness in meeting the demands of its customers and the needs of its business partners. Let's look at a recent example.

Emerson Transaction Hub: A Bright Idea That's Paying Off

A couple of years ago, some executives at Emerson asked themselves a question: Why pay to send inventory from one supplier on one ship and goods from a second supplier on another ship, when both deliveries are coming from the same place and could be loaded into a single container?

It was an *aha!* moment that ended up saving millions for the St. Louis manufacturer that regularly ships supplies from Asia to North America and Europe. In late 2005, the company started a pilot program in which a logistics provider that specializes in transportation management for freight carriers worked with two Emerson divisions to consolidate multiple orders into the same shipping container. Not only did the pilot save money, the business units were able to tighten their global supply chains by better tracking shipments and managing inventory.

Naturally, Emerson wanted to expand the program, but here's where things got complicated: Emerson has 70 separate business units that purchase goods from 35,000 suppliers. Each unit communicates with its own suppliers via a combination of e-mail, spreadsheets, faxes, and phone calls. Asking a logistics provider to step into the middle of this tangled transaction web simply wasn't feasible. "It's a brittle system," says Steve Hassell, VP and CIO at Emerson. "If a provider or a business unit makes changes, you have to go and touch tens or hundreds of connections."

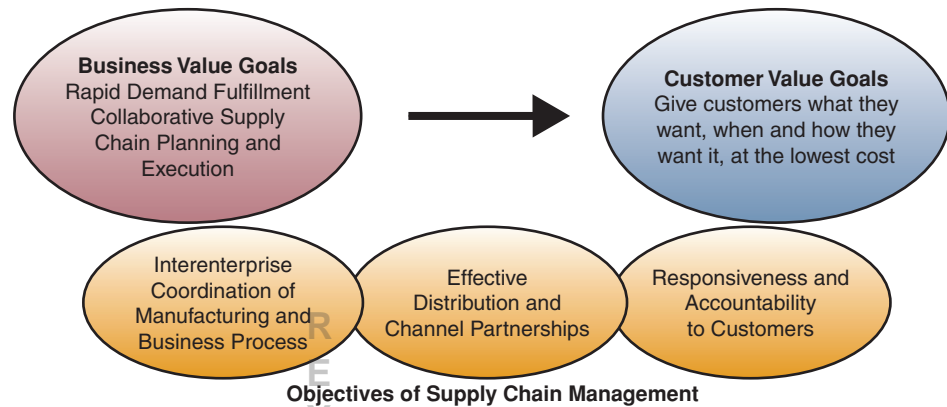
Instead, Hassell's team envisioned a single hub that everyone would link to using common communications mechanisms and data formats. It would serve as a unified gateway that Emerson's business units, logistics providers, and suppliers could use to exchange information. Of course, for a single communications hub to work, everyone has to speak the same language. Emerson decided to conduct transactions via two data formats: EDI, using the ANSI ASC X12 format, and OAGIS XML.

Here's how the system works: A business unit initiates a transaction, such as a purchase order, through its ERP system. The order is sent to the transaction hub, which translates the message into OAGIS XML. Providers and suppliers then coordinate shipping, and the providers communicate shipment status to the Emerson division through the hub. The hub is processing about 10,000 transactions per day. Once all business units are on board, Emerson expects to see that number jump to 100,000 transactions.

Hassell estimates that Emerson invested about \$500,000 in the hub and has recovered those costs more than several times. Putting 10 suppliers in the same shipping container cuts costs by 35 percent. The company has saved millions in transport costs alone by consolidating shipping. Also, with information such as purchase orders and shipping notices in a common format, Emerson has more visibility into its supply chain, increasing inventory control efficiency by ensuring that materials aren't over- or under-stocked.

FIGURE 8.19

Achieving the goals and objectives of supply chain management is a major challenge for many companies today.



Finally, whereas Emerson used to look like 70 smaller businesses to its suppliers, it now looks like one big customer. Suppliers can streamline their business processes through the transaction hub while Emerson gains better leverage to negotiate prices and contracts.

Source: Adapted from Andrew Conry-Murray, "InformationWeek 500: Emerson Transaction Hub: A Bright Idea That's Paying Off in Efficiency, Savings," *InformationWeek*, September 18, 2007.

However, developing effective SCM systems has proven to be a complex and difficult application of information technology to business operations. So achieving the business value and customer value goals and objectives of supply chain management, as illustrated in Figure 8.19, has been a major challenge for most companies.

What are the causes of problems in supply chain management? Several reasons stand out. A lack of proper demand planning knowledge, tools, and guidelines is a major source of SCM failure. Inaccurate or overoptimistic demand forecasts will cause major production, inventory, and other business problems, no matter how efficient the rest of the supply chain management process is constructed. Inaccurate production, inventory, and other business data provided by a company's other information systems are a frequent cause of SCM problems. In addition, lack of adequate collaboration among marketing, production, and inventory management departments within a company, and with suppliers, distributors, and others, will sabotage any SCM system. Many companies that are installing SCM systems consider even the SCM software tools themselves to be immature, incomplete, and hard to implement. These problems are spotlighted in the real-world example of Nike Inc.

Nike Inc.: Failure (and Bouncing Back) with Supply Chain Management

Roland Wolfram, Nike's vice president of global operations and technology, calls the i2 problem a "speed bump." Some speed bump! The i2 problem is a software glitch that cost Nike more than \$100 million in lost sales, depressed its stock price by 20 percent, triggered a flurry of class-action lawsuits, and caused Phil Knight, its chairman, president, and CEO, to lament famously, "This is what you get for \$400 million, huh?" In the athletic footwear business, only Nike, with a 32 percent worldwide market share (almost double Adidas, its nearest rival) and a market cap that's more than the rest of the manufacturers and retailers in the industry combined, could afford to talk about \$100 million like that.

"For the people who follow this sort of thing, we became a poster child for failed implementations," Wolfram says. Yet there was a lesson too for people who do, in fact, follow "this sort of thing," specifically CIOs. The lesson of Nike's failure and subsequent rebound lies in the fact that it had a business plan that was widely understood

and accepted at every level of the company. Given that, and the resiliency it afforded the company, the i2 failure ultimately turned out to be, indeed, just a speed bump.

Nike's June 2000 problems with its i2 system reflect the double whammy typical of high-profile enterprise computing failures. First, there's a software problem closely tied to a core business process—in this case, factory orders. Then the glitch sends a ripple through product delivery that grows into a wave crashing on the balance sheet. The wave is big enough that the company must reveal the losses at a quarterly conference call with analysts, or risk the wrath of the Securities and Exchange Commission, shareholders, or both.

Wolfram says Nike's demand-planning strategy was and continues to be a mixture of art and technology. Nike sells too many products (120,000) in too many cycles (four per year) to do things by intuition alone. "We've tuned our system so we do our runs against historical models, and then people look at it to make sure it makes sense," he says. The computer models are trusted more when the product is a reliable seller (that is, just about anything with Michael Jordan's name on it) and the planners' intuition plays a bigger role in new or more volatile products. In this case, says Wolfram, talking with retailers does more good than consulting the system.

So how has Nike's business fared, six years and \$500 million later? Wolfram claims that better collaboration with Far East factories has reduced the amount of "prebuilding" of shoes from 30 percent of Nike's total manufacturing units to around 3 percent. The lead time for shoes, he asserts, has gone from nine months to six (in some periods of high demand, seven). Inventory levels have been reduced by cutting Nike's factory order interval time from one month to a week in some cases. So far, the most direct benefits of the system have been typical for ERP: improved financial visibility, cash flow management, revenue forecasting, and an ability to juggle Nike's cash stockpile in different currencies to take advantage of shifting exchange rates—benefits that are enhanced by the single database that holds all the data.

Yet because Nike developed a plan in 1998, and stuck with it, the company claims it can make a coordinated global effort to cut that lead time. The system to make that happen is in place. Given all that has transpired in the past several years, that is rather remarkable.

Source: Adapted from Christopher Koch, "Nike Rebounds: How (and Why) Nike Recovered from its Supply Chain Disaster," *CIO Magazine*, June 15, 2004.

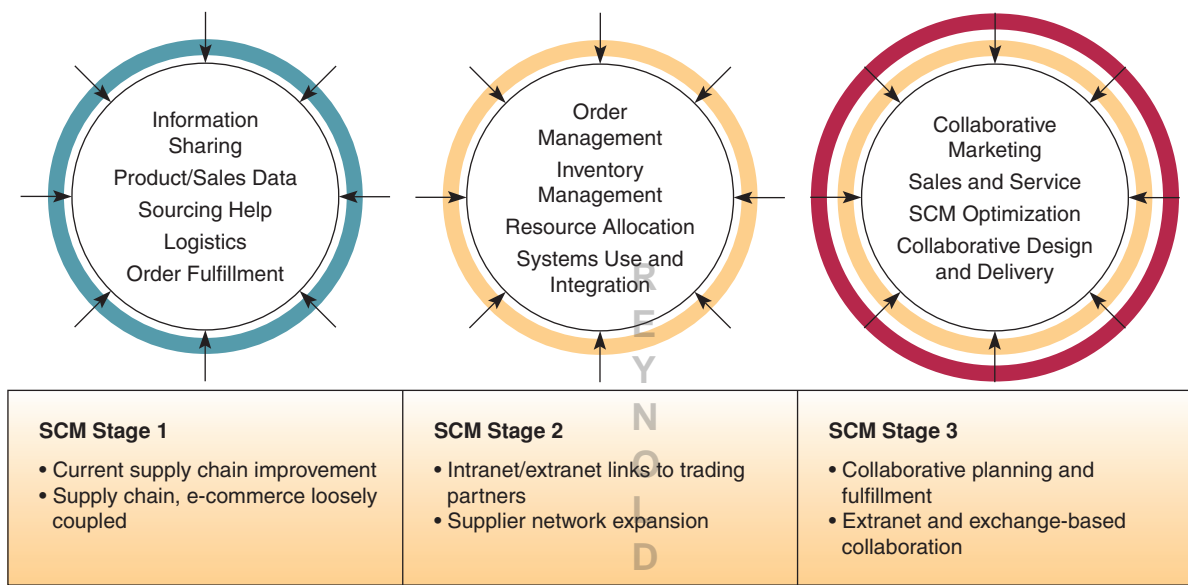
Trends in SCM

The supplier-facing applications arena will see the continued growth of public as well as private networks that transform linear and inflexible supply chains into nonlinear and dynamic fulfillment networks. Supplier-facing applications will also evolve along another dimension: from automation and integration of supply chains to collaborative sourcing, planning, and design across their supplier networks.

Figure 8.20 illustrates the trends in the use of supply chain management today as three possible stages in a company's implementation of SCM systems. In the first stage, a company concentrates on making improvements to its internal supply chain processes and its external processes and relationships with suppliers and customers. Its e-commerce Web site and those of some of its trading partners provide access to online catalogs and useful supply chain information as they support limited online transactions.

In stage two, a company accomplishes substantial supply chain management applications by using selected SCM software programs internally, as well as externally via intranet and extranet links among suppliers, distributors, customers, and other trading partners. Companies in this stage also concentrate on expanding the business network of Web-enabled SCM-capable trading partners in their supply chain to increase its operational efficiency and effectiveness in meeting their strategic business objectives.

FIGURE 8.20 Stages in the use of supply chain management.



In the third stage, a company begins to develop and implement cutting-edge collaborative supply chain management applications using advanced SCM software, full-service extranet links, and private and public e-commerce exchanges. Examples include collaborative supply chain planning and fulfillment applications like collaborative product design and delivery, and collaborative planning, forecasting, and replenishment (CPFR). In addition, collaborative marketing sales and service applications with trading partners, including customer and partner relationship management systems, may be developed. Companies in this third stage strive to optimize the development and management of their supply chains in order to meet their strategic customer value and business value goals. Let's look at some real-world examples.

CVS, McKesson, and MPT: Web-Based SCM Integration

CVS is a leading drug retail chain, while McKesson is the largest U.S. distributor of pharmaceuticals, health care products, and medical/surgical supplies, with annual sales in excess of \$20 billion. Better integration with McKesson is a key strategic move for CVS, as management sees significant potential for improving sales and margins through its enhanced pricing and promotional forecasting systems. Supply chain integration helps the retailer move from pull to push promotions by allowing marketing managers to plan promotions more effectively, using item history taken from historical point-of-sale data on a store-by-store basis. The integration with McKesson substantially reduces the amount of time needed to plan and to stock inventory for individual promotions.

A major objective in the CVS–McKesson chain is to improve business performance through better supply chain integration. This requires much closer cooperation between McKesson and CVS, with McKesson even taking responsibility for CVS stock levels. McKesson monitors CVS's store-level consumption via Web extranet links and replenishes the inventory to meet the agreed-on service levels—true supply chain integration. This cooperative process between supplier and customer is achieved through seamless interenterprise process integration and advanced SCM applications that link CVS directly to McKesson's production department.

Not every supply chain application, however, requires a hefty upfront investment. Modern Plastics Technology (MPT), an injection mold manufacturer in Port Huron,

Michigan, spends just several hundred dollars per month to access the i-Supply Service Web-based supply chain application from SupplySolution Inc. The company had been using electronic data interchange transmissions to fill its orders and was having a tough time keeping up with unscheduled changes in orders, says Doug Archer, vice president of Modern Plastics.

Then a large sealant manufacturer that was one of the company's customers persuaded Modern Plastics to connect with its i-Supply Service application. This Web-based SCM system has enabled Modern Plastics to see what its customers need on a real-time basis. Modern Plastics runs 30 to 40 different products through its presses, and i-Supply now allows management to better plan long production runs or prioritize specific product runs. Additionally, i-Supply helps MPT accomplish more accurate demand forecasting and production scheduling.

Summary

- **Customer Relationship Management: The Business Focus.** Customer relationship management is a cross-functional enterprise system that integrates and automates many of the customer-serving processes in sales, marketing, and customer services that interact with a company's customers. CRM systems use information technology to support the many companies that are re-orienting themselves into customer-focused businesses as a top business strategy. The major application components of CRM include contact and account management; sales, marketing, and fulfillment; customer service and support; and retention and loyalty programs, all aimed at helping a company acquire, enhance, and retain profitable relationships with its customers as a primary business goal. However, many companies have found CRM systems difficult to implement properly due to lack of adequate understanding and preparation by management and affected employees. Finally, many companies are moving toward collaborative CRM systems that support the collaboration of employees, business partners, and the customers themselves in enhancing profitable customer relationships.
- **Enterprise Resource Planning: The Business Backbone.** Enterprise resource planning is a cross-functional enterprise system that integrates and automates many of the internal business processes of a company, particularly those within the manufacturing, logistics, distribution, accounting, finance, and human resource functions of the business. Thus, ERP serves as the vital backbone information system of the enterprise, helping a company achieve the efficiency, agility, and responsiveness required to succeed in a dynamic business environment. ERP software typically consists of integrated modules that give a company a real-time cross-functional view of its core business processes, such as production, order processing, and

sales, and its resources, such as cash, raw materials, production capacity, and people. However, properly implementing ERP systems is a difficult and costly process that has caused serious business losses for some companies, which underestimated the planning, development, and training that were necessary to reengineer their business processes to accommodate their new ERP systems. However, continuing developments in ERP software, including Web-enabled modules and e-business software suites, have made ERP more flexible and user friendly, as well as extending it outward to a company's business partners.

- **Supply Chain Management: The Business Network.** Supply chain management is a cross-functional inter-enterprise system that integrates and automates the network of business processes and relationships between a company and its suppliers, customers, distributors, and other business partners. The goal of SCM is to help a company achieve agility and responsiveness in meeting the demands of its customers and needs of its suppliers, by enabling it to design, build, and sell its products using a fast, efficient, and low-cost network of business partners, processes, and relationships, or supply chain. SCM is frequently subdivided into supply chain planning applications, such as demand and supply forecasting, and supply chain execution applications, such as inventory management, logistics management, and warehouse management. Developing effective supply chain systems and achieving the business goals of SCM have proven to be complex and difficult challenges for many firms. But SCM continues to be a major concern and top e-business initiative as companies increase their use of Internet technologies to enhance integration and collaboration with their business partners, and improve the operational efficiency and business effectiveness of their supply chains.

Key Terms and Concepts

These are the key terms and concepts of this chapter. The page number of their first explanation is in parentheses.

- | | | |
|-------------------------------------------|---------------------------------------|----------------------------------|
| 1. Customer relationship management (309) | 3. Electronic data interchange (334) | 5. Supply chain (330) |
| <i>a.</i> Application components | 4. Enterprise resource planning (320) | 6. Supply chain management (330) |
| <i>b.</i> Business benefits | <i>a.</i> Application components | <i>a.</i> Application components |
| <i>c.</i> Challenges | <i>b.</i> Business benefits | <i>b.</i> Business benefits |
| <i>d.</i> Trends | <i>c.</i> Challenges | <i>c.</i> Challenges |
| 2. E-business suites (328) | <i>d.</i> Trends | <i>d.</i> Trends |

Review Quiz

Match one of the key terms and concepts listed previously with each of the brief examples or definitions that follow. Try to find the best fit for answers that seem to fit more than one term or concept. Defend your choices.

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| _____ 1. A cross-functional enterprise system that helps a business develop and manage its customer-facing business processes. | _____ 11. Failure of order processing and inventory accounting systems that are reengineered to accommodate a new cross-functional system. |
| _____ 2. A cross-functional enterprise system that helps a business integrate and automate many of its internal business processes and information systems. | _____ 12. A lack of adequate demand-planning knowledge, tools, and guidelines may cause major overproduction and excess inventory problems. |
| _____ 3. A cross-functional interenterprise system that helps a business manage its network of relationships and processes with its business partners. | _____ 13. Toward Web portals and collaborative systems involving business partners as well as customers to coordinate sales and service across all marketing channels. |
| _____ 4. Includes contact and account management; sales, marketing, and fulfillment; and customer service and support systems. | _____ 14. Toward more flexible, user-friendly, Web-enabled software, integrated into e-business software suites. |
| _____ 5. Includes order management, production planning, accounting, finance, and human resource systems. | _____ 15. Toward the use of Internet technologies to integrate and enhance collaboration with a company's network of business partners. |
| _____ 6. Includes demand forecasting, inventory management, logistics management, and warehouse management systems. | _____ 16. An integrated system of software modules for customer relationship management, enterprise resource planning, supply chain management, and other business applications. |
| _____ 7. Acquiring, enhancing, and retaining profitable relationships with customers. | _____ 17. The automatic exchange of electronic business documents between the networked computers of business partners. |
| _____ 8. Improvements in the quality, efficiency, cost, and management of internal business processes. | _____ 18. A network of business partners, processes, and relationships that supports the design, manufacture, distribution, and sale of a company's products. |
| _____ 9. Development of a fast, efficient, and low-cost network of business partners to get products from concept to market. | |
| _____ 10. Resistance from sales and customer service professionals who are not adequately involved in the development of the system. | |

Discussion Questions

- | | |
|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Should every company become a customer-focused business? Why or why not? | 3. Refer to the Real World Case on Dow Corning and DirecTV in the chapter. Are mobile applications limited to be scaled-down versions of their enterprise counterparts, or will companies start to develop enterprise applications thinking about mobile deployments? Discuss. |
| 2. Why would systems that enhance a company's relationships with customers have such a high rate of failure? | |

4. How could some of the spectacular failures of ERP systems have been avoided?
5. Should companies continue to use EDI systems? Why or why not?
6. Refer to the Real World Case on Kennametal, Haworth, and Others in the chapter. Do the examples discussed in the case show that customization and ERPs should never go together? Discuss.
7. How can the problem of overenthusiastic demand forecasts in supply chain planning be avoided?
8. What challenges do you see for a company that wants to implement collaborative SCM systems? How would you meet such challenges?
9. Refer to the Real World Case on Cisco Systems and Others in the chapter. Are supply chains becoming so tightly integrated that resilience against external shocks is minimal? Discuss.
10. Should companies install e-business software suites or “best of breed” e-business software components? Why?

Analysis Exercises

1. NetSuite's NetSuite

Enterprise Systems to Go

NetSuite by NetSuite Inc. (www.netsuite.com) enables small businesses to develop and deploy ERP, CRM, and e-commerce applications quickly. Their Web site presents detailed information about this software suite. Visit NetSuite's Web site and click on their “NetSuite” product link to see more information about the product's components. Click on the “Customers” link for a list of success stories. Notice the tremendous variety of business types.

- a. Identify and explore NetSuite's components that relate to your business major.
- b. Click on the “Customers” link on NetSuite's home page and select a customer in an industry that interests you (or one assigned by your instructor). Read the customer's success story. What benefits were emphasized?
- c. Would you recommend this suite to a small business owner? Why or why not?

2. Collaborative CRM

Distributed Teams

A large telecommunications company's real estate holdings include more than 6 million square feet of property. To aid in its more than 400 real estate-related transactions each year, the company contracted the services of a corporate real estate company and a law firm that specialized in corporate real estate. Real estate transactions significantly differ based on type and circumstances unique to each property and property owner. Legal specialists help ensure that each transaction meets its client's risk preferences.

The telecommunications company wanted an information system using the Lotus Notes/Domino messaging platform to link it with the real estate firm and the law firm in order to:

- Capture common transaction information such as property location, transaction type, business unit, “opposing party,” and lead contacts.
- Record and report what tasks have been completed, when they were completed, and who completed them.
- Allow ad hoc posting of additional, transaction-specific information into a common electronic file.

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Team members quickly found that by taking time to update the system they would reduce miscommunications and interruptions and therefore save time overall. Management liked the system because they could track team members' performance, identify processes open to improvement, and identify project delays before they became costly problems.

- a. How do these property transactions differ from commodity supply chain transactions?
- b. What advantage do the real estate company and the law firm gain by adopting their client's technology platform (Lotus Notes/Domino)?
- c. Find a Lotus Notes/Domino product review on the Web, read it, and report your findings to the class. Your presentation should answer the following questions: Who provided the review? What is the reviewer's relationship to the product? What did the reviewer like? What did the reviewer dislike? What competitors were mentioned in the review? How did Lotus Notes/Domino compare?

3. Enterprise Sales Support

Making Up for Missing Features

Christina Lovan works as an independent agent for Farmers Insurance (www.farmers.com) in O'Fallon, Illinois. As an independent agent, she manages her own office and earns her income entirely from policy sales. Farmers Insurance supports Christina's efforts with training and access to a Web-based suite of applications that help her manage her business. This *extranet* includes contact, customer, and policy management systems, as well as corporate communications. The system also includes a feedback feature agents may use to report software problems or make suggestions regarding future software enhancements.

Christina enjoys working with people to help them solve their problems. However, to meet these people, Christina needs leads. She purchases leads from Farmers Insurance, Net Quote (www.netquote.com), InsureMe (www.insureme.com), AllQuotes (www.allquotesinsurance.com), and Crisscross (www.crisscross.org), a database of local residents and businesses. She asks each client for three referrals at each meeting. She is a member of Business Networking International

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(www.bni.com), and she is an active member of the local chamber of commerce.

Although the software tools provided by Farmers Insurance allow Christina to track prospective customers, they do not measure information quality. Lead information is expensive to purchase or solicit. Christina needs to know the best way to spend her time and money. Until Farmers provides a system update to accommodate this need, Christina has developed her own data-quality evaluation tools using Microsoft Excel.

With a few basic Excel skills, we can duplicate Christina's efforts. Download and save "Insurance.xls" from the MIS 10e OLC and use it to complete the following exercises. Note that the data providers used in this exercise are real, but the data in this spreadsheet are randomly generated.

- a. Pending sales need Christina's immediate attention. Help her spot these opportunities by automatically highlighting them. Select the "Sales Leads" spreadsheet and use Excel's Conditional Formatting feature to set the cell shading color of each *Status* cell (Life, Auto, Home, Health) to green if the status is "Sale" (S) and red if the status is "Pending" (P).
- b. Select the "Cover Sheet" spreadsheet. In cell C2, use the COUNTA function to count the total number of sales leads in the Sales Leads sheet. In cells C5 through C8, use the COUNTIF function to count the number of sales made for each type of insurance. In cells D5 through D8, divide the sales made by the number of leads to calculate the percentage of sales. Write these formulas so they calculate the correct answers even when Christina later adds more records to the list. Which product has the highest sales rate?
- c. When rating the quality of her information, Christina counts whether or not a lead resulted in at least one sale. Using the IF and the OR functions, write a formula that will display "1" when at least one sale was made to a lead and "0" if the lead generated no sales.

- d. Ultimately, Christina needs to know which lead source results in the most sales. Create a pivot table to average the data in the "Sales" for each "Source." Format this result as a percentage. Because a 1 indicates at least one sale and a 0 indicates no sales, the average per source indicates each source's closing rate. Which source had the highest closing rate? Which source had the lowest closing rate?

4. The Future of Enterprise Systems

Plug-in ERP

As enterprise systems grow in size to perform ever more operations for an organization, the software system itself becomes increasingly complex and hard to maintain. Add the fact that organizations typically customize these applications and it becomes clear why organizations end up with ever-increasing annual software maintenance budgets.

Is there an alternative model to enterprisewide systems that try to do it all? What if third-party developers produced mutually compatible components or modules for enterprise systems? Such components would plug in to a central system much like a printer, mouse, monitor, and modem plug into a personal computer.

If third parties wrote individual components, they might make them more closely fit the needs of specific types of business. With a better fit, these components would require less customization. Organizations could upgrade or replace components individually and only when needed.

So what is the current state of the art? Visit 20/20 Software Inc.'s Web site (www.2020software.com) and use its "Compare Software" feature to research applications.

- a. Identify a system that runs on more than one server operating system.
- b. Identify a system that runs on more than one database platform.
- c. Describe 20/20 software's revenue model.

REAL WORLD

CASE

4

NetSuite Inc., Berlin Packaging, Churchill Downs, and Others: The Secret to CRM Is in the Data

Zach Nelson sits in a Silicon Valley coffeehouse, sipping a latte, nibbling a pastry, and drawing IT architecture diagrams. His mission: to illustrate what he believes is the biggest reason that the software category known as customer relationship management (CRM) has been unable to shake the black marks of too many failed multimillion-dollar deployments.

CRM is easier to implement when a company is young, he says. “The elephant in the room with CRM systems is that there’s no customer data native in them,” says Nelson, CEO of NetSuite Inc., which sells a suite of Web-based, on-demand business applications, including CRM. “That’s why they fail.”

When CRM came onto the market in the mid-1990s, driven largely by Siebel Systems, the software typically came bundled with proprietary databases that then had to be populated with customer data housed in disparate enterprise systems. The result? “Customer records are scattered and there’s often overlap and inconsistency,” Nelson contends.

By the time he’s finished with his morning snack, Nelson has also made a convincing case as to why small and midsize companies are primed to get CRM right.

CRM is a lot easier to do early in a company’s history than it is later. Also, Web-based subscription software, such as the kind that Nelson’s company offers, has given them access to IT applications that in the past might have been too costly or too complex. Designs for Health Inc., a \$10 million-a-year maker of prescription nutritional supplements, isn’t ready to invest millions in a big CRM package, but it did need a more sophisticated accounting system than Intuit Corp.’s QuickBooks. So, it turned to NetSuite to host a general-ledger application that would let the company automate its accounting processes and easily share the data with other NetSuite applications, such as the CRM module it would add later.

Perhaps the most crucial factor to the CRM success of small and midsize businesses is that most aren’t yet paralyzed by data silos and disparate systems, and they’ve learned from those that have had to spend lots of time and energy bridging the silos. “The biggest problem I have with having disparate systems is determining what is your source of the truth,” says Steve Canter, CIO at Berlin Packaging LLC, a \$200 million-a-year maker of cans and bottles used to package everything from makeup to jelly. “I have a customer-relationship-management system that has a customer master file. I have an order-management system that has a customer master. If the information between those systems doesn’t agree, which one is true? Having a single instance of the customer master, we know what the truth is.”

In theory, customer data integration provides a universal view of a customer by resolving discrepancies in names and addresses, as well as summarizing customer interaction data from multiple systems. Customer data in many IT companies remain balkanized as CRM, enterprise resource planning,

and supply chain management systems have proliferated. That means the IT behind customer-facing operations such as call centers often can’t provide employees with a single view of a customer.

Berlin considered adding a PeopleSoft CRM application to the company’s existing PeopleSoft enterprise resource planning and supply chain management system, but it decided that such an effort might prove too distracting. So Berlin opted to use the PeopleTools programming code in the ERP system to build bolt-on applications that convert financial and supply chain management functions into CRM processes. Including housing records on more than 27,000 customers acquired since the mid-1990s, the ERP database now serves as a clearinghouse of customer data that lets any part of the company access definitive and wide-ranging information. The knowledge that there are no other collections of customer data elsewhere in the company provides significant peace of mind.

What’s more, Canter not only has accomplished this without absorbing any hard costs, but employees have quickly adopted every tool he’s introduced, something that any big-company CIO will tell you is the most elusive part of a CRM deployment. The key, Canter says, has been a combination of incremental changes and interfaces salespeople already are familiar with. “It’s not like implementing a CRM system where overnight their lives are changed,” he says. “Little by little, they’re getting a CRM system without even realizing it.”

Creating de facto CRM systems out of other applications isn’t for everyone, says Barton Goldenberg, president of CRM consulting firm ISM. Goldenberg is a firm believer that CRM software can provide data intelligence and support for front-end business processes that even the most carefully tweaked ERP system can’t match. “Data in its own right [are] useless unless it’s put into context,” he says. “I can serve data up via pigeons, but it’s the CRM application that adds the value.”

A CRM deployment that’s carefully thought out has done just that for Churchill Downs Inc., the \$500 million-a-year operator of six horse-racing tracks, including its namesake, the famed home of the Kentucky Derby. It’s also converting its mass-market advertising to a more one-to-one approach.

Before Atique Shah joined the company in late 2003 as vice president of CRM and technology solutions, Churchill Downs had just assumed that the aggregate data culled from its Twin Spires loyalty club could be broken into four distinct buckets of customers.

Shah wasn’t so sure. So, he got budget approval to obtain a range of technologies, starting with Epiphany Inc.’s CRM software and supported by SPSS Inc.’s Clementine data-mining tool and IBM’s Ascential data-extraction and transformation software. Shah then ran the data through Clementine and discovered that there were actually nine

aggregate customer types, which was an indication that its previous marketing efforts probably weren't as useful or relevant as they should have been.

Asked how close he is to achieving a 360-degree view of his customers, he laughs and says, "I believe we're probably at about 190 degrees." Churchill Downs has 27 sources of customer information, and refereeing among them is a constant problem, Shah says.

To reflect the more-detailed profiles that emerged, Shah transitioned from generic labels for the old buckets—platinum, gold, silver, and bronze—to descriptions that hinted at the personalities of each segment. So, a female customer who only visits the track a few times a year and is there more for the social spectacle than for the betting is now known as a "Seldom Sally," and a wealthy man in his fifties who spends more than \$100,000 a year at the track and is confident in his racing knowledge is a "Smarty Steve."

Shah published the new intelligence to the company's various tracks and engineered a test campaign with Arlington Park near Chicago. Arlington's staff selected 55,000 households from its database and then broke them into the nine customer segments Clementine had spit out.

Each distinct group of customers then received direct-mail advertisements that reflected its profile, with information and offers that jibed with its attributes. The response rate was impressive, with nearly 10 percent of those who received the mailing coming to the park during the following season. "What was more amazing was that the group of customers they had segmented generated \$1.6 million in the

first two weeks," Shah says. "A year earlier, the same customers generated \$950,000." The success of that campaign underscored the value of the data that Churchill Downs had, in many ways, been sitting on.

However small and midsize companies implement CRM, it's clear that data can translate into increased sales. ISM's Goldenberg reiterates, though, that companies need to make sure data are in order before they launch any major CRM initiative. Even though he believes that in most cases, it's the CRM application, not the data, that's providing the real business value, it's also clear that one can't thrive without the other. "Without accurate, complete, and comprehensive data, any CRM effort will be less than optimal," he says.

Which brings us back to the prediction that NetSuite's Nelson makes: A few years from now, today's small companies will be running circles around their larger competitors, primarily because establishing a master record of customer data will prove to be a less-daunting task for them. The way Nelson sees it, the decision to jump on establishing unified sources of customer data will pay off for the emerging companies that do so. "Once you get your data in place, things that were very complex before become quite trivial, he says.

Maybe not as trivial as sipping coffee and nibbling on a Danish pastry, but wouldn't it be great if it were pretty darn close?

Source: Adapted from Tony Kontzer, "CRM's Secret Is in the Data," *InformationWeek*, August 15, 2005; and Charles Babcock, "Looking for a Clearer View of the Customer," *InformationWeek*, August 8, 2005.

CASE STUDY QUESTIONS

1. What are the business benefits of CRM implementations for organizations such as Berlin Packaging and Churchill Downs? What other uses of CRM would you recommend to the latter? Provide several alternatives.
2. Do you agree with the idea that smaller organizations are better positioned to be more effective users of CRM than larger ones? Why or why not? Justify your answer.
3. One of the main issues noted in the case is the importance of "good" data for the success of CRM implementations. We discussed many of these in Chapter 5, when we compared the file processing and database management approaches to data resource management. Which of the problems discussed there do you see present in this case? How do CRM applications attempt to address them. Use examples from the case to illustrate your answer.

REAL WORLD ACTIVITIES

1. NetSuite Inc. is a leading provider of on-demand enterprise applications, including CRM as featured in the case. Other important players in this market include Salesforce.com and Siebel On Demand. Use the Internet to research all three product offerings and discover how these companies are faring in this increasingly competitive industry. Compare and contrast their product features to understand whether offerings are becoming differentiated or more alike as a result.
2. The CRM implementations in this case highlight the critical importance of information about customers, their preferences and activities, and how to use it to understand and develop better marketing solutions. On the other hand, the degree to which these companies are able to target customers individually may be of concern to some people. Break into small groups with your classmates to discuss these concerns, as well as ways for both companies and their customers to benefit from CRM systems and still protect customer privacy.

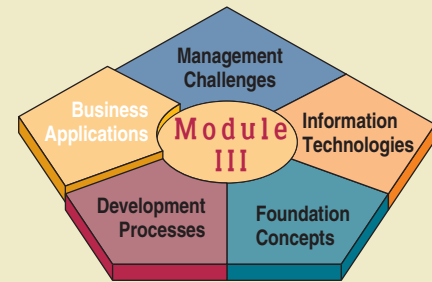
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CHAPTER 9



e-COMMERCE SYSTEMS

Chapter Highlights

Section I e-Commerce Fundamentals

Introduction to e-Commerce

The Scope of e-Commerce

Real World Case: Sony, 1-800-Flowers, Starbucks, and Others: Social Networks, Mobile Phones, and the Future of Shopping

Essential e-Commerce Processes

Electronic Payment Processes

Section II e-Commerce Applications and Issues

Business-to-Consumer e-Commerce

Real World Case: LinkedIn, Umbria, Mattel, and Others: Driving the “Buzz” on the Web

Web Store Requirements

Business-to-Business e-Commerce

e-Commerce Marketplaces

Clicks and Bricks in e-Commerce

Real World Case: Entellium, Digg, Peerflix, Zappos, and Jigsaw: Success for Second Movers in e-Commerce

Real World Case: KitchenAid and the Royal Bank of Canada: Do You Let Your Brand Go Online All by Itself?

Learning Objectives

1. Identify the major categories and trends of e-commerce applications.
2. Identify the essential processes of an e-commerce system, and give examples of how it is implemented in e-commerce applications.
3. Identify and give examples of several key factors and Web store requirements needed to succeed in e-commerce.
4. Identify and explain the business value of several types of e-commerce marketplaces.
5. Discuss the benefits and trade-offs of several e-commerce clicks-and-bricks alternatives.

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SECTION I

e-Commerce Fundamentals

Introduction to e-Commerce

E-commerce is changing the shape of competition, the speed of action, and the streamlining of interactions, products, and payments from customers to companies and from companies to suppliers.

For most companies today, **electronic commerce** is more than just buying and selling products online. Instead, it encompasses the entire online process of developing, marketing, selling, delivering, servicing, and paying for products and services transacted on inter-networked, global marketplaces of customers, with the support of a worldwide network of business partners. In fact, many consider the term “e-commerce” to be somewhat antiquated. Given that many young businesspeople have grown up in a world in which online commerce has always been available, it may soon be time to eliminate the distinction between e-commerce and e-business and accept that it is all just “business as usual.” Until then, we will retain the term “e-commerce” because it allows for a clearer picture of the differences between online and more traditional business transactions.

As we will see in this chapter, e-commerce systems rely on the resources of the Internet and many other information technologies to support every step of this process. We will also see that most companies, large and small, are engaged in some form of e-commerce activities. Therefore, developing an e-commerce capability has become a competitive necessity for most businesses in today’s marketplace.

Read the Real World Case on the next page. We can learn a lot about new ways to reach customers using technology from this case. See Figure 9.1.

The Scope of e-Commerce

Figure 9.2 illustrates the range of business processes involved in the marketing, buying, selling, and servicing of products and services in companies that engage in e-commerce. Companies involved in e-commerce as either buyers or sellers rely on Internet-based technologies and e-commerce applications and services to accomplish marketing, discovery, transaction processing, and product and customer service processes. For example, e-commerce can include interactive marketing, ordering, payment, and customer support processes at e-commerce catalog and auction sites on the World Wide Web. However, e-commerce also includes e-business processes such as extranet access of inventory databases by customers and suppliers (transaction processing), intranet access of customer relationship management systems by sales and customer service reps (service and support), and customer collaboration in product development via e-mail exchanges and Internet newsgroups (marketing/discovery).

The advantages of e-commerce allow a business of virtually any size that is located virtually anywhere on the planet to conduct business with just about anyone, anywhere. Imagine a small olive oil manufacturer in a remote village in Italy selling its wares to major department stores and specialty food shops in New York, London, Tokyo, and other large metropolitan markets. The power of e-commerce allows geographical barriers to disappear, making all consumers and businesses on earth potential customers and suppliers.

e-Commerce Technologies

Which technologies are necessary for e-commerce? The short answer is that most information technologies and Internet technologies that we discuss in this text are, in some form, involved in e-commerce systems. A more specific answer is illustrated in Figure 9.3, which gives an example of the technology resources required by many e-commerce systems. The figure illustrates some of the hardware, software, data, and network components used by FreeMarkets Inc. to provide business-to-business (B2B) online auction e-commerce services.

REAL WORLD

CASE

1

Sony, 1-800-Flowers, Starbucks, and Others: Social Networks, Mobile Phones, and the Future of Shopping

A number of major retailers have been driven into bankruptcy protection during this recession, including RedEnvelope and Eddie Bauer, or gone out of business altogether, like Circuit City. Blockbuster, Virgin Megastores, and many more have closed stores. Survivors, suffering deflated profits and slow sales, warn of a bleak future.

But smart retailers are going where it's warm: the hot little hands of cellphone- and laptop-toting consumers who want to shop right now, wherever they happen to be sipping their lattes or watching their kids' soccer games. Technology-backed projects to increase revenue include mobile e-commerce, coupons by text message, and even storefronts on social networks. As enablers of these projects, CIOs are moving ever closer to the customer.

"Out of recession develops one picture—finally—of what true business-IT alignment looks like," says Drew Martin, CIO of Sony Electronics. "IT is becoming part of the product offerings." Whether that's hotel kiosks, mobile banking, hospital patient portals, or retail, CIOs are getting their IT groups to the front line in the competition for consumer dollars. When a customer logs on to his new Sony e-book reader, for example, the device automatically connects him to his existing customer profile, from which he can start buying e-books. This feature is available thanks to Martin's efforts to connect product development with Sony's internal customer relationship management system.

As exciting as it is to live on the progressive edge of the CIO profession, though, it's a new world to navigate at a time when wrong moves can severely hurt a company. "The challenge is that now you're entering into the revenue space,"

FIGURE 9.1



Companies are expanding from Web sites and email into new ways of reaching consumers through innovative uses of technology.

Source: © Alex Segre/Alamy.

Martin says. "You need to commit to delivering your part of what needs to be delivered."

"Web sites and e-mail—that's just too many steps now," says Brett Michalak, CIO with Tickets.com, which sells tickets to games, concerts, and other events, as well as having its own ticketing technology.

Social media such as Twitter, Facebook, and YouTube take e-mail out of the equation, putting offers in front of customers on sites they already visit. Dell, JetBlue, Whole Foods, and other big brands have pounced on Twitter as a marketing and promotion tool, tweeting special deals to followers. Dell, for example, attributes more than \$2 million in sales to its 14 Twitter accounts that promote offers to 1.4 million followers. ("15 percent off any Dell Outlet Inspiron laptop. Enter code at checkout . . .")

Sony is using Twitter, among other social networking sites, to hype the SonyReader. A recent tweet included a link to a page at Sony's site comparing the product favorably to Amazon's Kindle. "You can't build a site and expect people to come. We are on YouTube, Facebook, and Twitter to go out and get them," Martin says.

1-800-Flowers intends to find out whether social networkers are also social shoppers. In July 2009, the \$714-million flower delivery company launched the first Facebook storefront. Collectively, Facebook's 300 million active members spend eight billion minutes per day on the site, according to the company. An Experian survey found that dwell time for an adult visiting a social network is 19 minutes and 32 seconds. Meanwhile, 35 percent of adults who had been on a social network in the past month had also bought something online in that time period, the survey found—a ripe demographic.

"Still, there's a lot to do on Facebook, so any shopping has to be fast," says Vibhav Prasad, vice president of Web marketing and merchandising at 1-800-Flowers.

The company's Facebook store, therefore, offers only 10 percent to 15 percent of the several hundred bouquets available from the main 1-800-Flowers Web site, and the checkout process has been pared down. No suggestions to buy related products pop up, for example, and four special-occasion tabs span the top of the page, instead of the eight on the main site.

"It's a fairly impulsive purchase in this channel," Prasad says. "As simple and as quick as we can make it, the more effective we'll be." Impulsiveness is key. Every time Facebook members log in, they see updates about who among their friends is having a birthday. Prasad wants those regular reminders to spark flower buys. Going social was "a logical extension" for 1-800-Flowers, which was one of the first retailers to put up an e-commerce site in the early 1990s, notes Kevin Ranford, director of Web marketing. "It comes from listening to customers and responding to the channels in which they're interacting," Ranford says.

Facebook users spend most of their time looking at their own home pages. They read their news feed—a display of their friends' status updates, quizzes taken, notes posted, and

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games played. So, 1-800-Flowers is planning a way into the news feed. When a fan fills out a wish list to indicate which flowers she'd like to receive, notification goes into the feeds of her friends. Carol logs on to Facebook, sees that Alice has a birthday on Thursday and wishes for the "Pleasantly Pink" bouquet. Ding! Carol clicks over to the 1-800-Flowers store and \$29.99-plus-shipping later, takes care of that gift without ever leaving Facebook. "We think people will do it because social networking is all about you expressing your interests and your friends responding," says Wade Gerten, CEO of Alvenda, the Minneapolis software developer that built the Facebook store for 1-800-Flowers. "Shopping online can be social again, as it was in person."

People lose their credit cards and forget their wallets. But cell phones? There is perhaps no combination of vices so bursting with commercial promise than that of cell phone-plus-coffee. Starbucks is there. In September 2009, the \$9.8 billion coffee chain began testing a system to let customers pay using their iPhones or iPod touch devices. They download the Starbucks Card Mobile App and type in the number of their Starbucks loyalty card, preloaded with spending money. A 2-D bar code appears that cashiers can scan.

Royal Oak Music Theatre, a Michigan music and comedy venue that has featured such acts as Train and Bob Saget, started mobile ticketing three years ago and has adjusted its marketing to cover for finicky technology.

Anyone who's done self-checkout at the supermarket knows that scanning takes a special, knowing touch. Still, scanning bar codes on the screens of mobile devices often requires extra wiggling of the phone and slanting it at different angles. It's slower than scanning paper tickets. To avoid ticking off patrons lined up to run in and grab general-admission floor spots, Royal Oak created a separate VIP entrance for the mobile customers. There, staff use the newer model scanners required for reading mobile bar codes, and it's not so apparent that the scanning takes longer, says Diana Williams, box office manager.

Mobile customers are also allowed to get into the theater a few minutes before traditional customers, which encourages more people to buy their tickets by cell phone, she says. That's cheaper for the theater than handling paper tickets;

saving money and hassle time is Williams' goal. But it also positions the theater well for collecting future revenue.

"Mobile ticketing skews young," Williams observes. The theater does shows for all ages, and for a typical adult event, 16 percent of tickets sold are through the mobile channel. But for a recent show by the boy-band Hansen, popular with tween girls, mobile accounted for nearly 40 percent of tickets. "There's an age—around 22 or younger—where it would never occur to patrons that you couldn't buy a ticket from your phone," Williams says.

Mobile and social commerce projects will change the business of any company that invests in it, says Russ Stanley, managing vice president of ticket services and client relations for the San Francisco Giants. For example, instead of being a long-planned activity, a Major League Baseball game can become an impulse buy, Stanley says, bringing in more sales for the organization.

Every game day, the Giants have 40,000 seats to sell. If they've sold only 30,000, 10,000 spoil every bit as badly as old pears. Last year, the team changed prices daily on about 2,000 seats. Stanley imagines the day when he'll have a database of fans who, say, live within a mile of the ballpark to whom he can text last-minute offers. "Hey, the Giants have \$5 tickets left for tonight. For \$5, I'll walk down there," he says. "As they're walking up to the entrance, they're buying on the mobile."

The Giants started to offer mobile tickets midway through the 2008 season, when they sold about 100 tickets that way per game. In 2009, it was about 200 and Stanley expects to do about 400 per game in the coming years. "Fans who use it love it. It's getting the people to use it," he says.

Like hot dogs and cold beer, holding a ticket is part of the rite of baseball, he says. Plus, there's the souvenir value. When pitcher Jonathan Sanchez threw a no-hitter against the San Diego Padres in July 2009, about 50 mobile fans, as well as people who had bought tickets online and printed them on plain paper at home, later requested the team print "real" tickets for them to commemorate the event. "We did that for them. It's good relations," says Stanley. And, he adds, it could turn into a money-making service in the future.

Source: Adapted from Kim S. Nash, "Facebook, Mobile Phones, and the Future of Shopping," *CIO.com*, November 24, 2009.

CASE STUDY QUESTIONS

1. How do the companies involved benefit from the innovations discussed in the case? Is it about more efficient transaction processing, better reaching out to customers, or both?
2. Use examples from the case to illustrate your answer.
3. "Shopping online can be social again, as it was in person," says Wade Gerten, CEO of Alvenda. Do you think this is a stretch, or are we in the midst of a turning point in online shopping? Explain your answer.
4. Many of the applications discussed in the case are mostly used by the younger demographic, who grew up around technology. How do online behavior patterns change as they become older, with more responsibilities, and more challenging jobs? Do applications like those discussed in the case become less important? More important?

REAL WORLD ACTIVITIES

1. Consider the examples discussed in the case. Go online and research what other companies or industries are doing in terms of the use of social networking sites and mobile commerce. What other examples can you find? Prepare a report that compares those in your research with the ones described here, highlighting similarities and differences. Can you spot any new trends?
2. How often, if ever, do you shop with your mobile phone? What do you think are some of the roadblocks that prevent the widespread adoption of mobile shopping?
3. What would you suggest companies do to overcome those? Break into small groups with your classmates to develop a few recommendations.

FIGURE 9.2 E-commerce involves accomplishing a range of business processes to support the electronic buying and selling of goods and services.

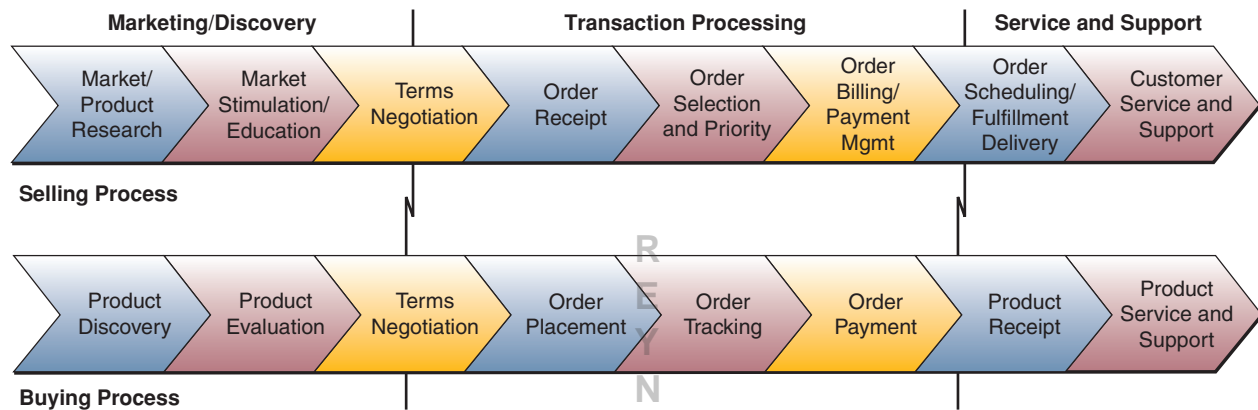
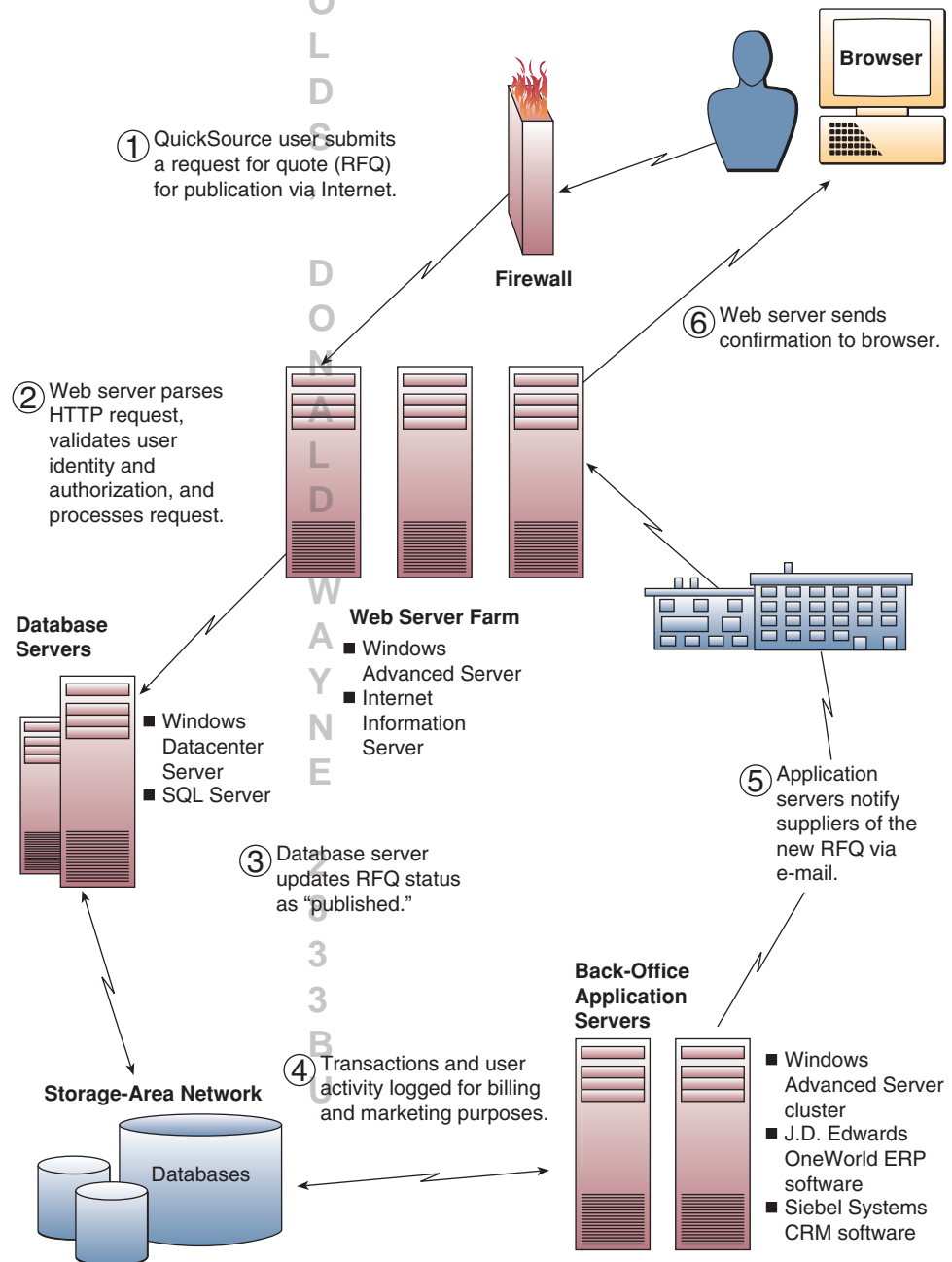


FIGURE 9.3

The hardware, software, network, and database components and IT architecture of B2B online auctions provider FreeMarkets Inc. are illustrated in this example of its Internet-based QuickSource auction service.



Forrester: Web 2.0 Has a Bright Future

As a standard enterprise tool, Web 2.0 has a bright future, one for which companies are expected to spend \$4.6 billion by 2013 to integrate into their corporate computing environments, according to a Forrester Research report. Though still considered an upstart technology, Forrester believes that conventional Web 2.0 elements—social networking, RSS, blogs, wikis, mashups, podcasting, and widgets—are fast becoming the norm for communicating with employees and customers. The report highlights megacompanies such as General Motors, McDonald's, Northwestern Mutual Life Insurance, and Wells Fargo among those who have already jumped into the Web 2.0 pool with both feet. In addition, some 56 percent of North American and European enterprises consider Web 2.0 to be a priority.

"If I wanted to be anywhere in the Web 2.0 economy, I'd want to be on the enterprise side," says report author and Forrester Research analyst Oliver Young. "We're seeing enterprise-class software coming from startups, but we're seeing them through very low price points . . . so it [Web 2.0] will never be a mega market," says Young. "It will eventually disappear into the fabric of the enterprise, despite the major effects the technology will have on how businesses market their products and optimize their workforces."

The consumer-facing ad-funded Web 2.0 sites like Facebook, MySpace, and Delicious will also have difficulty as similar technologies are incorporated into the enterprise. "Even Google is having a hard time selling the advertising," Young said. Still, start-ups have much to gain in pursuing the Web 2.0 world, such as understanding how companies are adopting their technology. Small groups within a company are more likely to adopt blogs, wikis, mashups, and widgets. The key to adoption, he adds, is to show how there is a business value in using the Web 2.0 tools. "Web 2.0 is not a critical 'must have' for any company at this point, but it's more than likely that your competition is using it and is showing faster results because of it."

Source: Adapted from Michael Singer, "Web 2.0: Companies Will Spend \$4.6 Billion by 2013, Forrester Predicts," *InformationWeek*, April 21, 2008.

Categories of e-Commerce

Many companies today are participating in or sponsoring four basic categories of e-commerce applications: **business-to-consumer**, **business-to-business**, **consumer-to-consumer** and business-to-government e-commerce. Note: We do not explicitly cover business-to-government (B2G) and *e-government* applications because they are beyond the scope of this text, but many e-commerce concepts apply to such applications.

Business-to-Consumer (B2C) e-Commerce. In this form of e-commerce, businesses must develop attractive electronic marketplaces to sell products and services to consumers. For example, many companies offer e-commerce Web sites that provide virtual storefronts and multimedia catalogs, interactive order processing, secure electronic payment systems, and online customer support. The B2C marketplace is growing like a wildfire but still remains the tip of the iceberg when compared with all online commerce.

Consumer-to-Consumer (C2C) e-Commerce. The huge success of online auctions like eBay, where consumers (as well as businesses) can buy from and sell to one another in an auction process at an auction Web site, makes this e-commerce model an important e-commerce business strategy. Thus, participating in or sponsoring consumer or business auctions is an important e-commerce alternative for B2C, C2B (consumer-to-business), or B2B e-commerce. Electronic personal advertising of

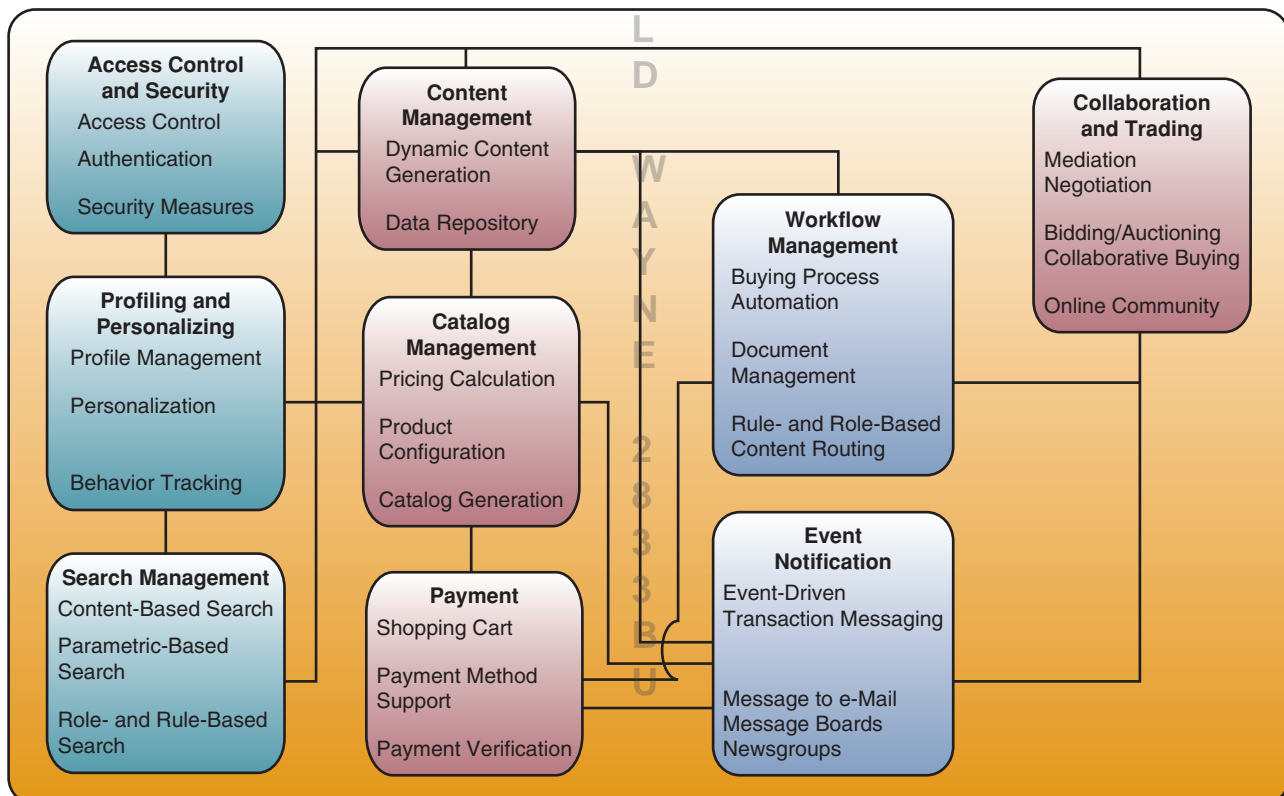
products or services to buy or sell by consumers at electronic newspaper sites, consumer e-commerce portals, or personal Web sites is also an important form of C2C e-commerce.

Business-to-Business (B2B) e-Commerce. If B2C activities are the tip of the iceberg, B2B represents the part of the iceberg that is under the water—the biggest part. This category of e-commerce involves both e-business marketplaces and direct market links between businesses. For example, many companies offer secure Internet or extranet e-commerce catalog Web sites for their business customers and suppliers. Also very important are B2B e-commerce portals that provide auction and exchange marketplaces for businesses. Others may rely on electronic data interchange (EDI) via the Internet or extranets for computer-to-computer exchange of e-commerce documents with their larger business customers and suppliers.

Essential e-Commerce Processes

The essential **e-commerce processes** required for the successful operation and management of e-commerce activities are illustrated in Figure 9.4. This figure outlines the nine key components of an *e-commerce process architecture* that is the foundation of the e-commerce initiatives of many companies today. We concentrate on the role these processes play in e-commerce systems, but you should recognize that many of these components may also be used in internal, noncommerce e-business applications. An example would be an intranet-based human resource system used by a company's employees, which might use all but the catalog management and product payment processes shown in Figure 9.4. Let's take a brief look at each essential process category.

FIGURE 9.4 This e-commerce process architecture highlights nine essential categories of e-commerce processes.



Access Control and Security

E-commerce processes must establish mutual trust and secure access between the parties in an e-commerce transaction by authenticating users, authorizing access, and enforcing security features. For example, these processes establish that a customer and e-commerce site are who they say they are through user names and passwords, encryption keys, or digital certificates and signatures. The e-commerce site must then authorize access to only those parts of the site that an individual user needs to accomplish his or her particular transactions. Thus, you usually will be given access to all resources of an e-commerce site except for other people's accounts, restricted company data, and Web master administration areas. Companies engaged in B2B e-commerce may rely on secure industry exchanges for procuring goods and services or Web trading portals that allow only registered customers to access trading information and applications. Other security processes protect the resources of e-commerce sites from threats such as hacker attacks, theft of passwords or credit card numbers, and system failures. We discuss many of these security threats and features in Chapter 13.

Profiling and Personalizing

Once you have gained access to an e-commerce site, profiling processes can occur that gather data on you and your Web site behavior and choices, as well as build electronic profiles of your characteristics and preferences. User profiles are developed using profiling tools such as user registration, cookie files, Web site behavior tracking software, and user feedback. These profiles are then used to recognize you as an individual user and provide you with a personalized view of the contents of the site, as well as product recommendations and personalized Web advertising as part of a *one-to-one marketing* strategy. Profiling processes are also used to help authenticate your identity for account management and payment purposes and gather data for customer relationship management, marketing planning, and Web site management. Some of the ethical issues in user profiling are discussed in Chapter 13.

Search Management

Efficient and effective search processes provide a top e-commerce Web site capability that helps customers find the specific product or service they want to evaluate or buy. E-commerce software packages can include a Web site search engine component, or a company may acquire a customized e-commerce search engine from search technology companies like Google and Requisite Technology. Search engines may use a combination of search techniques, including searches based on content (e.g., a product description) or parameters (e.g., above, below, or between a range of values for multiple properties of a product).

Content and Catalog Management

Content management software helps e-commerce companies develop, generate, deliver, update, and archive text data and multimedia information at e-commerce Web sites. For example, German media giant Bertelsmann, part owner of BarnesandNoble.com, uses StoryServer content manager software to generate Web page templates that enable online editors from six international offices to easily publish and update book reviews and other product information, which are sold (syndicated) to other e-commerce sites.

E-commerce content frequently takes the form of multimedia catalogs of product information. As such, generating and managing catalog content is a major subset of content management, or catalog management. For example, W.W. Grainger & Co., a multibillion-dollar industrial parts distributor, uses the CenterStage catalog management software suite to retrieve data from more than 2,000 supplier databases, standardize the data, translate it into HTML or XML for Web use, and organize and enhance the data for speedy delivery as multimedia Web pages at its www.grainger.com Web site.

Content and catalog management software works with the profiling tools we mentioned previously to personalize the content of Web pages seen by individual users. For example, Travelocity.com uses OnDisplay content manager software to push

personalized promotional information about other travel opportunities to users while they are involved in an online travel-related transaction.

Finally, content and catalog management may be expanded to include *product configuration* processes that support Web-based customer self-service and the *mass customization* of a company's products. Configuration software helps online customers select the optimum feasible set of product features that can be included in a finished product. For example, both Dell Computer and Cisco Systems use configuration software to sell built-to-order computers and network processors to their online customers.

e-Commerce Tools to Close the Deal

Nothing is as heart-wrenching to an e-tailer as watching a customer abandon a full cart just seconds before consummating the deal. To be so close yet so cashless is more than frustrating; it's harmful to an e-tailer's health. A virtual armory of tools are in use to woo, cajole, prompt, and push consumers to make the buy—but are they working, or are they turning even more customers away?

"Most fall woefully short," says Matthew Brown, senior director of e-commerce and interactive marketing at MarketNet. "Instead of focusing on using tools and technologies to help the customer, much more thought and time needs to go into Web site architecture in the first place."

Many theories are being tossed about as to why consumers turn fickle a hair short of the finish line. For each theory, there are a multitude of technological solutions. "Retailers continue to launch and test technologies and features aimed at reducing abandonment or increasing online conversion," says Jessica Ried, a director of retail strategy at Resource Interactive. "In our experience, it is difficult to know for sure if any particular one is going to be effective for a given retailer without testing it with that retailer's customer base, or at least having a solid understanding of existing customer behaviors on the site through site analytics and surveys."

Once an e-tailer understands the true obstacles to closing the deal, there are a range of tools available to clear the way to bigger profits. The most commonly deployed are live chat, pop-up discounts, and follow-up email programs; some are achieved through the standard use of cookies, others via pixel-based triggers. Third-person endorsements are also frequently used. "Hosting consumer-generated content such as ratings and reviews has typically allowed retailers to improve conversions," explains Ried, "as customers are more confident with their selections. That's because they have access to an 'unbiased' opinion, building trust rather than having to rely solely on the marketing copy on the retailer's site."

"We use Liveperson chat extensively. It has been an incredible tool for answering any last-minute doubts during the last few states of the transaction," notes Adrian Salamunovic, cofounder of DNA 11, a multimillion-dollar e-commerce art retailer. "Our average transaction is over US\$500, so this is very important to us."

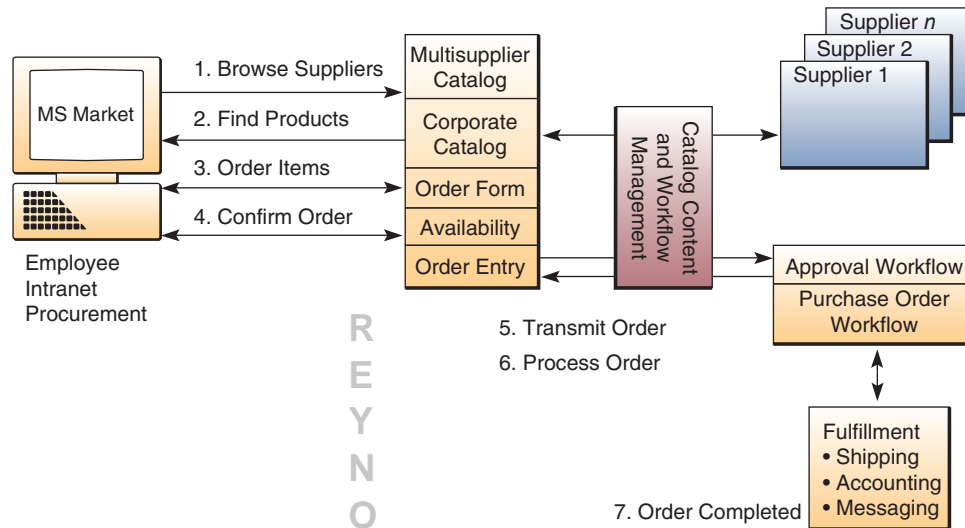
"It pays for itself many times over each month," he adds. "For us, interrupting the client with pop-ups or invitations to chat really doesn't work—in fact, it does the opposite. We've watched customers bounce (exit) quite quickly after being interrupted with pop-ups."

Therein lies the conundrum. No two customers are identical. At least some personalized customization is essential. There is a point, however, at which actions considered helpful by the retailer are perceived as intrusive by the consumer. "Some customers welcome the help; others are unnerved by the Big Brother effect it can suggest," says Resource Interactive's Ried. "Start by considering what is known about consumer behavior in evaluating which technologies, features, and functionalities to explore first."

Source: Adapted from Pam Baker, "Rescuing the e-Commerce Deal When the Customer's Walking Away," *E-Commerce Times*, April 24, 2009.

FIGURE 9.5

The role of catalog/content management and workflow management in a Web-based procurement process: the MS Market system used by Microsoft Corp.



Workflow Management

Many of the business processes in e-commerce applications can be managed and partially automated with the help of workflow management software. E-business workflow systems for enterprise collaboration help employees electronically collaborate to accomplish structured work tasks within knowledge-based business processes. Workflow management in both e-business and e-commerce depends on a *workflow software engine* containing software models of the business processes to be accomplished. The workflow models express the predefined sets of business rules, roles of stakeholders, authorization requirements, routing alternatives, databases used, and sequence of tasks required for each e-commerce process. Thus, workflow systems ensure that the proper transactions, decisions, and work activities are performed, and the correct data and documents are routed to the right employees, customers, suppliers, and other business stakeholders.

As many of you begin your business careers, you will be charged with the responsibility of driving cost out of existing business processes while maintaining or improving the effectiveness of those processes. As you continue to acquire a greater appreciation for, and understanding of, how technology can benefit business, you will explore workflow management as the key to this optimization of cost and effectiveness throughout the business.

For example, Figure 9.5 illustrates the e-commerce procurement processes of the MS Market system of Microsoft Corp. Microsoft employees use its global intranet and the catalog/content management and workflow management software engines built into MS Market to purchase electronically more than \$3 billion annually of business supplies and materials from approved suppliers connected to the MS Market system by their corporate extranets.

Microsoft Corporation: e-Commerce Purchasing Processes

MS Market is an internal e-commerce purchasing system that works on Microsoft's intranet. MS Market has drastically reduced the personnel required to manage low-cost requisitions and gives employees a quick, easy way to order materials without being burdened with paperwork and bureaucratic processes. These high-volume, low-dollar transactions represent about 70 percent of total volume but only 3 percent of Microsoft's accounts payable. Employees were wasting time turning requisitions into purchase orders (POs) and trying to follow business rules and processes. Managers wanted to streamline this process, so the decision was made to create a requisitioning tool that would take all the controls and validations used by requisitioning personnel and push them onto the Web. Employees wanted an easy-to-use online form for ordering supplies that included extranet interfaces to procurement partners, such as Boise Cascade and Marriott.

How does this system work? Let's say a Microsoft employee wants a technical book. He goes to the MS Market site on Microsoft's intranet, and MS Market immediately identifies his preferences and approval code through his log-on ID. The employee selects the Barnes & Noble link, which brings up a catalog, order form, and a list of hundreds of books with titles and prices that have been negotiated between Microsoft buyers and Barnes & Noble. He selects a book, puts it in the order form, and completes the order by verifying his group's cost center number and manager's name.

The order is transmitted immediately to the supplier, cutting down on delivery time, as well as accounting for the payment of the supplies. Upon submission of the order, MS Market generates an order tracking number for reference, sends notification via e-mail to the employee's manager, and transmits the order over the Internet to Barnes & Noble for fulfillment. In this case, since the purchase total is only \$40, the manager's specific approval is not required. Two days later, the book arrives at the employee's office. Thus, MS Market lets employees easily order low-cost items in a controlled fashion at a low cost, without going through a complicated PO approval process.

Source: Adapted from Microsoft IT Showcase, "MS Market: Business Case Study," 2002.

Event Notification

Most e-commerce applications are *event-driven* systems that respond to a multitude of events—from a new customer's first Web site access, to payment and delivery processes, to innumerable customer relationship and supply chain management activities. That is why event notification processes play an important role in e-commerce systems; customers, suppliers, employees, and other stakeholders must be notified of all events that might affect their status in a transaction. **Event notification** software works with workflow management software to monitor all e-commerce processes and record all relevant events, including unexpected changes or problem situations. Then it works with user-profiling software to notify all involved stakeholders automatically of important transaction events using appropriate user-preferred methods of electronic messaging, such as e-mail, newsgroup, pager, and fax communications. This notification includes a company's management, who then can monitor their employees' responsiveness to e-commerce events and customer and supplier feedback.

For example, when you purchase a product at a retail e-commerce Web site like Amazon.com, you automatically receive an e-mail record of your order. Then you may receive e-mail notifications of any change in product availability or shipment status and, finally, an e-mail message notifying you that your order has been shipped and is complete.

Collaboration and Trading

This major category of e-commerce processes consists of those that support the vital collaboration arrangements and trading services needed by customers, suppliers, and other stakeholders to accomplish e-commerce transactions. Thus, in Chapter 2, we discussed how a customer-focused e-business uses tools such as e-mail, chat systems, and discussion groups to nurture online *communities of interest* among employees and customers to enhance customer service and build customer loyalty in e-commerce. The essential collaboration among business trading partners in e-commerce may also be provided by Internet-based trading services. For example, B2B e-commerce Web portals provided by companies like Ariba and Commerce One support matchmaking, negotiation, and mediation processes among business buyers and sellers. In addition, B2B e-commerce is heavily dependent on Internet-based trading platforms and portals that provide online exchange and auctions for e-business enterprises. Therefore, the online auctions and exchanges developed by companies like FreeMarkets are revolutionizing the procurement processes of many major corporations. We will discuss these and other e-commerce applications in Section II.

Electronic Payment Processes

Web Payment Processes

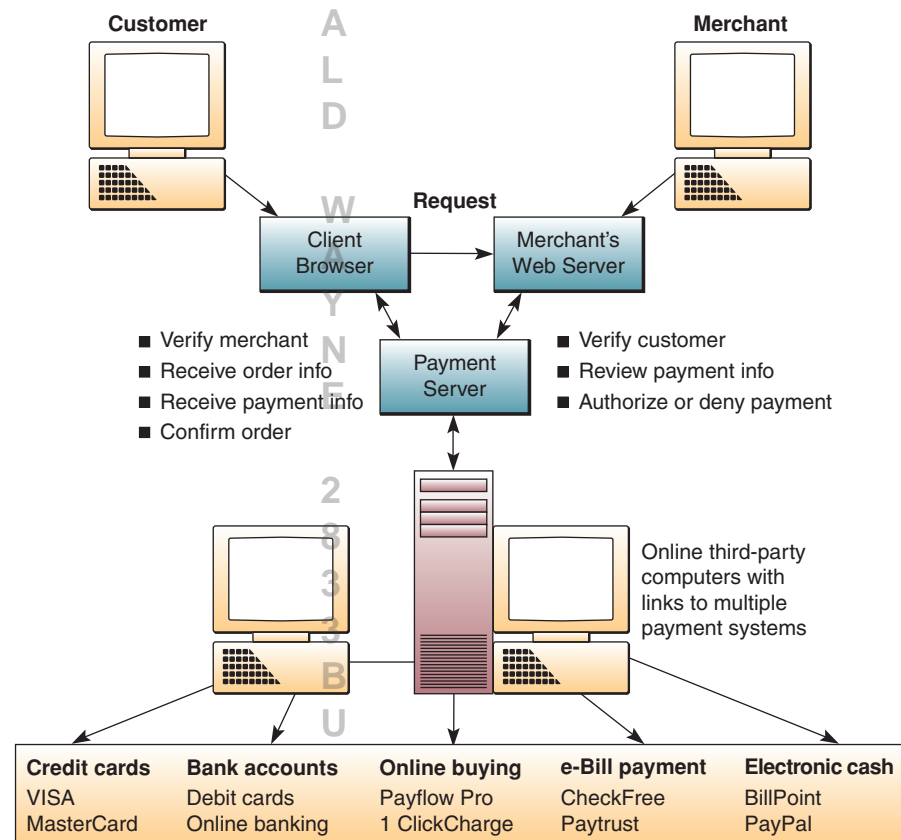
Electronic Funds Transfer

FIGURE 9.6
An example of a secure electronic payment system with many payment alternatives.

Payment for the products and services purchased is an obvious and vital set of processes in e-commerce transactions. Payment processes, however, are not simple because of the nearly anonymous electronic nature of transactions taking place between the networked computer systems of buyers and sellers and the many security issues involved. E-commerce payment processes are also complex because of the wide variety of debit and credit alternatives, as well as the financial institutions and intermediaries that may be part of the process. Therefore, a variety of **electronic payment systems** have evolved over time. In addition, new payment systems are being developed and tested to meet the security and technical challenges of e-commerce over the Internet.

Most e-commerce systems on the Web involving businesses and consumers (B2C) depend on credit card payment processes, but many B2B e-commerce systems rely on more complex payment processes based on the use of purchase orders, as was illustrated in Figure 9.5. However, both types of e-commerce typically use an electronic *shopping cart* process, which enables customers to select products from Web site catalog displays and put them temporarily in a virtual shopping basket for later checkout and processing. Figure 9.6 illustrates and summarizes a B2C electronic payment system with several payment alternatives.

Electronic funds transfer (EFT) systems are a major form of electronic payment systems in banking and retailing industries. EFT systems use a variety of information technologies to capture and process money and credit transfers between banks and businesses and their customers. For example, banking networks support teller terminals at all bank offices and automated teller machines (ATMs) at locations throughout the world. Banks, credit card companies, and other businesses may support pay-by-phone services. Very popular also are Web-based payment services, such as PayPal and BillPoint for cash transfers, and CheckFree and Paytrust for automatic bill payment,



that enable the customers of banks and other bill payment services to use the Internet to pay bills electronically. In addition, most point-of-sale terminals in retail stores are networked to bank EFT systems, which makes it possible for you to use a credit card or debit card to pay instantly for gas, groceries, or other purchases at participating retail outlets.

Secure Electronic Payments

When you make an online purchase on the Internet, your credit card information is vulnerable to interception by *network sniffers*, software that easily recognizes credit card number formats. Several basic security measures are being used to solve this security problem: (1) encrypt (code and scramble) the data passing between the customer and merchant, (2) encrypt the data passing between the customer and the company authorizing the credit card transaction, or (3) take sensitive information off-line. Note: Because encryption and other security issues are discussed in Chapter 13, we will not explain how they work in this section.

For example, many companies use the Secure Socket Layer (SSL) security method developed by Netscape Communications that automatically encrypts data passing between your Web browser and a merchant's server. However, sensitive information is still vulnerable to misuse once it's decrypted (decoded and unscrambled) and stored on a merchant's server, so a digital wallet payment system was developed. In this method, you add security software add-on modules to your Web browser. That enables your browser to encrypt your credit card data in such a way that only the bank that authorizes credit card transactions for the merchant gets to see it. All the merchant is told is whether your credit card transaction is approved or not.

The Secure Electronic Transaction (SET) standard for electronic payment security extends this digital wallet approach. In this method, software encrypts a digital envelope of digital certificates specifying the payment details for each transaction. VISA, MasterCard, IBM, Microsoft, Netscape, and most other industry players have agreed to SET. Therefore, a system like SET may become the standard for secure electronic payments on the Internet. See Figure 9.7.

FIGURE 9.7

VeriSign provides electronic payment, security, and many other e-commerce services.



Source: Courtesy of VeriSign Inc.

SECTION II

e-Commerce Applications and Issues

E-commerce is here to stay. The Web and e-commerce are key industry drivers. It's changed how many companies do business. It's created new channels for our customers. Companies are at the e-commerce crossroads, and there are many ways to go.

Thus, e-commerce is changing how companies do business both internally and externally with their customers, suppliers, and other business partners. As managers confront a variety of e-commerce alternatives, the way companies apply e-commerce to their businesses is also subject to change. The applications of e-commerce by many companies have gone through several major stages as e-commerce matures in the world of business. For example, e-commerce between businesses and consumers (B2C) moved from merely offering multimedia company information at corporate Web sites (*brochureware*) to offering products and services at Web storefront sites via electronic catalogs and online sales transactions. B2B e-commerce, in contrast, started with Web site support to help business customers serve themselves, and then moved toward automating intranet and extranet procurement systems. One of the most important things to understand about e-commerce is that by converting a business model from bricks and mortar to an e-commerce approach, the transaction costs (i.e., the costs of doing business with a customer or supplier) drop dramatically. Thus, anything that can be digital will be digital.

Read the Real World Case on the next page. We can learn a lot from this example about the challenges and opportunities faced by companies attempting to conduct online marketing campaigns. See Figure 9.8.

e-Commerce Trends

Figure 9.9 illustrates some of the trends taking place in the e-commerce applications that we introduced at the beginning of this section. Notice how B2C e-commerce moves from simple Web storefronts to interactive marketing capabilities that provide a personalized shopping experience for customers, and then toward a totally integrated Web store that supports a variety of customer shopping experiences. B2C e-commerce is also moving toward a self-service model in which customers configure and customize the products and services they wish to buy, aided by configuration software and online customer support as needed.

B2B e-commerce participants moved quickly from self-service on the Web to configuration and customization capabilities and extranets connecting trading partners. As B2C e-commerce moves toward full-service and wide-selection retail Web portals, B2B is also trending toward the use of e-commerce portals that provide catalog, exchange, and auction markets for business customers within or across industries. Of course, both of these trends are enabled by e-business capabilities like customer relationship management and supply chain management, which are the hallmarks of the customer-focused and inter-networked supply chains of a fully e-business-enabled company.

Business-to-Consumer e-Commerce

E-commerce applications that focus on the consumer share an important goal: to attract potential buyers, transact goods and services, and build customer loyalty through individual courteous treatment and engaging community features.

What does it take to create a successful B2C e-commerce business venture? That's the question that many are asking in the wake of the failures of many pure B2C *dot-com* companies. One obvious answer would be to create a Web business initiative that offers attractive products or services of great customer value, with a business plan based on realistic forecasts of profitability within the first year or two of operation—a condition that was lacking in many failed dot-coms. Such failures, however, have not stemmed the tide of millions of businesses, both large and small, that are moving at least part of

REAL WORLD

CASE

2

LinkedIn, Umbria, Mattel, and Others: Driving the "Buzz" on the Web

David Hahn has spotted a trend. As director of advertising for the popular online business networking site LinkedIn, he's being asked pointed questions by large advertisers about his ability to help them find "influentials"—those people within the LinkedIn community who are the most likely to go out and spread the word about a particular product or experience. "Some of them are requesting it specifically, while others are more implying it, but it comes down to the same thing," Hahn says. "Marketers are very interested in the value of online social networks, and how leaders in those networks can be used to drive proactive behaviors in the population."

Hahn isn't alone in his observations.

"The notion of the online influencer is quite the thing today in the marketing world," says Janet Edan-Harris, CEO of Umbria, which monitors chatter in cyberspace communities for corporations wanting to know what's being discussed online about their brands and products. "Companies are incredibly eager to get to those people. Do that—or so the conventional wisdom says—and you'll be in marketing heaven."

But new research, as well as growing business experience, suggests that such thinking may be overly simplistic. The effectiveness of using online word-of-mouth campaigns—or using individuals rather than traditional media advertising to spread the word about products—is increasingly viewed as an effective way to reach consumers.

But the popular notion that frequently accompanies this—that there are special individuals who hold the key to the hearts of entire online communities—is coming under fire.

Dave Balter certainly thinks so. Three years ago, Balter, CEO of BzzAgent, a word-of-mouth marketing firm, had a

revelation: The so-called "influentials," or opinion leaders, in online communities can't be influenced in a way that accelerates the success of a word-of-mouth campaign. "We actually believed in the idea that influentials drove market trends at that point," says Balter. "But upon closer look, we found out it didn't add up. The sales data of our campaigns didn't match the profiles of the opinion leaders we had targeted, and it really caused us to re-evaluate some of our core assumptions." Today, when a client comes in with the goal of influencing the influentials, "we tell them that's fools' gold," says Balter. "It sounds really great, it sounds really sexy, but the results simply don't fly."

This indeed is what Edan-Harris has concluded from her experiences working with online communities. "We say, 'Wait a minute, is this really a correct assumption, that there are individuals on the Internet that have that much influence?'" she says.

Her conclusion: "Not nearly as much as everyone seems to think."

Despite this, companies are putting significant dollars into efforts to find these online opinion leaders, whether they're bloggers, contributors to discussion boards, or members of online social networks. Indeed, a whole cottage industry has sprung up based upon the notion that all marketers need to kick off a successful marketing strategy with a list of Internet opinion leaders. And with the expanding universe of blogs, online communities, and social networks such as MySpace, FaceBook, and LinkedIn, the appeal of this idea has become even more entrenched. There's a growing perception that the increasingly ubiquitous availability of broadband, coupled with the rise in popularity of blogs and online communities, makes influentials even more influential.

It's critical to understand, however, that all of these proponents of opinion leaders as drivers of social and commercial trends aren't talking about media stars or personalities, but about otherwise seemingly ordinary members of a community who, through accumulation of knowledge or number of connections with others, act as catalysts for change. Not surprisingly, marketers of all stripes almost at once began trying to take advantage of this—at first off-line, and now increasingly within the online social networks rising in popularity.

"The largest companies had already established influence-based programs and are now extending that model into the online social networking space," says Matthew Hurst, a scientist at Microsoft LiveLabs who follows online marketing trends. "It's not the notion of influence that's new, it's the technology that is now enabling it to a greater degree." Not surprisingly, a rapidly increasing number of companies have leaped into the fray to help firms identify the influentials in cyberspace.

Buzzlogic is one of them. Launched in 2007, Buzzlogic is dedicated to the idea that opinion leaders in online social networks can be identified, and their influence can be measured.

An early Buzzlogic beta customer is Protuo.com, a Web-based career management portfolio service that provides

FIGURE 9.8



Online opinion leaders may be tapping into underlying trends that are critical to marketers.

matchmaking between employers and potential employees. Not having the funds to buy expensive marketing spots in TV, radio, or mainstream print media, Jennifer Gerlach, vice president of marketing, hired Buzzlogic to find the people who are the most influential in the human resource/employee professional space, contact them, and get them to buzz about the product. “We noticed that once one blogger wrote about our service, then suddenly a bunch of other people were writing about it. All at once, there were reviewers everywhere,” says Gerlach, who just snagged a major feature in Inc. that she attributes to the online influentials campaign. She says she can map increases in site traffic precisely to blog mentions, and she views the campaign as a huge success.

But despite this apparent triumph, a steadily growing number of online marketing experts would argue that rather than being responsible for the deluge of publicity that Protuo.com is experiencing, the bloggers targeted by Buzzlogic were simply tapping into a sort of zeitgeist waiting to happen—in this case, intense interest in how the Internet could be used to bring employers and candidates together more efficiently than traditional job boards are capable of doing.

Indeed, a growing school of thought is that influentials aren’t so much leading trends as acting as mouthpieces for underlying social movements that are either already in progress or lying fallow waiting to be triggered. Thus, successful marketing doesn’t depend so much on finding influential people and seeding them with ideas as much as doing the kind of research that exposes embryo trends, and then helping influentials discover them.

This in fact is what Umbria does by focusing on tracking online conversations taking place in discussion boards and social networks as well as blogs. “It’s much more important to identify those themes that are gaining momentum than try to find opinion leaders,” says Edan-Harris. “You want to ride the wave rather than trying to start one on your own.” By listening first to the conversations and being nimble enough to use the Internet to craft campaigns that jump on an existing trend, “you get much better results than attempting to generate your own little epicenter,” she says.

Protuo.com’s Gerlach agreed with some aspects of that. “There has to be a story around your product, and that story

has to resonate in the world for the opinion leader strategy to work,” she says.

Herein lies the problem with swallowing the influentials theory whole cloth. Much of the so-called evidence of how the process works is a matter of reverse engineering. Once something happens—if there’s a best-selling book coming out of nowhere, or a surprise political upset—you can always go back to the beginning and find the event or person that seems to have triggered it. You can always tell a causal story in retrospect.

Michael Shore, vice president of worldwide consumer insights for Mattel, directs an organization that increasingly monitors blogs, social networks, discussion boards, and forums to figure out what the market might want from toys in general and Mattel products in particular. But unlike many other global consumer-brands companies, Mattel isn’t interested in simply smoking out those individuals who are inordinately influential in their online communities and pushing top-down marketing messages onto them.

Despite the fact that this has become the strategy du jour in the online world, Shore’s philosophy is a more holistic one.

“We’re not just interested in opinion leaders. We’d consider that too narrow a focus,” says Shore, who hired MarketTools.com to help him develop and get involved with online communities. Instead, he uses the online universe to do what he calls “cultural assessments” that involve analyzing language, behavioral patterns, and values. Armed with that information, Shore says, Mattel gets valuable information from the Internet that it uses to shape future product development as well as marketing campaigns.

If there’s one thing that everyone agrees on, it’s that marketers need to invest a great deal more effort into how online social networks and Internet communities actually work with respect to selling products and services at the grassroots level.

“It’s an emerging medium, and the rules haven’t yet been established,” says Umbria’s Edan-Harris. “We’re still learning what does and doesn’t work.”

Source: Adapted from Alice LaPlante, “Online Influencers: How the New Opinion Leaders Drive Buzz on the Web,” *InformationWeek*, May 5, 2007.

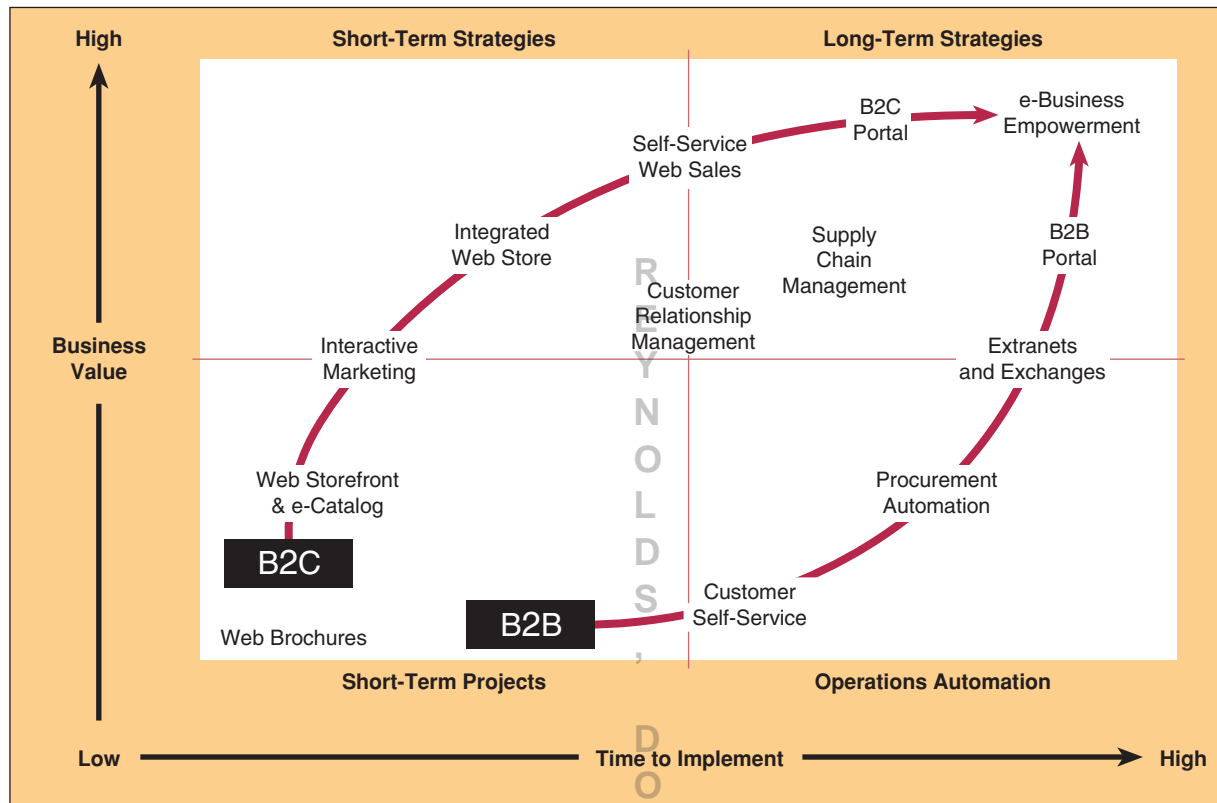
CASE STUDY QUESTIONS

1. How can companies benefit from the “cultural assessments” regularly performed by Mattel? How could the information obtained be used to create business value for those organizations? Provide multiple examples.
2. The case notes that, in spite of disconfirming evidence as to the effectiveness of targeting online opinion leaders, companies are nonetheless increasing their efforts to identify and contact them. Why do you think this is the case?
3. One of the participants in the case states that “you want to ride the wave rather than trying to start one of your own.” What does she mean by that? If companies are not starting these “waves,” where are they coming from?

REAL WORLD ACTIVITIES

1. A number of technological and cultural developments in recent years has resulted in the emergence of extensive social networks and a large number of avidly followed blogs. Go online to research how companies are tapping into these trends and what new marketing practices have arisen as a result. Prepare a report to summarize your findings.
2. Reflect on your own purchasing behavior. How much do you rely on blogs, feedbacks, and recommendations from past customers to make your own purchase decisions? Why do you (or don’t you) rely on these sources of information? Do you believe they are largely unbiased? Break into small groups to discuss these issues with your classmates and compare perspectives on them.

FIGURE 9.9 Trends in B2C and B2B e-commerce, and the business strategies and value driving these trends.



Source: Adapted from Jonathan Rosenoer, Douglas Armstrong, and J. Russell Gates, *The Clickable Corporation: Successful Strategies for Capturing the Internet Advantage* (New York: The Free Press, 1999), p. 24.

their business to the Web. So let's take a look at some essential success factors and Web site capabilities for companies engaged in either B2C or B2B e-commerce. Figure 9.10 provides examples of a few top-rated retail Web companies.

e-Commerce Success Factors

On the Internet, the barriers of time, distance, and form are broken down, and businesses are able to transact the sale of goods and services 24 hours a day, 7 days a week, 365 days a year with consumers all over the world. In certain cases, it is even possible to convert a physical good (CDs, packaged software, a newspaper) to a virtual good (MP3 audio, downloadable software, information in HTML format).

A basic fact of Internet retailing is that all retail Web sites are created equal as far as the “location, location, location” imperative of success in retailing is concerned. No site is any closer to its Web customers, and competitors offering similar goods and services may be only a mouse click away. This scenario makes it vital that businesses find ways to build customer satisfaction, loyalty, and relationships so that customers keep coming back to their Web stores. Thus, the key to e-tail (retail business conducted online) success is to optimize several key factors, such as selection and value, performance and service efficiency, the look and feel of the site, advertising and incentives to purchase, personal attention, community relationships, and security and reliability. Let's briefly examine each of these factors that are essential to the success of a B2C Web business. See Figure 9.11.

Selection and Value. Obviously, a business must offer Web shoppers a good selection of attractive products and services at competitive prices, or the shoppers will

FIGURE 9.10
Examples of a few top-rated retail Web sites.

Top Retail Web Sites		
•	Amazon.com \$19.2B Web sales volume www.amazon.com Amazon.com is the exception to the rule that consumers prefer to shop “real world” retailers online. The mother of all shopping sites, Amazon features a vast selection of books, videos, DVDs, CDs, toys, kitchen items, electronics, and even home and garden goods sold to millions of loyal customers.	
•	Staples, Inc. \$7.7B Web sales volume www.staples.com Staples tops the “Big 3” office supply giants in terms of Internet sales, although Office Depot and OfficeMax are also members of the top 10 retail Web sites list. Consumers can access the entire catalog online and can have their purchases delivered to their home or office within 24 hours and often within the same business day.	
•	Dell, Inc. \$4.8B Web sales volume www.dell.com Dell has created an online shopping experience for their customers that makes buying and configuring a computer system to meet a specific need almost effortless.	
•	Office Depot \$4.8B Web sales volume www.officedepot.com The Internet has become a transforming force for Office Depot and their Web sales have increased every year since they first launched their Web site. Today, customers can order any product online and can have their purchase delivered directly to their home or business with applicable freight charges or can pick up their purchase at their local Office Depot store with no additional shipping charges.	

quickly click away from a Web store. However, a company’s prices don’t have to be the lowest on the Web if it builds a reputation for high quality, guaranteed satisfaction, and top customer support while shopping and after the sale. For example, top-rated e-tailer REI.com helps you select quality outdoor gear for hiking and other activities with a “How to Choose” section and gives a money-back guarantee on your purchases.

Performance and Service. People don’t want to be kept waiting when browsing, selecting, or paying in a Web store. A site must be efficiently designed for ease of

FIGURE 9.11
Some of the key factors for success in e-commerce.

e-Commerce Success Factors
• Selection and Value. Attractive product selections, competitive prices, satisfaction guarantees, and customer support after the sale.
• Performance and Service. Fast and easy navigation, shopping, and purchasing, and prompt shipping and delivery.
• Look and Feel. Attractive Web storefront, Web site shopping areas, multimedia product catalog pages, and shopping features.
• Advertising and Incentives. Targeted Web page advertising and e-mail promotions, discounts, and special offers, including advertising at affiliate sites.
• Personal Attention. Personal Web pages, personalized product recommendations, Web advertising and e-mail notices, and interactive support for all customers.
• Community Relationships. Virtual communities of customers, suppliers, company representatives, and others via newsgroups, chat rooms, and links to related sites.
• Security and Reliability. Security of customer information and Web site transactions, trustworthy product information, and reliable order fulfillment.
• Great Customer Communication. Easy-to-find contact information, online order status, product support specialists.

access, shopping, and buying, with sufficient server power and network capacity to support Web site traffic. Web shopping and customer service must also be friendly and helpful, as well as quick and easy. In addition, products offered should be available in inventory for prompt shipment to the customer.

Look and Feel. B2C sites can offer customers an attractive Web storefront, shopping areas, and multimedia product catalogs. These could range from an exciting shopping experience with audio, video, and moving graphics to a more simple and comfortable look and feel. Thus, most retail e-commerce sites let customers browse product sections, select products, drop them into a virtual shopping cart, and go to a virtual checkout station when they are ready to pay for their order.

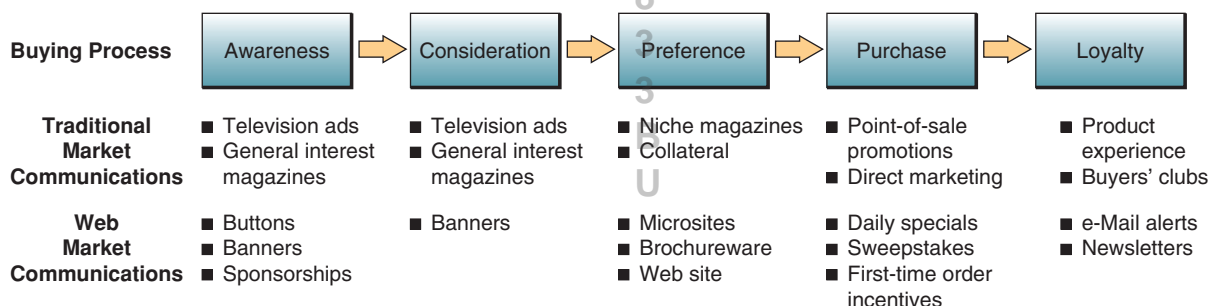
Advertising and Incentives. Some Web stores may advertise in traditional media, but most advertise on the Web with targeted and personalized banner ads and other Web page and e-mail promotions. Most B2C sites also offer shoppers incentives to buy and return. Typically, these incentives mean coupons, discounts, special offers, and vouchers for other Web services, sometimes with other e-tailers at cross-linked Web sites. Many Web stores also increase their market reach by being part of Web banner advertising exchange programs with thousands of other Web retailers. Figure 9.12 compares major marketing communications choices in traditional and e-commerce marketing to support each step of the buying process.

Personal Attention. Personalizing your shopping experience encourages you to buy and make return visits. Thus, e-commerce software can automatically record details of your visits and build user profiles of you and other Web shoppers. Many sites also encourage you to register with them and fill out a personal interest profile. Then, whenever you return, you are welcomed by name or with a personal Web page, greeted with special offers, and guided to those parts of the site in which you are most interested. This *one-to-one marketing* and relationship building power is one of the major advantages of personalized Web retailing.

Community Relationships. Giving online customers with special interests a feeling of belonging to a unique group of like-minded individuals helps build customer loyalty and value. Thus, Web site relationship and affinity marketing programs build and promote virtual communities of customers, suppliers, company representatives, and others via a variety of Web-based collaboration tools. Examples include discussion forums or newsgroups, chat rooms, message board systems, and cross-links to related Web site communities.

Security and Reliability. As a customer of a successful Web store, you must feel confident that your credit card, personal information, and details of your transactions

FIGURE 9.12 How traditional and Web marketing communications differ in supporting each step of the buying process.



are secure from unauthorized use. You must also feel that you are dealing with a trustworthy business whose products and other Web site information you can trust to be as advertised. Having your orders filled and shipped as you requested, in the time frame promised, and with good customer support are other measures of an e-tailer's reliability.

Great Customer Communications. As more consumers shift their habits from the traditional brick-and-mortar approach to an online shopping experience, one thing becomes even more important than ever: the need for constant and informative communication channels with the customer. Despite the conveniences associated with online shopping, consumers still have questions that need to be answered by a human being. Issues ranging from product information to order status or modification are often still handled the "old fashioned way." Land's End, the famous outdoor clothing retailer, provides telephone and chat space access to customer representatives that will even help you pick out your purchases in real time.

Amazon.com: Partnering and Leveraging Infrastructure

Amazon.com has just launched an application on Facebook that enables members of the social network to buy gifts for each other based on wish lists registered with the online retailer. *Amazon Giver* also provides Facebook members with the option of viewing suggested items for friends based on interests listed on their profile pages. A second Facebook application, *Amazon Grapevine*, provides a news feed of friends' activity on Amazon, such as when they update their wish lists, write reviews, or tag products. Both applications only share information between Facebook members who have opted in to the service.

"By combining Amazon's vast selection of products with Facebook's millions of users, we are able to make activities like giftgiving more efficient and rewarding for Facebook users," says Eva Manolis, vice president of Amazon.

By adding the *Amazon Giver* application to their profile, Facebook members get the option of clicking directly to a secure Amazon checkout page. If the recipient has a wish list, then Amazon can ship the item without the buyer entering a shipping address, which would already be on file. In order for people to view a wish list, it would have to be set as "public." With *Amazon Grapevine*, people have the option to choose what type of activity they would be willing to share with friends through the news feed. Activity updates are entirely opt-in.

Amazon.com has also introduced a new way for online merchants to leverage Amazon's infrastructure to ship physical products. "The *Amazon Fulfillment Web Service* (Amazon FWS) allows merchants to tap in to Amazon's network of fulfillment centers and our expertise in logistics," says Amazon Web Services evangelist Jeff Barr. "Merchants can store their own products to our fulfillment centers and then, using a simple Web service interface, fulfill orders for the products."

Amazon FWS is designed to complement *Fulfillment By Amazon* (FBA), the fulfillment service Amazon has offered since 2006, by making the fulfillment process accessible programmatically. Amazon also maintains a separate fulfillment program called *Amazon Advantage*, which allows content publishers to send Amazon music, books, and videos for sale on consignment, with a 55 percent fee.

The idea, Barr explains, is to be able to ship a product with a simple Web service call. By making it possible for merchants to further automate their e-commerce and fulfillment efforts, Amazon is demonstrating its commitment to selling "muck," as CEO Jeff Bezos has referred to his company's e-commerce infrastructure.

Source: Adapted from Antone Gonsalves, "Amazon.com Launches Shopping Apps on Facebook," *InformationWeek*, March 13, 2008; and Thomas Claburn, "Amazon Introduces Fulfillment Web Service," *InformationWeek*, March 20, 2008.

Web Store Requirements

Most business-to-consumer e-commerce ventures take the form of retail business sites on the World Wide Web. Whether a huge retail Web portal like Amazon.com or a small specialty Web retailer, the primary focus of such e-tailers is to develop, operate, and manage their Web sites so they become high-priority destinations for consumers who will repeatedly choose to go there to buy products and services. Thus, these Web sites must be able to demonstrate the key factors for e-commerce success that we have just covered. In this section, let's discuss the essential Web store requirements that you would have to implement to support a successful retail business on the Web, as summarized and illustrated in Figure 9.13.

Developing a Web Store

Before you can launch your own retail store on the Internet, you must build an e-commerce Web site. Many companies use simple Web site design software tools and predesigned templates provided by their Web site hosting service to construct their Web retail store. That includes building your Web storefront and product catalog Web pages, as well as tools to provide shopping cart features, process orders, handle credit card payments, and so forth. Of course, larger companies can use their own software developers or hire an outside Web site development contractor to build a custom-designed e-commerce site. Also, like most companies, you can contract with your ISP (Internet service provider) or a specialized Web hosting company to operate and maintain your B2C Web site.

Once you build your Web site, it must be developed as a retail Web business by marketing it in a variety of ways that attract visitors to your site and transform them into loyal Web customers. So, your Web site should include Web page and e-mail advertising and promotions for Web visitors and customers, as well as Web advertising

FIGURE 9.13 To develop a successful e-commerce business, these Web store requirements must be implemented by a company or its Web site hosting service.

Developing a Web Store		
<ul style="list-style-type: none"> • Build <ul style="list-style-type: none"> Web site design tools Site design templates Custom design services Web site hosting 	<ul style="list-style-type: none"> • Market <ul style="list-style-type: none"> Web page advertising E-mail promotions Web advertising exchanges with affiliate sites Search engine registrations and optimization 	
Serving Your Customers		
<ul style="list-style-type: none"> • Serve <ul style="list-style-type: none"> Personalized Web pages Dynamic multimedia catalog Catalog search engine Integrated shopping cart 	<ul style="list-style-type: none"> • Transact <ul style="list-style-type: none"> Flexible order process Credit card processing Shipping and tax calculations E-mail order notifications 	<ul style="list-style-type: none"> • Support <ul style="list-style-type: none"> Web site online help Customer service e-mail Discussion groups and chat rooms Links to related sites
Managing a Web Store		
<ul style="list-style-type: none"> • Manage <ul style="list-style-type: none"> Web site usage statistics Sales and inventory reports Customer account management Links to accounting system 	<ul style="list-style-type: none"> • Operate <ul style="list-style-type: none"> 24×7 Web site hosting Online tech support Scalable network capacity Redundant servers and power 	<ul style="list-style-type: none"> • Protect <ul style="list-style-type: none"> User password protection Encrypted order processing Encrypted Web site administration Network firewalls and security monitors

exchange programs with other Web stores. Also, you can register your Web business with its own domain name (e.g., yourstore.com), as well as registering your Web site with the major Web search engines and directories to help Web surfers find your site more easily. In addition, you might consider affiliating as a small business partner with large Web portals like Yahoo! and Netscape, large e-tailers and auction sites like Amazon and eBay, and small business e-commerce portals like Microsoft's Small Business Center.

Spamming Web Searches



A new market for writing has arisen online, and it's targeted at search engines. Content optimized for successful search results ranges from informative articles to incoherent copy stuffed with keywords, a plague that's been labeled search-engine spam. Popular keywords generate significant traffic for Web sites with related content, giving Web site owners a financial incentive to host content that ranks near the top of search results. As traffic rises, ad revenue tends to follow, often through ad-delivery services for Web sites like Google's AdSense.

A cottage industry has formed to help people tailor content for search engines, such as rewriting copy by substituting synonyms for certain words so that text can be repurposed to score well on search engines. The rephrased text looks different to a search engine, contributing to the host site's rank and traffic. Google's Webmaster Guidelines warns against the practice of crafting copy for its search engine: "Make pages for users, not for search engines." But that hasn't stopped many from trying.

Creating content for search engines is one aspect of what's called search-engine optimization or SEO, part of a broader business known as search-engine marketing, or SEM. In sufficient quantity, and absent sufficient quality, SEO content is a form of spam that's aimed at search engines rather than people. And like product-oriented spam, it's controversial.

Chris Winfield, president and cofounder of SEM company 10e20 LLC, says one of the biggest problems for Google, MSN, and Yahoo is search-engine spam. "That spam consists of pages that are created for the search engines or pages that otherwise trick the end user," he says. Ani Kortikar, CEO of SEM company Netramind Technologies Pvt. Ltd., says that while search engines may require businesses to employ certain tactics to show up in search results, the tactics should be used to support good content rather than simply to drive traffic.

But just as legitimate e-mail marketers have felt the backlash against spammers, well-intentioned search-engine marketers—and search engines as well—may suffer if the tricksters continue to thrive. Says Winfield of 10e20, "One of the most important things for any search engine is people having confidence and becoming repeat users."

Source: Adapted from Thomas Claburn, "The Spamming of Web Search," *InformationWeek*, April 1, 2005.

Getting Customers to Find You

Just because your Web store has been launched does not mean customers will come flocking to your cyber front door. Your Web store needs to be discovered by your customers, and this means getting listed in the popular search engines.

You can submit your Web site to search engines such as Yahoo, Google, Live, and others, and each will begin looking at your Web pages and listing you when appropriate search terms are entered. Waiting for your site to show up competitively ranked with all the other similar sites could take weeks and even months. There is a science to search engine ranking and it is an essential element in Web store success.

Search engine optimization (SEO) is considered a subset of search engine marketing, and it focuses on improving the number and/or quality of visitors to a Web site over "natural" (also called "organic" or "algorithmic" search engine) listings. The term SEO can also refer to search engine optimizers, an industry of consultants who carry out optimization projects on behalf of clients.

Search engines display different kinds of listings on a results page, including paid advertising in the form of pay-per-click (PPC) advertisements and paid inclusion listings, as well as unpaid organic search results and keywords specific listings, such as news stories, definitions, map locations, and images. As an Internet marketing strategy, SEO considers how search engines work and what people search for.

Optimizing a Web site primarily involves editing its content and HTML coding to both increase its relevance to specific keywords and to remove barriers to the indexing activities of search engines. Because SEO requires making changes to the source code of a site, it is often most effective when incorporated into the initial development and design of a site, leading to the use of the term “search engine friendly” to describe designs, menus, content management systems, and shopping carts that can be optimized easily and effectively.

A range of strategies and techniques are employed in SEO, including changes to a site’s code (referred to as on-page factors) and getting links from other sites (referred to as off-page factors). These techniques include two broad categories: techniques that search engines recommend as part of good design, and those techniques that search engines do not approve of and attempt to minimize the effect of, referred to as spamdexing. Methods such as *link farms*, where a group of Web sites is set up so that all hyperlink to every other Web site in the group, and *keyword stuffing*, where a Web page is loaded with keywords in the meta tags or in content, are examples of techniques considered “black hat” SEO. Such techniques serve only to degrade both the relevance of search results and the user experience of search engines.

SEO, as a marketing strategy, can often generate a good return. However, as the search engines are not paid for the traffic they send from **organic search**, the algorithms used can and do change, and there are many factors that can cause search engine problems when crawling or ranking a site’s pages. There are no guarantees of success, either in the short or long term. Because of the lack of guarantees and certainty, SEO is often compared to traditional public relations (PR), with PPC advertising closer to traditional advertising.

Serving Your Customers

Once your retail store is on the Web and receiving visitors, the Web site must help you welcome and serve them personally and efficiently so that they become loyal customers. So most e-tailers use several Web site tools to create user profiles, customer files, and personal Web pages and promotions that help them develop a one-to-one relationship with their customers. This effort includes creating incentives to encourage visitors to register, developing *Web cookie files* to identify returning visitors automatically, or contracting with Web site tracking companies like DoubleClick and others for software to record and analyze the details of the Web site behavior and preferences of Web shoppers automatically.

Of course, your Web site should have the look and feel of an attractive, friendly, and efficient Web store. That means having e-commerce features like a dynamically changing and updated multimedia catalog, a fast catalog search engine, and a convenient shopping cart system that is integrated with Web shopping, promotions, payment, shipping, and customer account information. Your e-commerce order processing software should be fast and able to adjust to personalized promotions and customer options like gift handling, special discounts, credit card or other payments, and shipping and tax alternatives. Also, automatically sending your customers e-mail notices to document when orders are processed and shipped is a top customer service feature of e-tail transaction processing.

Providing customer support for your Web store is an essential Web site capability. Thus, many e-tail sites offer help menus, tutorials, and lists of FAQs (frequently asked questions) to provide self-help features for Web shoppers. Of course, e-mail correspondence with customer service representatives of your Web store offers more personal assistance to customers. Establishing Web site discussion groups and chat rooms

for your customers and store personnel to interact helps create a more personal community that can provide invaluable support to customers, as well as build customer loyalty. Providing links to related Web sites from your Web store can help customers find additional information and resources, as well as earning commission income from the affiliate marketing programs of other Web retailers. For example, the Amazon.com affiliate program pays commissions of up to 15 percent for purchases made by Web shoppers clicking to its Web store from your site.

Managing a Web Store

A Web retail store must be managed as both a business and a Web site, and most e-commerce hosting companies offer software and services to help you do just that. For example, companies like FreeMerchant, Prodigy Biz, and Verio provide their hosting clients with a variety of management reports that record and analyze Web store traffic, inventory, and sales results. Other services build customer lists for e-mail and Web page promotions or provide customer relationship management features to help retain Web customers. Also, some e-commerce software includes links to download inventory and sales data into accounting packages like QuickBooks for bookkeeping and preparation of financial statements and reports.

Of course, Web-hosting companies must enable their Web store clients to be available online 24 hours a day and seven days a week all year. This availability requires them to build or contract for sufficient network capacity to handle peak Web traffic loads and redundant network servers and power sources to respond to system or power failures. Most hosting companies provide e-commerce software that uses passwords and encryption to protect Web store transactions and customer records, as well as to employ network firewalls and security monitors to repel hacker attacks and other security threats. Many hosting services also offer their clients 24-hour tech support to help them with any technical problems that arise. We will discuss these and other e-commerce security management issues in Chapter 13.

Luxury Goes Digital: Fashion House Embraces Online Shopping

Historically, luxury brands have been slow to embrace e-commerce. But in recent years, high-end retail sites like Net-a-Porter and Yoox and discount luxury flash sales like those on Gilt Groupe and Rue La La are forcing executives to rethink the benefits of online sales. Bain & Co. estimates that the \$4.9 billion online luxury market grew by 20 percent in 2009.

Richemont, which owns luxury names like Cartier, Van Cleef & Arpels, Montblanc, and Jaeger-LeCoultre, has a 33 percent stake in Net-a-Porter and will buy the remaining 66 percent of the company, with founder Natalie Massenet remaining as the executive chairman. Richemont made the offer, valuing Net-a-Porter at \$534 million.

Net-a-Porter, founded in 2000 by former fashion journalist Natalie Massenet, has been a forerunner in selling expensive designer women's clothes and accessories online. That is a space that was long overlooked by big luxury goods houses like Richemont, Burberry PLC, and LVMH Moët Hennessy Louis Vuitton SA, which jumped on the online sales bandwagon far later than their lower-priced counterparts did.

With the acquisition of a successful luxury e-tailer—Net-a-Porter saw sales of \$183 million last year—Richemont is clearly making a commitment to boosting its presence in the online luxury space. Just one month earlier, Cartier had launched its U.S. transactional site.

At the time, Cartier North America CEO Emmanuel Perrin acknowledged the importance of selling on the Web. “The Internet has been a medium taking an increasing part in our client's lifestyle and means of interaction,” he says.

Being available online is no longer a stigma to luxury brands, and things like holograms allow them to help consumers identify authorized resellers online. High-end designers like Narciso Rodriguez and Norma Kamali have even created exclusive collections for EBay.

The big luxury brands have made digital retailing a higher priority, having recognized that shoppers are increasingly willing to buy very expensive products on the Web. But selling \$1,000 dresses online is different from hawking groceries or second-hand books: Customers want an editorial element, a guiding hand to replace the in-store salesperson and signal what's in style, which is where Net-a-Porter has carved out its niche.

"It's just as much a magazine as it is a store," says Massenet. "That really has served us well, because when you're online you lose the offline experience of walking into a store."

Says Massenet, "Richemont has completely embraced our vision and strategy since they came on board as a shareholder and together we are going to continue to build the 21st century model for luxury fashion retailing."

That model would be online shopping.

Source: Adapted from Anne C. Lee, "Luxury Goes Digital: Fashion House Richemont Embraces E-Commerce," *Fast Company*, April 1, 2010; and Paul Sonne, "Richemont to Buy Net-a-Porter," *The Wall Street Journal*, April 2, 2010.

Business-to-Business e-Commerce

Business-to-business e-commerce is the wholesale and supply side of the commercial process, where businesses buy, sell, or trade with other businesses. B2B e-commerce relies on many different information technologies, most of which are implemented at e-commerce Web sites on the World Wide Web and corporate intranets and extranets. B2B applications include electronic catalog systems, electronic trading systems such as exchange and auction portals, electronic data interchange, electronic funds transfers, and so on. All of the factors for building a successful retail Web site that we discussed previously also apply to wholesale Web sites for business-to-business e-commerce.

In addition, many businesses are integrating their Web-based e-commerce systems with their e-business systems for supply chain management, customer relationship management, and online transaction processing, as well as with their traditional, or legacy, computer-based accounting and business information systems. This integration ensures that all e-commerce activities are integrated with e-business processes and supported by up-to-date corporate inventory and other databases, which in turn are automatically updated by Web sales activities.

Avnet Tears Up the B2B E-Commerce Playbook

When does a global distributor of electronic components need to start operating more like Amazon.com and other consumer-focused companies? When the market demands that it move in that direction.

At Avnet Inc., they came to just that realization a few years ago as they saw a shift taking place within their electronic components market. While large manufacturers continued to buy large quantities of components for their designs, a growing segment of engineers and smaller companies wanted to buy low volumes (including product samples) online, instead of by phone or face to face. Many of their customers had to either be really patient or simply stubborn to make a successful purchase on the e-commerce site they offered at the time.

Avnet realized the need to shift their B2B e-commerce approach to incorporate a B2C perspective. While they were dealing with business customers, their online purchasing expectations were shaped by their experiences on consumer-friendly Web sites such as Amazon.com and HomeDepot.com. The problem was that the experience and functionality that those kinds of sites provide users isn't easily replicated in a B2B environment, especially within the components industry. For example, Avnet deals with millions of parts, and each part has dozens of technical attributes that must be precisely specified for engineers to determine whether it's the part they need. Additionally, legal and country-specific regulations determine which companies and individuals Avnet can ship certain parts to around the world.

So Avnet went ahead and made a few changes. First, they eliminated the need to register. Previously, all customers had to register to get on the commerce site. To make matters even more complicated, all customers had to qualify for credit before they could search for parts, even if they were purchasing with a credit card. Now anyone can search for part information without having to register and share personal details. Only when customers reach a purchase point does the site then ask them for their information. And if the customer is paying with a credit card, credit checks are out the window.

Previously, customers could search for parts only by entering precise supplier part numbers, which may be up to 50 characters—the equivalent of making a reader search for a book by the unique ISBN number. Furthermore, the search result displayed information on only the part corresponding to the number entered, not on alternative parts that may also meet the customer's requirements. Customers can now search by part number, product name, description, and technical attributes. Returned search results now include similar products that match the engineer's requirements, so the engineer can make informed decisions about alternative parts based on factors such as availability, cost, and manufacturer.

The new e-commerce site, featuring more than 3.5 million electronic components, took two years to develop and deploy, and Avnet keeps on adding functionality based on customer feedback. So far, however, results tell them that customers already like what they see: There has been a 75 percent annual increase in e-commerce revenue and a 50 percent annual increase in site visitors.

Source: Adapted from Steve Phillips and Beth Ely, "Global CIO : Avnet Tears Up the B2B E-Commerce Playbook," *InformationWeek*, June 15, 2009.

e-Commerce Marketplaces

The latest e-commerce transaction systems are scaled and customized to allow buyers and sellers to meet in a variety of high-speed trading platforms: auctions, catalogs, and exchanges.

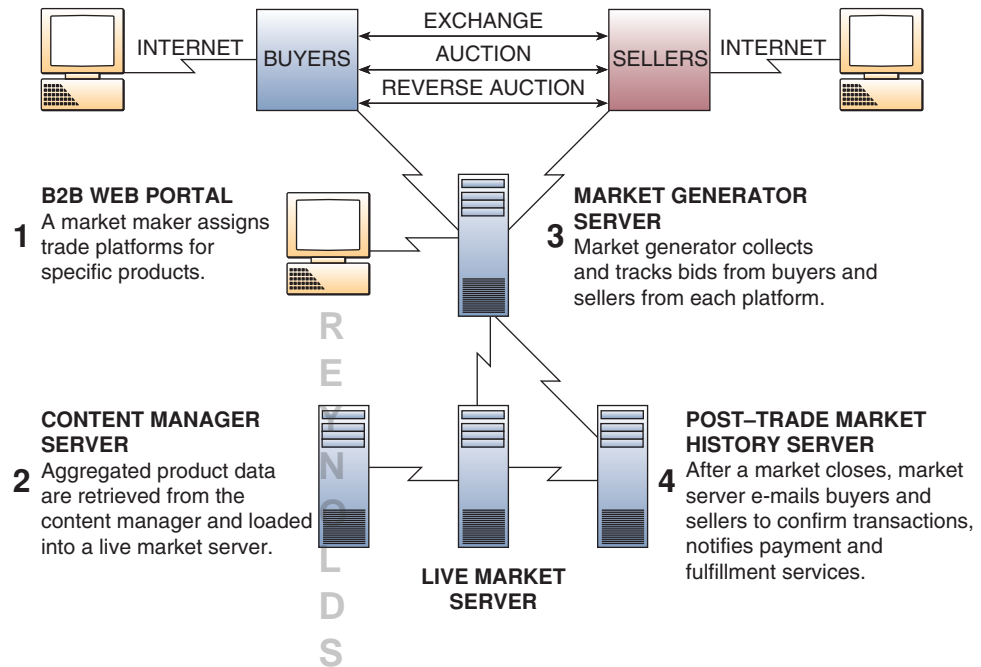
Businesses of any size can now buy everything from chemicals to electronic components, excess electrical energy, construction materials, or paper products at business-to-business **e-commerce marketplaces**. Figure 9.14 outlines five major types of e-commerce marketplaces used by businesses today. However, many B2B **portals** provide several types of marketplaces. Thus, they may offer an electronic **catalog** shopping and ordering site for products from many suppliers in an industry. Or they may serve as an **exchange** for buying and selling via a bid-ask process

FIGURE 9.14
Types of e-commerce marketplaces.

e-Commerce Marketplaces
● One to Many. Sell-side marketplaces. Host one major supplier, who dictates product catalog offerings and prices. Examples: Cisco.com and Dell.com.
● Many to One. Buy-side marketplaces. Attract many suppliers that flock to these exchanges to bid on the business of a major buyer like GE or AT&T.
● Some to Many. Distribution marketplaces. Unite major suppliers who combine their product catalogs to attract a larger audience of buyers. Examples: VerticalNet and Works.com.
● Many to Some. Procurement marketplaces. Unite major buyers who combine their purchasing catalogs to attract more suppliers and thus more competition and lower prices. Examples: the auto industry.
● Many to Many. Auction marketplaces used by many buyers and sellers that can create a variety of buyers. Examples: eBay and FreeMarkets.

FIGURE 9.15

An example of a B2B e-commerce Web portal that offers exchange, auction, and reverse auction electronic markets.



or at negotiated prices. Very popular are electronic **auction** Web sites for B2B auctions of products and services. Figure 9.15 illustrates a B2B trading system that offers exchange, auction, and reverse auction (where sellers bid for the business of a buyer) electronic markets.

Many of these B2B **e-commerce portals** are developed and hosted by third-party *market-maker* companies who serve as **infomediaries** that bring buyers and sellers together in catalog, exchange, and auction markets. Infomediaries are companies that serve as intermediaries in e-business and e-commerce transactions. Examples are Ariba, Commerce One, and VerticalNet, to name a few successful companies. All provide e-commerce marketplace software products and services to power business Web portals for e-commerce transactions.

These B2B e-commerce sites make business purchasing decisions faster, simpler, and more cost effective because companies can use Web systems to research and transact with many vendors. Business buyers get one-stop shopping and accurate purchasing information. They also get impartial advice from infomediaries that they can't get from the sites hosted by suppliers and distributors. Thus, companies can negotiate or bid for better prices from a larger pool of vendors. Of course, suppliers benefit from easy access to customers from all over the globe. Now, let's look at a real-world example.

SpecEx.com: B2B Trading of Wireless Spectrum

Online marketplaces like Craigslist and Freecycle allow consumers to make low-cost sales—or even exchange goods for free—through sophisticated technological systems that make such transactions efficient.

Some companies are attempting to apply a similar model to online business-to-business marketplaces.

The FCC holds auctions to grant licenses for radio spectrums, and most of these are used by cell phone carriers, or for first responders and their communication gear. But some of these spectrums aren't being used for a variety of reasons.

Spectrum Bridge's Web site, SpecEx.com, aims to create a secondary market for these unused spectrum. The company says the site can provide an easy and effective way to connect buyers and sellers. The market could potentially be large, as

public-safety agencies and major wireless carriers like Verizon Wireless and AT&T routinely purchase spectrum on the secondary market. The cable companies could also become potential buyers, especially as some are eyeing the wireless voice space. Spectrum Bridge makes money by taking a percentage of the transaction.

All transfers of spectrum would have to be approved by the FCC, but the agency has been supportive of spectrum trading in the past.

The idea of organizing the secondary spectrum market isn't a new one, but previous attempts have not been successful because they couldn't get enough buyers and sellers. "The spectrum world is almost tribal," says Peter Stanforth, chief technology officer for Spectrum Bridge. "It consists of small groups of people who know each other—and do everything manually." That is not an efficient system for smaller parcels—SpecEx's sweet spot. "By automating a lot of functions and bringing in a wider audience of buyers and sellers, we are making these smaller pieces more liquid and valuable," explains Stanforth.

Rick Rotondo, chief marketing officer of Spectrum Bridge, compares the SpecEx service to Craigslist, a favorite site for consumer bargains. With its launch several years ago, Craigslist made the sale of small consumer items efficient, which is what SpecEx aims to do with respect to the sale of wireless spectrum parcels. "Let's say you had used sunglasses you wanted to sell, for maybe \$25. Before online classifieds were introduced, it would not have been cost-efficient to try to sell them to a huge audience in a paper, because the ad probably would have cost you \$20." Same thing with wireless spectrum, he says. "Transaction costs are eating up most of the value for small buyers and sellers."

E-commerce technology can standardize much of the process, notes Stanforth. "What we are trying to do is be the eBay of the wireless spectrum world—a one-stop shop where companies can go to monetize excess or idle spectrum, and spectrum seekers can go to find reasonably priced unused spectrums."

Source: Adapted from Erika Morphy, "The Corporate Bargain Hunters' Quest for a Business Model," *E-Commerce Times*, January 20, 2009; and Marin Perez, "Spectrum Bridge Launches Online Secondary Market," *InformationWeek*, September 5, 2008.

Clicks and Bricks in e-Commerce

Companies are recognizing that success will go to those who can execute clicks-and-mortar strategies that bridge the physical and virtual worlds. Different companies will need to follow very different paths when deciding how closely—or loosely—to integrate their Internet initiatives with their traditional operations.

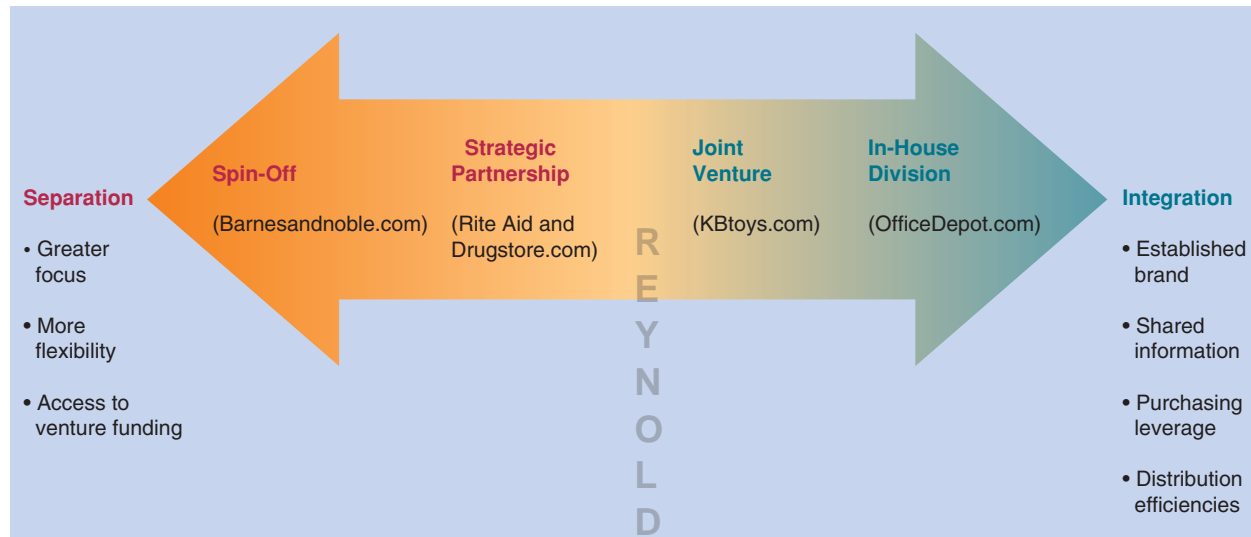
Figure 9.16 illustrates the spectrum of alternatives and benefit trade-offs that e-business enterprises face when choosing an e-commerce **clicks-and-bricks strategy**. E-business managers must answer this question: Should we integrate our e-commerce virtual business operations with our traditional physical business operations or keep them separate? As Figure 9.16 shows, companies have implemented a range of integration/separation strategies and made key benefit trade-offs in answering that question. Let's take a look at several alternatives.

e-Commerce Integration

The Internet is just another channel that gets plugged into the business architecture.

So says CIO Bill Seltzer of the office supply retailer Office Depot, which fully integrates its OfficeDepot.com e-commerce sales channel into its traditional business operations. Thus, Office Depot is a prime example of why many companies have chosen integrated clicks-and-bricks strategies, where their e-commerce business is integrated in some major ways into the traditional business operations of a company. The business case for such strategies rests on:

FIGURE 9.16 Companies have a spectrum of alternatives and benefit trade-offs when deciding on an integrated or separate e-commerce business.



- Capitalizing on any unique strategic capabilities that may exist in a company's traditional business operations that could be used to support an e-commerce business.
- Gaining several strategic benefits of integrating e-commerce into a company's traditional business, such as sharing established brands and key business information, joint buying power, and distribution efficiencies.

For example, Office Depot already had a successful catalog sales business with a professional call center and a fleet of more than 2,000 delivery trucks. Its 1,825 stores and 30 warehouses were networked by a sophisticated information system that provided complete customer, vendor, order, and product inventory data in real time. These business resources made an invaluable foundation for coordinating Office Depot's e-commerce activities and customer services with its catalog business and physical stores. Thus, customers can shop at OfficeDepot.com at their home or business or at in-store kiosks. Then they can choose to pick up their purchases at the stores or have them delivered. In addition, the integration of Web-enabled e-commerce applications within Office Depot's traditional store and catalog operations has helped increase the traffic at their physical stores and improved the catalog operation's productivity and average order size.

Borders and Amazon.com: Splitting Up Is Never Easy

Borders.com has always been run by Amazon.com. It features Amazon's inventory, site content, fulfillment, and customer service capabilities. The sales even belong to Amazon, with a percentage going to Borders. The new Borders site marks a major juncture in Borders's business and e-commerce strategy and the end of what will be a seven-year relationship with Amazon.com at a time when the Ann Arbor, Michigan-based bookseller is in the midst of a turnaround.

In 2001, when the retailing rivals inked this deal to develop a cobranded Web site, it was mutually beneficial. Amazon.com, which had gone public in 1997, was under pressure to turn its first profit. Extending the e-commerce infrastructure into which it had invested millions of dollars to third parties such as Borders injected much-needed cash into Amazon.com's business. Borders, which like many traditional brick-and-mortar stores at the time, was struggling to make the e-commerce game work for

them, got a tried and tested, user-friendly e-commerce site powered by a company that consumers trusted. Never mind the fact that Amazon was a competitor.

“The relationship with Amazon.com allowed us at the time to focus on our brick-and-mortar stores while still having an online channel that was branded Borders,” says Anne Roman, a spokeswoman for Borders. She notes that the company had its own e-commerce site before it partnered with Amazon but that the costs associated with operating and marketing it outweighed the revenue it generated at the time.

Roman says the existing relationship with Amazon doesn’t allow Borders to do all the things it wants to do to move forward to create a more integrated, cross-channel experience for customers, such as give Borders’ customers access to author readings and concerts at the company’s flagship store in Ann Arbor via online video. Borders also wants customers to be able to earn points toward the Borders Rewards loyalty program when they shop online. Currently, customers can’t earn points when they use the cobranded site because it exists as a separate silo of Borders’s business. “Once we launch the proprietary site, that loyalty program will be fully integrated into it,” says Roman.

However, Borders has to give customers a compelling reason to buy books, movies, and music from Borders.com instead of Amazon.com. That’s not going to be easy when Amazon.com has customer loyalty locked up and is so competitive on pricing. Gartner Research analyst Adam Sarner notes that the Web influences 40 percent of commerce in the off-line world. If Borders can take advantage of that dynamic, he adds, they’ll be better able to compete with Amazon. “If their site can become a lead management tool that gets more people to visit the store and pick up more books or visit three times instead of two, that might be a better model for them,” says Sarner. “Borders has the benefit of the physical stores. That’s where they can differentiate themselves from Amazon.”

Source: Adapted from Meridith Levinson, “Borders Tries to Open New Chapter with Web Site Relaunch Separate from Amazon.com,” *CIO Magazine*, October 2, 2007.

Other Clicks-and-Bricks Strategies

As Figure 9.16 illustrates, other clicks-and-bricks strategies range from partial e-commerce integration using joint ventures and strategic partnerships to complete separation via the spin-off of an independent e-commerce company.

For example, KBtoys.com is an e-commerce joint venture of KB Online Holdings LLC, created by toy retailer KB Toys, and BrainPlay.com, formerly an e-tailer of children’s products. The company is 80 percent owned by KB Toys but has independent management teams and separate distribution systems. However, KBtoys.com has successfully capitalized on the shared brand name and buying power of KB Toys, as well as the ability of its customers to return purchases to more than 1,300 KB Toys stores, which also heavily promote the e-commerce site.

The strategic partnership of the Rite Aid retail drugstore chain and Drugstore.com is a good example of a less integrated e-commerce venture. Rite Aid only owns about 25 percent of Drugstore.com, which has an independent management team and a separate business brand. However, both companies share the decreased costs and increased revenue benefits of joint buying power, an integrated distribution center, cobranded pharmacy products, and joint prescription fulfillment at Rite Aid stores.

Finally, let’s look at an example of the benefits and challenges of a completely separate clicks-and-bricks strategy. Barnesandnoble.com was created as an independent e-commerce company that was spun off by the Barnes & Noble book retail chain. This status enabled it to gain several hundred million dollars in venture capital funding, create an entrepreneurial culture, attract quality management, maintain a high degree of business flexibility, and accelerate decision making. However, the book e-retailer has done poorly since its founding and failed to gain market share from Amazon.com,

FIGURE 9.17

Key questions for developing an e-commerce channel strategy.

A Checklist for Channel Development	
1.	What audiences are we attempting to reach?
2.	What action do we want those audiences to take? To learn about us, to give us information about themselves, to make an inquiry, to buy something from our site, to buy something through another channel?
3.	Who owns the e-commerce channel within the organization?
4.	Is the e-commerce channel planned alongside other channels?
5.	Do we have a process for generating, approving, releasing, and withdrawing content?
6.	Will our brands translate to the new channel or will they require modification?
7.	How will we market the channel itself?

its leading competitor. Many business analysts say that the failure of Barnes & Noble to integrate some of the marketing and operations of Barnesandnoble.com within their thousands of bookstores meant it forfeited a key strategic business opportunity.

e-Commerce Channel Choices

Some of the key questions that the management of companies must answer in making a clicks-and-bricks decision and developing the resulting e-commerce channel are outlined in Figure 9.17. An **e-commerce channel** is the marketing or sales channel created by a company to conduct and manage its chosen e-commerce activities. How this e-commerce channel is integrated with a company's traditional sales channels (e.g., retail/wholesale outlets, catalog sales, and direct sales) is a major consideration in developing its e-commerce strategy.

Thus, the examples in this section emphasize that there is no universal clicks-and-bricks e-commerce strategy or e-commerce channel choice for every company, industry, or type of business. Both e-commerce integration and separation have major business benefits and shortcomings. Deciding on a clicks-and-bricks strategy and e-commerce channel depends heavily on whether a company's unique business operations provide strategic capabilities and resources to support a profitable business model successfully for its e-commerce channel. As these examples show, most companies are implementing some measure of clicks-and-bricks integration because "the benefits of integration are almost always too great to abandon entirely."

REI: Scaling e-Commerce Mountain

When outdoor equipment retailer REI wanted to boost in-store sales, the company looked to its Web site. In June 2003, REI.com launched free in-store pickup for customers who ordered online. The logic behind that thinking: People who visit stores to collect their online purchases might be swayed to spend more money upon seeing the colorful displays of clothing, climbing gear, bikes, and camping equipment.

REI's hunch paid off. "One out of every three people who buy something online will spend an additional \$90 in the store when they come to pick something up," says Joan Broughton, REI's vice president of multichannel programs. That tendency translates into a healthy 1 percent increase in store sales.

As Broughton sees it, the mantra for any multichannel retailer should be "a sale is a sale is a sale, whether online, in stores or through catalogs." The Web is simply not an isolated channel with its own operational metrics or exclusive group of customers.

As the Web has matured as a retail channel, consumers have turned to online shopping as an additional place to interact with a retailer rather than a replacement for existing channels such as stores or catalogs.

And to make that strategy as cost-efficient as possible, the company uses the same trucks that restock its stores to fulfill online orders slated for in-store pickup. To

make this work, REI had to integrate order information from the Web site and replenishment orders from stores at its distribution warehouse in Washington state.

In and of itself, integrating the two types of order information wasn't complex, says Brad Brown, REI's vice president of information services. What was difficult, however, was coordinating fulfillment of both online and replenishment orders because "orders placed on the Web by customers are nothing like replenishment orders that stores place," he says. Online orders are picked from the warehouse at the time of the order and then put in a queue until the appropriate truck is loaded, whereas store orders are picked by an automated replenishment system that typically picks orders at one time based on either a weekly or biweekly replenishment schedule.

To make in-store pickup a reality, Brown's group wrote a "promise algorithm" that informs customers of a delivery date when they place an online order. Timing can get tricky when orders are placed the day before a truck is scheduled to depart the warehouse with a store-replenishment delivery. For example, if an online order is placed on a Monday night and a truck is scheduled to depart Tuesday morning, the system promises the customer a pickup date of a week later, as if the order would be placed on the following week's truck. However, REI will shoot for fulfilling the order that night; if it can do it, REI (and, ultimately, the customer) is happy because the order arrives sooner than was promised.

Creating effective business-to-consumer retail Web sites entails more than simply calculating sales figures. It's about delivering the functionality that users expect and using the site to drive sales through other channels. And only IT integration can make this happen.

Source: Adapted from Megan Santosus, "Channel Integration—How REI Scaled e-Commerce Mountain," *CIO Magazine*, May 15, 2004.

Summary

- **e-Commerce.** E-commerce encompasses the entire online process of developing, marketing, selling, delivering, servicing, and paying for products and services. The Internet and related technologies and e-commerce Web sites on the World Wide Web and corporate intranets and extranets serve as the business and technology platforms for e-commerce marketplaces for consumers and businesses in the basic categories of business-to-consumer (B2C), business-to-business (B2B), and consumer-to-consumer (C2C) e-commerce. The essential processes that should be implemented in all e-commerce applications—access control and security, personalizing and profiling, search management, content management, catalog management, payment systems, workflow management, event notification, and collaboration and trading—are summarized in Figure 9.4.
- **e-Commerce Issues.** Many e-business enterprises are moving toward offering full-service B2C and B2B e-commerce portals supported by integrated customer-focused processes and inter-networked supply chains, as illustrated in Figure 9.9. In addition, companies must evaluate a variety of e-commerce integration or separation alternatives and benefit trade-offs when choosing a clicks-and-bricks strategy and e-commerce channel, as summarized in Figures 9.16 and 9.17.
- **B2C e-Commerce.** Businesses typically sell products and services to consumers at e-commerce Web sites that provide attractive Web pages, multimedia catalogs, interactive order processing, secure electronic payment systems, and online customer support. However, successful e-tailers build customer satisfaction and loyalty by optimizing factors outlined in Figure 9.11, such as selection and value, performance and service efficiency, the look and feel of the site, advertising and incentives to purchase, personal attention, community relationships, and security and reliability. In addition, a Web store has several key business requirements, including building and marketing a Web business, serving and supporting customers, and managing a Web store, as summarized in Figure 9.13.
- **B2B e-Commerce.** Business-to-business applications of e-commerce involve electronic catalog, exchange, and auction marketplaces that use Internet, intranet, and extranet Web sites and portals to unite buyers and sellers, as summarized in Figure 9.14 and illustrated in Figure 9.15. Many B2B e-commerce portals are developed and operated for a variety of industries by third-party market-maker companies called infomediaries, which may represent consortiums of major corporations.

Key Terms and Concepts

These are the key terms and concepts of this chapter. The page number of their first explanation is in parentheses.

- | | | |
|---------------------------------------------|------------------------------------------------|--------------------------------------------|
| 1. Clicks-and-bricks strategy (376) | <i>b.</i> Collaboration and trading (359) | 5. Electronic commerce (350) |
| 2. E-commerce channel (379) | <i>c.</i> Content and catalog management (356) | <i>a.</i> Business-to-business (B2B) (354) |
| 3. E-commerce marketplaces (374) | <i>d.</i> Electronic payment systems (360) | <i>b.</i> Business-to-consumer (B2C) (354) |
| <i>a.</i> Auction (375) | <i>e.</i> Event notification (359) | <i>c.</i> Consumer-to-consumer (C2C) (354) |
| <i>b.</i> Catalog (374) | <i>f.</i> Profiling and personalizing (356) | 6. Electronic funds transfer (EFT) (360) |
| <i>c.</i> Exchange (374) | <i>g.</i> Search management (356) | 7. Infomediaries (375) |
| <i>d.</i> Portal (374) | <i>h.</i> Workflow management (358) | 8. Search engine optimization (370) |
| 4. E-commerce processes (355) | | |
| <i>a.</i> Access control and security (356) | | |

Review Quiz

Match one of the key terms and concepts listed previously with each of the brief examples or definitions that follow. Try to find the best fit for the answers that seem to fit more than one term or concept. Defend your choices.

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ___ 1. The online process of developing, marketing, selling, delivering, servicing, and paying for products and services. | ___ 12. Companies that serve as intermediaries in e-commerce transactions. |
| ___ 2. Business selling to consumers at retail Web stores is an example. | ___ 13. A process aimed at improving the volume and/or quality of traffic to a Web site. |
| ___ 3. Using an e-commerce portal for auctions by business customers and their suppliers is an example. | ___ 14. An e-commerce marketplace that may provide catalog, exchange, or auction service for businesses or consumers. |
| ___ 4. Using an e-commerce Web site for auctions among consumers is an example. | ___ 15. Buyers bidding for the business of a seller. |
| ___ 5. E-commerce applications must implement several major categories of interrelated processes, such as search and catalog management, in order to be effective. | ___ 16. Marketplace for bid (buy) and ask (sell) transactions. |
| ___ 6. Helps to establish mutual trust between you and an e-tailer at an e-commerce site. | ___ 17. The most widely used type of marketplace in B2C e-commerce. |
| ___ 7. Tracks your Web site behavior to provide you with an individualized Web store experience. | ___ 18. The marketing or sales channel created by a company to conduct and manage its e-commerce activities. |
| ___ 8. Develops, generates, delivers, and updates information to you at a Web site. | ___ 19. The processing of money and credit transfers between businesses and financial institutions. |
| ___ 9. Ensures that proper e-commerce transactions, decisions, and activities are performed to serve you more efficiently. | ___ 20. Ways to provide efficient, convenient, and secure payments in e-commerce. |
| ___ 10. Sends you an e-mail when your e-commerce order has been shipped. | ___ 21. Companies can evaluate and choose from several e-commerce integration alternatives. |
| ___ 11. Includes matchmaking, negotiation, and mediation processes among buyers and sellers. | ___ 22. Web sites and portals hosted by individual companies, consortiums, or intermediaries that bring together buyers and sellers to accomplish e-commerce transactions. |
| | ___ 23. A component of e-commerce sites that helps customers find what they are looking for. |

Discussion Questions

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Most businesses should engage in e-commerce on the Internet. Do you agree or disagree with this statement? Explain your position. | 2. Are you interested in investing in, owning, managing, or working for a business that is primarily engaged in e-commerce on the Internet? Explain your position. |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|

3. Refer to the Real World Case on social networks, mobile commerce, and online shopping in the chapter. Do you think that mobile devices (not just phones anymore) are becoming the major platform for shopping, communication, everything? What are the implications for companies?
4. Why do you think there have been so many business failures among dot-com companies that were devoted only to retail e-commerce?
5. Do the e-commerce success factors listed in Figure 9.11 guarantee success for an e-commerce business venture? Give a few examples of what else could go wrong and how you would confront such challenges.
6. If personalizing a customer's Web site experience is a key success factor, then electronic profiling processes to track visitor Web site behavior are necessary. Do you agree or disagree with this statement? Explain your position.
7. All corporate procurement should be accomplished in e-commerce auction marketplaces, instead of using B2B Web sites that feature fixed-price catalogs or negotiated prices. Explain your position on this proposal.
8. Refer to the Real World Case on LinkedIn, Umbria, Mattel, and Others in the chapter. What is your take on the debate as to whether these "influential" individuals do really have an effect on others, or they are representative of an underlying cultural trend? How would a company react based on their position on the issue?
9. If you were starting an e-commerce Web store, which of the business requirements summarized in Figure 9.13 would you primarily do yourself, and which would you out-source to a Web development or hosting company? Why?

Analysis Exercises

Complete the following exercises as individual or group projects that apply chapter concepts to real-world business situations.

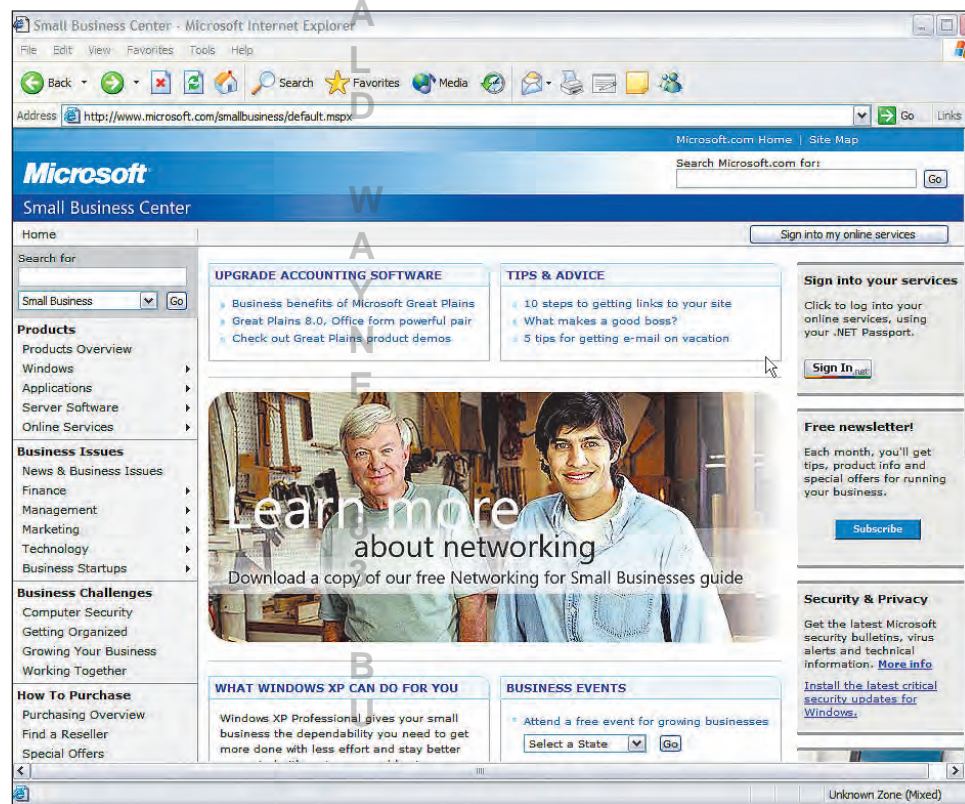
1. Small Business e-Commerce Portals

On the Internet, small businesses have become big business, and a really big business, Microsoft, wants a piece of the action. The company's Small Business Center (www.microsoft.com/smallbusiness) is one of many sites offering advice and services for small businesses moving online. Most features, whether free or paid, are

what you'd expect: lots of links and information along the lines established by Prodigy Biz (www.prodigybiz.com) or Entrabase.com. Small Business Center, however, stands out for its affordable advertising and marketing services. See Figure 9.18.

One program helps businesses create banner ads and places them on a collection of Web sites that it

FIGURE 9.18
Microsoft's Small Business Center is a small business e-commerce portal.



Source: Courtesy of Microsoft®.

claims are visited by 60 percent of the Web surfing community. With its “Banner Network Ads” program, buyers don’t pay a huge fee upfront, and they don’t run the risk that a huge number of visitors will unexpectedly drive up clickthrough commissions. Instead, this program allows small business to pay a small, fixed fee for a guaranteed number of clickthroughs (people who click on your banner ad to visit your Web site). Small Business Center rotates these banner ads around a network of participating Web sites and removes the ad as soon as it has received the guaranteed number of clickthrough visitors. This action eliminates the guesswork regarding both traffic and fees. The three packages—100, 250, and 1,000 visitors—break down to 50 cents per visitor.

- a. Check out Small Business Center and the other e-commerce portals mentioned. Identify several benefits and limitations for a business using these Web sites.
 - b. Which Web site is your favorite? Why?
 - c. Which site would you recommend or use to help a small business wanting to get into e-commerce? Why?
2. **e-Commerce Web Sites for Car Buying**
 Nowadays new car buyers can configure the car of their dreams on Microsoft’s MSN Autos Web site, as well as those of Ford, GM, and other auto giants. Many independent online car purchase and research companies offer

similar services. See Figure 9.19. Car buying information provided by manufacturers, brokerage sites, car dealers, financial institutions, and consumer advocate Web sites has exploded in the past few years.

Yet in the age of the Internet, the auto industry remains a steadfast holdout to innovations that might threaten the well-established and well-connected supply chain, the car dealership. American new car buyers simply cannot skip the middleperson and purchase an automobile directly from the manufacturer. That’s not just a business decision by the manufacturers; that’s the law.

Even so, many car buyers use the Internet as a place to research their purchases. Instead of selling new cars directly, Web sites such as Autobyte.com of Irvine, California, just put consumers in touch with a local dealer where they test-drive a vehicle and negotiate a price. Autobyte.com has been referring buyers to new and used car dealers since 1995. It also offers online financing and insurance.

Online car-buying sites on the Web make consumers less dependent on what cars a dealer has on the lot. At online sites, buyers can customize a car—or van, truck, or sport utility vehicle—by selecting trim, paint, color, and other options before purchase. They can also use Web sites such as CarBuyingTips.com to help prepare for the final negotiating process.

FIGURE 9.19
Table for Problem 2.

Top Car-Buying Web Sites	
• Autobyte.com Enter make and model, and a local dealer will contact you with a price offer. Home delivery is an option.	www.autobyte.com
• AutoNation Every make and model available, as well as financing and insurance information, home delivery, and test drives.	www.autonation.com
• Microsoft MSN Autos Auto reviews, detailed vehicle specifications, safety ratings, and buying services for new and used cars, including customizing your very own Ford.	www.autos.msn.com
• cars.com Research tools include automotive reviews, model reports, dealer locators, and financing information.	www.cars.com
• CarsDirect.com Research price and design, and then order your car. CarsDirect will deliver it to your home. A top-rated site.	www.carsdirect.com
• Edmunds.com For an objective opinion, Edmunds.com provides reviews, safety updates, and rebate news for car buyers.	www.edmunds.com
• FordVehicles.com Research, configure, price, and order your new Ford car, minivan, truck, or SUV at this Web site.	www.fordvehicles.com
• GM BuyPower With access to nearly 6,000 GM dealerships, car shoppers can get a price quote, schedule a test drive, and buy.	www.gmbuypower.com

- a. Check out several of the Web sites shown in Figure 9.19. Evaluate them based on ease of use, relevance of information provided, and other criteria you feel are important. Don't forget the classic: "Did they make you want to buy?"
- b. Which sites would you use or recommend if you or a friend actually wanted to buy a car? Why?
- c. Check out the Consumer Federation of America's study on anticompetitive new car-buying state laws or similar studies online. How much does it estimate consumers would save if they could purchase cars directly from manufacturers online?

3. Comparing e-Commerce Sites

In this exercise, you will experiment with electronic shopping and compare alternative e-commerce sites. First, select a category of product widely available on the Web, such as books, CDs, or toys. Second, select five specific products to price on the Internet, for example, five specific CDs you might be interested in buying. Third, search three prominent e-commerce sites selling this type of product and record the price charged for each product by each site.

- a. Using a spreadsheet, record a set of information similar to that shown for each product. (Categories describing the product will vary depending on the type of product you select—CDs might require the title of the CD and the performer[s], whereas toys or similar products would require the name of the product and its description.) See Figure 9.20.
- b. For each product, rank each company on the basis of the price charged. Give a rating of 1 for the lowest price and 3 for the highest, and split the ratings for ties—two sites tying for the lowest price would each receive a 1.5. If a site does not have one of the products available for sale, give that site a rating of 4 for that product. Add the ratings across your products to produce an overall price/availability rating for each site.

- c. Based on your experience with these sites, rate them on their ease of use, completeness of information, and order-filling and shipping options. As in Part (b), give a rating of 1 to the site you feel is best in each category, a 2 to the second best, and a 3 to the poorest site.
- d. Prepare a set of PowerPoint slides or similar presentation materials summarizing the key results and including an overall assessment of the sites you compared.

4. e-Commerce: The Dark Side

Anonymous transactions on the Internet can have a dark side. Research each of the terms below on the Web. Prepare a one-page report for each term researched. Your paper should describe the problem and provide examples and illustrations where possible. Conclude each paper with recommendations on how to guard against each type of fraud.

- a. Search using the terms "Ponzi Scheme" or "Pyramid Scheme." To find current examples in action, try searching for "plasma TV \$50," "cash matrix," "e-books" and "matrix," or "gifting" through a search engine or auction site.
- b. Search using the terms "phishing" and "identity." If possible, include a printout of a real-world example that you or an acquaintance may have received via e-mail.
- c. Search using the term "third-party escrow." What legitimate function does this serve? Provide an example of a legitimate third-party escrow service for Internet transactions. How has the third-party escrow system been used to commit fraud on the Internet?
- d. Prepare a one-page paper describing a type of online fraud not covered in the previous questions. Prepare presentation materials and present your findings to the class. Be sure to include a description of the fraud, how to detect it, and how to avoid it. Use real-world illustrations if possible.

FIGURE 9.20 Table for Problem 3.

Title of Book	Author		Price			Rating		
			Site A	Site B	Site C	A	B	C
The Return of Little Big Man	Berger, T.		15.00	16.95	14.50	2	3	1
Learning Perl/Tk	Walsh, N. & Mui, L.	2	26.36	25.95	25.95	3	1.5	1.5
Business at the Speed of Thought	Gates, W.	8	21.00	22.95	21.00	1.5	3	1.5
Murders for the Holidays	Smith, G.	3		8.25	7.95	4	2	1
Designs for Dullards	Jones	3	17.95	18.50	18.50	1	2.5	2.5
Sum of ratings (low score represents most favorable rating)		B				11.5	12	7.5

REAL WORLD CASE 3

Entellium, Digg, Peerflix, Zappos, and Jigsaw: Success for Second Movers in e-Commerce

Anyone who has watched short-track speed skating during the Winter Olympics knows that skating with the lead is no easy task.

The No. 2 skater gets to conserve precious energy by drafting behind the leader. No. 2 watches the frontrunner's every move, gauging when and where to make a bid for the gold. Now corporate America and speed skating have much in common.

There are no safe leads.

For companies that use the Internet as the home base for their businesses, the second-mover advantage seems even more substantial. That's why Paul Johnston is deeply grateful to Marc Benioff.

Johnston's Seattle-based start-up, Entellium, has won hundreds of contracts against Benioff's Salesforce.com and other competitors since it moved from Malaysia in 2004, and its revenues grew fivefold in 2005. What Johnston really likes, though, is not having to sell companies on the concept of letting an outsider host their customer relationship management software.

What makes fast-following the hot strategy of the moment is the relative ease with which founders can get a start-up out on the track and send it chasing the competition. Cheap open-source tools can help you deploy new business software quickly.

Offshore manufacturers can quickly churn out anything from semiconductors to engine parts. The Web connects marketers to a vast pool of beta testers, while angel investors and venture capitalists, flush with new funds, stand at the ready.

Of course, fast-following isn't as simple as saying "Me too." To battle established leaders, you need the right product and strategy, as well as a big dose of savvy. Here's how to show up after the starting gun and still come out on top.

Number 1: Be better, faster, cheaper, and easier

To steal business from Benioff, Johnston knew that Entellium had to offer something different. "This is true for any follower," he says.

It's what Johnston calls the "awesome, awesome, not totally ****-ed up" approach. The first "awesome" is how Entellium's software works. Johnston, formerly an Apple sales executive, aims to bring to the stodgy world of enterprise software the ease of use of consumer-directed offerings like Google Maps and the role-playing game Everquest. He even hired developers from the gaming industry to borrow interface tricks.

After appealing to customers on usability, Johnston hits them with the price: about 40 percent less than the competition. That's the second "awesome." The last part is making Entellium a less risky decision.

Who wants to put their job on the line for a start-up the boss has never heard of? Johnston offers free 24×7 service to make it easier for new customers to stick their necks out.

Number 2: Trip up incumbents with tactics from other fields

Common wisdom would say that the last thing the world needs is another technology news Web site, but Digg founders Jay Adelson and Kevin Rose are uncommonly wise.

A year ago, inspired by social-networking sites like MySpace—whose users rank everything from people to music—Adelson and Rose decided to use the same approach to build a better version of tech news site Slashdot.

Digg lets readers submit news stories and vote for the ones they think are most important. The top 15 vote-getters make it to the front page. The formula is working. Between May and November, the number of monthly unique visitors to Digg surged 284 percent to 404,000, eclipsing Slashdot's 367,000, according to ComScore Media Metrix. In addition, Adelson and Rose recently landed \$2.8 million from investors, including eBay founder Pierre Omidyar and Netscape cofounder Marc Andreessen.

Moving forward, Adelson and Rose won't be shy about borrowing even more from seemingly unrelated companies. Soon they'll start tracking what members read and offering story recommendations à la Amazon. Digg is also set to branch out into nontechnology stories, which readers will be able to categorize with Delicious-style social bookmarking tags.

"A lot of companies are afraid to touch their original technology, to reconsider the premise on which they started the business," Adelson notes. "But when you stop doing that, that's when you get lapped [overtaken]."

Number 3: Swipe their business models and start your own race

When Billy McNair and Danny Robinson were hatching the idea for a new DVD company, Netflix handed them part of their business plan. Consumers had already learned that renting by mail was easy. McNair and Robinson believed they could do better than rentals. After all, eBay had shown them how.

By mixing together the best of two worlds, the founders came up with Peerflix, a Web site on which people exchange DVDs for a 99-cent transaction fee. Like eBay, Peerflix sits in the middle, linking movie fans and taking a piece of the action. Eager to avoid going head-to-head with eBay, however, McNair and Robinson are starting with lower-ticket items—those that sell for less than \$25—for which auctions may not be worth the hassle.

"We've married the best of online rental services and online secondary markets," McNair claims. Since it launched

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in September, Peerflix has helped trade nearly 200,000 DVDs, and the founders are now talking about extending the idea to video games and other items.

Number 4: Follow the biggest leader you can find

When he hatched Zappos six years ago, Nick Swinnum put other online shoe sellers in his cross-hairs. Web-based competitors typically carried a limited number of brands and catered to small niches—say, women's dress shoes or men's outdoor boots. Zappos would crush them, Swinnum reasoned, with an online store that offered every conceivable make and model.

That was the right idea, but it focused on the wrong competitors. The online shoe market was so tiny that even if Zappos dominated it, there wouldn't be enough business for the company to thrive. To grow, it had to steal customers from bricks-and-mortar stores. Before 2001, Zappos didn't carry inventory; rather, the company asked distributors to drop-ship directly to consumers.

It was an easy, cheap arrangement, but the problem was that Zappos couldn't guarantee service; 8 percent of the time customers tried to buy shoes, the desired pair was out of stock. In other words, the experience was nothing like walking into a shoe store. "We realized then who our real competition was, and that we had to find a way to make an inventory model work," Swinnum says.

So Zappos began to cozy up to suppliers.

Contrary to industry practice, Swinnum shared data with manufacturers on exactly how well their shoes were selling. "Traditionally the vendor–retail relationship was adversarial," he recognizes. "We thought, 'Instead of trying to hide this information from the brands, let's open everything

up. They can help us build the business.'" Did they ever! Grateful shoe reps helped Zappos craft promotions to spur sales.

Since targeting traditional shoe stores, Zappos has thrived. In 2001, the company did \$8.6 million in sales; the next year it did \$32 million. In 2005, Zappos posted more than \$300 million in revenues from an expanding line of shoes, handbags, and other leather goods.

Number 5: Aim for the leader's Achilles' heel

When he was vice president for sales at online marketing shop Digital Impact, Jim Fowler watched his field reps fail with a growing sense of frustration. Their problem? The leading online databases of corporate information, such as Dun & Bradstreet subsidiary Hoover's, didn't offer the deep, up-to-date contact lists that salespeople need to close deals.

Rather than complain about those vendors, Fowler decided to improve on them.

His company, Jigsaw, is a new kind of contact subscription service: All of the names and addresses in Jigsaw's database come from its users. Sales reps pay a minimum of \$25 per month to access contacts at thousands of companies, or they pay nothing if they contribute 25 contacts per month themselves. Users police the listings to ensure they're current.

Since Jigsaw's launch in December 2004, its database has surged from 200,000 contacts to more than 2 million; some 38,000 subscribers are adding 10,000 new contacts a day. Through Jigsaw you can find more than 16,000 contacts at Medtronic, for example; Hoover's, meanwhile, offers extensive research on the company but only about 30 contacts. According to Fowler, "It's never too late if you are smarter and better than everyone else."

CASE STUDY QUESTIONS

1. Is the second-mover advantage always a good business strategy? Defend your answer with examples of the companies in this case.
2. What can a front-runner business do to foil the assaults of second movers? Defend your answer using the examples of the front-runner companies in the case.
3. Do second movers always have the advantage in Web-based business success? Why or why not? Evaluate the five strategies given in the case and the companies that used them to help defend your answer.

REAL WORLD ACTIVITIES

1. Use the Internet to research the current business status of all of the many companies in this case. Are the second movers still successfully using their strategies, or have the first movers foiled their attempts? Have new strong players entered the markets of the first and second movers, or have business, economic, or societal developments occurred to change the nature of competition in these markets?
2. Assume you will start an Internet-based business similar to one of those mentioned in this case or another one of your choice. Would you be a first, second, or later mover in the market you select? How would you differentiate yourself from other competitors or prospective new entrants? Break into small groups to share your ideas and attempt to agree on the best Web-based business opportunity of the group.

REAL WORLD

CASE

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KitchenAid and the Royal Bank of Canada: Do You Let Your Brand Go Online All by Itself?

A reputation is a fragile thing—especially on the Internet, where trademarked images are easily borrowed, corporate secrets can be divulged anonymously in chat rooms, and idle speculation and malicious commentary on a blog can affect a company's stock price. Brands are under constant attack, but companies such as BrandProtect, MarkMonitor, and NameProtect (now part of Corporation Services Company) are stepping in to offer companies some artillery in the fight for control of their brands and reputations.

Brian Maynard, director of marketing for KitchenAid, a division of Whirlpool, had a rather unique problem. Like the classic Coke bottle and Disney's Mickey Mouse ears, the silhouette of the KitchenAid mixer, that colorful and distinctively rounded wedding registry staple, is a registered trademark. Although the KitchenAid stand mixer silhouette has been a registered trademark since the mid-1990s, it has been a well-recognized symbol since the current design was introduced in the 1930s. "The KitchenAid mixer is an incredible asset so it is important for us to protect both the name and the image from becoming generic," says Maynard, who reports that the equity of the brand has been estimated to be in the tens of millions of dollars. Any kind of violations that go unnoticed can quickly erode that precious equity.

KitchenAid had experienced some problems on the Web with knockoffs and unauthorized uses of the mixer's image, but getting a handle on the many and varied online trademark infringements seemed daunting. Maynard knew that historically, corporate brands that were not well-protected and policed by their owners had been ruled generic by the courts—*aspirin* and *escalator* are two examples. "Throughout history terms like *escalator* and *aspirin* have become generic simply because people did not do the work to protect them," says Maynard. "To avoid that fate, you have to show the courts that you have put every effort into protecting your brand. If you don't police your brand, courts will typically rule that the mark is no longer meaningful and has become ubiquitous." So when he received a cold-call from BrandProtect, he was intrigued.

Criminals hijacking online corporate brands and masquerading for profit, however, are ramping up their efforts. Dubbed "brandjacking" by MarkMonitor Inc., a San Francisco-based brand protection service provider, the practice is becoming a major threat to household names. "Not only is the volume of these abuses significant, but abusers are becoming alarmingly savvy marketers," says Frederick Felman, MarkMonitor's chief marketing officer. In its first Brandjacking Index report, MarkMonitor tracked 25 of the top 100 brands for three weeks by monitoring illegal or unethical tactics that ranged from cybersquatting to pay-per-click fraud. Media companies made up the greatest percentage of targeted brands.

Cybersquatting, which usually means registering a URL that includes a real brand's name, easily took the prize for

the most threats. MarkMonitor tracked more than 286,000 instances in the three-week span. "When I heard about the solution I didn't even realize there was anything like that out there," says Maynard. "I saw right away that it solved a problem I didn't even realize existed."

BrandProtect uses a technology platform that functions like a giant spider, mapping the Web and identifying what's going on in its darkest recesses. The mapping technology is combined with a filter and human analysis component that identifies and returns to its clients actionable data on illicit activities that may adversely affect their corporate identity. Depending on the client's chosen service level, those activities can include any of 22 categories of infractions—from phishing to counterfeiting, misuse of corporate logos and trademarked product images, domain infractions, and employees blogging about corporate trade secrets. Staying ahead of the many ways that a company's brand can be compromised or diluted online is a challenge that Kevin Joy, vice president of marketing for BrandProtect, compares to a never-ending game of Whack-a-Mole.

The challenge of brand protection, however, has grown exponentially for companies operating in the online world. "With the advent of the Internet a few things happened," explains Maynard. "Everyone in the world could now see the mixer so the potential for misuse of our trademark became greater. Because it is so well known, there was more risk of companies creating knock-off products and marketing them under other names. So it was even more important than ever to prove that we were putting every effort into protecting the brand and our trademarks."

Other types of violations also surfaced as KitchenAid's online policing activities grew. Some, such as sites using the logo without permission, were minor and could be easily fixed with a warning letter. Others were not so innocent, such as using the logo to create links to illegal sites. "We spent a lot of time training people and policing online activities," says Maynard.

The many successes have made the relationship worthwhile. Recently, Maynard was impressed by how quickly he was able to resolve a case of domain infraction. A small vendor that works with KitchenAid was experimenting with registering URLs such as *shopkitchenaid.com* and *buykitchenaid.com* for marketing purposes. That Friday when Maynard received his report, he noticed the new URLs, recognized the name of the owner, and called his contact at the company to explain that any URLs containing the name KitchenAid had to be owned by the company. Maynard says his contact was shocked by how quickly KitchenAid had gotten on top of the issue. "He didn't even know he couldn't have ownership of that URL and was stunned that we knew about it so quickly."

Given the strategic importance of the KitchenAid brand, Maynard says BD-BrandProtect has played a major role in

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bringing him peace of mind. “It is my responsibility to protect this brand and I am not going to allow any loss of equity on my watch. In fact, the value of the stand mixer silhouette continues to increase year after year. Before BD-BrandProtect, however, I thought I was out there doing it on my own. Now I know I can leave the brand in better condition than when I started.”

As Manager of Brand Standards for the Royal Bank of Canada, Lise Buisson knows that the job of protecting the bank’s brand online involves a lot more than finding out when someone has cut and pasted a logo onto their site without permission. “As brands become more valued, any improper use of your brand can become a reputational risk. When someone displays your logo, for example, it becomes a de facto endorsement, whether we have approved it or not. We have to be careful about things like that.” Royal Bank of Canada and its subsidiaries operate under the master brand name of RBC. With 70,000 full- and part-time employees serving 15 million clients through offices in North America and 34 countries around the world, RBC is the largest bank in Canada.

“We didn’t expect to see what we saw. We were inundated. No one realized how easy it was for someone to come to our site, grab a logo, and put it somewhere else. It forced us to sit down as a group and figure out what we could do,” says Buisson. She quickly discovered that a majority of the infractions noted were harmless and did not require a second thought. “In most cases the users were well meaning,” she says. “It could be a charity site or mortgage partner using

our logo. I would say that 90 percent of these incidents were quite harmless.”

“BD-BrandProtect immediately flagged and dealt with a bank in the North Sea region that had used our logo and positioned themselves with another name. When anyone misrepresents themselves as an affiliate of ours, it makes us very nervous,” notes Buisson. Where concerns are raised, RBC will take the appropriate measures, from issuing a polite request to the user to cease using their brand to initiating legal action. “In the vast majority of cases a polite letter is enough.” Once a year, RBC reviews its branding policies to ensure that the reports continue to reflect their top priorities. It has also established a number of policies to ensure that the appropriate follow-up measures are used when required. “If, for example, we find advertising of our logo on a gambling site, we now have a policy about that,” she says.

Buisson says that as Internet activities continue to escalate, she has come to realize that the job of monitoring online brand activities properly would just have been too much for departmental staff to handle. “I’m a big proponent of going to the experts and sitting down and working with them. It’s very reassuring to work with a company that’s looking out for us. It certainly helps some of us sleep at night.”

Source: Adapted from Daintry Duffy, “Brand Aid for a Manufacturer’s Online Property,” *CIO Magazine*, September 17, 2007; *Royal Bank of Canada Case Study and KitchenAid Case Study*, www.bdbrandprotect.com, accessed April 22, 2008; and Gregg Ketzner, “Brandjackers’ Make Millions Feeding Off Internet Brand Names,” *Computerworld*, April 30, 2007.

CASE STUDY QUESTIONS

1. Consider your own online shopping patterns. How much weight do you place on the presence of a name or logo or other trademark (such as the KitchenAid silhouette) on a Web site when purchasing goods or services? Do you ever stop to consider whether you may have been misled? How could you tell the difference?
2. Brian Maynard of KitchenAid notes that the development of the Internet changed the problem of brand policing. What are some of these changes? What new challenges can you think of that did not exist in the pre-online world? Provide several examples.
3. The companies mentioned in the case (e.g., KitchenAid, RBC, Disney, and Coke) were well established and enjoyed strong brand recognition well before the advent of the Internet. Do you think online-only companies face the same problems as they do? Why or why not? Justify the rationale for your answer.

REAL WORLD ACTIVITIES

1. Online trust providers such as eTrust (www.etrust.org) and others review privacy policies, including information collection and use, sharing and disclosure, and security, and then certify Web sites as meeting their standards. Companies that achieve this can then display a logo to that effect. Search the Internet to discover how these providers prevent unauthorized lifting and use of their certification logos by Web sites that have not gone through the process. Prepare a report to summarize your findings. Have you ever noticed these logos? Does it make any difference to you as a consumer whether a Web site displays them or not?
2. The case features technology developed by BrandProtect (www.brandprotect.com); competitors include MarkMonitor (www.markmonitor.com) and NameProtect (www.cscprotectbrands.com). Visit their Web sites to compare and contrast their offerings. Then break into small groups to compare your findings and discuss new features that you believe are lacking, as well as why you think these vendors should include these features.