CHAPTER 1

Organizations, Business Processes, and Information Systems

Learning Objectives

After completing this chapter, you should be able to:

- Understand that work in organizations is completed in processes that consist of many steps.
- Compare and contrast the functional and process views of organizations and identify the negative consequences of the traditional functional organizational structure.
- Discuss and describe the various flows in a process—physical, data, document, and information.
- Explain how enterprise systems enable organizations to execute and manage processes.

Based on the fact that you are taking a college or university course that uses this book as part of the curriculum, it is safe to assume that you are planning some sort of career in business. You might be considering a career in marketing, finance, or accounting, or you might even start your own business. Alternatively, you might not have any idea of what you want to be when you "grow up," and this course sounded like something that would be a good introduction to business—"just in case." Either way, you are probably wondering what *business processes* are and why they are important enough for your instructor to include them in this course. You also might be curious regarding the types of *information and communication technology* (ICT) that companies use to run their businesses. Briefly, business processes are the tasks or activities that companies use to produce goods or services, and these activities are increasingly supported by ICT, such as computers, the Internet, the Web, and, *information systems*.

We will examine business processes and ICT more closely later in the chapter and then address them throughout this book. Before you start learning about them in detail, however, it will help if you understand why they are critical to modern business operations. Thus, we begin this chapter by discussing the global competitive environment in which contemporary organizations operate. The need to compete in this environment has led organizations to increasingly view their operations in terms of business processes and to develop information systems to support these processes.

We then define and discuss business processes, information systems, and their role in modern organizations in more detail. Finally, we develop a framework that we will use in later chapters to increase your understanding of business processes, the role of information systems in supporting these processes, and the financial impact of business processes on organizations.

As illustrated in the boxed feature, Business Processes in Practice 1-1, the challenges presented by globalization have a huge impact on companies' business and information technology (IT) strategies. To effectively adapt to the changing global environment of the technology industry, Apple needed to adopt a process view of their business and to implement information technology systems to support those processes.

► 1.1 THE MODERN GLOBAL BUSINESS ENVIRONMENT

The Apple case illustrates the competitive environment to which modern organizations must adapt. To fully understand the modern business world, you need to become familiar with the terms "*global competition*," "*information revolution*," and "*knowledge worker*." What exactly do these terms mean, and why do they appear at the beginning of an introductory book on business processes? Finally—and perhaps most important—why should they matter to you?

As we discuss in this section, we introduce these three concepts because they are likely to have a major impact on the world of business in the foreseeable future. Thus, it is very important that you understand them in order to develop a "big picture" of the business environment in which your future employers will be operating.

1.1.1 Global Competition

Evidence that we live in a **global competitive environment** is all around us. We see it, for example, in the products and services we use. Rarely will you find a product that is designed and produced entirely in one country. More often, the product is designed in one country, the parts to make the product are produced in several countries, the product is assembled in another country, and service and support for the product are provided by people in yet another country.

Why has this shift toward globalization occurred? There are clearly many reasons, including national and international politics and policies. Regardless of the reasons, however, the fact remains that over the last several years, organizations have relocated parts of their operations to places outside their home countries to take advantage of unique business efficiencies. For example, companies have moved manufacturing to places where labor is less expensive, and they have transferred research and development to locations that offer an abundant supply of highly educated scientists and engineers.

As you see in Business Processes in Practice 1-1 Apple designs its products in California, but it produces them in specialized contract manufacturing facilities in Asia. These contract manufacturers are not owned by Apple; in fact, they often produce products for Apple's competitors in the same facilities. Because these manufacturers are so specialized in producing electronic products, they can fabricate very high quality finished goods at a lower cost than Apple could in its own factories. Apple can then invest the money it saves by outsourcing its production process in hiring more researchers and designers in California.

Another type of relocation of processes and operations actually results in new factories and production facilities being built in the United States. For many years,

▶ BUSINESS PROCESSES IN PRACTICE 1-1

APPLE COMPUTERS

Apple Computers (now Apple Inc.) is a good example of a company that has embraced globalization and has grown very quickly by taking advantage of integrated business processes and information technology. If you have ever purchased or used an Apple iPod, you probably have noticed a label on the back that reads, "Designed by Apple in California, Assembled in China." Apple does not manufacture iPods in its own factories. In fact, it hardly has any factories anymore.

In 1998, Apple Computer was a much different company than it is today. For one thing, there weren't any iPods or iPhones or Apple Stores. The company sold only Mac laptop and desktop computers and a few other similar products. In fact, Apple produced only six main products and sold them almost entirely through a network of resellers. The company manufactured these products in their main factories in Ireland and Singapore, and they controlled every aspect of production and distribution, from the initial design through the delivery of finished products to their resellers. Apple's resellers were typically small, specialized local computer firms that placed orders with Apple for computers and then sold them to local companies or individuals. Unless you knew exactly where to look, it was often difficult to find an Apple computer. In addition, Apple had very little knowledge about its customers because the resellers, and not Apple, actually sold the computers to them.

Over the next 10 years, Apple Computers evolved into Apple Inc., a much larger and more visible company. Consider these numbers. In 1998, Apple Computers had 6,658 employees and less than $6 billion in revenues. At the beginning of 2008, Apple Inc. had 21,600 employees and more than $24 billion in revenues. In 1998, Apple generated almost all its revenues through reseller channels. By 2008 they had opened nearly 200 retail stores all over the world and had nearly $4 billion in revenues just from those stores and Internet sales. Apple's product line had also grown from 6 to more than 27 main products, including digital music, movies, and television through iTunes.

How and why did this transformation occur? The answer is that several things occurred in 1998 that signaled this rapid growth and expansion for Apple and resulted in some major changes in the way the company operated. First, Steve Jobs returned to Apple as its CEO after several years outside the company. At the time Jobs returned, Apple wasn't doing very well. In an attempt to turn the company around, Jobs instituted some very big and difficult changes. Jobs understood that Apple needed to focus on its core competency: designing easy-to-use and engaging hardware and software products. He immediately revamped the product line by modernizing the Mac operating system and providing Apple computers with new Internet capabilities.

In addition, Jobs started to outsource manufacturing operations to specialized high-tech manufacturing companies, primarily located in Asia. Because Apple's core competency was designing the products, they did not need to continue to manufacture these products themselves. Jobs's next initiative was to launch the Apple Online Store to sell products directly to consumers over the Internet. Getting close to customers was crucial for Apple's plans to provide users with a better and more engaging experience. Finally, Jobs implemented SAP R/3, an enterprise system, to manage all the new processes that resulted from the other strategic changes in product design, manufacturing, and sales.

Every one of the strategic business changes that Apple made in 1998 fundamentally transformed the core business processes that had been in place for many years. For these new processes to be effective, they had to be visible and accessible to employees across Apple's entire spectrum of business operations. They also had to eliminate several areas of inefficiency among groups in the company. The information systems that were in place in 1998 could not grow to support the expansion in product categories, geographic locations, and revenues. Therefore, Apple had to implement an integrated enterprise system that would be able to grow flexibly as the company's business expanded.

Since 1998 Apple has continuously expanded its enterprise system to incorporate new business processes and capabilities. By 2008 Apple had one of the largest and most advanced integrated enterprise systems in the world. The company manages every iPod, iPhone, Mac, and other Apple product from the design phase through final sales in a set of integrated enterprise systems. In fact, Apple's enterprise systems are so critical that its business would come to a halt if these systems stopped working for even a few minutes.

Source: Compiled from Apple Inc. Annual Reports; and "Hard Sell," *Information Week*, March 1, 1999.

Toyota designed and built its automobiles in Japan and then shipped them to the United States to be sold. After analyzing the costs and benefits, Toyota realized that if they could build a production facility in the United States and ensure that it would maintain the same high-quality production processes as their plants in Japan, they would save a significant amount of money that they could then reinvest in new product design back in Japan.

One consequence of globalization is increased competition. Companies are no longer limited to their local markets. Instead, the world is their market. Of course, as a company's market expands, so do the number and types of firms with which it competes. This increased global competition puts pressure on companies to be more efficient and productive. In addition, they must develop strategies to tightly integrate their operations, which can be distributed across many different geographic locations. Clearly, then, globalization has significant implications for how organizations operate. This observation brings us to the second term mentioned in the opening paragraph—information revolution.

1.1.2 The Information Revolution

Information revolution refers to the increased use of information and communication technology to create, deliver, and use information. ICT includes such things as the Internet (e.g., e-mail, Web) and computer-based business information systems (e.g., SAP® ERP) that support the work of organizations. The information revolution plays an important role in the global competitive environment. As we saw, because organizations are expanding and their processes are becoming widely dispersed, it is vital that they exchange and share information efficiently and accurately. ICT has helped organizations to globalize their operations by enabling them to coordinate business processes that are performed around the world.

If we look back at the Apple and Toyota examples, both of those companies use very advanced ICT capabilities to manage their distributed operations and partner networks. For example, Apple must quickly communicate any changes in its sales forecasts to its Asian contract manufacturers to ensure that they can adjust their production capacities to meet the new sales requirements. Toyota must closely monitor every aspect of its production facilities to ensure that the quality of cars and trucks manufactured in the United States meets the same standards as those manufactured in Japan.

The only way for Apple and Toyota to effectively monitor, manage, and communicate between their distributed networks of facilities and partners is to utilize ICT effectively. They simply could not control such complicated and intertwined global processes without the aid of ICT.

Significantly, the ability to communicate instantly via documents, data voice, and video makes it unnecessary for everybody involved in designing and producing a product to be in the same location. In this sense, then, ICT enables, supports, and even encourages globalization. At the same time, however, organizations are becoming critically dependent on ICT to run smoothly, precisely because their various operations are spread all over the world. In addition, they rely on ICT to be more productive and thus remain competitive. The danger here is that, if the ICT doesn't function properly, the entire organization can't function.

Clearly, then, people in modern organizations increasingly depend on information to do their work. For this reason these employees are increasingly referred to as knowledge workers based on the large amount of decisions they must make and the information they must constantly analyze.

1.1.3 The Knowledge Worker

A **knowledge worker** is one who uses ICT to create, acquire, process, synthesize, disseminate, analyze, and use information to be more productive. Examples of knowledge workers are product manager, sales executive, production manager, and financial analyst. Knowledge workers perform work that often requires both *structured information* and *unstructured information* from multiple sources. Structured information is well defined, and its source is known; that is, a manager will know what information is needed and where to find it. Unstructured information is not well defined or readily available; that is, a manager may not know what information is needed or where to find it.

Knowledge work is typically nonroutine in that it is not repeated throughout the course of the workday or workweek. For example, product managers might speak to customers on a monthly basis to collect feedback regarding their products. Although they may do this in regular meetings, this work is not considered routine because each interaction with the customer is very different. For example, one meeting might deal with a quality issue related to a particular product, whereas another meeting might focus on a new feature that was added to the product. To perform these tasks successfully, knowledge workers must have a thorough understanding of the business processes that occur across different areas of the company. They also must be able to work with multifunctional teams from different groups.

In contrast to knowledge workers, *task workers* perform routine, structured tasks, typically in a repeated manner. Task workers include customer service representatives, purchasing and accounting clerks, and insurance claims processors. Task workers are usually confined to one specific set of tasks in their functional area and are required to deal with other areas of the company only in rare cases. Although task workers are extremely important to the operations of the company, they tend to have a much more narrow view of the overall business, and compared to knowledge workers, they use information in a much more specific way.

Knowledge workers are employed in all parts of an organization, not just in IT departments. *In all likelihood, you will be a knowledge worker at some point in your career*. As a knowledge worker, you must develop the skills to find and use the information you need rather than rely on others to find it for you. As one company executive recently remarked: "We have technology coming out of our ears, but not enough people who know how to use it." In other words, his organization does not have enough knowledge workers.

To be an effective knowledge worker, you must understand how, where, and why the underlying data are generated. Significantly, the data that are essential to your work are frequently generated by your coworkers, just as the data you create affect others. In other words, you must understand the "big picture" of your organization and not just your part in it. For example, a product manager must deal extensively with the detailed customer data forwarded by the sales group and reconcile these data with the product features coming from the design group and the production data generated by the operations group

What does all this have to do with your decision to take what might be your first course in business? The answer is that we want to impress on you the importance of some key skills that companies are desperately looking for in a good knowledge worker:

1. **Strategic Thinking.** The ability to see the big picture and understand how your organization works as a whole.

2. **Information Literacy.** The ability to determine what information is needed, where to find it, and how to use it.
3. **Communication and Collaboration.** The ability to function as an effective part of a project team where you understand your role as well as the roles of others.

You will develop these skills during your tenure in college and refine them as you gain experience in the workplace. However, you need a solid foundation on which to build. This foundation is a thorough understanding of both the fundamental business processes that organizations use to do their work and the role ICT plays in supporting these processes. In the next section, we take a closer look at some of these fundamental processes.

1.1.4 Key Business Processes

Organizations create and deliver value in the form of a product or service, which they offer to consumers or to other organizations. Manufacturing organizations create tangible products such as cars, flashlights, and skateboards. Other organizations create intangible "products" or services such as education, health, information, and financial services. Regardless of the type of organization, however, the product or service is created via a sequence of tasks or activities that take a set of inputs and convert them into the desired output. We refer to this sequence of activities as a **business process**. Figure 1.1 illustrates a process in its most basic, or generic, form. A process consists of multiple sequential *steps* or *activities* that produce some outcome or output.

Organizations today use a number of processes. However, most of our discussions will focus on three fundamental processes: procurement, production, and fulfillment. In the **procurement process**, the organization acquires the basic materials that it uses to produce goods or services. The **production process**, as its name implies, involves manufacturing or generating the desired goods and services. Finally, in the **fulfillment process**, the company delivers the goods or services to its customers or resellers.

We have included these three processes in this book because they are typically considered the "core" processes that exist in most companies. Going further, we describe each process in simple terms to provide a big picture of how it works. In reality, these processes are far more complex, and they differ greatly among companies and industries. Because this is an introductory text, it is not terribly important that you understand every variation and difference between processes in every industry. Rather, our goal is to communicate the basic concepts and vocabulary of these core processes so that you can quickly adapt this knowledge to the company and industry where you will eventually start your career.

To understand how modern organizations utilize these processes, let's use the example of a company that manufactures skateboards. This company takes

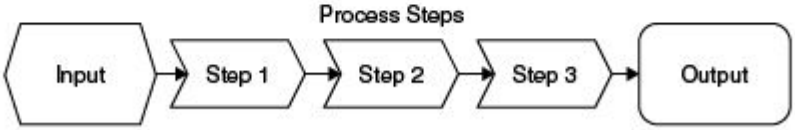

Figure 1.1 Generic process

Figure 1.2 Procurement process

the different components (input)—such as a board, wheels, nuts, and bolts—and assembles them into a skateboard. It then inspects the skateboard for quality and packs it in a box. Assembly, inspection, and packing are the required steps or activities. The result (output) is skateboards. Because the objective of these activities is to produce or manufacture the skateboard, this sequence of activities constitutes the production process.

Before the company undertakes the production process, however, it must first acquire the necessary components, or raw materials. This is the procurement process. This process might include the steps shown in Figure 1.2. First, someone in the company determines how many of which materials are needed, by whom, and by which date. He or she then completes a purchase requisition for these materials. The next steps are to select a suitable supplier and to create and send a purchase order to the supplier. The supplier then ships the materials, which the company receives and stores in its warehouse. The supplier also sends an invoice, which the company pays. Thus, the result or outcome of the procurement process is an inventory of materials in stock.

The third key process—the fulfillment process—generally occurs after the company has completed the production process. The fulfillment process is concerned with filling a customer order, and it might include the five steps shown in Figure 1.3. First, the organization receives a customer's order over the phone. It then prepares and ships the order to the customer, along with an invoice. Finally, the customer sends a payment to the company.

The skateboard company we just discussed manufactures its own product. Now, let's consider an organization that buys and sells products but does not actually make them. That is, the organization buys finished products from a supplier, stores them in a warehouse, and fills customer orders from this inventory.

A familiar example of such a company is Amazon.com. Amazon purchases books from publishers such as John Wiley & Sons (procurement), puts those books in its warehouses, and then ships them to customers when they place an order on the Web site (fulfillment). Amazon.com does not manufacture any books (production); it simply resells books from other companies. This is a very efficient business model for Amazon because it can sell an almost infinite number of books from many publishers on its Web site, and it does not have to worry about dealing with the authors, editors, bookbinders, paper manufacturers, and ink suppliers involved with producing the actual books.

Figure 1.3 Fulfillment process

In contrast to the skateboard manufacturer, then, Amazon.com has no production process. Therefore, it has only two key processes: procurement and fulfillment. Amazon's procurement process differs somewhat from that for the skateboard manufacturer because Amazon doesn't make its products. Therefore, instead of purchasing raw materials (e.g., paper and ink), it acquires the final products (books).

These examples are deliberately very simplistic. There are many details and additional steps associated with these processes, which we will discuss in later chapters. For now, it's sufficient to understand the basic activities involved in the three processes.

It is very important, however, to recognize that the activities involved in processes are carried out by individuals located in different parts of the organization. Most companies group their employees into different units. The manner in which they group their people is determined by the organization's structure and design, and it has significant implications for how well the various processes are executed.

► 1.2 THE FUNCTIONAL ORGANIZATIONAL STRUCTURE

The most common organizational structure is the **functional structure**. Organizations that utilize a functional structure are divided into *functions*, or departments, each of which is responsible for a set of closely related activities. For example, the accounting department sends and receives payments, and the warehouse receives and ships goods and materials. Typical functions or departments found in a modern organization include *purchasing, operations, warehouse (inventory management), sales and marketing, research and development, finance and accounting, human resources*, and *information technology*. Figure 1.4 identifies the key functions, and Table 1-1 describes the basic activities that each function performs.

Go back to the procurement and fulfillment processes that we introduced earlier, and think for a minute about where in the organization the various activities are performed or who in the organization is responsible for performing them. (To keep things simple, we won't deal with production in this chapter.) We'll begin with procurement. In this process, the warehouse determines what it needs, and it creates the purchase requisition. The purchasing department then selects the supplier and creates and sends the purchase order to the supplier. The warehouse receives the goods from the supplier and places them into inventory. Finally, the accounting department receives the invoice from the supplier and makes the payment. For the fulfillment process, the sales department takes the order, the warehouse packs and ships the order, and the accounting department sends the invoice and receives payment.

Figure 1.4 Functional organization

TABLE 1-1 Basic Activities in a Functional Organizational Structure

Functions	Key Activities
Purchasing	Identify vendors Select vendors Create and send purchase orders to vendors Evaluate vendor performance
Warehouse (Inventory Management)	Receive goods from vendors Perform quality inspection of goods received Prepare goods to be returned to vendors Prepare goods for shipment to customers Ship goods to customers Receive goods returned by customers
Operations	Plan capacity Design workflow Schedule production Execute production Perform quality inspection of goods produced
Marketing and Sales	Identify customers Manage relationships with customers Promote products and services Receive customer orders Initiate processing of customer orders Provide after-sales service
Research and Development	Conduct research Develop/refine products Develop/refine processes
Finance and Accounting	Process incoming payments from customers Process outgoing payments to vendors Manage cash flow Manage capital needs Prepare financial statements
Human Resources	Identify workforce needs Recruit employees Hire employees Train employees Evaluate (appraise) employees Manage compensation Manage employee rights and benefits
Information Systems	Help process transactions Capture transaction data Provide information to monitor processes Provide information to detect and define problems with processes Provide information and tools to solve problems

Clearly, then, the procurement and fulfillment processes consist of activities that occur in different, seemingly unrelated functions or departments. In other words, these processes are *cross-functional*; no single group or function is responsible for their execution. For the process to be successfully completed, then, the company must rely on each functional group to execute its individual steps in the process.

If value in organizations is created by processes such as procurement and fulfillment, why, then, are organizations structured according to function? Shouldn't they be structured according to processes? Wouldn't it make sense to group people who deal with all the steps in a process into one unit?

To answer these questions, we need to briefly examine the history of organizations in the United States. Since the beginning of the 20th century, the United States has experienced tremendous growth in organizations. As the organizations grew larger, they also became more complex and difficult to manage. In smaller organizations, managers can typically see what is happening fairly easily—there are few people involved, and they are typically located in one place. One person can manage all the people involved very effectively. If the manager wants to know what is happening in sales, he can talk with one of the few salespeople. If he wants to see how many finished goods are available in inventory, he can examine the warehouse shelves. If he wants to know how production is going, he can walk down and talk to the factory workers.

As companies grow, however, it becomes increasingly difficult to physically monitor all these activities and manage all the people involved because these activities involve a much greater number of employees spread across multiple geographical areas. Eventually, a company can grow to a size at which it becomes impossible to manage processes effectively and to remain competitive without distributing this responsibility to specialized groups.

The need to simplify and better manage activities led organizations to adopt the functional structure. This structure involves the principles of division of labor and specialization. Grouping people who perform similar tasks or functions into one department or unit made it easier to manage the people and the activities they perform. It also allowed groups—or teams—to perform one activity extremely well by isolating each team from the distractions of other groups.

By design, a functional structure is a *bureaucracy* that includes administrative

rules and procedures intended to help manage large organizations. The functional organization persists today; in fact, most large organizations are structured by function. The university or college where you are studying right now very likely mirrors the functional organization found in most companies. Inside the business school, there is an accounting department, finance department, marketing department, operations department, and so on.

1.2.1 The Silo Effect

The functional structure served organizations well for a number of years because it enabled them to cope with the challenges generated by their rapid growth. Over time, however, this system developed a serious drawback. Put simply, people in the different functional areas came to perform their steps in the process in isolation, without fully understanding what steps happen before and what steps happen next. They essentially complete their part of the process, hand it off to the next person, and then proceed to the next task. By focusing so narrowly on their specific tasks, they lose sight of the "big picture" of the larger process, be it procurement, fulfillment, or anything else. This tendency is commonly referred to as the **silo effect**

because workers complete their tasks in their functional "silos" without regard to the consequences for the other components of the process.

A key point here is that the silo nature of the functional organizational structure and the cross-functional nature of processes are at odds with each other. That is, while workers focus on their specific function, each business process involves workers located in multiple functions. A major challenge facing organizations, then, is to effectively coordinate the activities among the different functions or departments. For example, in the procurement process, how does the person in the warehouse who is requisitioning the product inform the purchasing department of the need? How does the receiver in the warehouse know which order just came in? How does the accountant know what the invoice he just received is for and whether it should it be paid? In the fulfillment process, how does the salesperson communicate the customer order to the other employees involved in the process? How does the warehouse know that a customer order has been received and authorized for delivery? When does the accountant send the invoice? Unless the organization carefully coordinates

the activities taking place in different functions, it cannot execute the process.

How does an organization achieve this type of coordination? The key is to exchange information efficiently and effectively. People in each step in a process must be informed when it is time for them to complete their step. This exchange of information takes place in a number of ways. In a manual environment, companies use paper documents to communicate information among different departments. In the case of the fulfillment process, for instance, the salesperson completes a multipart sales order document, keeps one part, and sends the remaining parts of the document to the warehouse. The shipper in the warehouse updates the document to reflect her work, keeps a copy, and sends the remaining parts to the accounting department. This process includes many opportunities for error. For example, what happens if the salesperson forgets to send the paperwork to the warehouse? What if the warehouse ships the goods to the customer but forgets to send the paperwork to the accountant? What if the paperwork gets lost? These examples illustrate the importance of coordination in executing processes. Unfortunately, in many organizations, the coordination of work across the process is not very efficient, is time consuming, and results in numerous problems: delays, excess inventory, and lack of visibility across the process. Let's take a closer look at each of these problems.

1.2.2 Delays in Executing the Process

The first consequence of poor coordination is *delays* caused by the time it takes to communicate information among different parts of the process. When an organization performs this coordination manually—for example, by using the multipart sales order document in our fulfillment process—delays are inevitable. Further, requiring employees to complete, forward, and file paperwork wastes time that they could be devoting to their tasks. Finally, in addition to causing delays, this paperwork constitutes a significant cost incurred by the company. Figure 1.5 illustrates the two sources of delays in the fulfillment process: delays due to the need to maintain paperwork and delays in sending the paperwork to other functions.

Delays occur in the form of increased *lead times* (e.g., how far in advance a company must plan to obtain raw materials from its suppliers) and *cycle times* (i.e., the amount of time needed to produce a product or process a customer order). Increased lead times can cause a company to have an insufficient inventory of material when it is needed. Increased cycle times can prevent the company from producing goods and filling customer orders in a timely manner. Both of these

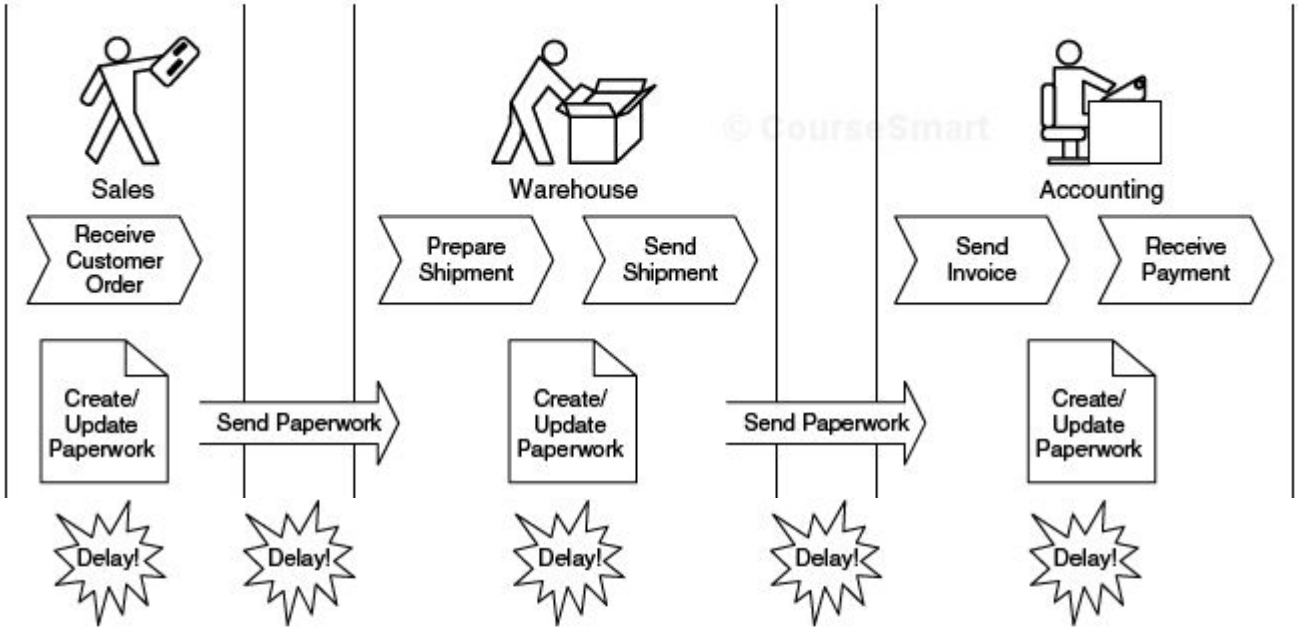

Figure 1.5 A paper-based process

problems can lead to lost sales, as the case of Nintendo Wii illustrates (see Business Processes in Practice 1-2).

1.2.3 Excess Inventory

The second consequence of poor coordination among functions is *excess inventory*. Companies that are plagued by delays and poor communication frequently tend to "cover themselves" by creating a buffer of inventory. Thus, the factory manager will keep a little extra raw material on hand, just in case the purchasing

► *BUSINESS PROCESSES IN PRACTICE 1-2*

NINTENDO WII

When Nintendo introduced the Wii gaming console in 2007, it was an immediate hit with consumers. In fact, it became so popular so quickly that Nintendo was unable to build enough units to keep up with the demand. The company had sufficient production capacity, but their factories weren't building enough units because they couldn't get the necessary amounts of raw materials from their suppliers as quickly as they needed them. Nintendo had planned for the manufacturing capacity to meet demand, but it had failed to communicate the increased requirements to both their purchasing department and their raw material suppliers.

The increased lead times for raw materials in turn led to a severe increase in the cycle times for production and delivery of finished goods to stores. That is, it took Nintendo much longer to produce the Wii because the factories had to wait for suppliers to provide them with the necessary materials. As a result, Nintendo missed an opportunity to sell more products and meet the consumer demand. These delays not only cost Nintendo a great deal of revenue, but they also enabled Nintendo's competitors to sell their products to consumers who otherwise would have purchased the Wii. One analyst estimated that the Wii shortage cost Nintendo close to US$1.3 billion.

Source: Compiled from Nintendo company reports; and "A Year Later, the Same Scene: Long Lines for the Elusive Wii," *New York Times*, December 14, 2007.

▶ *BUSINESS PROCESSES IN PRACTICE 1-3*

CISCO SYSTEMS

In 2001, Cisco Systems was selling huge amounts of their key networking products, driven largely by the dot-com boom. Cisco was having a difficult time keeping up with the demand for their products due to severe shortages of raw materials, so they had placed double and triple orders for some parts with their suppliers to "lock up" the parts. In addition, they had accumulated a "safety stock" of finished goods based on optimistic sales forecasts. When the Internet boom started to crash, however, orders began to taper off quickly. Even more damaging for Cisco, the company was unable to communicate the drop in demand through their organization so that they could reduce their production capacity to sell off their "safety stock" of finished goods and also reduce the amount of raw materials they were purchasing to reduce their supply buffer.

This mismatch between lower demand, substantial inventories of raw materials, and excessive production capacity ultimately forced Cisco to write off more than $2.5 billion of excess inventory from their books in 2001—the largest inventory write-off in history.

Source: Compiled from: Cisco company reports; and "Cisco 'Fesses Up to Bad News," *Infoworld*. April 16, 2001.

process is delayed (which history has shown is often the case), the warehouse manager will stockpile a little extra inventory of raw material and finished goods, just in case the purchasing process and the production process are delayed, and so on. If all the groups involved in the process pile up extra inventory, the result will be an excessive—and costly—amount of extra "just in case" inventory for the organization. The case of Cisco Systems illustrates this process (see Business Processes in Practice 1-3).

1.2.4 Lack of Visibility across Processes

A third consequence of poor coordination is a lack of *visibility across the process*. That is, the people involved in the process do not have information about (1) the status of the process in other parts of the organization and/or (2) how well the process is performing over time. Typically, the paperwork and information about process steps are not readily available to people in other departments. Referring back to Figure 1.5, for instance, in the fulfillment process, once the salesperson sends the customer order to the warehouse, the salesperson receives no follow-up information regarding the subsequent steps in the process. As a result, if the customer calls to inquire about the status of the order, the salesperson has to call the warehouse or the accounting department to track down this information. A costly consequence of not having good visibility across the organization is illustrated in the case of Nike (see Business Processes in Practice 1-4). In this case, the problems were caused by a lack of visibility across multiple processes, not just across one process.

The root cause of these three problems is the tendency to view work in terms of functional silos rather than in terms of cross-functional processes. Because the people in each functional area are focused on their own world, they do not easily see how significant the negative consequences of the little delays, small mistakes, and excess inventory can be to the process or to the organization as a whole. At the process level, small delays can accumulate to significantly extend the time required to fill a customer order or acquire raw materials. Similarly, at the organizational level, small quantities of extra inventory can add up to cost the organization significant amounts of money in terms of storage and opportunity costs.

► BUSINESS PROCESSES IN PRACTICE 1-4

NIKE

In 2000, Nike produced too many of the wrong shoes and not enough of the right shoes due to a mismatch between what their demand planning process was telling them to produce and what their customers were telling them they wanted. The production planning department generated an incorrect demand forecast within their departmental information system for the shoe group. Compounding this error, the manufacturing, procurement and sales departments never checked to see if the forecast matched what their customers were requesting in the sales department. Instead, these departments simply took the demand forecast generated by the planning system and typed it into the manufacturing system, thereby generating the procurement requirements. The information system in the sales department was never double-checked to determine what the actual customer order levels were.

Even though Nike had highly advanced information systems in its forecasting, manufacturing, sales, and procurement departments, the lack of visibility across the entire process, coupled with manual integration across the departmental systems, cost Nike more than $100 million that quarter. In addition, their share price went down 20% the day after they publicly announced the mistake.

Source: Compiled from: Nike company reports; "Supply Chain Debacle," *Internet Week*, March 5, 2001; and "Nike Rebounds: How (and Why) Nike Recovered from Its Supply Chain Disaster," *CIO Magazine*, June 15, 2004.

Organizations have historically accepted these negative consequences of the functional structure. The early benefits of the functional structure—namely, the ability to better manage rapidly growing organizations—outweighed these consequences. Thus, the functional structure remains a common form of organizing. Today, however, global competition is forcing organizations to become more efficient and effective. As a result, organizations are actively seeking to eliminate or reduce the problems of delays, excess inventories, and lack of visibility. To accomplish these goals, organizations must break out of silos and focus on processes. In other words, they need to substitute a *process view* for the traditional functional view. Dell Corporation is a great example of an organization that is designed around a process rather than functional silos (see Business Processes in Practice 1-5).

► BUSINESS PROCESSES IN PRACTICE 1-5

DELL

Unlike Nike, which implemented a functional system, Dell is organized around a process view of computer sales and manufacturing. Dell largely operates on a business model that builds computers after the company receives an order from a customer, an approach known as make-to-order. The process of building the computer begins as soon as Dell receives the customer order (and usually the payment). This order triggers different steps, including procuring the components, building the computer to exact specifications, shipping the computer, and so on. In contrast, most other computer manufacturers try to forecast what customers will want and then procure the components needed to produce them. They then build the computers in advance and sell from their stock of finished goods.

Because Dell was a new company and did not have a historical functional organization to deal with, they could radically rethink their process for building and selling computers and then build their company around the new process. This process-based production model enabled Dell to become the leader in the personal computer industry and remain much more profitable than their competitors.

Source: Compiled from: Dell company reports; and "Supply Meets Demand at Dell Inc.," *Accenture*, accessed July 22, 2008, http://www.accenture.com/Global/Services/By_Industry/Communications/Access_Newsletter/Article_Index/SupplyComputer.htm.

A process view is a philosophy that emerged in the early 1990s as a result of the increasing complexity and distributed operations that globalization created. So many companies were acquiring companies in other countries and expanding operations globally that they were running into massive inefficiencies and operational issues. The process view of the enterprise gave companies a powerful way to standardize the way they did their work across many countries and gain significant cost savings as a result.

Because processes span multiple departments across companies—and in many cases across multiple countries—it is not possible to manage these processes manually; that is, using paperwork. For this reason, ICT is an essential part of the process view of organizations. In particular, a class of ICT, known as enterprise systems (ES) or enterprise resource planning (ERP) systems, is essential to managing business processes. At the same time as the process view came into popularity, software companies such as SAP introduced the first integrated enterprise systems. It was the combination of a process view of the company and the capabilities of enterprise systems to manage global processes that brought about a huge shift in the productivity and profitability of many global companies. In today's business reality, the process view and ICT cannot be separated. In the next section, we will discuss the role of information and information systems in supporting business processes.

▶ 1.3 THE IMPORTANCE OF INFORMATION SYSTEMS

Information systems are computer-based systems that capture, store, and retrieve data associated with process activities. In addition, they organize these data into meaningful information that organizations use to support and assess these activities.

1.3.1 Data and Information

Every activity in an organization generates **data**, which are raw facts that, by themselves, have limited value or meaning. Examples of data are customer names, product numbers, and quantities of products sold. By themselves, these facts might not have much value. However, a report that uses these data to summarize product sales over time has tremendous value. Data that are organized in a way that is useful to an organization are referred to as **information**. In this case, the organization can utilize this sales information to determine which products are doing well and which are not.

1.3.2 Functional Information Systems

Although organizations utilize a variety of information systems, most systems—like most organizations—tend to focus on functions rather than processes and are not well integrated. That is, they do not easily share data and information with one another. Once again, this lack of integration arose from historical situations. Systems in organizations have evolved over the years in isolation. That is, each functional area or department developed a system that suited its purposes well. Thus, sales developed order management systems, warehouses developed systems to track inventory of materials, accounting developed systems to track invoices and payments, and so on. These **functional information systems** evolved independently of one another. Because the work was performed in functional silos, organizations gave little thought to sharing the data among functions or departments. As a

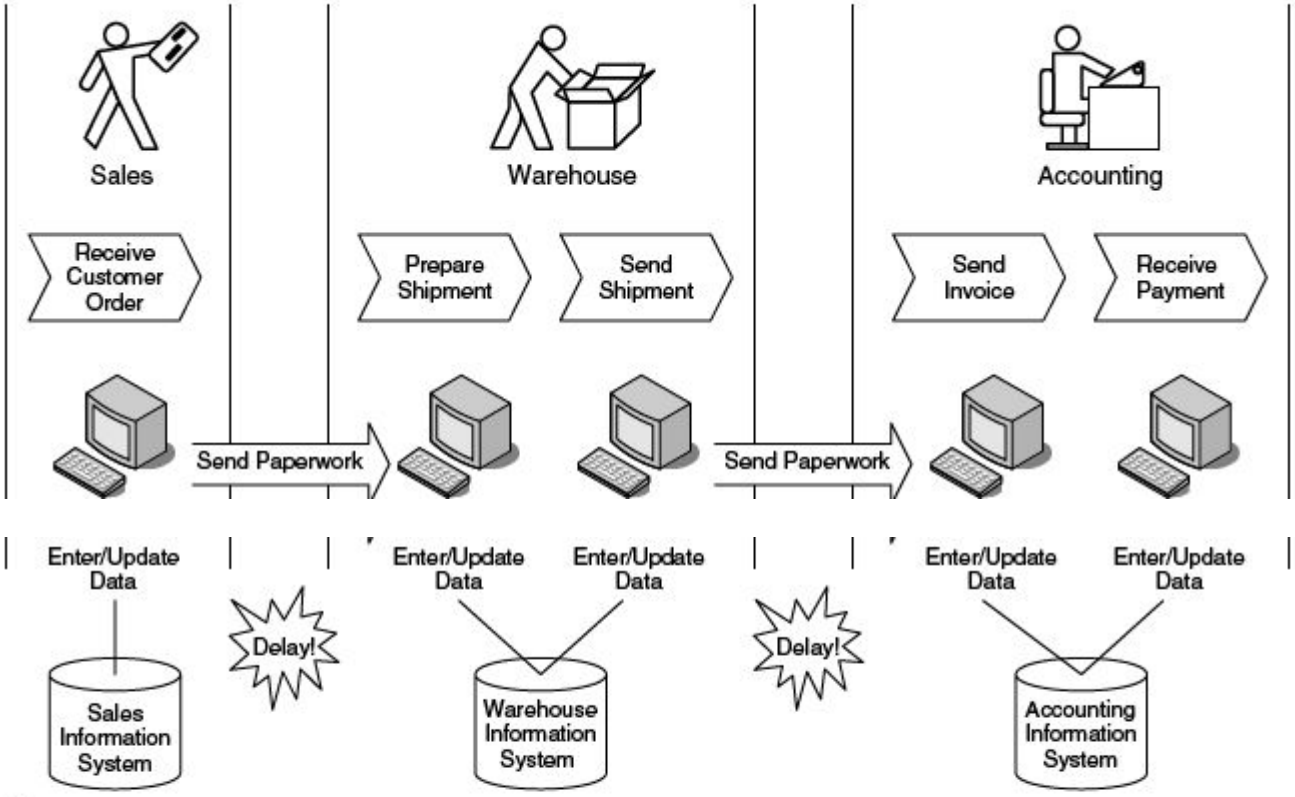

Figure 1.6 A process supported by functional information systems

result, although organizations have implemented systems to support the work of individual functional areas, exchanging information among them is often difficult. To make matters worse, information is often exchanged manually, as Figure 1.6 illustrates. The use of functional information systems has reduced delays associated with maintaining data within the functions. However, the delays associated with communicating with other departments persist because much of this communication still involves paper documents.

1.3.3 Enterprise Systems

Given the complexity of managing the data across entire processes, it is not feasible to rely on manually connecting functional information systems by printing information from one system and rekeying it into the next system. Therefore, in addition to moving from silos to processes, organizations must also move from functionally focused information systems to integrated **enterprise systems** (ES). Enterprise systems support the entire process rather than parts of the process. Put differently, enterprise systems not only support the execution of individual activities in a process, they also help the organization coordinate work across functions. This coordination further reduces delays, avoids excess inventory, and increases visibility. Figure 1.7 illustrates the role of an ES within an organization.

Consider the fulfillment process. When the sales department receives a customer order, it enters the order into the ES and authorizes delivery. People in the warehouse are automatically notified and have access to the information necessary to prepare and ship the order. (Recall that in a manual system, they would have to wait for

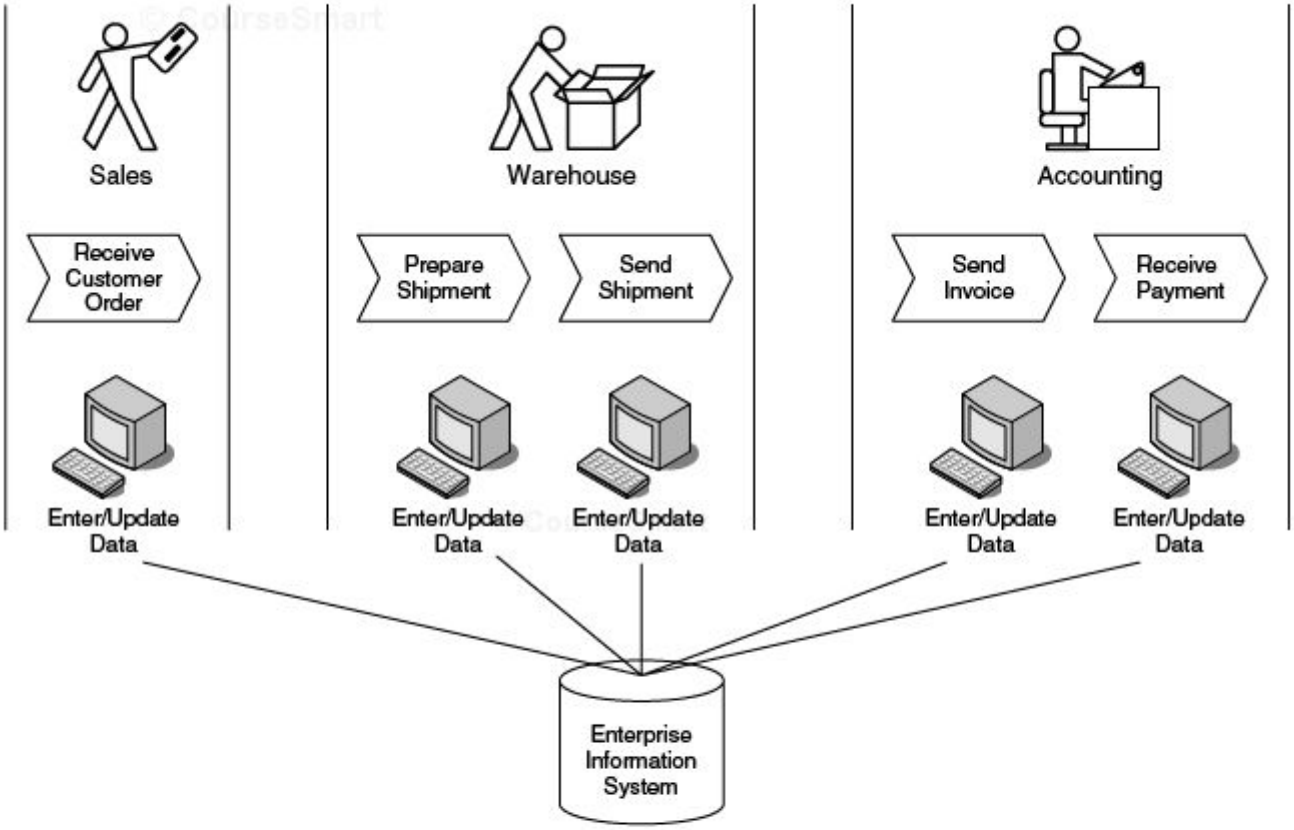

Figure 1.7 A process supported by an enterprise system

the paperwork from sales.) As soon as the order is shipped, accounting receives the information necessary to send the invoice.

An ES can similarly streamline the procurement process. The purchase requisition created in the warehouse is immediately available to the purchasing department, which creates a purchase order and forwards it electronically to a suitable supplier. When the shipment from the supplier is received and the receipt is entered into the system, accounting has immediate access to the information needed to process the invoice when it arrives from the supplier. Thus, there is no need to explicitly communicate this information among functions.

In addition to eliminating the need to communicate explicitly among departments, enterprise systems make processes more efficient by automating some of the routine steps in the process. In the procurement process, for example, when a purchase requisition is created, the ES automatically selects a suitable supplier, creates a purchase order, and sends it to the supplier, based on previously established rules. In the fulfillment process, the ES automatically generates an invoice as soon as a shipment is sent to the customer and electronically send it to the customer.

A final benefit of enterprise systems is that they provide greater visibility across the process. Each person involved in the process has almost instant access to the information about the process. At any time, the system can be queried about the current state of the customer order or purchase requisition, for example, which part of the order fulfillment process is currently being executed, or when the purchase order was sent to the supplier. This increased visibility reduces uncertainty for all

concerned parties. For instance, the anxious customer can be assured that the order was shipped this morning, and the anxious warehouse manager can rest easy with the knowledge that the shipment from the supplier will be arriving on time. The reduced delays and increased visibility have a positive impact on lead times, cycle times, inventory, lost sales, and customer service.

1.3.4 Why Is This Information Important to You?

Now that we've discussed processes and enterprise systems, you might be wondering: What does this information have to do with me? Very often students believe that this material is important only to IT majors. This belief is incorrect. Recall our discussion at the beginning of the chapter of the skills possessed by knowledge workers. One of these skills is the ability to think strategically and understand the big picture. At a very fundamental level, this skill requires you to understand the following aspects of an organization:

- How processes are executed within the organization
- How your work supports the execution of the process
- How your failure to perform your work successfully will cause the process to fail
- What you must do well to ensure the process succeeds

Another skill is communication and collaboration, which enables you to work well in project teams. How will you be effective in a cross-functional project team if you do not understand the role others play in the process and how what you do affects them? A final skill is information literacy and the ability to utilize an information system to identify, obtain, and use the necessary information to do your job well. Do you still doubt that information systems are for everyone in the organization and not just the "techies"?

In the next three sections, we will develop a framework to understand processes, the role of enterprise systems, and the financial impact of processes. We will then incorporate this framework throughout the book as we discuss specific processes in greater detail.

► 1.4 FLOWS IN BUSINESS PROCESSES

A process "flows" through different functions in an organization as the various steps needed to complete the process are executed. This flow, which was represented in Figure 1.1, represents the **physical flow** of a process, that is, the physical activities associated with the process. There are additional "flows" associated with a process, which we depict in Figure 1.8. We previously explained that there are data associated with each step of the process, such as dates, quantities, locations, and amounts. These data accompany, or "flow," through the physical steps in a process, and along the way, they are often modified and updated. For example, when a shipment is made against a customer order, the quantity shipped is now associated with the process. Thus, a **data flow** is associated with a process. Going further, the data are often found in documents such as purchase orders and invoices that are created or modified in different steps of a process. These documents can be either physical or electronic. Like data, these documents "flow" along with the process steps. For instance, a customer order accompanies the process steps, and as various steps are completed,

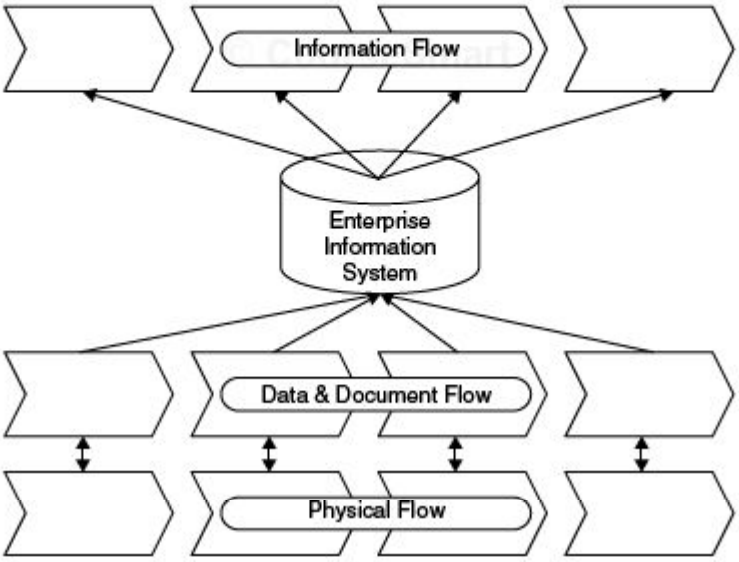

Figure 1.8 Process flows

the order is updated to reflect the completion of steps. This is the **document flow** associated with a process.

Processes are executed multiple times. For example, a company will process numerous customer orders in a day. Each execution of the process is an instance or occurrence of the process. The three flows discussed above are associated with each instance of a process. That is, each time the physical steps in a process are executed, data and documents are created or modified.

One additional flow, **information flow**, is associated with each instance of the process as well as at an aggregate level, that is, across multiple instances or executions of a process. Data generated in each step and across an entire process are accumulated over time. For example, data about numerous customer orders are collected and stored in the ES. These data are then organized in a manner that is meaningful and useful for some purpose, such as creating a report summarizing sales for the previous month. Once the data have been organized into a sales report, managers and employees can analyze problem areas and work together to improve them.

► 1.5 THE ROLES OF ENTERPRISE SYSTEMS IN ORGANIZATIONS

As we have seen, enterprise systems are a critical component of the process view of organizations. They facilitate communication and coordination among different functions, and they allow easy exchange of, and access to, data across the process. More specifically, ES play a vital role in the following three areas:

1. Execute the process
2. Capture and store process data
3. Monitor process performance

In this section we discuss each of these roles. In some cases the role is fully automated; that is, it is performed entirely by the system. In other cases the system must rely on the managers' judgment, expertise, and intuition.

1.5.1 Execute the Process

Enterprise systems help organizations execute processes efficiently and effectively. ES are embedded into the processes, and they play a critical role in executing the processes. In other words, the system and the process are intertwined. If the system stops working, the process cannot be executed.

Enterprise systems help execute processes by informing people when it is time to complete a task, by providing the data necessary to complete the task, and in some cases by providing the means to complete the task. In the fulfillment process, for example, the system will inform people in the warehouse that orders are ready for shipment and provide them with a listing of what materials must be included in the order and where to find the materials in the warehouse. In the procurement process, the system generates the purchase requisitions and then informs the purchasing department that they need to act on these requisitions. The accountant will be able to view all shipments received to match an invoice that has been received from a supplier and verify that the invoice is accurate. Without the system, these steps, and therefore the process, cannot be completed. For example, if the system is not available, how will the warehouse know which orders are ready to pack and ship? As you might have concluded by now, because organizations rely so heavily on ES, they must make certain that these systems are functioning all the time so that the work is not interrupted. They also should have extremely good backup systems in case of failure. Business Processes in Practice 1-6 illustrates the dependence of processes on systems in the case of Amazon.com.

1.5.2 Capture and Store Process Data

As we previously discussed, processes create data such as dates, times, product numbers, quantities, prices, and addresses, as well as who did what, when, and where. Enterprise systems capture and store these data, commonly referred to as *process data* or *transaction data*. Some of these data are generated and automatically captured by the system. These are data related to who, when, and where an activity is completed. Other data are generated outside the system and must be entered into

► *BUSINESS PROCESSES IN PRACTICE 1-6*

AMAZON.COM

Earlier in the chapter we explained that, rather than manufacture its own products, Amazon.com purchases and stores finished goods and then resells them to its customers. Significantly, the company receives most of their orders via their Web site, their online storefront. This Web site is connected to an enterprise system that supports the fulfillment process. When an order is received, the system communicates this information to the warehouse, where the order is packed and shipped. If the online store stops working, then Amazon.com can't take any orders, and their entire warehouse will come to a stop.

Source: Compiled from: Amazon company reports; "Amazon.com: Evolution of the e-Tailer," March 30, 2001, *Harvard Business School* Case #SM83; and "Amazon.com: The Wild World of e-Commerce," *Business Week*, December 14, 1998.

it. This data entry can occur in various ways, ranging from manual data entry to automated methods involving data in forms such as bar codes that can be read by machines. In the fulfillment process, for example, when a customer order is received (by mail or over the phone), the person taking the order must enter data such as the name of the customer, what they ordered, and how much they ordered. Data such as the name of the person entering the data (who), at which location they are completing this task (where), and the date and time (when) are automatically included by the system when it creates the order in the system. The data are updated as the process steps are executed. When the order is shipped, the warehouse will provide data about what products were shipped and how many, whereas the system will automatically include data related to who, when, and where.

An important advantage of using an ES compared to a manual system or multiple functional systems is that the data need to be entered into the system only once. Moreover, once they are entered, they are easily accessible to other people in the process, and there is no need to reenter them in subsequent steps. The data captured by an ES, along with data already in the system, provide immediate feedback. For example, they can be used to create a receipt or to make recommendations for additional or alternate products. The data are also stored for later use and analysis. Business Processes in Practice 1-7 illustrates the immediate feedback capabilities of an ES.

1.5.3 Monitor Process Performance

A final contribution of enterprise systems is to help to monitor the state of the processes, that is, to indicate how well the process is executing. An ES performs this role by evaluating information about the process. This information can be created either at the *instance level* (i.e., a specific task or activity) or the *process* or *aggregate level* (i.e., the process as a whole). At the instance level, for example, a company might be interested in the state of a particular customer order. Where is the order within the fulfillment process? When was it shipped? Was the complete order shipped? If it has not been shipped, then when can we expect it to be shipped? Or, for the procurement process, when was the purchase order sent to the supplier? What will be the cost of acquiring the material?

At the aggregate level, the ES can evaluate how well the procurement process is being executed by calculating the lead time, or the time between sending the purchase order to a vendor and receiving the goods, for each order and each vendor over time. Figure 1.9 is an example of aggregate-level information regarding the fulfillment process. This figure provides a summary of customer orders for the

► BUSINESS PROCESSES IN PRACTICE 1-7

AMAZON.COM

When a customer purchases something on Amazon.com, the system provides a confirmation number that can be used to track the progress of the order. In addition, the data in the current order are combined with historical sales data to recommend additional products that may be of interest to the customer—resulting in higher sales.

Source: Compiled from: Amazon company reports; "Amazon.com: Evolution of the e-Tailer," March 30, 2001, *Harvard Business School* Case #SM83; and "Amazon.com: The Wild World of e-Commerce," *Business Week*, December 14, 1998.

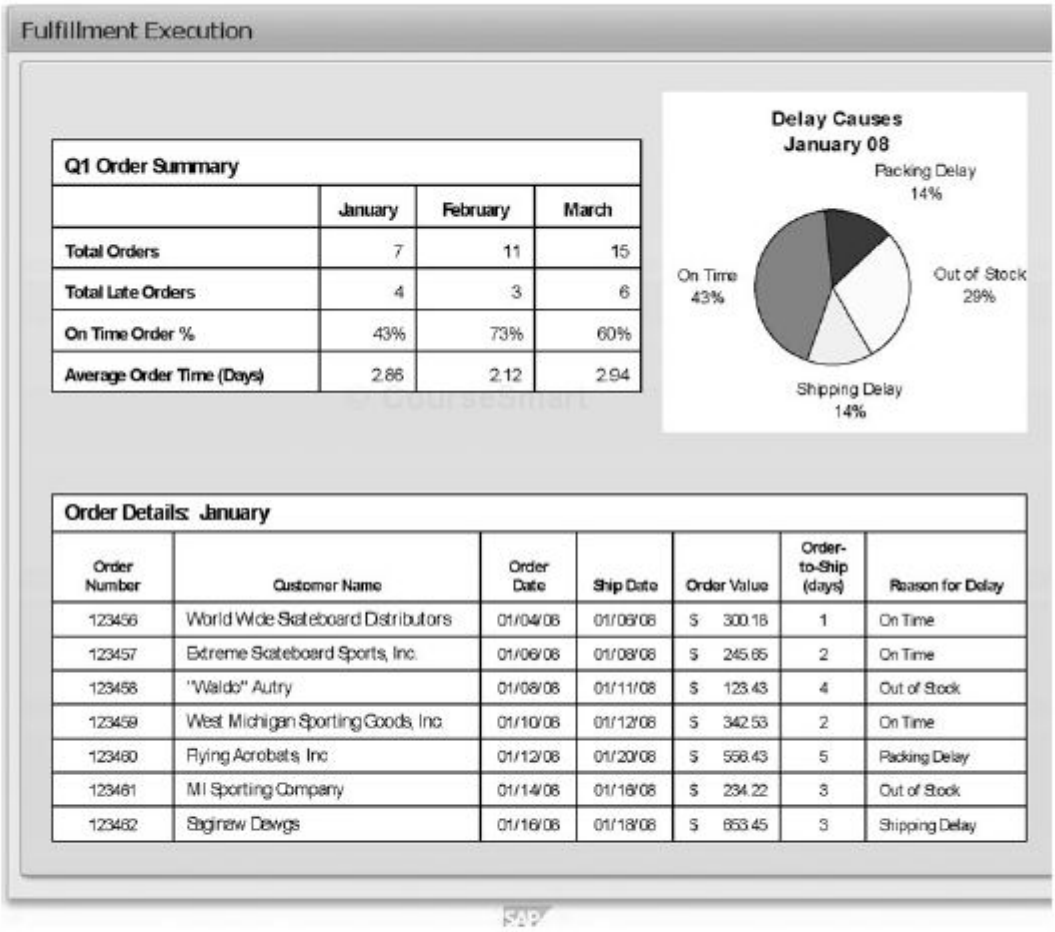

Figure 1.9 Example of process-level information
Source: Copyright SAP AG 2008

months of January, February, and March (top left) as well as detailed information about specific orders (bottom). It also graphically depicts reasons for delays in processing the orders.

Not only can the ES help monitor a process, it can also detect problems with the process. It performs this role by comparing the information with a *standard*—that is, what the company expects or desires—to determine if the process is performing within expectations. Management establishes standards based on organizational goals. If the information provided by the ES indicates that the process is falling short of the standards, then the company assumes that some type of problem exists. Some problems can be routinely and automatically detected by the system, whereas others require a person to review the information and make judgments. For example, the system can calculate the expected date that a specific order will be shipped and determine whether this date will meet the established standard. Or, it can calculate the average time taken to fill all orders over the last month and compare this information to the standard to determine if the process is working as expected.

Monitoring the process, then, helps detect problems with the process. Very often these "problems" are really symptoms of a more fundamental problem. In such cases the ES can help diagnose the cause of the symptoms by providing

► *BUSINESS PROCESSES IN PRACTICE 1-8*

AMAZON.COM

By capturing detailed data on each activity in their organization, Amazon can assess multiple factors that cause problems or reduce performance. In many cases the company must look at a problem from many angles to determine how to address it. By comparing similar processes across multiple locations, managers can identify higher-performing teams to determine the key factors for their success. They can also identify lower-performing teams to find areas for improvement.

Source: Compiled from: Amazon company reports; "Amazon.com: Evolution of the e-Tailer," March 30, 2001, *Harvard Business School* Case #SM83; and "Amazon.com: The Wild World of e-Commerce," *Business Week*, December 14, 1998.

managers with additional, detailed information. For example, if the average time to process a customer order appears to be increasing over the last month, this problem could actually be a symptom of a more basic problem. A manager can then dig deeper, or drill down, into the information to diagnose the underlying problem. To accomplish this, the manager can request a breakdown of the information by type of product, customer, location, employees, day of the week, time of day, and so on. After reviewing this detailed information, the manager might determine that there has been a high employee turnover in the warehouse over the last month and that the delays are occurring because new employees are not sufficiently familiar with the process. The manager might conclude that this problem will work itself out in time, in which case there is nothing more to be done. Alternatively, the manager could conclude that the new employees are not being adequately trained and supervised. In this case, the company must take some actions to correct the problem. Business Processes in Practice 1-8 illustrates the performance monitoring capabilities of an ES.

► 1.6 FINANCIAL IMPACT OF PROCESS STEPS

A final component of the framework is used to understand the financial impact the different steps in a process have on the organizations. For example, when a company receives a shipment of material from a vendor, it assumes an obligation to pay the vendor. At the same time, the value of the material (inventory) in the warehouse increases. When the company pays the vendor, the obligation to pay no longer exists. At the same time, the amount of money the company has in the bank is reduced.

Significantly, not all activities have a financial impact. For example, when a customer's order is recorded in the system, there is no immediate financial impact. Nevertheless, to develop a complete understanding of processes—the first step in developing strategic thinking skills—it is necessary to understand their financial impact.

Financial impact is typically viewed through changes in an organization's income statement and balance sheet.[1] An **income statement**, also known as a *profit and loss (P&L) statement*, is a record of revenue and expenses for a specific period of time. An income statement shows how much money the company made (revenue), how much money the company had to spend to produce and sell its goods (expenses), and

[1]An in-depth discussion of financial statements is beyond the scope of this book. We provide very simple definitions and explanations necessary to understand the financial impact of processes.

Revenues **Revenues from Sales** Other Revenues ---------- Total Revenues
Expenses **Cost of Goods Sold** Selling Expenses Advertising Commission Shipping Salaries Etc. General and Administrative Expenses Salaries Legal and Professional Utilities Insurance Supplies Etc. ---------- Total Expenses
Net Income = Revenue – Expenses

Figure 1.10 Simple income statement

how much profit the company earned (net income). Typical expenses include the cost of goods sold (what the products that were sold cost the company), advertising, wages, insurance, and utilities. Net income is the difference between revenue and expenses. Figure 1.10 shows a simple income statement. In this book we will concern ourselves only with the highlighted elements of the income statement—revenue from sales and cost of goods sold.

Whereas an income statement provides a picture of a company's financial condition over a period of time, a **balance sheet** indicates the financial condition of a company at a specific point in time. It shows what the company owns (assets), what it owes to others (liabilities), and how much money shareholders have invested in the company (equity). Figure 1.11 shows a simple balance sheet. Assets include cash, accounts receivable or money owed to the company by customers, value of the inventory of finished goods and raw material, fixed assets such as buildings and machinery, and so on. Liabilities include any monies that the company owes to vendors as well as any loans the company must repay. Retained earnings are that part of the company's income that it has not reinvested or distributed to shareholders. They are also liabilities in the sense that they are owed to shareholders. In this book we will concern ourselves only with the highlighted elements of the balance sheet—cash, accounts receivables, the various inventory accounts, accounts payable, and retained earnings.

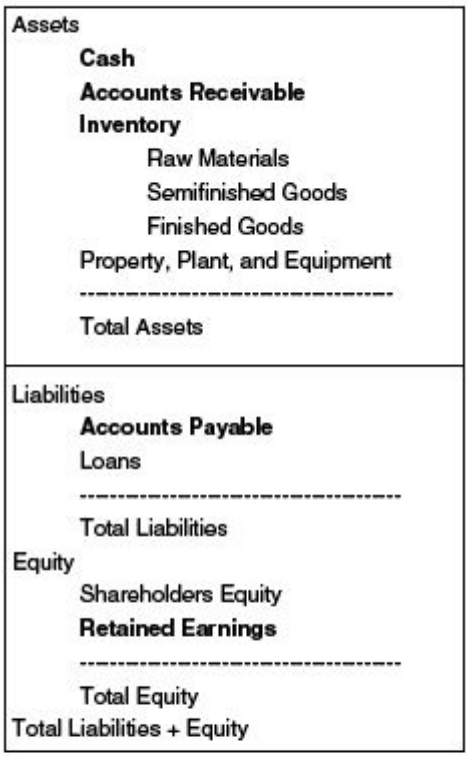

Figure 1.11 Simple balance sheet

Assets, liabilities, revenues, and expenses are tracked through specific accounts. The collection of these accounts is called a *chart of accounts*. Key accounts relevant to the processes discussed in this book are highlighted in Figure 1.10 and Figure 1.11 and are listed in Figure 1.12. Processes affect the financial position of an organization by offsetting an increase or decrease in one account with a corresponding increase or decrease in a different account (or accounts). These could be two accounts in the balance sheet or one each in the income statement and the balance sheet. For example, when the organization receives payment from a customer, accounts receivable is reduced by the amount of the payment, and cash assets (or money in the bank) are increased by that same amount. When there is a sale to a customer on credit, the accounts receivable account is increased, and the sales revenue account is also increased. Thus, there is not always an increase in one account and a decrease in another.

Figure 1.12 Simple chart of accounts

For a process to have a financial impact, it must involve two basic elements: an external entity[2] (a customer or a vendor) and an exchange of value (buy, sell, pay, or get paid). You will learn a great deal more about the financial impact of processes in your accounting courses. For now, we will keep things very simple so that you can focus on the impact of the process rather than the accounting rules for revenues, expenses, and income.

► CHAPTER SUMMARY

In this chapter we have introduced a number of concepts, terms, and ideas that will be helpful as we discuss processes in greater detail in later chapters. The key ideas in this chapter are

1. Work in organizations is completed by business processes that consist of various steps that are executed in different parts of the organization. Key processes in an organization are procurement, fulfillment, and production.
2. Working within functions has severe limitations and negative consequences that cannot be tolerated in the current global competitive climate. These problems are caused by the "silo effect" and poor coordination of activities across processes. Common problems are delays, excess inventory, and a lack of visibility across processes.
3. Several "flows" are associated with a process. Physical, data, and document flows are associated with instances or occurrences of processes. Information flow is associated with both the instances of processes and the aggregate process level.
4. Enterprise systems are essential in viewing organizations from a process perspective. Enterprise systems connect the work that is done across the organization and provide coordination, data access, and visibility across the process. They capture process data and help monitor the performance of processes, which can help the organization detect and diagnose problems.
5. Processes have a financial impact on the organization. Financial impact is measured by the impact on financial statements such as the income statement and balance sheet.

► LAYOUT OF THE BOOK

To reinforce the concepts presented in this book, we will use the case of a hypothetical manufacturing company, *Super Skateboard Builders (SSB), Inc.*, throughout this book. In addition, we will use *SAP* software, the world's leading provider of enterprise systems, as an example of how ICT support the various business processes. We will explain the nature of SSB and the SAP environment used in this book in Chapter 2. The next three chapters will discuss the three key processes: procurement, fulfillment, and production; these are the typical core processes in most organizations. The final chapter will provide an integrated view of the end-to-end business processes in action.

► KEY TERMS

balance sheet
business process
data
data flow
document flow
enterprise systems
fulfillment process
functional information systems
functional structure
global competitive environment
income statement
information
information flow
information revolution
information systems
knowledge worker
physical flow
procurement process
production process
silo effect

[2]Strictly speaking, this is not correct. There can be an exchange of value internally. For example, paying employee salaries and wages (a human resources process) has an impact on the financial position of the firm. In this book we will only discuss the financial impact due to an exchange in value with an external entity.