2

Global E-business and Collaboration

LEARNING OBJECTIVES

After reading this chapter, you will be able to answer the following questions:

2-1 What are business processes? How are they related to information systems?

2-2 How do systems serve the different management groups in a business, and how do systems that link the enterprise improve organizational performance?

2-3 Why are systems for collaboration and social business so important, and what technologies do they use?

2-4 What is the role of the information systems function in a business?

2-5 How will MIS help my career?

CHAPTER CASES

Enterprise Social Networking Helps Sanofi Pasteur Innovate and Improve Quality

Data Changes How NFL Teams Play the Game and How Fans See It

Videoconferencing: Something for Everyone

Should Companies Embrace Social Business?

VIDEO CASES

Walmart's Retail Link Supply Chain

CEMEX: Becoming a Social Business

Instructional Video:

U.S. Foodservice Grows Market with Oracle CRM on Demand

MyLab MIS

Discussion Questions: 2-5, 2-6, 2-7; **Hands-on MIS Projects:** 2-8, 2-9, 2-10, 2-11; **Writing Assignments:** 2-16, 2-17; **eText with Conceptual Animations**

Enterprise Social Networking Helps Sanofi Pasteur Innovate and Improve Quality

Sanofi Pasteur is the vaccines division of the multinational pharmaceutical company Sanofi and the largest company in the world devoted entirely to vaccines. It is headquartered in Lyon, France, has nearly 15,000 employees worldwide, and produces more than 1 billion doses of vaccine per year to inoculate more than 500 million people around the globe. Sanofi Pasteur's corporate vision is to work toward a world where no one suffers or dies from a vaccine-preventable disease. Every day the company invests more than € 1 million in research and development. Collaboration, sharing information, ongoing innovation, and rigorous pursuit of quality are essential for Sanofi Pasteur's business success and commitment to improving the health of the world's population.

Until recently, the company lacked appropriate tools to encourage staff to have dialogues, share ideas, and work with other members of the company, including people that they might not know. As a large, centralized firm with a traditional hierarchical culture, initiatives were primarily driven from the top down. The company wanted to give employees more opportunities to experiment and innovate on their own, and adopted Microsoft Yammer as the platform for this change. Ideas for improvement can come from anywhere in the organization and through Yammer can be shared everywhere.

Microsoft Yammer is an enterprise social networking platform for internal business uses, although it can also create external networks

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linking to suppliers, customers, and others outside the organization. Yammer enables employees to create groups to collaborate on projects and share and edit documents, and includes a news feed to find out what's happening within the company. A People Directory provides a searchable database of contact information, skills, and expertise. Yammer can be accessed through the web using desktop and mobile devices, and can be integrated with other Microsoft tools such as SharePoint and Office 365, to make other applications more "social." (SharePoint is Microsoft's platform for collaboration, document sharing, and document management. Office 365 is Microsoft's online service for its desktop productivity applications such as word processing, spreadsheet, electronic presentations, and data management.)

How has Sanofi Pasteur benefited from becoming more "social"? Employees are using Yammer to share updates, ask for feedback, and connect volunteers to improvement initiatives. A recent project involving Yammer resulted in

a 60 percent simplification of a key quality process at one manufacturing site, saving the company thousands of Euros, and reducing overall end-to-end process time. Through Yammer, employees spread the word about this improvement to other locations around the globe.

Using Yammer, Sanofi employees set up activist networks for change in large manufacturing sites. Each group has attracted more than 1,000 people. These networks help create a more collegial, personal culture that helps people feel comfortable about making suggestions for improvements and working with other groups across the globe. They also provide management with observations about policies and procedures across departments and hierarchies that can be used to redesign the firm's manufacturing and business processes to increase quality and cost-effectiveness. For example, a building operator shared his ideas about how to reduce waste when managing a specific material in his production facility. The new procedure for handling the material saved his facility more than 100,000 Euros per year and became a global best practice at all Sanofi Pasteur production sites. Yammer-powered communities raised awareness of health, safety, and attention to detail, and more attention to these issues helped reduce human errors by 91 percent.
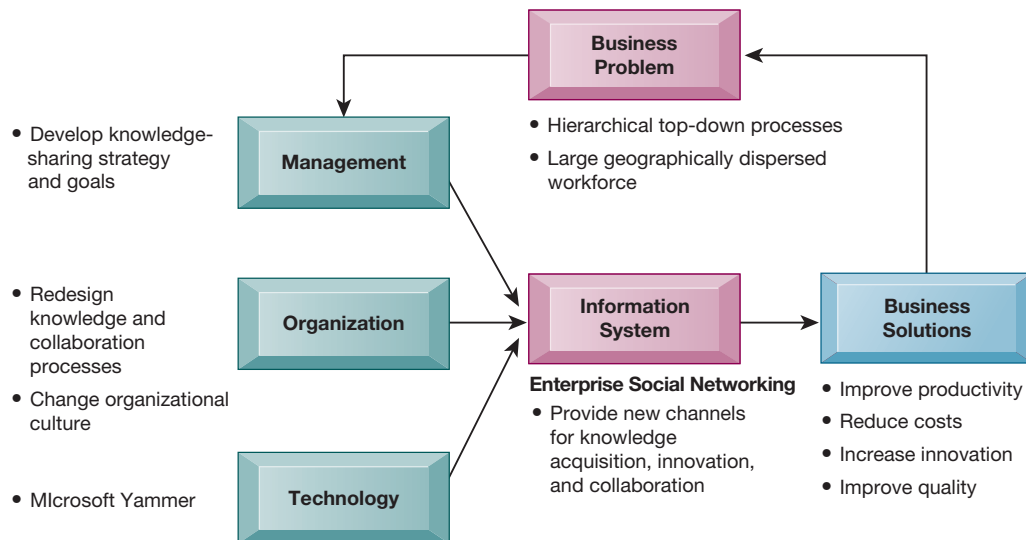
Sources: "Yammer Collaboration Helps Sanofi Pasteur Improve Quality, Make More Life-Saving Vaccines," www.microsoft.com, January 24, 2017; www.sanofipasteur.us, accessed February 4, 2018; and Jacob Morgan, "Three Ways Sanofi Pasteur Encourages Collaboration," *Forbes,* October 20, 2015.

Sanofi Pasteur's experience illustrates how much organizations today rely on information systems to improve their performance and remain competitive. It also shows how much systems supporting collaboration and teamwork make a difference in an organization's ability to innovate, execute, grow profits, and, in this case, provide important social benefits.

The chapter-opening diagram calls attention to important points raised by this case and this chapter. Sanofi Pasteur is a knowledge-intensive company that prizes innovation, but it was hampered by hierarchical top-down processes that prevented employees and managers from freely sharing information and innovating. This impacted the company's ability to create and deliver new leading-edge products and maintain its high quality standards.

Sanofi Pasteur management found that the best solution was to deploy new technology to move from a hierarchical corporate knowledge and work environment to one that actively engaged employees and enabled them to obtain more knowledge from colleagues. The company took advantage of Microsoft Yammer's social tools to increase employee collaboration and engagement. There is more effective sharing of employee knowledge, and the company has become more innovative and cost-efficient.

New technology alone would not have solved Sanofi Pasteur's problem. To make the solution effective, Sanofi Pasteur had to change its organizational culture and business processes for knowledge dissemination and collaborative work, and the new technology made these changes possible.

- Develop knowledge-sharing strategy and goals

Management

Business Problem

- Hierarchical top-down processes
- Large geographically dispersed workforce

- Redesign knowledge and collaboration processes
- Change organizational culture

Organization

Information System

Business Solutions

Enterprise Social Networking
- Provide new channels for knowledge acquisition, innovation, and collaboration

- Improve productivity
- Reduce costs
- Increase innovation
- Improve quality

- MIcrosoft Yammer

Technology

Here are some questions to think about: How are collaboration and employee engagement keeping Sanofi Pasteur competitive and quality-conscious? How did using Yammer change the way work was performed at Sanofi Pasteur?

2-1 What are business processes? How are they related to information systems?

In order to operate, businesses must deal with many different pieces of information about suppliers, customers, employees, invoices, and payments, and of course their products and services. They must organize work activities that use this information to operate efficiently and enhance the overall performance of the firm. Information systems make it possible for firms to manage all their information, make better decisions, and improve the execution of their business processes.

Business Processes

Business processes, which we introduced in Chapter 1, refer to the manner in which work is organized, coordinated, and focused to produce a valuable product or service. Business processes are the collection of activities required to produce a product or service. These activities are supported by flows of material, information, and knowledge among the participants in business processes. Business processes also refer to the unique ways in which organizations coordinate work, information, and knowledge, and the ways in which management chooses to coordinate work.

To a large extent, the performance of a business firm depends on how well its business processes are designed and coordinated. A company's business processes can be a source of competitive strength if they enable the company to innovate or to execute better than its rivals. Business processes can also be liabilities if they are based on inefficient ways of working that impede organizational responsiveness and efficiency. The chapter-opening case describing Sanofi Pasteur's improvements in knowledge-sharing processes clearly illustrates these points, as do many of the other cases in this text.

TABLE 2.1 EXAMPLES OF FUNCTIONAL BUSINESS PROCESSES

FUNCTIONAL AREA	BUSINESS PROCESS
Manufacturing and production	Assembling the product Checking for quality Producing bills of materials
Sales and marketing	Identifying customers Making customers aware of the product Selling the product
Finance and accounting	Paying creditors Creating financial statements Managing cash accounts
Human resources	Hiring employees Evaluating employees' job performance Enrolling employees in benefits plans

Every business can be seen as a collection of business processes, some of which are part of larger encompassing processes. For instance, uses of mentoring, wikis, blogs, and videos are all part of the overall knowledge management process. Many business processes are tied to a specific functional area. For example, the sales and marketing function is responsible for identifying customers, and the human resources function is responsible for hiring employees. Table 2.1 describes some typical business processes for each of the functional areas of business.

Other business processes cross many different functional areas and require coordination across departments. For instance, consider the seemingly simple business process of fulfilling a customer order (see Figure 2.1). Initially, the sales department receives a sales order. The order passes first to accounting to ensure the customer can pay for the order either by a credit verification or request for immediate payment prior to shipping. Once the customer credit is

FIGURE 2.1   THE ORDER FULFILLMENT PROCESS

Fulfilling a customer order involves a complex set of steps that requires the close coordination of the sales, accounting, and manufacturing functions.
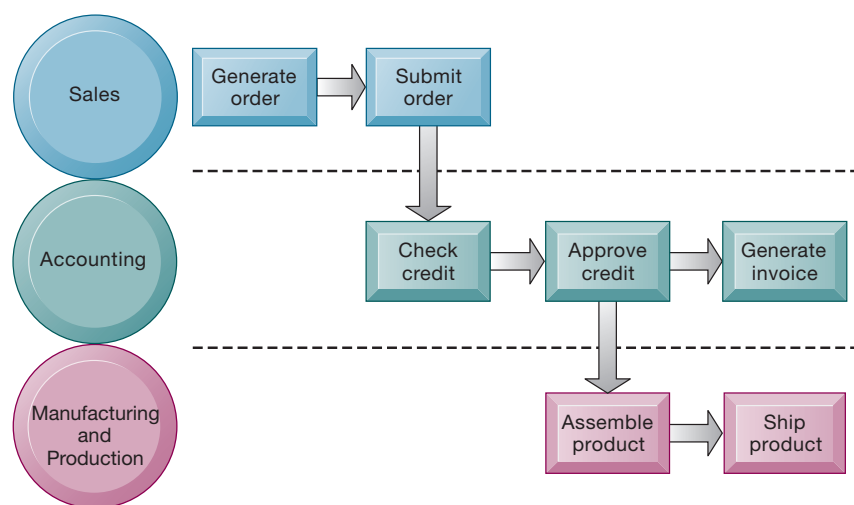
established, the production department pulls the product from inventory or produces the product. Then the product is shipped (and this may require working with a logistics firm, such as UPS or FedEx). A bill or invoice is generated by the accounting department, and a notice is sent to the customer indicating that the product has shipped. The sales department is notified of the shipment and prepares to support the customer by answering calls or fulfilling warranty claims.

What at first appears to be a simple process, fulfilling an order, turns out to be a very complicated series of business processes that require the close coordination of major functional groups in a firm. Moreover, to efficiently perform all these steps in the order fulfillment process requires a great deal of information. The required information must flow rapidly within the firm from one decision maker to another; with business partners, such as delivery firms; and with the customer. Computer-based information systems make this possible.

How Information Technology Improves Business Processes

Exactly how do information systems improve business processes? Information systems automate many steps in business processes that were formerly performed manually, such as checking a client's credit or generating an invoice and shipping order. But today, information technology can do much more. New technology can actually change the flow of information, making it possible for many more people to access and share information, replacing sequential steps with tasks that can be performed simultaneously, and eliminating delays in decision making. New information technology frequently changes the way a business works and supports entirely new business models. Downloading a Kindle e-book from Amazon, buying a computer online at Best Buy, and downloading a music track from iTunes are entirely new business processes based on new business models that would be inconceivable without today's information technology.

That's why it's so important to pay close attention to business processes, both in your information systems course and in your future career. By analyzing business processes, you can achieve a very clear understanding of how a business actually works. Moreover, by conducting a business process analysis, you will also begin to understand how to change the business by improving its processes to make it more efficient or effective. Throughout this book, we examine business processes with a view to understanding how they might be improved by using information technology to achieve greater efficiency, innovation, and customer service.

2-2 How do systems serve the different management groups in a business, and how do systems that link the enterprise improve organizational performance?

Now that you understand business processes, it is time to look more closely at how information systems support the business processes of a firm. Because there are different interests, specialties, and levels in an organization, there are different kinds of systems. No single system can provide all the information an organization needs.

A typical business organization has systems supporting processes for each of the major business functions—sales and marketing, manufacturing and production, finance and accounting, and human resources. You can find examples of systems for each of these business functions in the Learning Tracks for this chapter. Functional systems that operate independently of each other are becoming a thing of the past because they cannot easily share information to support cross-functional business processes. Many have been replaced with large-scale cross-functional systems that integrate the activities of related business processes and organizational units. We describe these integrated cross-functional applications later in this section.

A typical firm also has different systems supporting the decision-making needs of each of the main management groups we described in Chapter 1. Operational management, middle management, and senior management each use systems to support the decisions they must make to run the company. Let's look at these systems and the types of decisions they support.

Systems for Different Management Groups

A business firm has systems to support different groups or levels of management. These systems include transaction processing systems and systems for business intelligence.

Transaction Processing Systems

Operational managers need systems that keep track of the elementary activities and transactions of the organization, such as sales, receipts, cash deposits, payroll, credit decisions, and the flow of materials in a factory. **Transaction processing systems (TPS)** provide this kind of information. A transaction processing system is a computerized system that performs and records the daily routine transactions necessary to conduct business, such as sales order entry, hotel reservations, payroll, employee record keeping, and shipping.

The principal purpose of systems at this level is to answer routine questions and to track the flow of transactions through the organization. How many parts are in inventory? What happened to Mr. Smith's payment? To answer these kinds of questions, information generally must be easily available, current, and accurate.

At the operational level, tasks, resources, and goals are predefined and highly structured. The decision to grant credit to a customer, for instance, is made by a lower-level supervisor according to predefined criteria. All that must be determined is whether the customer meets the criteria.

Figure 2.2 illustrates a TPS for payroll processing. A payroll system keeps track of money paid to employees. An employee time sheet with the employee's name, social security number, and number of hours worked per week represents a single transaction for this system. Once this transaction is input into the system, it updates the system's master file (or database—see Chapter 6) that permanently maintains employee information for the organization. The data in the system are combined in different ways to create reports of interest to management and government agencies and to send paychecks to employees.

Managers need TPS to monitor the status of internal operations and the firm's relations with the external environment. TPS are also major producers of information for the other systems and business functions. For example, the payroll system illustrated in Figure 2.2, along with other accounting TPS, supplies data to the company's general ledger system, which is responsible for maintaining records of the firm's income and expenses and for producing

A PAYROLL TPS

A TPS for payroll processing captures employee payment transaction data (such as a time card). System outputs include online and hard-copy reports for management and employee paychecks.
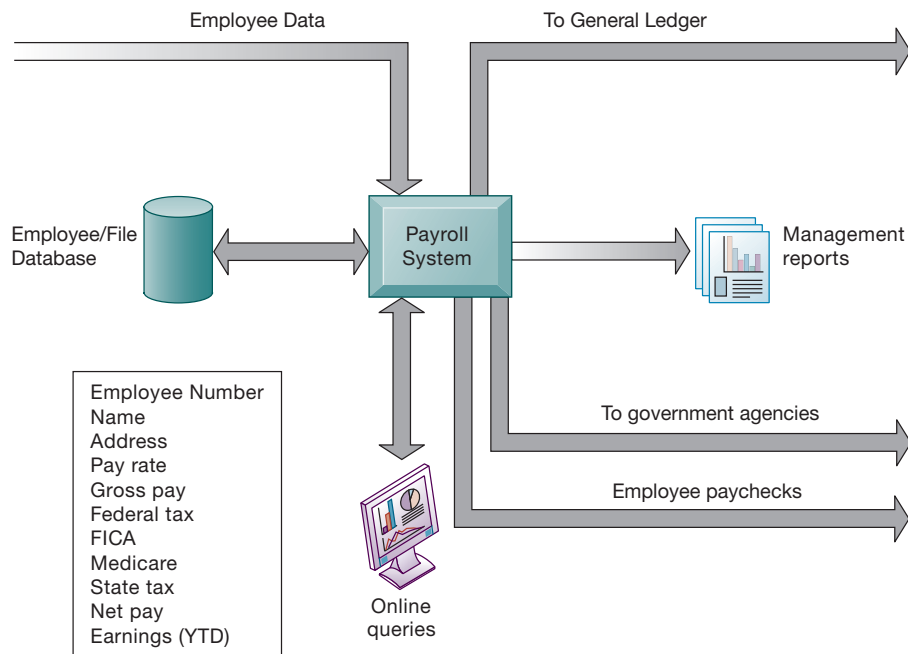
Payroll data on master file

reports such as income statements and balance sheets. It also supplies employee payment history data for insurance, pension, and other benefits calculations to the firm's human resources function and employee payment data to government agencies such as the U.S. Internal Revenue Service and Social Security Administration.

Transaction processing systems are often so central to a business that TPS failure for a few hours can lead to a firm's demise and perhaps that of other firms linked to it. Imagine what would happen to UPS if its package tracking system was not working! What would the airlines do without their computerized reservation systems?

Systems for Business Intelligence

Firms also have business intelligence systems that focus on delivering information to support management decision making. **Business intelligence** is a contemporary term for data and software tools for organizing, analyzing, and providing access to data to help managers and other enterprise users make more informed decisions. Business intelligence addresses the decision-making needs of all levels of management. This section provides a brief introduction to business intelligence. You'll learn more about this topic in Chapters 6 and 12.

Business intelligence systems for middle management help with monitoring, controlling, decision-making, and administrative activities. In Chapter 1, we defined management information systems as the study of information systems in business and management. The term **management information systems (MIS)** also designates a specific category of information systems serving middle

In the system illustrated by this diagram, three TPS supply summarized transaction data to the MIS reporting system at the end of the time period. Managers gain access to the organizational data through the MIS, which provides them with the appropriate reports.
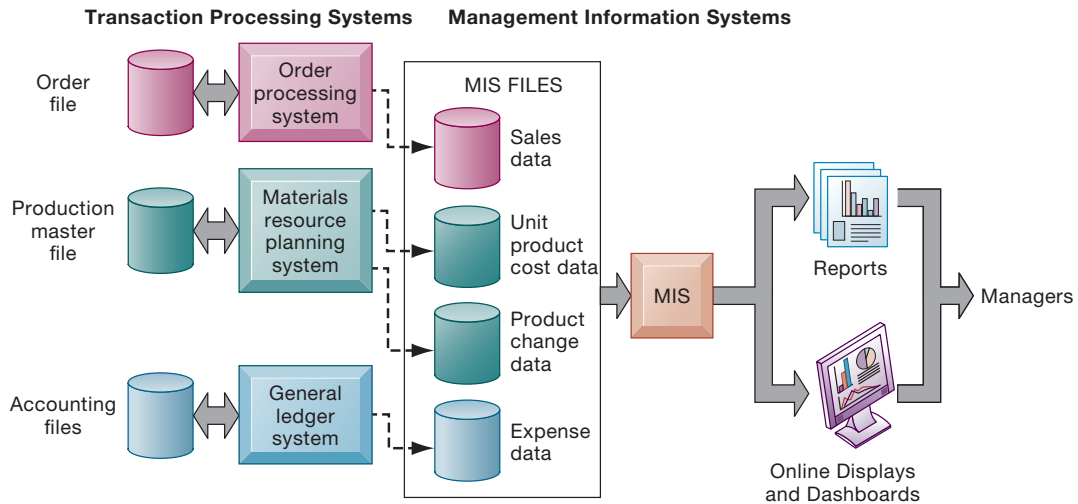
management. MIS provide middle managers with reports on the organization's current performance. This information is used to monitor and control the business and predict future performance.

MIS summarize and report on the company's basic operations using data supplied by transaction processing systems. The basic transaction data from TPS are compressed and usually presented in reports that are produced on a regular schedule. Today, many of these reports are delivered online. Figure 2.3 shows how a typical MIS transforms transaction-level data from inventory, production, and accounting into MIS files that are used to provide managers with reports. Figure 2.4 shows a sample report from this system.

FIGURE 2.4 SAMPLE MIS REPORT

This report, showing summarized annual sales data, was produced by the MIS in Figure 2.3.

Consolidated Consumer Products Corporation Sales by Product and Sales Region: 2019

PRODUCT CODE	PRODUCT DESCRIPTION	SALES REGION	ACTUAL SALES	PLANNED	ACTUAL versus PLANNED
4469	Carpet Cleaner	Northeast	4,066,700	4,800,000	0.85
		South	3,778,112	3,750,000	1.01
		Midwest	4,867,001	4,600,000	1.06
		West	4,003,440	4,400,000	0.91
	TOTAL		16,715,253	17,550,000	0.95
5674	Room Freshener	Northeast	3,676,700	3,900,000	0.94
		South	5,608,112	4,700,000	1.19
		Midwest	4,711,001	4,200,000	1.12
		West	4,563,440	4,900,000	0.93
	TOTAL		18,559,253	17,700,000	1.05

MIS typically provide answers to routine questions that have been specified in advance and have a predefined procedure for answering them. For instance, MIS reports might list the total pounds of lettuce used this quarter by a fast-food chain or, as illustrated in Figure 2.4, compare total annual sales figures for specific products to planned targets. These systems generally are not flexible and have little analytical capability. Most MIS use simple routines, such as summaries and comparisons, as opposed to sophisticated mathematical models or statistical techniques.

Other types of business intelligence systems support more non-routine decision making. **Decision-support systems (DSS)** focus on problems that are unique and rapidly changing, for which the procedure for arriving at a solution may not be fully predefined in advance. They try to answer questions such as these: What would be the impact on production schedules if we were to double sales in the month of December? What would happen to our return on investment if a factory schedule were delayed for six months?

Although DSS use internal information from TPS and MIS, they often bring in information from external sources, such as current stock prices or product prices of competitors. These systems are employed by "super-user" managers and business analysts who want to use sophisticated analytics and models to analyze data.

An interesting, small, but powerful DSS is the voyage-estimating system of a large global shipping company that transports bulk cargoes of coal, oil, ores, and finished products. The firm owns some vessels, charters others, and bids for shipping contracts in the open market to carry general cargo. A voyage-estimating system calculates financial and technical voyage details. Financial calculations include ship/time costs (fuel, labor, capital), freight rates for various types of cargo, and port expenses. Technical details include myriad factors, such as ship cargo capacity, speed, port distances, fuel and water consumption, and loading patterns (location of cargo for different ports).

The system can answer questions such as the following: Given a customer delivery schedule and an offered freight rate, which vessel should be assigned at what rate to maximize profits? What is the optimal speed at which a particular vessel can optimize its profit and still meet its delivery schedule? What is the optimal loading pattern for a ship bound for the U.S. West Coast from Malaysia? Figure 2.5 illustrates the DSS built for this company. The system operates on a powerful desktop personal computer, providing a system of menus that makes it easy for users to enter data or obtain information.

The voyage-estimating DSS we have just described draws heavily on models. Other business intelligence systems are more data-driven, focusing instead on extracting useful information from very large quantities of data. For example, large ski resort companies such as Intrawest and Vail Resorts collect and store large amounts of customer data from call centers, lodging and dining reservations, ski schools, and ski equipment rental stores. They use special software to analyze these data to determine the value, revenue potential, and loyalty of each customer to help managers make better decisions about how to target their marketing programs.

Business intelligence systems also address the decision-making needs of senior management. Senior managers need systems that focus on strategic issues and long-term trends, both in the firm and in the external environment. They are concerned with questions such as: What will employment levels be in five years? What are the long-term industry cost trends? What products should we be making in five years?

FIGURE 2.5   VOYAGE-ESTIMATING DECISION-SUPPORT SYSTEM

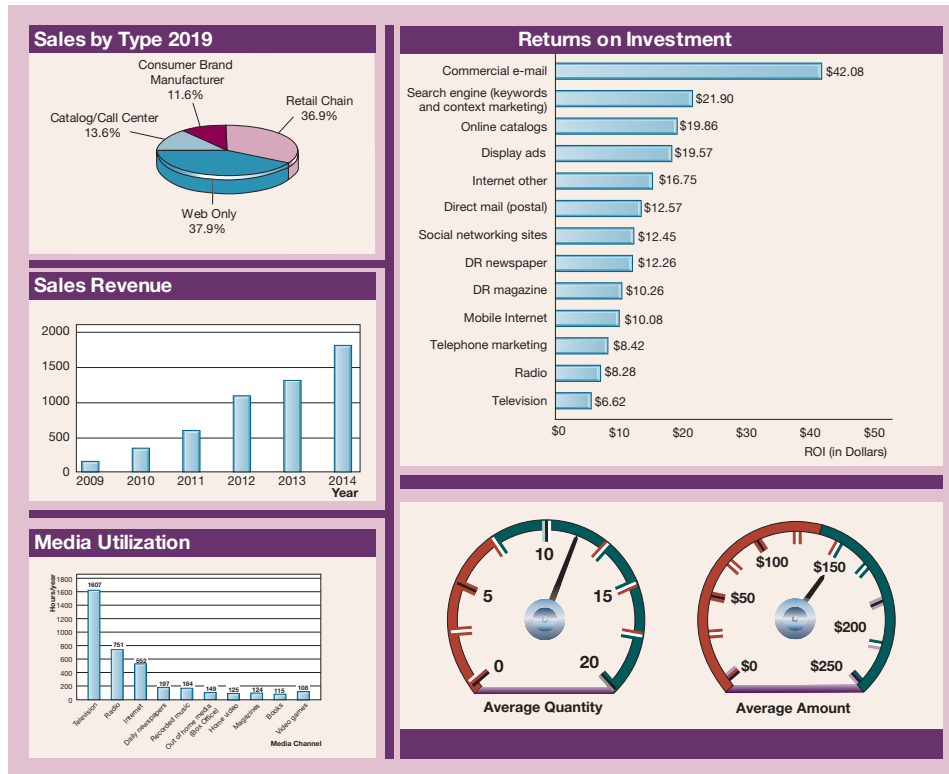This DSS operates on a powerful PC. It is used daily by managers who must develop bids on shipping contracts.
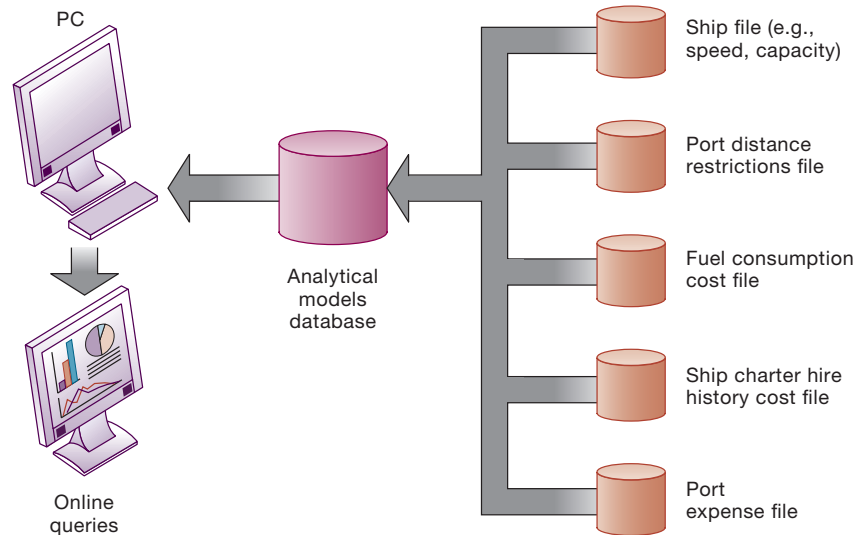
Executive support systems (ESS) help senior management make these decisions. They address nonroutine decisions requiring judgment, evaluation, and insight because there is no agreed-on procedure for arriving at a solution. ESS present graphs and data from many sources through an interface that is easy for senior managers to use. Often the information is delivered to senior executives through a **portal**, which uses a web interface to present integrated personalized business content.

ESS are designed to incorporate data about external events, such as new tax laws or competitors, but they also draw summarized information from internal MIS and DSS. They filter, compress, and track critical data, displaying the data of greatest importance to senior managers. Increasingly, such systems include business intelligence analytics for analyzing trends, forecasting, and "drilling down" to data at greater levels of detail.

For example, the chief operating officer (COO) and plant managers at Valero, the world's largest independent petroleum refiner, use a Refining Dashboard to display real-time data related to plant and equipment reliability, inventory management, safety, and energy consumption. With the displayed information, the COO and his team can review the performance of each Valero refinery in the United States and Canada in terms of how each plant is performing compared to the production plan of the firm. The headquarters group can drill down from executive level to refinery level and individual system-operator level displays of performance. Valero's Refining Dashboard is an example of a **digital dashboard**, which displays on a single screen graphs and charts of key performance indicators for managing a company. Digital dashboards are becoming an increasingly popular tool for management decision makers.

The Interactive Session on Organizations describes examples of several of these types of systems that the NFL (National Football League) and its teams use. Note the types of systems illustrated by this case and the role they play in improving both operations and decision making.

Sales by Type 2019

Consumer Brand Manufacturer 11.6%
Catalog/Call Center 13.6%
Retail Chain 36.9%
Web Only 37.9%

Sales Revenue

Media Utilization

Returns on Investment

	ROI (in Dollars)
Commercial e-mail	$42.08
Search engine (keywords and context marketing)	$21.90
Online catalogs	$19.86
Display ads	$19.57
Internet other	$16.75
Direct mail (postal)	$12.57
Social networking sites	$12.45
DR newspaper	$12.26
DR magazine	$10.26
Mobile Internet	$10.08
Telephone marketing	$8.42
Radio	$8.28
Television	$6.62

Average Quantity

Average Amount

A digital dashboard delivers comprehensive and accurate information for decision making, often using a single screen. The graphical overview of key performance indicators helps managers quickly spot areas that need attention.

Systems for Linking the Enterprise

Reviewing all the different types of systems we have just described, you might wonder how a business can manage all the information in these different systems. You might also wonder how costly it is to maintain so many different systems. And you might wonder how all these different systems can share information and how managers and employees are able to coordinate their work. In fact, these are all important questions for businesses today.

Enterprise Applications

Getting all the different kinds of systems in a company to work together has proven a major challenge. Typically, corporations are put together both through normal "organic" growth and through acquisition of smaller firms. Over a period of time, corporations end up with a collection of systems, most of them older, and face the challenge of getting them all to "talk" with one another and work together as one corporate system. There are several solutions to this problem.

One solution is to implement **enterprise applications**, which are systems that span functional areas, focus on executing business processes across the firm, and include all levels of management. Enterprise applications help businesses become more flexible and productive by coordinating their business processes more closely and integrating groups of processes so they focus on efficient management of resources and customer service.

There are four major enterprise applications: enterprise systems, supply chain management systems, customer relationship management systems, and knowledge management systems. Each of these enterprise applications integrates a related set of functions and business processes to enhance the

INTERACTIVE SESSION ORGANIZATIONS

Data Changes How NFL Teams Play the Game and How Fans See It

All professional sports teams today collect detailed data on player and team performance, fan behavior, and sales, and increasingly use these data to drive decisions about every aspect of the business—marketing, ticketing, player evaluation, and TV and digital media deals. This includes the National Football League (NFL), which is increasingly turning to data to improve how its players and teams perform and how fans experience the game.

Since 2014 the NFL has been capturing player movement data on the field by putting nickel-sized radio frequency identification (RFID) tags beneath players' shoulder pads to track every move they make. The information the sensors gather is used by NFL teams to improve their training and strategy, by commentators on live game broadcasts, and by fans attending games or using the NFL app on the Xbox One.

The NFL's player tracking system is based on the Zebra Sports Solution developed by Zebra Technologies, a Chicago-based firm specializing in tracking technology that includes the bar codes on groceries and other consumer goods and radio frequency identification (RFID) technology. The Zebra Sports Solution system records players' speed, direction, location on the field, how far they ran on a play, and how long they were sprinting, jogging, or walking. The system can also determine what formation a team was in and how players' speed or acceleration affects their on-field performance. Want to know how hard Eli Manning is throwing passes or the force with which a ball arrives in the hands of receiver Odell Beckham? The system knows how to do all that.

NFL players have RFID chips in their left and right shoulder pads that transmit data to 20 radio receivers strategically located in the lower and upper levels of stadiums to collect data about how each player moves, using metrics such as velocity, speed in miles per hour, and distance traveled. From there the data are transmitted to an on-site server computer, where Zebra's software matches an RFID tag to the correct player or official. The football also has a sensor transmitting location data. The data are generated in real-time as the game is being played. Each sensor transmits its location about 25 times per player.

It takes just two seconds for data to be received by the motion sensors, analyzed, and pushed out to remote cloud computers run by Amazon Web Services for the NFL. From the NFL cloud computers, the data are shared with fans, broadcasters, and NFL teams. The data captured by the NFL are displayed to fans using the NFL Next Gen Stats website, NFL social media channels, and the NFL app on Windows 10 and the Xbox One. The data are also transmitted to the giant display screens in the arena to show fans during the game.

The data have multiple uses. NFL teams use them to evaluate player and team performance and to analyze tactics, such as whether it might be better to press forward or to punt in a particular fourth-down situation. Data transmitted to broadcasters, to stadium screens, to Next Gen Stats, and to the Next Gen Stats feature of Microsoft's Xbox One NFL app help create a deeper fan experience that gets fans more involved in the game.

Some of the statistics fans can now see on Next Gen Stats include Fastest Ball Carriers, Longest Tackles, Longest Plays, Passing Leaders, Rushing Leaders, and Receiving Leaders. Next Gen Stats also features charts for individual players and videos that explain the differences and similarities between players, teams, and games based on the data.

While the data may be entertaining for fans, they could prove strategic for the teams. Data markers for each play are recorded, including type of offense, type of defense, whether there was a huddle, all movement during the play, and the yard line where the ball was stopped. The NFL runs custom-created analytics to deliver visualizations of the data to each team within 24 hours of the game, via a custom-built web portal. The system displays charts and graphs as well as tabular data to let teams have more insight. Each NFL team may also hire its own data analyst to wring even more value from the data. The data are giving NFL fans, teams, coaches, and players a deeper look into the game they love.

Sources: Jason Hiner, "How the NFL and Amazon Unleashed 'Next Gen Stats' to Grok Football Games," *TechRepublic,* February 2, 2018; Teena Maddox, "Super Bowl 52: How the NFL and US Bank Stadium Are Ready to Make Digital History," *TechRepublic,* February 1, 2018; Brian McDonough, "How the NFL's Data Operation Tracks Every Move on the Field*," Information Management,* December 7, 2016; www.zebra.com, accessed March 15, 2017; and Mark J. Burns, "Zebra Technologies, NFL Revamp Partnership For Third Season*," SportTechie,* September 6, 2016.

CASE STUDY QUESTIONS

1. What kinds of systems are illustrated in this case study? Where do they obtain their data? What do they do with the data? Describe some of the inputs and outputs of these systems.

2. What business functions do these systems support? Explain your answer.

3. How do the data about teams and players captured by the NFL help NFL football teams and the NFL itself make better decisions? Give examples of two decisions that were improved by the systems described in this case.

4. How did using data help the NFL and its teams improve the way they run their business?

performance of the organization as a whole. Figure 2.6 shows that the architecture for these enterprise applications encompasses processes spanning the entire organization and, in some cases, extending beyond the organization to customers, suppliers, and other key business partners.

Enterprise Systems Firms use **enterprise systems**, also known as enterprise resource planning (ERP) systems, to integrate business processes in manufacturing and production, finance and accounting, sales and marketing, and human resources into a single software system. Information that was previously

FIGURE 2.6 ENTERPRISE APPLICATION ARCHITECTURE

Enterprise applications automate processes that span multiple business functions and organizational levels and may extend outside the organization.
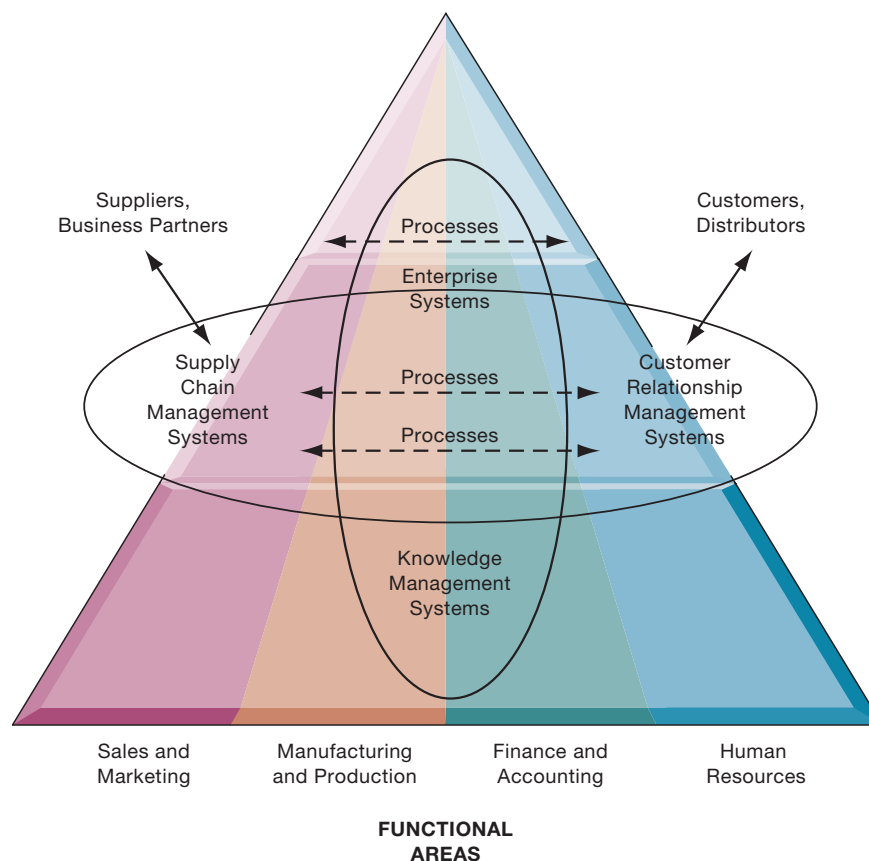
fragmented in many different systems is stored in a single comprehensive data repository where it can be used by many different parts of the business.

For example, when a customer places an order, the order data flow automatically to other parts of the company that are affected by them. The order transaction triggers the warehouse to pick the ordered products and schedule shipment. The warehouse informs the factory to replenish whatever has been depleted. The accounting department is notified to send the customer an invoice. Customer service representatives track the progress of the order through every step to inform customers about the status of their orders. Managers are able to use firmwide information to make more-precise and timely decisions about daily operations and longer-term planning.

Supply Chain Management Systems   Firms use **supply chain management (SCM) systems** to help manage relationships with their suppliers. These systems help suppliers, purchasing firms, distributors, and logistics companies share information about orders, production, inventory levels, and delivery of products and services so they can source, produce, and deliver goods and services efficiently. The ultimate objective is to get the right amount of their products from their source to their point of consumption in the least amount of time and at the lowest cost. These systems increase firm profitability by lowering the costs of moving and making products and by enabling managers to make better decisions about how to organize and schedule sourcing, production, and distribution.

Supply chain management systems are one type of **interorganizational system** because they automate the flow of information across organizational boundaries. You will find examples of other types of interorganizational information systems throughout this text because such systems make it possible for firms to link digitally to customers and to outsource their work to other companies.

Customer Relationship Management Systems   Firms use **customer relationship management (CRM) systems** to help manage their relationships with their customers. CRM systems provide information to coordinate all of the business processes that deal with customers in sales, marketing, and service to optimize revenue, customer satisfaction, and customer retention. This information helps firms identify, attract, and retain the most profitable customers; provide better service to existing customers; and increase sales.

Knowledge Management Systems   Some firms perform better than others because they have better knowledge about how to create, produce, and deliver products and services. This firm knowledge is unique, is difficult to imitate, and can be leveraged into long-term strategic benefits. **Knowledge management systems (KMS)** enable organizations to better manage processes for capturing and applying knowledge and expertise. These systems collect all relevant knowledge and experience in the firm and make it available wherever and whenever it is needed to improve business processes and management decisions. They also link the firm to external sources of knowledge.

We examine enterprise systems and systems for supply chain management and customer relationship management in greater detail in Chapter 9. We discuss collaboration systems that support knowledge management in this chapter and cover other types of knowledge management applications in Chapter 11.

Intranets and Extranets

Enterprise applications create deep-seated changes in the way the firm conducts its business, offering many opportunities to integrate important business

data into a single system. They are often costly and difficult to implement. Intranets and extranets deserve mention here as alternative tools for increasing integration and expediting the flow of information within the firm and with customers and suppliers.

Intranets are simply internal company websites that are accessible only by employees. The term *intranet* refers to an internal network, in contrast to the Internet, which is a public network linking organizations and other external networks. Intranets use the same technologies and techniques as the larger Internet, and they often are simply a private access area in a larger company website. Likewise with extranets, which are company websites that are accessible to authorized vendors and suppliers and are often used to coordinate the movement of supplies to the firm's production apparatus.

For example, Six Flags, which operates 18 theme parks throughout North America, maintains an intranet for its 1900 full-time employees that provides company-related news and information on each park's day-to-day operations, including weather forecasts, performance schedules, and details about groups and celebrities visiting the parks. The company also uses an extranet to broadcast information about schedule changes and park events to its 30,000 seasonal employees. We describe the technology for intranets and extranets in more detail in Chapter 7.

E-business, E-commerce, and E-government

The systems and technologies we have just described are transforming firms' relationships with customers, employees, suppliers, and logistic partners into digital relationships using networks and the Internet. So much business is now enabled by or based upon digital networks that we use the terms *electronic business* and *electronic commerce* frequently throughout this text.

Electronic business, or e-business, refers to the use of digital technology and the Internet to execute the major business processes in the enterprise. E-business includes activities for the internal management of the firm and for coordination with suppliers and other business partners. It also includes **electronic commerce, or e-commerce**.

E-commerce is the part of e-business that deals with the buying and selling of goods and services over the Internet. It also encompasses activities supporting those market transactions, such as advertising, marketing, customer support, security, delivery, and payment.

The technologies associated with e-business have also brought about similar changes in the public sector. Governments on all levels are using Internet technology to deliver information and services to citizens, employees, and businesses with which they work. **E-government** refers to the application of the Internet and networking technologies to digitally enable government and public sector agencies' relationships with citizens, businesses, and other arms of government.

In addition to improving delivery of government services, e-government makes government operations more efficient and also empowers citizens by giving them easier access to information and the ability to network electronically with other citizens. For example, citizens in some states can renew their driver's licenses or apply for unemployment benefits online, and the Internet has become a powerful tool for instantly mobilizing interest groups for political action and fundraising.

2-3 Why are systems for collaboration and social business so important, and what technologies do they use?

With all these systems and information, you might wonder how it is possible to make sense of them. How do people working in firms pull it all together, work toward common goals, and coordinate plans and actions? In addition to the types of systems we have just described, businesses need special systems to support collaboration and teamwork.

What Is Collaboration?

Collaboration is working with others to achieve shared and explicit goals. Collaboration focuses on task or mission accomplishment and usually takes place in a business or other organization and between businesses. You collaborate with a colleague in Tokyo who has expertise on a topic about which you know nothing. You collaborate with many colleagues in publishing a company blog. If you're in a law firm, you collaborate with accountants in an accounting firm in servicing the needs of a client with tax problems.

Collaboration can be short-lived, lasting a few minutes, or longer term, depending on the nature of the task and the relationship among participants. Collaboration can be one-to-one or many-to-many.

Employees may collaborate in informal groups that are not a formal part of the business firm's organizational structure, or they may be organized into formal teams. **Teams** have a specific mission that someone in the business assigned to them. Team members need to collaborate on the accomplishment of specific tasks and collectively achieve the team mission. The team mission might be to "win the game" or "increase online sales by 10 percent." Teams are often short-lived, depending on the problems they tackle and the length of time needed to find a solution and accomplish the mission.

Collaboration and teamwork are more important today than ever for a variety of reasons.

- *Changing nature of work.* The nature of work has changed from factory manufacturing and pre-computer office work where each stage in the production process occurred independently of one another and was coordinated by supervisors. Work was organized into silos. Within a silo, work passed from one machine tool station to another, from one desktop to another, until the finished product was completed. Today, jobs require much closer coordination and interaction among the parties involved in producing the service or product. A report from the consulting firm McKinsey & Company estimated that 41 percent of the U.S. labor force is now composed of jobs where interaction (talking, e-mailing, presenting, and persuading) is the primary value-adding activity (McKinsey, 2012). Even in factories, workers today often work in production groups, or pods.

- *Growth of professional work.* "Interaction" jobs tend to be professional jobs in the service sector that require close coordination and collaboration. Professional jobs require substantial education and the sharing of information and opinions to get work done. Each actor on the job brings specialized expertise to the problem, and all the actors need to take one another into account in order to accomplish the job.

- *Changing organization of the firm.* For most of the industrial age, managers organized work in a hierarchical fashion. Orders came down the hierarchy, and responses moved back up the hierarchy. Today, work is organized into

groups and teams, and the members are expected to develop their own methods for accomplishing the task. Senior managers observe and measure results but are much less likely to issue detailed orders or operating procedures. In part, this is because expertise and decision-making power have been pushed down in organizations.

- *Changing scope of the firm.* The work of the firm has changed from a single location to multiple locations—offices or factories throughout a region, a nation, or even around the globe. For instance, Henry Ford developed the first mass-production automobile plant at a single Dearborn, Michigan factory. In 2017, Ford employed 202,000 people at about 67 locations worldwide. With this kind of global presence, the need for close coordination of design, production, marketing, distribution, and service obviously takes on new importance and scale. Large global companies need to have teams working on a global basis.

- *Emphasis on innovation.* Although we tend to attribute innovations in business and science to great individuals, these great individuals are most likely working with a team of brilliant colleagues. Think of Bill Gates and Steve Jobs (founders of Microsoft and Apple), both of whom are highly regarded innovators and both of whom built strong collaborative teams to nurture and support innovation in their firms. Their initial innovations derived from close collaboration with colleagues and partners. Innovation, in other words, is a group and social process, and most innovations derive from collaboration among individuals in a lab, a business, or government agencies. Strong collaborative practices and technologies are believed to increase the rate and quality of innovation.

- *Changing culture of work and business.* Most research on collaboration supports the notion that diverse teams produce better outputs faster than individuals working on their own. Popular notions of the crowd ("crowdsourcing" and the "wisdom of crowds") also provide cultural support for collaboration and teamwork.

What Is Social Business?

Many firms today enhance collaboration by embracing **social business**—the use of social networking platforms, including Facebook, Twitter, and internal corporate social tools—to engage their employees, customers, and suppliers. These tools enable workers to set up profiles, form groups, and "follow" each other's status updates. The goal of social business is to deepen interactions with groups inside and outside the firm to expedite and enhance information sharing, innovation, and decision making.

A key word in social business is *conversations*. Customers, suppliers, employees, managers, and even oversight agencies continually have conversations about firms, often without the knowledge of the firm or its key actors (employees and managers).

Supporters of social business argue that if firms could tune in to these conversations, they would strengthen their bonds with consumers, suppliers, and employees, increasing their emotional involvement in the firm.

All of this requires a great deal of information transparency. People need to share opinions and facts with others quite directly, without intervention from executives or others. Employees get to know directly what customers and other employees think, suppliers will learn very directly the opinions of supply chain partners, and even managers presumably will learn more directly from their employees how well they are doing. Nearly everyone involved in the creation of value will know much more about everyone else.

TABLE 2.2 APPLICATIONS OF SOCIAL BUSINESS

SOCIAL BUSINESS APPLICATION	DESCRIPTION
Social networks	Connect through personal and business profiles
Crowdsourcing	Harness collective knowledge to generate new ideas and solutions
Shared workspaces	Coordinate projects and tasks; co-create content
Blogs and wikis	Publish and rapidly access knowledge; discuss opinions and experiences
Social commerce	Share opinions about purchasing on social platforms
File sharing	Upload, share, and comment on photos, videos, audio, text documents
Social marketing	Use social media to interact with customers; derive customer insights
Communities	Discuss topics in open forums; share expertise

If such an environment could be created, it is likely to drive operational efficiencies, spur innovation, and accelerate decision making. If product designers can learn directly about how their products are doing in the market in real time, based on consumer feedback, they can speed up the redesign process. If employees can use social connections inside and outside the company to capture new knowledge and insights, they will be able to work more efficiently and solve more business problems.

Table 2.2 describes important applications of social business inside and outside the firm. This chapter focuses on enterprise social business—its internal corporate uses. Chapters 7 and 10 describe social business applications relating to customers and suppliers outside the company.

Business Benefits of Collaboration and Social Business

Much of the research on collaboration has been anecdotal, but there is a general belief among both business and academic communities that the more a business firm is "collaborative," the more successful it will be, and that collaboration within and among firms is more essential than in the past. *MIT Sloan Management Review*'s research found that a focus on collaboration is central to how digitally advanced companies create business value and establish competitive advantage (Kiron, 2017). A global survey of business and information systems managers found that investments in collaboration technology produced organizational improvements that returned more than four times the amount of the investment, with the greatest benefits for sales, marketing, and research and development functions (Frost and Sullivan, 2009). McKinsey & Company consultants predict that social technologies used within and across enterprises could potentially raise the productivity of interaction workers by 20 to 25 percent (McKinsey Global Institute, 2012).

Table 2.3 summarizes some of the benefits of collaboration and social business that have been identified. Figure 2.7 graphically illustrates how collaboration is believed to affect business performance.

TABLE 2.3 BUSINESS BENEFITS OF COLLABORATION AND SOCIAL BUSINESS

BENEFIT	RATIONALE
Productivity	People interacting and working together can capture expert knowledge and solve problems more rapidly than the same number of people working in isolation from one another. There will be fewer errors.
Quality	People working collaboratively can communicate errors and corrective actions faster than if they work in isolation. Collaborative and social technologies help reduce time delays in design and production.
Innovation	People working collaboratively can come up with more innovative ideas for products, services, and administration than the same number working in isolation from one another. There are advantages to diversity and the "wisdom of crowds."
Customer service	People working together using collaboration and social tools can solve customer complaints and issues faster and more effectively than if they were working in isolation from one another.
Financial performance (profitability, sales, and sales growth)	As a result of all of the above, collaborative firms have superior sales, sales growth, and financial performance.

FIGURE 2.7 REQUIREMENTS FOR COLLABORATION

Successful collaboration requires an appropriate organizational structure and culture along with appropriate collaboration technology.
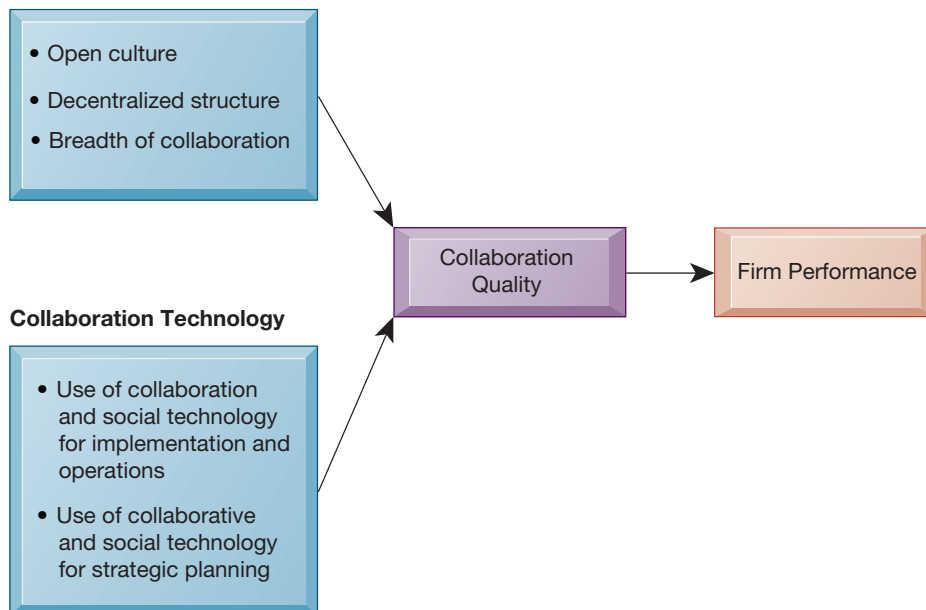
Collaboration Capability

- Open culture
- Decentralized structure
- Breadth of collaboration

Collaboration Technology

- Use of collaboration and social technology for implementation and operations
- Use of collaborative and social technology for strategic planning

Collaboration Quality → Firm Performance

Building a Collaborative Culture and Business Processes

Collaboration won't take place spontaneously in a business firm, especially in the absence of supportive culture or business processes. Business firms, especially large firms, had a reputation in the past for being "command and control" organizations where the top leaders thought up all the really important matters and then ordered lower-level employees to execute senior management plans. The job of middle management supposedly was to pass messages back and forth, up and down the hierarchy.

Command and control firms required lower-level employees to carry out orders without asking too many questions, with no responsibility to improve processes, and with no rewards for teamwork or team performance. If your work group needed help from another work group, that was something for the bosses to figure out. You never communicated horizontally, always vertically, so management could control the process. Together, the expectations of management and employees formed a culture, a set of assumptions about common goals and how people should behave. Many business firms still operate this way.

A collaborative business culture and business processes are very different. Senior managers are responsible for achieving results but rely on teams of employees to achieve and implement the results. Policies, products, designs, processes, and systems are much more dependent on teams at all levels of the organization to devise, to create, and to build. Teams are rewarded for their performance, and individuals are rewarded for their performance in a team. The function of middle managers is to build the teams, coordinate their work, and monitor their performance. The business culture and business processes are more "social." In a collaborative culture, senior management establishes collaboration and teamwork as vital to the organization, and it actually implements collaboration for the senior ranks of the business as well.

Tools and Technologies for Collaboration and Social Business

A collaborative, team-oriented culture won't produce benefits without information systems in place to enable collaboration and social business. Currently there are hundreds of tools designed to deal with the fact that, in order to succeed in our jobs, we are all much more dependent on one another, our fellow employees, customers, suppliers, and managers. Some of these tools are expensive, but others are available online for free (or with premium versions for a modest fee). Let's look more closely at some of these tools.

E-mail and Instant Messaging (IM)

E-mail and instant messaging (including text messaging) have been major communication and collaboration tools for interaction jobs. Their software operates on computers, mobile phones, tablets, and other wireless devices and includes features for sharing files as well as transmitting messages. Many instant messaging systems allow users to engage in real-time conversations with multiple participants simultaneously. In recent years, e-mail use has declined, with messaging and social media becoming preferred channels of communication.

Wikis

Wikis are a type of website that makes it easy for users to contribute and edit text content and graphics without any knowledge of web page development or programming techniques. The most well-known wiki is Wikipedia, the largest collaboratively edited reference project in the world. It relies on volunteers, makes no money, and accepts no advertising.

Wikis are very useful tools for storing and sharing corporate knowledge and insights. Enterprise software vendor SAP AG has a wiki that acts as a base of information for people outside the company, such as customers and software developers who build programs that interact with SAP software. In the past, those people asked and sometimes answered questions in an informal way on SAP online forums, but that was an inefficient system, with people asking and answering the same questions over and over.

Virtual Worlds

Virtual worlds, such as Second Life, are online 3-D environments populated by "residents" who have built graphical representations of themselves known as avatars. Companies like IBM, Cisco, and Intel Corporations use the online world for meetings, interviews, guest speaker events, and employee training. Real-world people represented by avatars meet, interact, and exchange ideas at these virtual locations using gestures, chat box conversations, and voice communication.

Collaboration and Social Business Platforms

There are now suites of software products providing multifunction platforms for collaboration and social business among teams of employees who work together from many different locations. The most widely used are Internet-based audio conferencing and video conferencing systems, cloud collaboration services such as Google's online services and tools, corporate collaboration systems such as Microsoft SharePoint and IBM Notes, and enterprise social networking tools such as Salesforce Chatter, Microsoft Yammer, Jive, Facebook Workplace, and IBM Connections.

Virtual Meeting Systems   In an effort to reduce travel expenses and enable people in different locations to meet and collaborate, many companies, both large and small, are adopting videoconferencing and web conferencing technologies. Companies such as Heinz, GE, and PepsiCo are using virtual meeting systems for product briefings, training courses, and strategy sessions.

A videoconference allows individuals at two or more locations to communicate simultaneously through two-way video and audio transmissions. High-end videoconferencing systems feature **telepresence** technology, an integrated audio and visual environment that allows a person to give the appearance of being present at a remote location (see the Interactive Session on Technology). Free or low-cost Internet-based systems such as Skype group videoconferencing, Amazon Chime, and Zoom are of lower quality, but still useful for smaller companies. Apple's FaceTime is useful for one-to-one videoconferencing. Some of these tools are available on mobile devices.

Companies of all sizes are finding web-based online meeting tools such as Cisco WebEx, Skype for Business, GoTo Meeting, and Adobe Connect especially helpful for training and sales presentations. These products enable participants to share documents and presentations in conjunction with audioconferencing and live video.

Videoconferencing: Something for Everyone

When it comes to collaboration, videoconferencing is becoming a tool of choice for organizations of all sizes. In the past, videoconferencing was limited to the very largest companies that could afford dedicated videoconference rooms and expensive networking and software for this purpose. Today, videoconferencing has been democratized. There's something for everyone.

The cost of the technology has radically fallen; global Internet and desktop transmission of video and audio data is affordable. There are inexpensive mobile and desktop tools as well as high-end videoconferencing and telepresence systems to manage business processes and to connect and collaborate with others—even customers—around the globe.

The current generation of telepresence platforms provide much more than video collaboration, with the ability to coordinate multiple rich data streams that integrate digital information from mobile, desktop, and video, create a collaborative environment, and move the information to where managers and professionals are making decisions. Cisco's IX5000 immersive telepresence system is an example. It offers leading-edge telepresence, but it's much more affordable and easier to use than in the past. Three 4K ultra high-definition cameras clustered discreetly above three 70-inch LCD screens provide crisp, high-definition video. Theater-quality sound emanates from 18 custom speakers and one powerful sub-woofer, creating a high-quality lifelike collaboration experience for 8 to 18 people. The camera and graphic processors are able to capture the whole room in fine detail, so you can stand up and move around or go the whiteboard. Images can be cropped to show participants seated behind their tables, but when someone stands up, the crop is removed to show both standing and sitting participants.

Installing the IX500 system requires no special changes to a room, and it needs only half the power, installation time, and data transmission capacity (bandwidth) as previous telepresence systems. A 6-seat IX5000 studio lists for $299,000, while the 18-seat studio costs $339,000.

Produban, Grupo Santander's technology company specializing in the continuous design and operation of IT infrastructures, adopted the IX5000 system to bring people together to make better decisions faster.

Grupo Santander is a Spanish banking group and one of the largest banks in the world, with over 188,000 employees serving more than 125 million customers and operations across Europe, Latin America, North America, Africa, and Asia. Produban is responsible for the entire IT infrastructure of this sprawling global company and also provides expertise to 120 other companies in IT infrastructure design and services. Produban has over 5,500 employees working in 9 different countries.

With 50 percent less power usage, 50 percent less data transmission capacity and half the installation time of earlier systems (only 8 hours), the IX5000 has reduced the total cost of purchasing and operating the telepresence system by 30 percent over 3 years. Lower overall costs enable Produban to set up video rooms in more locations, so more teams can benefit. Produban is intent on using videoconferencing throughout the entire corporation.

King County, Washington, which includes the city of Seattle and has 14,000 employees, opted for a less-sophisticated but more-affordable solution. In 2016 it started using Logitech's SmartDock audio and video videoconferencing and collaboration system to hold meetings, interview job candidates, and handle other tasks. SmartDock is a user-friendly touch-screen control console to launch and manage audio and video calls in any meeting space, large or small. It has an embedded Microsoft Surface Pro tablet running a special version of Skype for Business, called Skype Room System, and works with Office for Business productivity tools and qualified devices, including Logitech ConferenceCams. With Logitech SmartDock, people can start meetings with a single touch, then instantly project to the display in the room and share with remote participants via their Skype for Business clients on a smartphone or laptop. Participants can share content in a meeting and view and edit documents in real time. An embedded motion sensor activates the system when anyone is in the room. Prices range from $1,999 to $3,999, depending on the size of the meeting room and the need for webcams.

In the past, King County had used a variety of systems and technologies for videoconferencing and collaboration. They were time consuming for the county's IT staff to administer and had limited capabilities and

features. Teams couldn't connect remotely and establish multipoint connections with smartphones and tablets. King County's IT staff might spend 20 minutes or more setting up a videoconferencing system, which often relied on legacy technology from multiple vendors along with computer monitors and outdated VGA-quality TV sets. King County received multiple requests to use these systems daily in its 30 on-site conference rooms and needed to standardize the technology and make it more supportive of collaboration.

The King County IT staff was able to handle installation and implementation of the Logitech SmartDock system on its own. Employees are using the video-conferencing and collaboration systems without IT involvement. Being able to share presentations and co-edit documents in Word, Excel, and other formats has made working much more collaborative.

Sources: "'Less Is More' as Cisco Completely Reimagines Flagship Three-Screen Video Conferencing Technology" and "Cisco Telepresence IX5000 Series," www.cisco.com, accessed February 5, 2018; www.produban.com, accessed February 5, 2018; www. santander.com, accessed February 5, 2018; www.logitech.com, accessed February 5, 2018; and Samuel Greengard, "King County Focuses on Collaboration," *CIO Insight*, December 20, 2017.

CASE STUDY QUESTIONS

1. Compare the capabilities of Cisco's IX5000 telepresence and the Logitech SmartDock systems. How do they promote collaboration and innovation?

2. Why would a company like Produban want to invest in a high-end telepresence system such as Cisco's IX5000? How is videoconferencing technology and telepresence related to Produban's business model and business strategy?

3. Why would King County, Washington want to implement the Logitech SmartDock system? What business benefits did it obtain from using this technology?

Cloud Collaboration Services   Google offers many online tools and services, and some are suitable for collaboration. They include Google Drive, Google Docs, G Suites, and Google Sites. Most are free of charge.

Google Drive is a file storage and synchronization service for cloud storage, file sharing, and collaborative editing. Such web-based online file-sharing services allow users to upload files to secure online storage sites from which the files can be shared with others. Microsoft OneDrive and Dropbox are other leading cloud storage services. They feature both free and paid services, depending on the amount of storage space and administration required. Users are able to synchronize their files stored online with their local PCs and other kinds of devices, with options for making the files private or public and for sharing them with designated contacts.

Google Drive and Microsoft OneDrive are integrated with tools for document creation and sharing. OneDrive provides online storage for Microsoft Office documents and other files and works with Microsoft Office apps, both installed and on the web. It can share to Facebook as well. Google Drive is integrated with Google Docs, Sheets, and Slides, a suite of productivity applications that offer collaborative editing on documents, spreadsheets, and presentations. Google's cloud-based productivity suite for businesses, called G Suite, also works with Google Drive. Google Sites allows users to quickly create online team-oriented sites where multiple people can collaborate and share files.

Microsoft SharePoint and IBM Notes   Microsoft SharePoint is a browser-based collaboration and document management platform, combined with a powerful search engine, that is installed on corporate servers. SharePoint has a web-based interface and close integration with productivity tools such as Microsoft Office.

SharePoint software makes it possible for employees to share their documents and collaborate on projects using Office documents as the foundation.

SharePoint can be used to host internal websites that organize and store information in one central workspace to enable teams to coordinate work activities, collaborate on and publish documents, maintain task lists, implement workflows, and share information via wikis and blogs. Users are able to control versions of documents and document security. Because SharePoint stores and organizes information in one place, users can find relevant information quickly and efficiently while working closely together on tasks, projects, and documents. Enterprise search tools help locate people, expertise, and content. SharePoint now features social tools.

IBM Notes (formerly Lotus Notes) is a collaborative software system with capabilities for sharing calendars, e-mail, messaging, collective writing and editing, shared database access, and online meetings. Notes software installed on desktop or laptop computers obtains applications stored on an IBM Domino server. Notes is web-enabled and offers an application development environment so that users can build custom applications to suit their unique needs. Notes has also added capabilities for blogs, microblogs, wikis, online content aggregators, help desk systems, voice and video conferencing, and online meetings. IBM Notes promises high levels of security and reliability and the ability to retain control over sensitive corporate information.

Enterprise Social Networking Tools   The tools we have just described include capabilities for supporting social business, but there are also more specialized social tools for this purpose, such as Salesforce Chatter, Microsoft Yammer, Jive, Facebook Workplace, and IBM Connections. Enterprise social networking tools create business value by connecting the members of an organization through profiles, updates, and notifications similar to Facebook features but tailored to internal corporate uses. Table 2.4 provides more detail about these internal social capabilities.

TABLE 2.4 ENTERPRISE SOCIAL NETWORKING SOFTWARE CAPABILITIES

SOCIAL SOFTWARE CAPABILITY	DESCRIPTION
Profiles	Ability to set up member profiles describing who individuals are, educational background, interests. Includes work-related associations and expertise (skills, projects, teams).
Content sharing	Share, store, and manage content including documents, presentations, images, and videos.
Feeds and notifications	Real-time information streams, status updates, and announcements from designated individuals and groups.
Groups and team workspaces	Establish groups to share information, collaborate on documents, and work on projects with the ability to set up private and public groups and to archive conversations to preserve team knowledge.
Tagging and social bookmarking	Indicate preferences for specific pieces of content, similar to the Facebook Like button. Tagging lets people add keywords to identify content they like.
Permissions and privacy	Ability to make sure private information stays within the right circles, as determined by the nature of relationships. In enterprise social networks, there is a need to establish who in the company has permission to see what information.

Although companies have benefited from enterprise social networking, internal social networking has not always been easy to implement. The chapter-ending case study addresses this topic.

Checklist for Managers: Evaluating and Selecting Collaboration and Social Software Tools

With so many collaboration and social business tools and services available, how do you choose the right collaboration technology for your firm? To answer this question, you need a framework for understanding just what problems these tools are designed to solve. One framework that has been helpful for us to talk about collaboration tools is the time/space collaboration and social tool matrix developed in the early 1990s by a number of collaborative work scholars (Figure 2.8).

The time/space matrix focuses on two dimensions of the collaboration problem: time and space. For instance, you need to collaborate with people in different time zones, and you cannot all meet at the same time. Midnight in New York is noon in Mumbai, so this makes it difficult to have a videoconference (the people in New York are too tired). Time is clearly an obstacle to collaboration on a global scale.

Place (location) also inhibits collaboration in large global or even national and regional firms. Assembling people for a physical meeting is made difficult by the physical dispersion of distributed firms (firms with more than one location), the cost of travel, and the time limitations of managers.

The collaboration and social technologies we have just described are ways of overcoming the limitations of time and space. Using this time/space framework will help you to choose the most appropriate collaboration and teamwork tools for your firm. Note that some tools are applicable in more than one time/place scenario. For example, Internet collaboration suites such as IBM Notes have capabilities for both synchronous (instant messaging, meeting tools) and asynchronous (e-mail, wikis, document editing) interactions.

FIGURE 2.8   THE TIME/SPACE COLLABORATION AND SOCIAL TOOL MATRIX

Collaboration and social technologies can be classified in terms of whether they support interactions at the same or different times or places, and whether these interactions are remote or colocated.
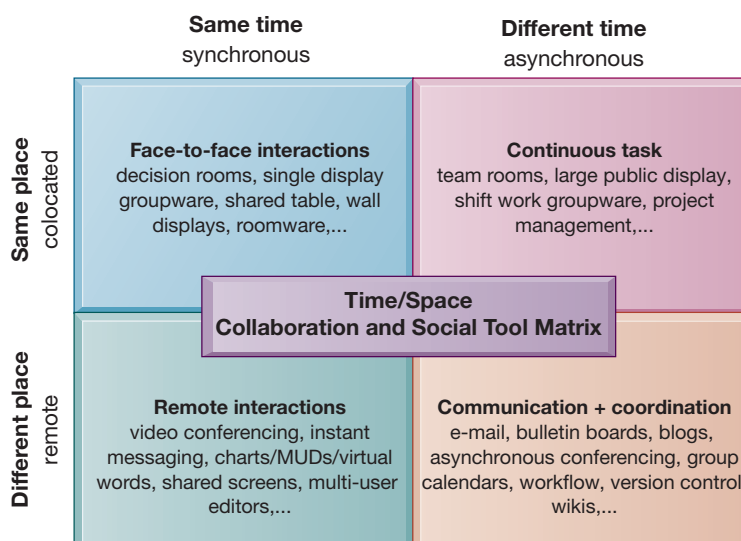
Here's a "to-do" list to get started. If you follow these six steps, you should be led to investing in the correct collaboration software for your firm at a price you can afford and within your risk tolerance.

1. What are the collaboration challenges facing the firm in terms of time and space? Locate your firm in the time/space matrix. Your firm can occupy more than one cell in the matrix. Different collaboration tools will be needed for each situation.

2. Within each cell of the matrix where your firm faces challenges, exactly what kinds of solutions are available? Make a list of vendor products.

3. Analyze each of the products in terms of its cost and benefits to your firm. Be sure to include the costs of training in your cost estimates and the costs of involving the information systems department, if needed.

4. Identify the risks to security and vulnerability involved with each of the products. Is your firm willing to put proprietary information into the hands of external service providers over the Internet? Is your firm willing to expose its important operations to systems controlled by other firms? What are the financial risks facing your vendors? Will they be here in three to five years? What would be the cost of making a switch to another vendor in the event the vendor firm fails?

5. Seek the help of potential users to identify implementation and training issues. Some of these tools are easier to use than others.

6. Make your selection of candidate tools, and invite the vendors to make presentations.

2-4 What is the role of the information systems function in a business?

We've seen that businesses need information systems to operate today and that they use many different kinds of systems. But who is responsible for running these systems? Who is responsible for making sure the hardware, software, and other technologies used by these systems are running properly and are up to date? End users manage their systems from a business standpoint, but managing the technology requires a special information systems function.

The Information Systems Department

In all but the smallest of firms, the **information systems department** is the formal organizational unit responsible for information technology services. The information systems department is responsible for maintaining the hardware, software, data storage, and networks that comprise the firm's IT infrastructure. We describe IT infrastructure in detail in Chapter 5.

The information systems department consists of specialists, such as programmers, systems analysts, project leaders, and information systems managers. **Programmers** are highly trained technical specialists who write the software instructions for computers. **Systems analysts** constitute the principal liaisons between the information systems groups and the rest of the organization. It is the systems analyst's job to translate business problems and requirements into information requirements and systems. **Information systems managers** are leaders of teams of programmers and analysts, project managers, physical facility managers, telecommunications managers, or database specialists. They are also managers of computer operations and data entry staff. Also, external specialists, such as hardware vendors and manufacturers, software firms, and

consultants, frequently participate in the day-to-day operations and long-term planning of information systems.

In many companies, the information systems department is headed by a **chief information officer (CIO)**. The CIO is a senior manager who oversees the use of information technology in the firm. Today's CIOs are expected to have a strong business background as well as information systems expertise and to play a leadership role in exploring new technologies and integrating technology into the firm's business strategy. Large firms today also have positions for a chief security officer, chief knowledge officer, chief data officer, and chief privacy officer, all of whom work closely with the CIO.

The **chief security officer (CSO)** is in charge of information systems security for the firm and is responsible for enforcing the firm's information security policy (see Chapter 8). (Sometimes this position is called the chief information security officer [CISO] where information systems security is separated from physical security.) The CSO is responsible for educating and training users and information systems specialists about security, keeping management aware of security threats and breakdowns, and maintaining the tools and policies chosen to implement security.

Information systems security and the need to safeguard personal data have become so important that corporations collecting vast quantities of personal data have established positions for a **chief privacy officer (CPO)**. The CPO is responsible for ensuring that the company complies with existing data privacy laws.

The **chief knowledge officer (CKO)** is responsible for the firm's knowledge management program. The CKO helps design programs and systems to find new sources of knowledge or to make better use of existing knowledge in organizational and management processes.

The **chief data officer (CDO)** is responsible for enterprise-wide governance and utilization of information to maximize the value the organization can realize from its data. The CDO ensures that the firm is collecting the appropriate data to serve its needs, deploying appropriate technologies for analyzing the data, and using the results to support business decisions. This position arose to deal with the very large amounts of data organizations are now generating and collecting (see Chapter 6).

End users are representatives of departments outside of the information systems group for whom applications are developed. These users are playing an increasingly large role in the design and development of information systems.

In the early years of computing, the information systems group was composed mostly of programmers who performed highly specialized but limited technical functions. Today, a growing proportion of staff members are systems analysts and network specialists, with the information systems department acting as a powerful change agent in the organization. The information systems department suggests new business strategies and new information-based products and services and coordinates both the development of the technology and the planned changes in the organization.

In 2019 there are about 4.5 million information system managers and employees in the United States, with an estimated growth rate of 13 percent through 2026, expanding the number of new jobs by more than 550,000. Although all IT/IS occupations show above-average growth, the fastest-growing occupations are information security analysts (28 percent), software developers (24 percent), computer scientists (19 percent), web developers (15 percent), IS/IT managers (12 percent), computer support specialists (11 percent), database administrators (11 percent), systems analysts (9 percent), computer network architects (6 percent), and network and system administrators (6 percent) (Bureau of Labor Statistics, 2018). The number of computer programmers will decline 7 percent in

this period, in part because the process of creating computer programs is becoming increasingly efficient with the growth of online software services, cloud computing, and outsourcing of coding to low-wage countries. In general, the management of IT occupations is showing faster expansion than the technical occupations in IT. System and network security management positions are especially in demand. See the Learning Track for this chapter titled "Occupational and Career Outlook for Information Systems Majors 2016–2026" for more details on IS job opportunities.

Organizing the Information Systems Function

There are many types of business firms, and there are many ways in which the IT function is organized within the firm. A very small company will not have a formal information systems group. It might have one employee who is responsible for keeping its networks and applications running, or it might use consultants for these services. Larger companies will have a separate information systems department, which may be organized along several different lines, depending on the nature and interests of the firm. Our Learning Track describes alternative ways of organizing the information systems function within the business.

The question of how the information systems department should be organized is part of the larger issue of IT governance. **IT governance** includes the strategy and policies for using information technology within an organization. It specifies the decision rights and framework for accountability to ensure that the use of information technology supports the organization's strategies and objectives. How much should the information systems function be centralized? What decisions must be made to ensure effective management and use of information technology, including the return on IT investments? Who should make these decisions? How will these decisions be made and monitored? Firms with superior IT governance will have clearly thought out the answers.

2-5 How will MIS help my career?

Here is how Chapter 2 and this book can help you find a job as a sales support specialist.

The Company

Comprehensive Supplemental Insurance USA is a leading provider of individual supplemental accident, disability, health, and life insurance products. It is headquartered in Minneapolis and has an open position for an entry-level sales support specialist. The company offers supplemental insurance to complement existing employer benefits programs, maintaining a field sales force and corporate staff of over 5,000 people worldwide. It is known for investing in its employees and their career development.

Position Description

This position will provide overall systems, administrative, and data management support to the national sales organization for the company's division that markets to small businesses. Job responsibilities include:

- Daily administration and support of the firm's Salesforce.com customer relationship management system, including managing user setup, profiles and roles, and validating data.

- Assisting with data management and providing system training and ongoing support to the field.
- Preparing routine weekly, monthly, and quarterly sales and key performance indicator reports for sales management.
- Preparing agent commission reports and creating new reports as requested.
- Supporting various projects related to agent licensing and agent compensation.

Job Requirements

- Strong Excel skills plus some knowledge of data management
- Strong customer service skills
- Strong analytical, critical thinking, and communication skills
- Ability to multitask in a fast-paced environment
- College degree or 2 years equivalent experience

Interview Questions

1. What do you know about customer relationship management? Have you ever worked with Salesforce.com? If so, what have you used the system for?
2. What do you know about data management? Have you ever worked with data management software? If so, what exactly have you done with it?
3. Tell us what you can do with Excel. What kinds of problems have you used Excel to solve? Did you take courses in Excel?
4. Have you ever worked in customer service? What exactly did you do? What do you think is required to take on a successful client-oriented role for this company's agents and customers?
5. Can you give an example of a client service challenge you had to face? How did you approach this challenge?

Author Tips

1. Review the section of this chapter on enterprise applications, the Chapter 9 discussion of customer relationship management, and Chapter 6 on data management.
2. Use the web and the professional networking site LinkedIn to find out more about the company, its insurance products and services, and the way it operates. Think about what it needs to do to support its agents and its customers and why customer relationship management and data management are so important. You might inquire about your responsibilities for data management in this job position.
3. Learn what you can about Salesforce.com, especially how to set up user profiles and roles and how to validate data. Indicate you want to learn more about Salesforce and work with this tool.
4. Inquire how you would be using Excel; for example, calculating agent commissions. If you've never done that before, show some of the Excel work you have done (and perhaps bring examples with you to the interview). Show that you would be eager to learn what you don't know in Excel to fulfill your job assignments.

REVIEW **SUMMARY**

2-1 **What are business processes? How are they related to information systems?**

A business process is a logically related set of activities that defines how specific business tasks are performed, and it represents a unique way in which an organization coordinates work, information, and knowledge. Managers need to pay attention to business processes because they determine how well the organization can execute its business, and they may be a source of strategic advantage. There are business processes specific to each of the major business functions, but many business processes are cross-functional. Information systems automate parts of business processes, and they can help organizations redesign and streamline these processes.

2-2 **How do systems serve the different management groups in a business, and how do systems that link the enterprise improve organizational performance?**

Systems serving operational management are transaction processing systems (TPS), such as payroll or order processing, that track the flow of the daily routine transactions necessary to conduct business. Management information systems (MIS) produce reports serving middle management by condensing information from TPS, and these are not highly analytical. Decision-support systems (DSS) support management decisions that are unique and rapidly changing using advanced analytical models. All of these types of systems provide business intelligence that helps managers and enterprise employees make more-informed decisions. These systems for business intelligence serve multiple levels of management and include executive support systems (ESS) for senior management that provide data in the form of graphs, charts, and dashboards delivered via portals using many sources of internal and external information.

Enterprise applications are designed to coordinate multiple functions and business processes. Enterprise systems integrate the key internal business processes of a firm into a single software system to improve coordination and decision making. Supply chain management systems help the firm manage its relationship with suppliers to optimize the planning, sourcing, manufacturing, and delivery of products and services. Customer relationship management (CRM) systems coordinate the business processes surrounding the firm's customers. Knowledge management systems enable firms to optimize the creation, sharing, and distribution of knowledge. Intranets and extranets are private corporate networks based on Internet technology that assemble information from disparate systems. Extranets make portions of private corporate intranets available to outsiders.

2-3 **Why are systems for collaboration and social business so important, and what technologies do they use?**

Collaboration is working with others to achieve shared and explicit goals. Social business is the use of internal and external social networking platforms to engage employees, customers, and suppliers, and it can enhance collaborative work. Collaboration and social business have become increasingly important in business because of globalization, the decentralization of decision making, and growth in jobs where interaction is the primary value-adding activity. Collaboration and social business enhance innovation, productivity, quality, and customer service. Tools for collaboration and social business include e-mail and instant messaging, wikis, virtual meeting systems, virtual worlds, cloud-based file-sharing services, corporate collaboration systems such as Microsoft SharePoint and IBM Notes, and enterprise social networking tools such as Chatter, Yammer, Jive, and IBM Connections.

2-4 **What is the role of the information systems function in a business?**

The information systems department is the formal organizational unit responsible for information technology services. It is responsible for maintaining the hardware, software, data storage, and networks that comprise the firm's IT infrastructure. The department consists of specialists, such as programmers, systems analysts, project leaders, and information systems managers, and is often headed by a CIO.

Key Terms

Business intelligence, 47
Chief data officer (CDO), 67
Chief information officer (CIO), 67
Chief knowledge officer (CKO), 67
Chief privacy officer (CPO), 67
Chief security officer (CSO), 67
Collaboration, 56
Customer relationship management (CRM) systems, 54
Decision-support systems (DSS), 49
Digital dashboard, 50
Electronic business (e-business), 55
Electronic commerce (e-commerce), 55
E-government, 55
End users, 67
Enterprise applications, 51
Enterprise systems, 53

Executive support systems (ESS), 50
Information systems department, 66
Information systems managers, 66
Interorganizational system, 54
IT governance, 68
Knowledge management systems (KMS), 54
Management information systems (MIS), 47
Portal, 50
Programmers, 66
Social business, 57
Supply chain management (SCM) systems, 54
Systems analysts, 66
Teams, 56
Telepresence, 61
Transaction processing systems (TPS), 46

MyLab MIS

To complete the problems marked with MyLab MIS, go to the EOC Discussion Questions in MyLab MIS.

Review Questions

2-1 What are business processes? How are they related to information systems?

- Define business processes and describe the role they play in organizations.
- Describe the relationship between information systems and business processes.

2-2 How do systems serve the different management groups in a business, and how do systems that link the enterprise improve organizational performance?

- Describe the characteristics of transaction processing systems (TPS) and the roles they play in a business.
- Describe the characteristics of management information systems (MIS) and explain how MIS differ from TPS and from DSS.
- Describe the characteristics of decision-support systems (DSS) and how they benefit businesses.
- Describe the characteristics of executive support systems (ESS) and explain how these systems differ from DSS.
- Explain how enterprise applications improve organizational performance.
- Define enterprise systems, supply chain management systems, customer relationship management systems, and knowledge

management systems and describe their business benefits.
- Explain how intranets and extranets help firms integrate information and business processes.

2-3 Why are systems for collaboration and social business so important, and what technologies do they use?

- Define collaboration and social business and explain why they have become so important in business today.
- List and describe the business benefits of collaboration and social business.
- Describe a supportive organizational culture and business processes for collaboration.
- List and describe the various types of collaboration and social business tools.

2-4 What is the role of the information systems function in a business?

- Describe how the information systems function supports a business.
- Compare the roles played by programmers, systems analysts, information systems managers, the chief information officer (CIO), the chief security officer (CSO), the chief data officer (CDO), and the chief knowledge officer (CKO).

Discussion Questions

2-5
MyLab MIS
How could information systems be used to support the order fulfillment process illustrated in Figure 2.1? What are the most important pieces of information these systems should capture? Explain your answer.

2-6
MyLab MIS
Identify the steps that are performed in the process of selecting and checking out a book from your college library and the information that flows among these activities. Diagram the process. Are there any ways this process could be changed to improve the performance of your library or your school? Diagram the improved process.

2-7
MyLab MIS
Use the time/space collaboration and social tool matrix to classify the collaboration and social technologies used by Sanofi Pasteur.

Hands-On MIS Projects

The projects in this section give you hands-on experience analyzing opportunities to improve business processes with new information system applications, using a spreadsheet to improve decision making about suppliers, and using Internet software to plan efficient transportation routes. Visit MyLab MIS to access this chapter's Hands-On MIS Projects.

Management Decision Problems

2-8 Don's Lumber Company on the Hudson River features a large selection of materials for flooring, decks, moldings, windows, siding, and roofing. The prices of lumber and other building materials are constantly changing. When a customer inquires about the price on prefinished wood flooring, sales representatives consult a manual price sheet and then call the supplier for the most recent price. The supplier in turn uses a manual price sheet, which has been updated each day. Often, the supplier must call back Don's sales reps because the company does not have the newest pricing information immediately on hand. Assess the business impact of this situation, describe how this process could be improved with information technology, and identify the decisions that would have to be made to implement a solution.

2-9 Henry's Hardware is a small family business in Sacramento, California. The owners, Henry and Kathleen, must use every square foot of store space as profitably as possible. They have never kept detailed inventory or sales records. As soon as a shipment of goods arrives, the items are immediately placed on store shelves. Invoices from suppliers are only kept for tax purposes. When an item is sold, the item number and price are rung up at the cash register. The owners use their own judgment in identifying items that need to be reordered. What is the business impact of this situation? How could information systems help Henry and Kathleen run their business? What data should these systems capture? What decisions could the systems improve?

Improving Decision Making: Using a Spreadsheet to Select Suppliers

Software skills: Spreadsheet date functions, data filtering, DAVERAGE function
Business skills: Analyzing supplier performance and pricing

2-10 In this exercise, you will learn how to use spreadsheet software to improve management decisions about selecting suppliers. You will filter transactional data on suppliers based on several different criteria to select the best suppliers for your company.

You run a company that manufactures aircraft components. You have many competitors who are trying to offer lower prices and better service to customers, and you are trying to determine whether you can benefit from better supply chain management. In MyLab MIS, you will find a spreadsheet file that contains a list of all of the items that your firm has ordered from its suppliers during the past three months. The fields in the spreadsheet file include vendor name, vendor identification number, purchaser's order number, item identification number and item description (for each item ordered from the vendor), cost per item, number of units of the item ordered (quantity), total cost of each order, vendor's accounts payable terms, order date, and actual arrival date for each order.

Prepare a recommendation of how you can use the data in this spreadsheet database to improve your decisions about selecting suppliers. Some criteria to consider for identifying preferred suppliers include the supplier's track record for on-time deliveries, suppliers offering the best accounts payable terms, and suppliers

offering lower pricing when the same item can be provided by multiple suppliers. Use your spreadsheet software to prepare reports to support your recommendations.

Achieving Operational Excellence: Using Internet Software to Plan Efficient Transportation Routes

Software skills: Internet-based software
Business skills: Transportation planning

2-11 In this exercise, you will use Google Maps to map out transportation routes for a business and select the most efficient route.

You have just started working as a dispatcher for Cross-Country Transport, a new trucking and delivery service based in Cleveland, Ohio. Your first assignment is to plan a delivery of office equipment and furniture from Elkhart, Indiana (at the corner of E. Indiana Ave. and Prairie Street), to Hagerstown, Maryland (at the corner of Eastern Blvd. N. and Potomac Ave.). To guide your trucker, you need to know the most efficient route between the two cities. Use Google Maps to find the route that is the shortest distance between the two cities. Use Google Maps again to find the route that takes the least time. Compare the results. Which route should Cross-Country use?

Collaboration and Teamwork Project

Identifying Management Decisions and Systems

2-12 With a team of three or four other students, find a description of a manager in a corporation in *Business Week, Forbes, Fortune*, the *Wall Street Journal*, or another business publication, or do your research on the web. Gather information about what the manager does and the role he or she plays in the company. Identify the organizational level and business function where this manager works. Make a list of the kinds of decisions this manager has to make and the kind of information the manager would need for those decisions. Suggest how information systems could supply this information. If possible, use Google Docs and Google Drive or Google Sites to brainstorm, organize, and develop a presentation of your findings for the class.

Should Companies Embrace Social Business?
CASE STUDY

As companies become more dispersed in the global marketplace, businesses are turning increasingly to workplace collaboration technology, including tools for internal social networking. These tools can promote employee collaboration and knowledge sharing, and help employees make faster decisions, develop more innovative ideas for products and services, and become more engaged in their work and their companies.

Adoption of internal enterprise social networking is also being driven by the flood of email that employees typically receive each day and are increasingly unable to handle. Hundreds of email messages must be opened, read, answered, forwarded, or deleted. For example, too much email is what drove Hawk Ridge Systems to adopt a Glip, a cloud-based social tool for its 200 employees located in 15 offices in the United States and Canada. Glip features real-time messaging, group chat, videoconferencing, shared calendars, task management, and file sharing all in one place. Glip helped Hawk Ridge operations manager Samuel Eakin go from 200 to around 30 emails per day. Another driver of enterprise social networking is "app fatigue." In order to collaborate, many employees have to log on to numerous apps, creating additional work. Contemporary enterprise social networking systems often integrate multiple capabilities in one place.

A recent survey of 421 professionals conducted by Harvard Business Review Analytics Services found that collaboration tools could be effective in boosting efficiency and productivity, while enabling users to make better business decisions. The products also expanded the potential for innovation. However, not all companies are successfully using them. Implementation and adoption of enterprise social networking depend not only on the capabilities of the technology but on the organization's culture and the compatibility of these tools with the firm's business processes.

When firms introduce new social media technology (as well as other technologies), a sizable number of employees resist the new tools, clinging to old ways of working, including email, because these methods are more familiar and comfortable. There are companies where employees have duplicated communication on both social media and email, increasing the time and cost of performing their jobs. BASF, the world's largest chemical producer with subsidiaries and joint ventures in more than 80 countries, prohibited some project teams from using e-mail to encourage employees to use new social media tools.

Social business requires a change in thinking, including the ability to view the organization more democratically in a flatter and more horizontal way. A social business is much more open to everyone's ideas. A secretary, assembly line worker, or sales clerk might be the source of the next big idea. As a result, getting people to espouse social business tools requires a more of a "pull" approach, one that engages workers and offers them a significantly better way to work. In most cases, they can't be forced to use social business apps.

Enterprise capabilities for managing social networks and sharing digital content can help or hurt an organization. Social networks can provide rich and diverse sources of information that enhance organizational productivity, efficiency, and innovation, or they can be used to support pre-existing groups of like-minded people that are reluctant to communicate and exchange knowledge with outsiders. Productivity and morale will fall if employees use internal social networks to criticize others or pursue personal agendas.

Social business applications modeled on consumer-facing platforms such as Facebook and Twitter will not necessarily work well in an organization or organizational department that has incompatible objectives. Will the firm use social business for operations, human resources, or innovation? The social media platform that will work best depends on its specific business purpose. Additionally, employees who have actively used Facebook and Twitter in their personal lives are often hesitant to use similar social tools for work purposes because they see social media primarily as an informal, personal means of self-expression and communication with friends and family. Most managers want employees to use internal social tools to communicate informally about work, but not to discuss personal matters. Employees accustomed to Facebook and Twitter may have trouble

imagining how they could use social tools without getting personal.

This means that instead of focusing on the technology, businesses should first identify how social initiatives will actually improve work practices for employees and managers. They need a detailed understanding of social networks: how people are currently working, with whom they are working, what their needs are, and measures for overcoming employee biases and resistance.

A successful social business strategy requires leadership and behavioral changes. Just sponsoring a social project is not enough—managers need to demonstrate their commitment to a more open, transparent work style. Employees who are used to collaborating and doing business in more traditional ways need an incentive to use social software. Changing an organization to work in a different way requires enlisting those most engaged and interested to help design and build the right workplace environment for using social technologies.

Management needs to ensure that the internal and external social networking efforts of the company are providing genuine value to the business. Content on the networks needs to be relevant, up to date, and easy to access; users need to be able to connect to people that have the information they need and that would otherwise be difficult or impossible to reach. Social business tools should be appropriate for the tasks on hand and the organization's business processes, and users need to understand how and why to use them.

For example, NASA's Goddard Space Flight Center had to abandon a custom-built enterprise social network called Spacebook because no one knew how its social tools would help people do their jobs. Spacebook had been designed and developed without taking into consideration the organization's culture and politics. This is not an isolated phenomenon. Dimension Data found that one-fourth of the 900 enterprises it surveyed focused more on the successful implementation of collaboration technology, rather than how it's used and adopted.

Despite the challenges associated with launching an internal social network, there are companies using these networks successfully. For example, Covestro, a leading global supplier of coatings and adhesives, polyurethanes, and highly impact-resistant plastics, made social collaboration a success by making the tools more accessible; demonstrating the value of these tools in pilot projects; employing a reverse mentoring

program for senior executives; and training employee experts to spread know-how of the new social tools and approaches within the company, and demonstrate their usefulness. Using IBM Connections as the social business toolset, Covestro's efforts are now paying off: 50 percent of employees are now routinely active in the company's enterprise social network. Although ROI on social business initiatives has been difficult to measure, Covestro has benefited from faster knowledge flows, increased efficiency, and lower operating costs.

Another company that has made social business work is ModCloth, a popular online apparel, accessories, and home décor retailer noted for its fun and engaging customer shopping experience. The company's business is based on strong social media ties with customers, with 134,000 Twitter followers and 1,600,000 Facebook "likes." Because social networks played such a large role in ModCloth's growth and development, the company was eager to adopt social networking tools for internal communication. ModCloth adopted Microsoft's Yammer as its social business tool.

ModCloth started piloting Yammer with a small test group, and used a People Team to promote the tool. Yammer caught on quickly with employees, and was soon being used by over 250 employees across four offices in the United States. Every new ModCloth employee is introduced to Yammer on his or her first day of work. Yammer helps new hires learn their coworkers' names and feel they are part of the company.

Yammer has proved very useful for connecting people and ideas, saving ModCloth considerable time and money. For example, Scott Hernandez, ModCloth Head of Talent Acquisition, has used Yammer to identify promising hires for engineering through referrals from ModCloth employees. Yammer has helped save teams from duplicating work that has already been done. ModCloth's User Experience group began designing a research campaign to find out what users wanted in mobile applications for the company, posting news of the project to Yammer. Within hours, a member of ModCloth's Social Team posted the results of a large user survey on mobile expectations, including a detailed spreadsheet with customer feedback data that it had already completed. The User Experience team was able to save two weeks of work.

The Esquel Group, based in Hong Kong, is a supplier of cotton textiles and apparel, doing everything from cotton farming and fabric production to garment manufacturing and finishing. Its core business

is making cotton tops for fashion brands such as Lacoste, Ralph Lauren, and Nike. This company was attracted to internal social networking as a way to unite its different lines of business in various locations. Esquel chose Microsoft Yammer as its enterprise social networking tool. Esquel employees communicate in a variety of languages, so it especially appreciated Yammer's translation capabilities.

Management sees many benefits in being able to "listen" to its workforce. When people post complaints on the network, it is able to find innovative solutions and new ideas. For example, workers in Esquel's garment operation posted a complaint on Yammer about having to wait in a long line to recharge their cards for purchasing meals in the company cafeteria. Four months later, the company had a solution—a kiosk that instantly transferred funds from payroll to the meal card.

Ideas posted on Yammer were used to improve Esquel's quality control process. Instead of using measuring tape to ensure that sleeves and collars matched specifications, an employee in the quality control department used Yammer to float the idea of an electric ruler. The concept was refined through more Yammer discussion. Instead of taking measurements and writing numbers down, staff can capture measurements faster and more accurately electronically.

Yammer also helps Esquel replicate innovation- and efficiency-promoting solutions throughout the company. Traditionally, an innovation at one site often is not rolled out to other locations. Yammer provides a channel for news of innovations and better practices to spread more easily throughout the organization.

Esquel's industry is one where companies often move to lower-wage countries as labor costs rise. Rather than relocating operations, Esquel prefers to achieve savings through improvements in productivity. By helping employees work more efficiently and effectively, business social networking has helped Esquel save approximately $2 million each year.

Sources: "Top Four Social Collaboration Software Fails," search-mobilecoputing.techtarget.com, accessed February 7, 2018; "ModCloth: Keeping Employees Engaged While Scaling Up," and "Esquel Group: Social Technology Weaves an Enterprise Together," blogs.office.com, accessed February 7, 2018; Margaret Jones and Cordelia Kroob, "The Growth of an Enterprise Social Network at BASF," www.simply-communicate.com, accessed March 12, 2018; Paul Leonardi and Tsedal Neeley, "What Managers Need to Know About Social Tools," *Harvard Business Review*, November-December 2017; Sue Hildreth, "What's Next for Workplace Collaboration?" searchcontentmanagement.com, March 2, 2017; Arunima Majumdar, "3 Reasons Why Collaboration Tools Fail to Make the intended Impact," *eLearning Industry*, January 20, 2017; Harvard Business Review Analytic Services, "Collaboration Technology Boosts Organizations," Insight Enterprises Inc. (February 13, 2017); and Dimension Data, "2016 Connected Enterprise Report," 2016.

CASE STUDY QUESTIONS

2-13 Identify the management, organization, and technology factors affecting adoption of internal corporate social networks.

2-14 Compare the experiences implementing internal social networks of the organizations described in this case. Why were some successful? What role did management play in this process?

2-15 Should all companies implement internal enterprise social networks? Why or why not?

MyLab MIS

Go to the Assignments section of MyLab MIS to complete these writing exercises.

2-16 Identify and describe the capabilities of enterprise social networking software. Describe how a firm could use each of these capabilities.

2-17 Describe the systems used by various management groups within the firm in terms of the information they use, their outputs, and groups served.

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