Chapter 2: Global E-business and Collaboration

Learning Track 1: Systems from a Functional Perspective

We will start by describing systems using a functional perspective because this is the most straightforward approach, and, in fact, because this is how you will likely first encounter systems in a business. For instance, if you are a marketing major and take a job in marketing, you will be working on the job first with marketing information systems. If you are an accounting major, you will be working with accounting and financial systems first. From a historical perspective, functional systems were the first kinds of systems developed by business firms. These systems were located in specific departments, such as accounting, marketing and sales, production, and human resources. Let's take a close look at systems from this functional perspective.

Sales and Marketing Systems

The sales and marketing function is responsible for selling the organization's products or services. Marketing is concerned with identifying the customers for the firm's products or services, determining what customers need or want, planning and developing products and services to meet their needs, and advertising and promoting these products and services. Sales is concerned with contacting customers, selling the products and services, taking orders, and following up on sales. Sales and marketing information systems support these activities.

Table 2-1 shows that information systems are used in sales and marketing in a number of ways. Sales and marketing systems help senior management monitor trends affecting new products and sales opportunities, support planning for new products and services, and monitor the performance of competitors. Sales and marketing systems aid middle management by supporting market research and by analyzing advertising and promotional campaigns, pricing decisions, and sales performance. Sales and marketing systems assist operational management and employees in locating and contacting prospective customers, tracking sales, processing orders, and providing customer service support.

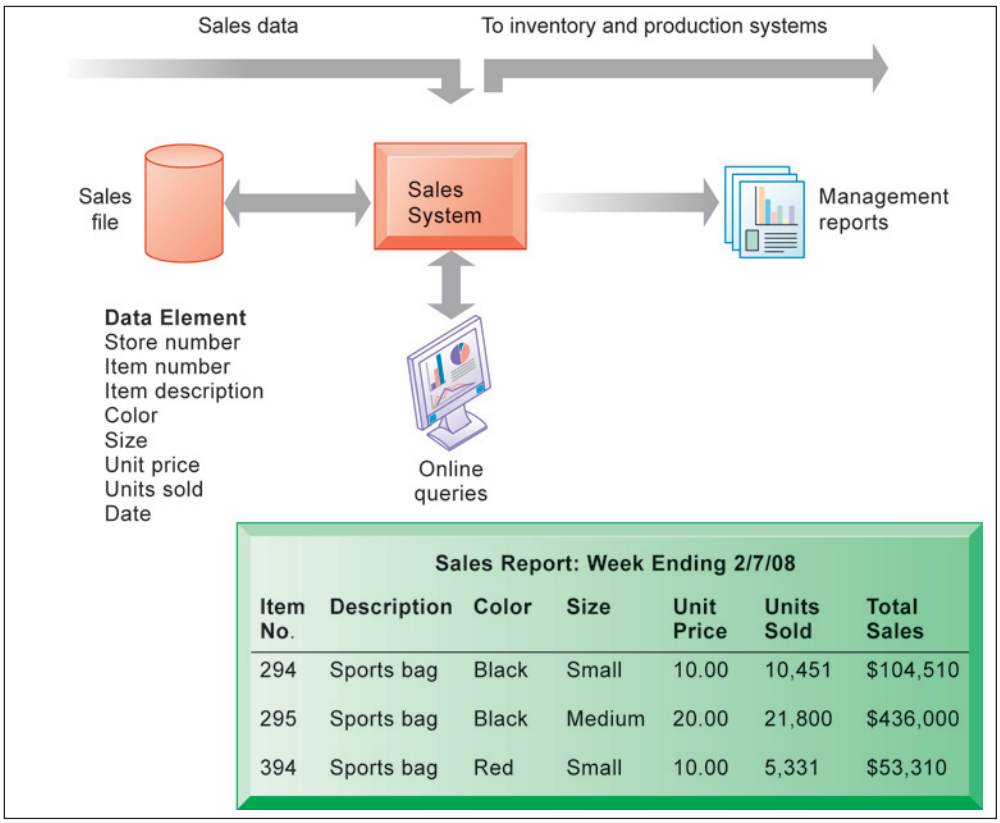
Figure 2-1 illustrates a sales information system used by retailers, such as The Gap or Target. Point-of-sale devices (usually handheld scanners at the checkout counter) capture data about each item sold, which update the sales system's figures about sales and send data about items sold to related systems dealing with items remaining in inventory and with production. These businesses use this information to track which items have been sold, to determine sales revenue, and to identify hot-selling items and other sales trends.

continued

TABLE 2-1 Examples of Sales and Marketing Information Systems

System	Description	Groups Served
Order processing	Enter, process, and track orders	Operational management Employees
Pricing analysis	Determine prices for products and services	Middle management
Sales trend forecasting	Prepare five-year sales forecasts	Senior management

FIGURE 2-1 Example of a Sales Information System



This system captures sales data at the moment the sale takes place to help the business monitor sales transactions and to provide information to help management analyze sales trends and the effectiveness of marketing campaigns.

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Manufacturing and Production Systems

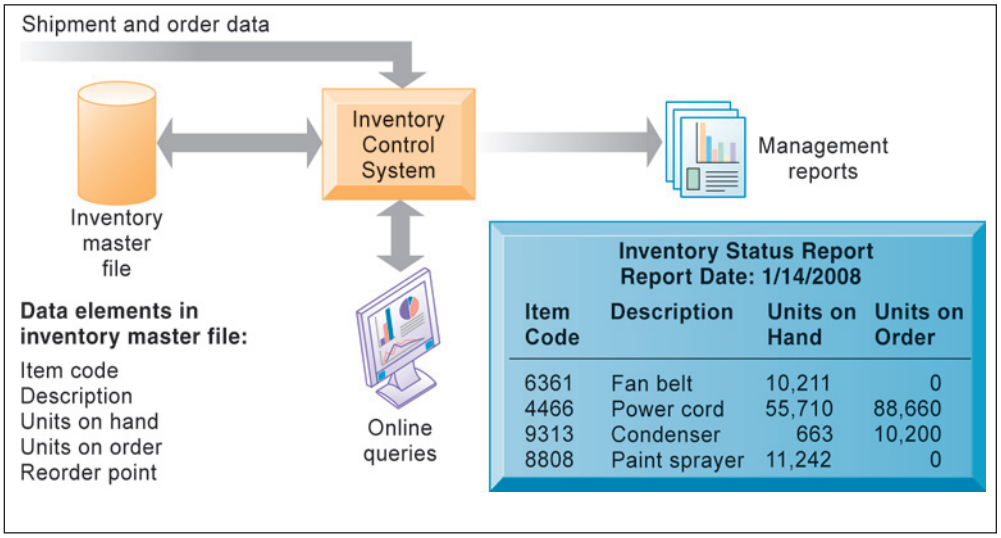
The manufacturing and production function is responsible for actually producing the firm's goods and services. Manufacturing and production systems deal with the planning, development, and maintenance of production facilities; the establishment of production goals; the acquisition, storage, and availability of production materials; and the scheduling of equipment, facilities, materials, and labor required to fashion finished products. Manufacturing and production information systems support these activities.

Table 2-2 shows some typical manufacturing and production information systems for each major organizational group. Senior management uses manufacturing and production systems that deal with the firm's long-term manufacturing goals, such as where to locate new plants or whether to invest in new manufacturing technology.

TABLE 2-2 Examples of Manufacturing and Production Information systems

System	Description	Groups Served
Machine control	Controls the actions of machines	Operational management and equipment
Production planning	Decides when and how many products should be produced	Middle management
Facilities location	Decides where to locate new production facilities	Senior management

FIGURE 2-2 Overview of an Inventory System



This system provides information about the number of items available in inventory to support manufacturing and production activities

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Manufacturing and production systems for middle management analyze and monitor manufacturing and production costs and resources. Operational management uses manufacturing and production systems that deal with the status of production tasks.

Most manufacturing and production systems use some sort of inventory system, as illustrated in Figure 2-2. Data about each item in inventory, such as the number of units depleted because of a shipment or purchase or the number of units replenished by reordering or returns, are either scanned or keyed into the system. The inventory master file contains basic data about each item, including the unique identification code for each item, a description of the item, the number of units on hand, the number of units on order, and the reorder point (the number of units in inventory that triggers a decision to reorder to prevent a stockout). Companies can estimate the number of items to reorder, or they can use a formula for calculating the least expensive quantity to reorder called the economic order quantity. The system produces reports that give information about such things as the number of each item available in inventory, the number of units of each item to reorder, or items in inventory that must be replenished.

Finance and Accounting Systems

The finance function is responsible for managing the firm's financial assets, such as cash, stocks, bonds, and other investments, to maximize the return on these financial assets. The finance function is also in charge of managing the capitalization of the firm (finding new financial assets in stocks, bonds, or other forms of debt). To determine whether the firm is getting the best return on its investments, the finance function must obtain a considerable amount of information from sources external to the firm.

The accounting function is responsible for maintaining and managing the firm's financial records—receipts, disbursements, depreciation, payroll—to account for the flow of funds in a firm. Finance and accounting share related problems—how to keep track of a firm's financial assets and fund flows. They provide answers to questions such as these: What is the current inventory of financial assets? What records exist for disbursements, receipts, payroll, and other fund flows?

Table 2-3 shows some of the typical finance and accounting information systems found in large organizations. Senior management uses finance and accounting systems to establish long-term investment goals for the firm and to provide long-range forecasts of the firm's financial performance. Middle management uses systems to oversee and control firm's financial resources. Operational management uses finance and accounting systems to track the flow of funds in the firm through transactions, such as paychecks, payments to vendors, securities reports, and receipts.

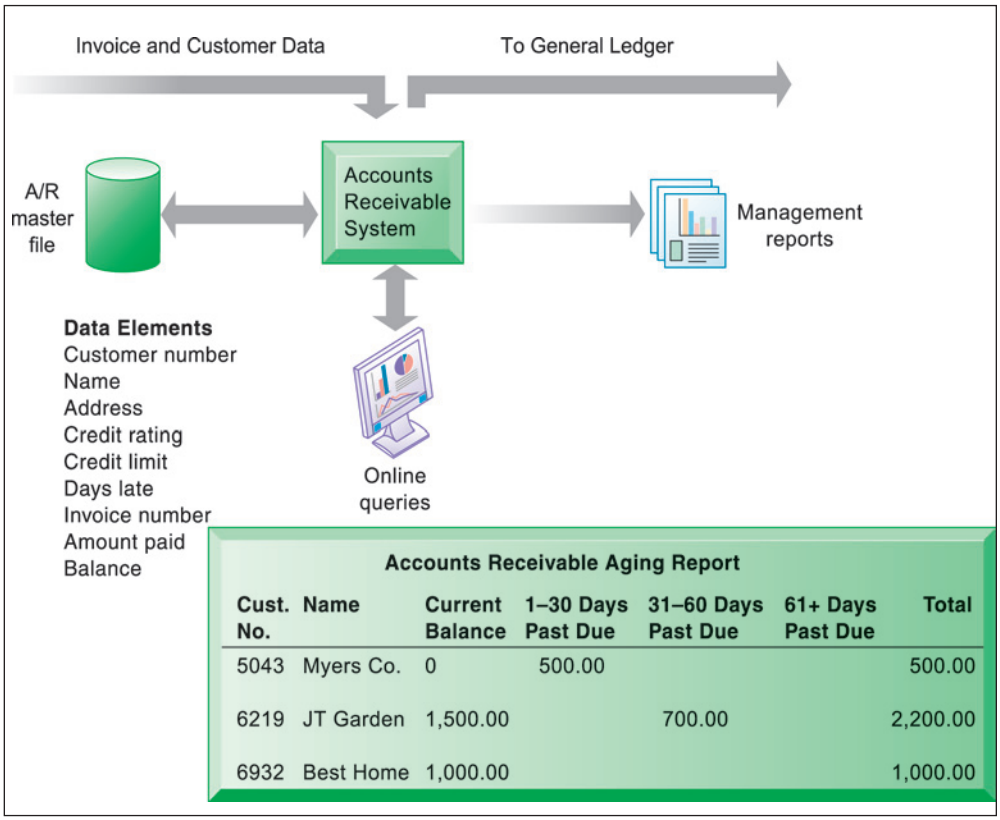
continued

TABLE 2-3 Examples of Finance and Accounting Information Systems

System	Description	Groups Served
Accounts receivable	Tracks money owed the firm	Operational management
Budgeting	Prepares short-term budgets	Middle management
Profit planning	Plans long-term profits	Senior management

Figure 2-3 illustrates an accounts receivable system, which keeps track of what customers who have made purchases on credit owe to a company. Every invoice generates an "account receivable"—that is, the customer owes the firm money. Some customers pay immediately in cash, but others are granted credit. The accounts receivable system records each invoice in a master file that also contains information on each customer, including that person's credit rating. The system also keeps track of all the bills outstanding and can produce a variety of output reports, both on paper and on the computer screen, to help the business collect bills. The system also answers queries about a customer's credit rating and payment history.

FIGURE 2-3 An Accounts Receivable System



An accounts receivable system tracks and stores important customer data, such as payment history, credit rating, and billing history.

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Human Resources Systems

The human resources function is responsible for attracting, developing, and maintaining the firm's workforce. Human resources information systems support activities such as identifying potential employees, maintaining complete records on existing employees, and creating programs to develop employees' talents and skills.

Human resources systems help senior management identify the manpower requirements (skills, educational level, types of positions, number of positions, and cost) for meeting the firm's long-term business plans. Middle management uses human resources systems to monitor and analyze the recruitment, allocation, and compensation of employees. Operational management uses human resources systems to track the recruitment and placement of the firm's employees (see Table 2-4).

TABLE 2-4 Examples of Human Resources Information Systems

System	Description	Groups Served
Training and development	Tracks employee training, skills, and performance appraisals	Operational management
Compensation analysis	Monitors the range and distribution of employee wages, salaries, and benefits	Middle management
Human resources planning	Plans the long-term labor force needs of the organization	Senior management

Figure 2-4 illustrates a typical human resources system for employee record keeping. It maintains basic employee data, such as the employee's name, age, sex, marital status, address, educational background, salary, job title, date of hire, and date of termination. The system can produce a variety of reports, such as lists of newly hired employees, employees who are terminated or on leaves of absence, employees classified by job type or educational level, or employee job performance evaluations. Such systems are typically designed to provide data that can satisfy federal and state record keeping requirements for Equal Employment Opportunity (EEO) and other purposes.

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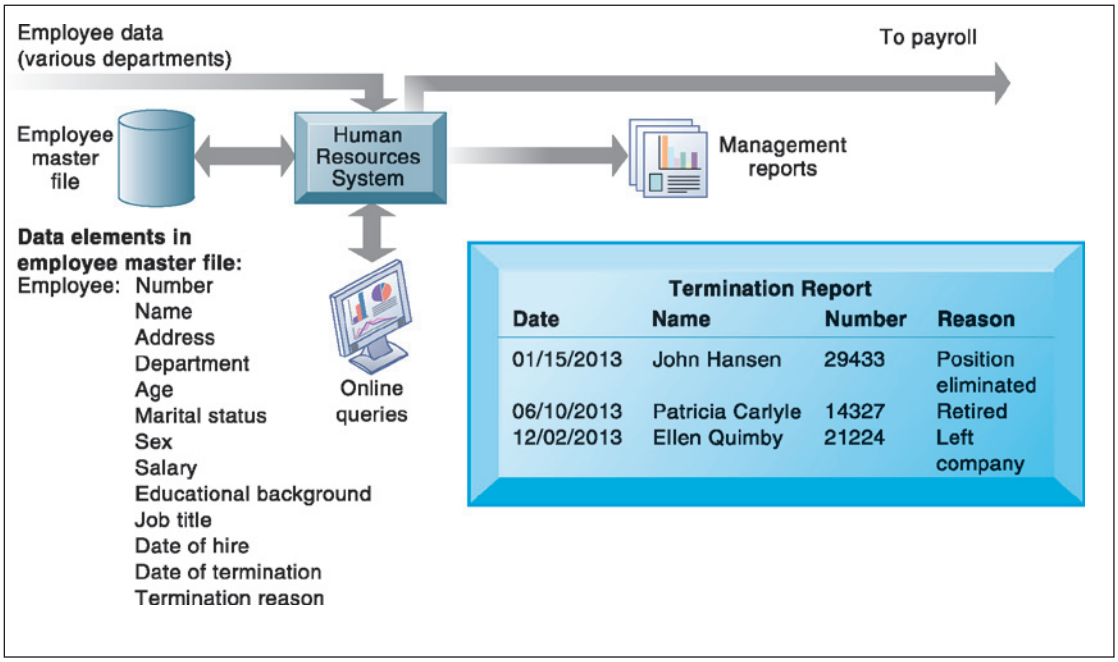
FIGURE 2-4 An Employee Record Keeping System



This system maintains data on the firm's employees to support the human resources function.

Google is an example of a company using a human resources system with a strategic orientation. Google is one of the world's most leading-edge, rapidly growing companies. It is best known for its powerful Internet search engine, but it is also the source of numerous other technology-based products and services. Innovation and knowledge are key business drivers. Google obviously has very special human resources requirements and prizes highly intelligent employees who can work in teams yet think outside the box.

Learning Track 2: Collaboration and Teamwork

Outline

RECOMMENDED VIDEOS:

- "Teamwork and Collaboration at Cisco." Cisco CEO John Chambers explains how abandoning command-and-control leadership has enabled the company to innovate more quickly, using collaboration and teamwork.
- See the Video Case Package for this book.

Introduction: It's a Collaborative World

It's a collaborative world that depends on teams of people working together across time zones and continents. It's a world of high bandwidth and "rich" communications, and "interaction" jobs where the value added by the employee is the ability to talk, write, present, persuade, sell and empathize with others. Over 40% of the labor force now has these kinds of jobs.

So what is collaboration, and what's the difference between cooperation, collaboration, and team work (project teams)? Figure 1-1 illustrates the differences and their relationship.

Cooperation (also referred to as "coordination") is working with others to achieve some shared (but not necessarily stated) goals. Cooperation comes from the fact that we are dependent on others, and we need to manage those dependencies somehow. For instance, you cooperate with your neighbors in keeping the neighborhood sidewalks clean; keeping an eye out for strangers; or deciding how to paint a fence that divides your property or a shared entrance. You cooperate with your spouse by putting dirty laundry in the washing machine. You help with the cooking and

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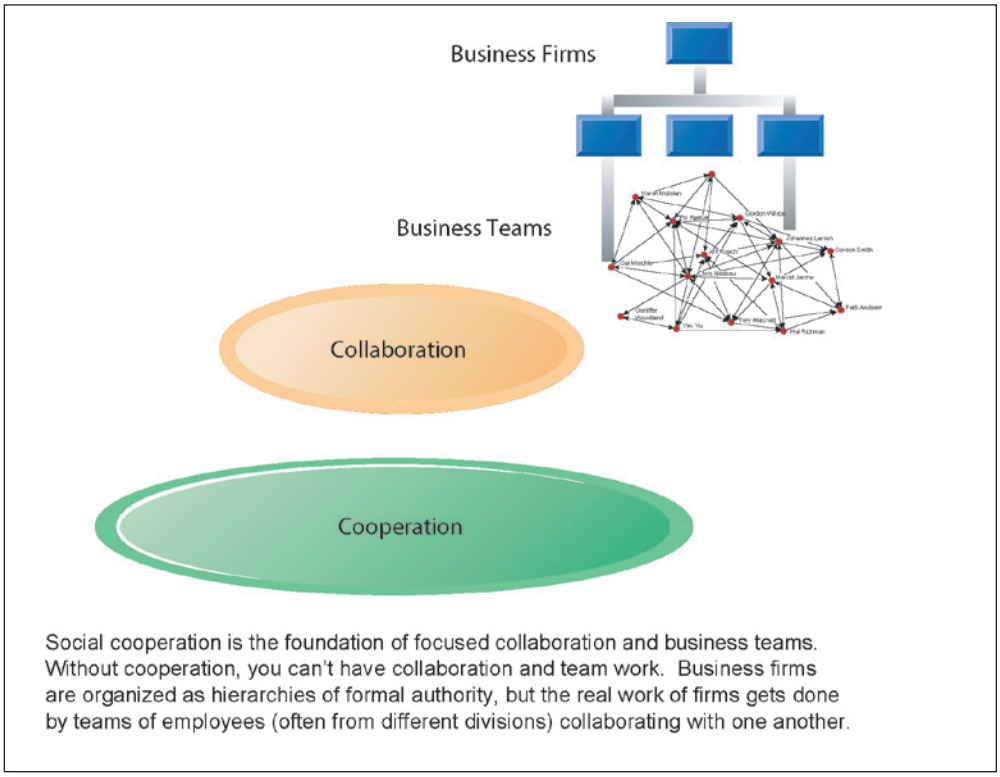
FIGURE 1-1 Cooperation, Collaboration, and Team work



Social cooperation is the foundation of focused collaboration and business teams. Without cooperation, you can't have collaboration and team work. Business firms are organized as hierarchies of formal authority, but the real work of firms gets done by teams of employees (often from different divisions) collaborating with one another.

dishes. You cooperate with complete strangers on the street by passing on the right, and you always go through revolving doors in the "right" way. Cooperation is general, broad, and the foundation of any organized social life. It occurs most often without anyone saying anything to one another. Without it, we would not have villages, towns, cities or countries. Or business firms. Now let's take it up a step.

Collaboration is cooperation that's more focused on task or mission accomplishment and usually takes place in a business, or other organization, and between businesses. It is explicit: we generally do talk about, plan and manage collaboration with one another.

You collaborate with a colleague in Tokyo looking for expertise on a topic you know nothing about. You collaborate with many colleagues in publishing a company blog. If you're in a law firm, you collaborate with accountants working 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 if the dependency among participants remains constant. You can collaborate informally with colleagues many times over a period of years through e-mail, voice mail, instant messaging, wikis (collections of documents), and bulletin boards. Collaboration can be one-to-one (among individuals), and many-to-many (collaboration among a number of people). Such collaborative groups are generally not a formal part of the business firm's organizational structure, but are rather informal groups. Now let's step it up one more time to talk about teams.

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Teams take all this one step further. Teams are part of the organization's business structure for getting things done. Teams and project groups are interchangeable terms. Teams have a specific mission that someone in the business assigned to them. They have a job to complete. The members of the team 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%," or "prevent insulating foam from falling off a space shuttle." 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. Teams often involve people in very different parts of a business firm, often in other time zones.

1.0 Why Are Collaboration and Teamwork So Important Today?

Collaboration and team work 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. Worked 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 the kinds of jobs we have require much closer coordination among the parties involved in producing the service or product. These so-called "interaction" jobs tend to be professional jobs in the service sector that require close coordination, and collaboration. But even in factories, workers today often work in production groups, or pods. Interaction jobs include most office jobs that require close coordination of many different people in order to complete the work. For instance, creating a Web site for a firm requires collaboration among senior management, marketing professionals, Web designers, and information technology specialists who can implement the site; delivering legal services requires a team of lawyers and accountants working together on a single case.
- **Growth of professional work.** In the last 50 years, the professional nature of work has greatly expanded. 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, more work is organized into groups and teams, who 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 has been pushed down in the organization, as have decision making powers.

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- **Changing scope of the firm.** The organization of the firm has changed from work at a single location, to work taking place in 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 2012, Ford produced 6.5 million automobiles and employed about 245,000 employees at 100 plants and facilities worldwide. More than half of its sales come from outside North America, as do one third of its revenues. 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 need to have teams working on a global basis.
- **Emphasis on innovation.** While we tend to think of innovations in business and science as coming from great individuals, but more common is that these great individuals are working with a team of brilliant colleagues, and all have been preceded by a long line of earlier innovators and innovations. 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.** There is growing support for the proposition that collaboration and team work produce better results, faster, than a similar number of people working in isolation from one another. 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 team work.

Briefly, collaboration and social networking have become a growing theme of social, political, and business organization in the age of the Internet. Economies, organizations and firms, along with their employees are becoming more informational, more global and above all more networked. Information technologies-from smart phones, netbooks and inexpensive servers, to high capacity broadband and large data centers, are all key components and enablers of collaboration practices.

2.0 What are the Business Benefits of Collaboration?

There are many articles and books that have been written about collaboration, some of them by business executives and consultants, and a great many by academic researchers in a variety of businesses. Nearly all of this research is anecdotal and testimonial rather than empirical assessments of collaboration within or between organizations. Among both business and academic communities there is a general belief that the more a business firm is "collaborative," the more successful it will

continued

be. Nearly all writers agree that collaboration is now more required within and between firms than was true in the past (for reasons outlined above).

Table 1-1 summarizes some of the benefits of collaboration identified by previous writers and scholars.

TABLE 1-1 Business Benefits of Collaboration and Their Rationale

Benefit	Rationale
Productivity	People working together can complete a complex task faster than the same number of people working in isolation from one another; there will be fewer errors.
Quality	People who work collaboratively can communicate errors, and take corrective actions faster, when they work together than if they worked in isolation. Reduction in buffers and time delay among production units.
Innovation	People working collaboratively in groups can come up with more innovative ideas for products, services, and administration than the same number working in isolation from one another. Advantages to diversity and the "wisdom of crowds."
Customer service	People working together in teams 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 financial performance

One of the difficulties of obtaining solid empirical evidence of these contributions involves the difficulties in measuring "extent of collaboration." One empirical study sponsored by Verizon Business and Microsoft created a collaboration index to measure the impact of communications culture, and deployment of collaborative technologies. That study concluded that "collaboration is a key driver of overall performance of companies around the world. Its impact is twice as significant as a company's aggressiveness in pursuing new market opportunities (strategic orientation) and five times as significant as the external market environment (market turbulence)… The results show that collaboration can positively impact each of the gold standards of performance - profitability, profit growth and sales growth - to determine a company's overall performance in the marketplace," according to Jaclyn Kostner, Ph.D., best-selling author, and expert on high-performance virtual collaboration. "As a general rule, global companies that collaborate better, perform better. Those that collaborate less, do not perform as well. It's just that simple."

A more rigorous empirical analysis of the diffusion of information in a single corporation found that social networks--the foundation of collaboration-- were exceptionally powerful in moving news information up and down the hierarchy of a firm, while discussions of topics were expedited among peers at that same level in an organization. The overall economic benefit of collaboration

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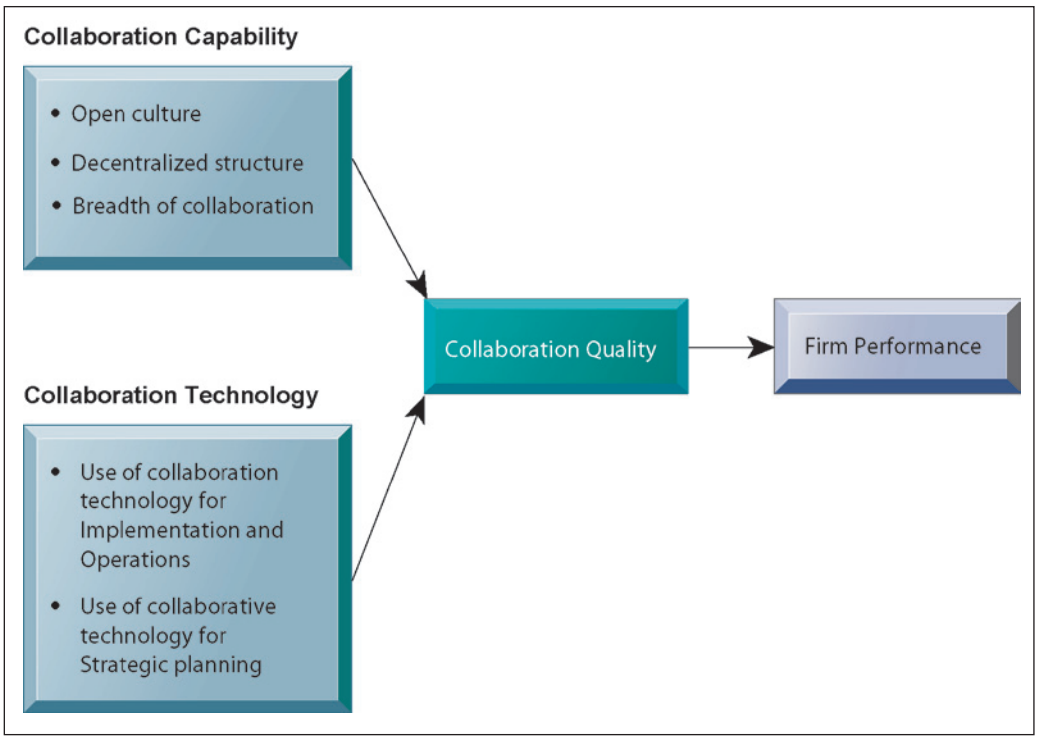
was signficicant: for every word seen by an employee in emails from others, $70 of additional revenue was generated (Aral, Brynjolfsson, and Van Alstyne, 2007).

Figure 1-2 depicts the model which the researchers came up with to explain their findings.

FIGURE 1-2 A Model of Collaboration



While there is scant empirical information to back up these statements, there is a wealth of anecdotal accounts which supports this general framework. While there are many presumed benefits to collaboration, as you can see in Figure 1-2, you really need the right business firm culture and the right decentralized structure before you can achieve meaningful collaboration. And you also need a health investment in collaborative technologies. We talk about these requirements below.

3.0 What Makes a Good Collaborator a Good Team Member?

So what does it take to be a good collaborator, a so-called "team player?" Think about some of the teams and groups you've been a member of, and consider the kinds of qualities of participants you respected. Table 1-2 provides a list of the eleven most important characteristics which are commonly found in the research literature on the qualities of good collaborators. This list is not exhaustive, but seeks to capture the central themes found in discussions of collaboration. These characteristics are in alphabetical order, not in order of importance.

continued

TABLE 1-2 Eleven Important Individual Characteristics for Collaboration

Characteristic	Description
Adaptable	Ability to learn; creative; works with a variety of others; mitigates problems; finds solutions.
Believe in collaboration	See teammates as collaborators; focused on team not self; selfless
Committed	Passionately believes in the mission and success of the team; enthusiastic; persistent.
Communicative	Ability to write, present, support; candid; truthful; believable; relates to others' needs; empathic.
Competent	Ability to complete assigned tasks; detail oriented; consistent
Dependable	Responds consistently to team requirements; individual requests
Disciplined	Hitting schedules, targets; persistence; tenacious
Value adder	Enhancing the abilities of others; teaching; exemplary.
Mission conscious	Big picture orientation; putting details into perspective.
Solutions orientation	Ability to come up with alternative solutions; brainstorming; thinking afresh.
Mission conscious	Big picture orientation; putting details into perspective.
Trustworthy	Dependable; discrete; reliable; integrity.

The characteristics of a good collaborator may seem a little abstract, but think of a basketball, football, or soccer team that you might have played on. Are these the characteristics you would want of your teammates? Are these characteristics they would want of you? Teams in business are not that different from teams in sports.

But this list is an "ideal" list. It's not what really happens in the real world of business (or sports teams). In fact, it would be a rare individual indeed who ranked number 1 on all these characteristics. Most of us might be passable on some, pretty good on others, and a star on a few. However, a good team has diversity: one or more people who are excellent on a few different characteristics. On a team of ten people, you might have two or three excellent learners; two really good communicators; a couple of solutions thinkers; most are highly competent for the mission although in different specialties, and most are committed, dependable, and mission conscious. These last three qualities-committed, dependable, and mission or goal oriented-seem to be absolute minimal requirements for good team members.

The significance of this finding is that it takes a diverse group of people to make a really successful team. You need a lot of different talents to make a team work. Sometimes this is also called synergy: the strengths of each of us complementing the strengths of others on the team. There are

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also management consequences discussed later. With a diverse group of talented people, it's possible for the output of a team to be much larger than the output of all the individuals in a group. In this case, the whole is greater than the sum of the parts.

TEAM BUILDING EXERCISE

With a team of 3-5 students, ask each member working alone to rank order the list in Table 1-1 in terms of importance to collaboration based on their own personal experience either in business or sports. Next, ask everyone to rate themselves on each characteristic using a 1 (weak) to 5 (very strong) scale. Come together and compare the rank orders that each person produced. You might find out how many people chose each feature as #1. If you have quantitative skills, you might calculate the rank order correlation coefficient for the rankings. What do you find? Next, compare the lists of individual strengths. What do you find?

From a business point of view, the meaning is obvious. If you could get all your people working together effectively on teams, you would greatly increase the total output, and the productivity of the firm would grow, all without hiring new people. So teamwork becomes integral to having a successful firm.

4.0 Leadership: What Makes a Good Team Leader?

All teams require some kind of leadership, some person or persons who take charge, to get things done and accomplish the mission. When we think of sports teams, from basketball to hockey, they all have leaders, people who call the plays and issue directions. Leaders are very important for collaboration on any team: they keep the team focused, support team work, and provide direction.

What makes for a good team leader? Thousands of books and an even larger number of articles have been written about leadership in business and elsewhere. Some "leaders" are appointed by their superiors (formal leaders like generals, and managers). Other leaders emerge spontaneously among a group of people working together (informal leaders). Quite often the formal leaders and the informal leaders are two different kinds of individuals: formal leaders are chosen by a hierarchy to serve the interests of those who appointed them, and informal leaders are chosen by the members of the team or business to represent the group or team to the larger world.

One way to think about both kinds of leaders is to consider that they generally are thought to have "more" of the key eleven characteristics that make for good team members, or more of the really important characteristics (Table 1-3).

continued

TABLE 1-3 Qualities of Leaders

Adaptable
Believe in collaboration
Committed
Communicative
Competent
Dependable
Disciplined
Value adder
Mission conscious
Solutions orientation
Mission conscious
Trustworthy

For instance, if you ask real world managers how they choose leaders for the teams needed by their business, they will tend to emphasize competence (does this person have the skills to get the job done), and communications capability (can this person talk and/or write, present, and listen). The other qualities are either assumed to be true, or as derived from superior competence and communications ability.

LEADERSHIP EXERCISE

With a team of 3-5 students, ask each member working alone to rank order the list in Table 1-3 in terms of the qualities of leadership they would use as managers when appointing leaders for their teams. You can score the team's performance by asking how people chose each characteristic as number 1. For instance, how many people in your group chose Adaptability as the number 1 quality they would use in choosing a leader. Do this for each characteristic. When finished, compare notes with one another, and examine the list of most favored characteristics. What kind of agreement is observed across members of the team?

Studies of teams and other social networks show that leaders-both formal and informal-are at the center of communications for their team, and also highly connected to other social teams and networks. Leaders are connected people (Figure 1-3).

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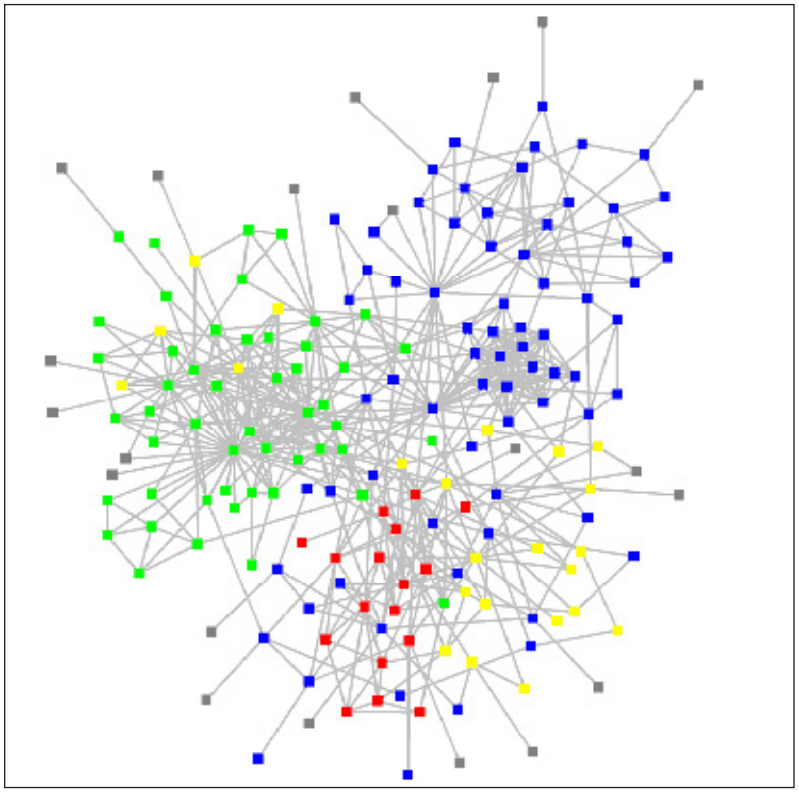
FIGURE 1-3 Social Networks in Crisis: E-mail Analysis



Following the missed deadline of an important project, a social network analysis company developed the above map of e-mail communications in the firm. One goal of the study was to identify the leaders in the company who potentially could get the project back on track, and another goal was discover how the various groups were linked together and the identity of these key people (so-called "bridges") across groups. There are five different colors of nodes (people): blue, grey, red, green, yellow) which represent members of five different groups or teams.

Source: mailchimp.com/blog/using-email-to-uncover-hidden-social-networks.

Examining Figure 1-3, you can see some interesting patterns. The groups blue, red, and green each have real "centers" where a small number of people receive and send a great deal of communications. These people are "leaders" of their teams because they are near the center of communication. You can also see some of these leaders are closely connected to other teams. These leaders are especially important as "bridges" across the organization: they communicate with a lot of people throughout the company as well as with their own members. These people tend to be the ones who can get additional resources for their teams. They are connected not just to people like themselves, but to others in different groups. Yellows, and grays, appear to talk more with other teams than they do among themselves. If you need leaders who can get the organization moving, these very highly connected individuals will be very influential.

5.0 How to Build and Manage a Collaborative Team

As a manager you will find that your success in large part will depend on the success of the teams you build and manage (Cohen and Prusak, 2001). Learning how to form successful teams in business is very important. Unfortunately, very little is written about how managers should form and manage teams. There are six steps to forming effective, collaborative, business teams.

1. **Identify the mission and teams.** As a manager you have some overarching objectives such as increasing sales to a new market, reducing costs in one part of the firm, or implementing

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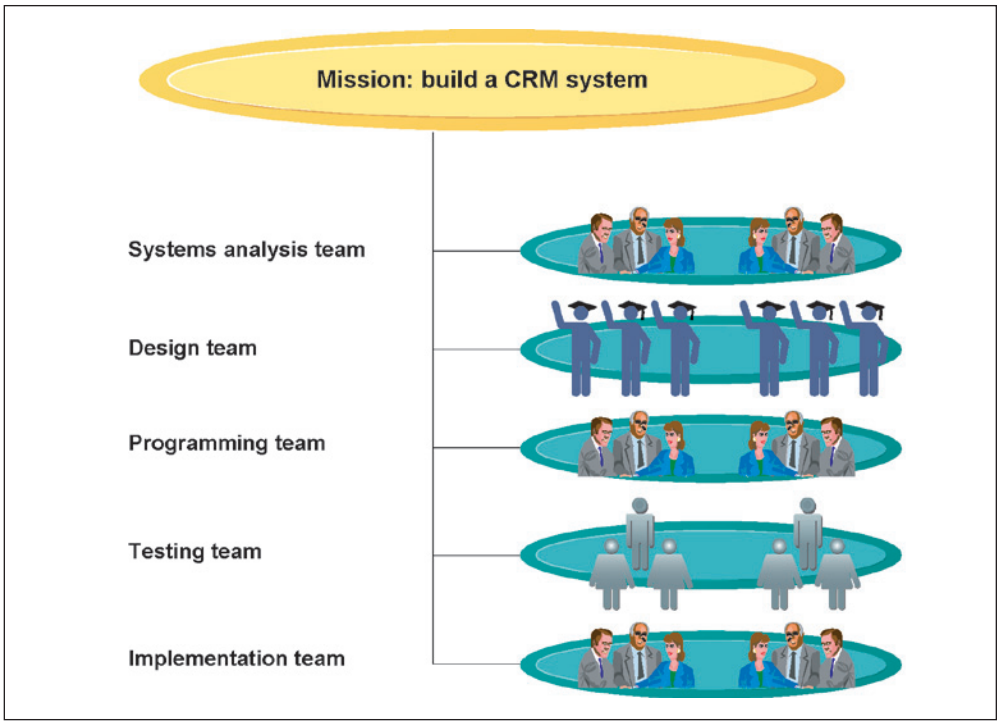
a new information system. Your job is to break this larger mission down into sub-objectives that smaller teams can be responsible for. Your next job is for the life of the project to integrate (coordinate) the work of all the teams until you achieve the larger mission. For instance, if the mission is to build a new sales force customer relationship management system (CRM), then you will want at least five teams including a systems analysis team to identify the business information requirements; a design team to select from a variety of different technical solutions; a programming team that builds the system (or adapts a packaged system to your firm); a testing team that ensures the system works; and an implementation team that handles the roll out of the system (Figure 1-4). Even if the technology solution involves purchasing a license to use an online CRM system, you may still need a group of technically competent people on staff who can build customized adaptations (e.g. programmers).

FIGURE 1-4 Missions and Teams



2. **Identify the skills required for each team.** Once you have identified the sub-objectives, and the teams, you will need to identify the skills needed for each team. Not all teams have the same requirements. The systems analysis and implementation teams interface directly with users and other business units, generally at a fairly high, middle management level. For these interaction jobs, communications skills are the most important, along with competence. The design, programming, and testing teams require technical competence first, and then the ability to communicate. Some members could be foremost in competence, others will need to be foremost in communication skills. It's the mix that counts. Just because some people don't communicate well does not mean they will not be valuable members of the team, and well respected for the things they can do really well.

continued

3. **Choose people who have the right qualities.** In all the teams you will need diversity of talent. In choosing people, you can rely on your own past experience with individuals, the recommendations of colleagues or other members of the team. You can choose a Team Leader and ask the Team Leader to choose people who will best help achieve their objectives. If you've been in the firm for a few years, you will know from your personal experience who to choose and why.

4. **Oversight.** Your job as a manager is to hold the team leaders and their teams accountable for meeting their objectives on schedule, and on budget. Call regular meetings with each team leader individually, and with all team leaders meeting as a group to review progress, identify blockages, and come up with solutions. Provide a support collaborative culture by rewarding team work, and providing incentives for teams to succeed. Incentives might something simple like a party celebrating a team success, or a reward ceremony.

In order to build effective teams in a firm, you will need two more elements. You will need a supportive collaborative culture. And you will need a suite of information technology tools and systems to enable the teamwork and collaboration.

6.0 Building a Collaborative Organizational Culture

Collaboration won't take place spontaneously in a business firm, especially if there is no supportive culture. If people are afraid to speak up, there might not even be cooperation, let along working together collaboratively. Business firms, especially large firms, had in the past a reputation 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. There often was a senior management Planning Group that spent most of each year just planning what lower level people should do. The job of middle management supposedly was to pass messages back and forth, up and down the hierarchy.

To some extent this is a caricature of how firms used to behave in the 1950s to1990s, but caricatures often have some truth. 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. As long employees showed up for work, and performed the job satisfactorily, that's all that was required. Together the expectations of management and employees formed a culture, a set of assumptions about how things really are. It is surprising how many business firms still operate this way.

A collaborative business culture is very different. Senior managers are responsible for achieving results, but rely on teams of employees to achieve and implement the results. Teams have some decision making power. 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

continued

for their performance, and individuals are rewarded for their performance in a team. You might be a brilliant star on a failed team and receive only half the rewards. The function of middle managers is to build the teams, coordinate their work, and monitor their performance. That's a far cry from the old style middle manager who was primarily a message processor.

In a collaborative culture, senior management establishes collaboration and teamwork as vital to the organization, and they actually implement collaboration for the senior ranks of the business as well.

You can tell if you work in a collaborative culture by answering six questions:

1. Is it easy to talk with just about anyone in your firm (ease of cooperation) regardless of their position?
2. Does your unit cooperate regularly with other units at work? (frequency of cooperation). You can substitute office, or department, depending on how your firm organizes itself.
3. Are people in other departments easy to access and communicate with?
4. Does your firm reward individuals only, or does it reward teams and individuals?
5. Does your firm extol the virtues of teamwork in public and private conversations?
6. Do your managers and executives work as a team?

7.0 Information Technology and Systems to Enable Collaboration and Team Work

Building a collaborative, team oriented culture will do little good if you don't have the information systems in place to enable that collaboration. This would be like having a house without the plumbing and electrical infrastructure.

Today with the Internet, it is possible for nearly the entire labor force of firms to be online and to collaborate with their respective fellow employees, customers, and suppliers. Research on the various ways in which information technology supports collaboration has been going on since the late 1980s when the Internet was in its infancy, and the first software tools began to appear that supported what was call "group work." These early tools were called "groupware," and the field of study was called "computer supported cooperative work" (CSCW). Groupware included capabilities for sharing calendars, collective writing, e-mail, shared database access, and electronic meetings with each participant able to see and display information to others, and other activities. Today, groupware is one of many software tools and applications for supporting and enhancing collaboration, many of which are Internet-enabled.

Currently there are literally 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,

continued

customers, suppliers and managers. For instance, one company enlisted the talents of over 100 groupware experts at a conference and produced a map listing 150 free (or nearly free) online collaborative tools in fifteen categories (Table 1-4 lists the categories or types of collaboration software identified by experts in the field).

TABLE 1-4 Fifteen Categories of Collaborative Software Tools

Collaborative writing
Collaborative reviewing
Event scheduling
Instant messaging
VoIP audio conferencing
Screen sharing
Video conferencing
White boarding
Web presenting
Work grouping
Document sharing (including wikis)
File sharing
Mind mapping
Large audience Webinars
Co-browsing

The entire map of over 150 collaboration tools is too large to reproduce here, but it is available at http://www.mindmeister.com/maps/show_public/12213323. Some of the high-end tools like IBM's Lotus Notes are expensive, but powerful enough for global firms. Others are available online for free (often with premium versions for a modest fee) and are suitable for small businesses.

For example, one of the most widely used "free" online services is Google Apps/Google Sites. Google Sites is a tool that allows users to quickly and easily design group-editable Web sites. Google Sites is one part of the larger Google Apps suite of tools. Google Sites users can put up Web sites in minutes and can, without any advanced technical skills, post a variety of files including calendars, text, spreadsheets, and videos for private, group, or public viewing and editing.

Google Apps include the typical desktop productivity software tools (word processing, spreadsheets, presentation, contact management and mail). Table 1-5 describes some of the capabilities of Google Apps and Google Sites.

continued

TABLE 1-5 Google Apps / Google Sites Features

Google apps/sites	Description
Google Calendar	Private and shared calendars; multiple calendars (family schedules, business schedules).
Gmail	Google's free online email service is used for e-mail messaging and IM.
Google Docs and Spreadsheets	Word/Excel replacements; simultaneous online editing, sharing, publishing
E-mail, online storage, chat, programming	Premium addition adds make this a full featured collaborative tool
Google Sites	Team collaboration sites for sharing of documents, schedules, calendars, and search documents.
Google Video	Firm wide video sharing and commenting capability

Socialtext, a widely used enterprise collaboration environmennt, takes adifferent approach from Google. Instead of shared applications, Socialtext provides a set of capabilities that support social networking. Socialtext's flagship product, Socialtext Workspace, is the first enterprise wiki and the foundation of the connected collaboration platform. Socialtext People enables enterprise social networking. Socialtext Dashboard provides personalized and customizable widget-based interface for people and teams to manage attention. Socialtext wiki provides enables employees to find expertise within the firm. SocialCalc is the social spreadsheet for distributed teams.

There are many other online collaboration tools (Table 1-6), among them is Microsoft's SharePoint, one of the most widely adopted collaboration environment for small and medium businesses.

TABLE 1-6 Other Popular Online Collaboration Tools

Tool	Description
Socialtext	A server-based collaboration environment which provides social networking, Twitter-like micro-blogging , wiki workspaces, with integrated weblogs, distributed spreadsheets, and a personal home page for every user. Connectors to Microsoft SharePoint and Lotus Connections are also available.
Microsoft SharePoint	A browser-based collaboration and a document-management platform, combined with a powerful search engine. These can be used to host web sites that access shared workspaces and documents, as well as specialized applications like wikis and blogs from a browser. Installed on corporate servers, not software as service.
Zoho Notebook and Project	Collecting and collaborating on text, line drawings, images, Web pages, video, RSS feeds. Project management (task management, work flow, reports, time tracking, forums, and file sharing). Free or $5/project/month for premium service.
Bluetie	Online collaboration with email, scheduling, to-do lists, contact management, file sharing. Free for less than 20 users, $4.99 user/month after that.
Basecamp	Share to-do lists, files, message boards, milestone tracking. Free for a single project, $12/month for 3 projects with 200 megabytes of storage
OneHub	Share documents, calendars, Web bookmarks; email integration and IM. Manage hub resources; bulletin board.
WorkZone	Collaboration with file sharing; project management; customization; security.

continued

Several of these online services have excellent video introductions to their products. These videos can give you a keen sense of what is available on the Internet for a very low cost or no cost. For a tour of OneHub, point your browser at: http://onehub.com/tour. For Google Sites go to http://www.youtube.com/watch?v=X_KnC2EIS5w.

For small and medium size firms that use Microsoft server products and local area networks, Microsoft SharePoint is the most widely adopted collaboration system. Microsoft's strategy is to take advantage of the fact that it owns the desktop through its Microsoft Office and Windows products. For Microsoft, the path towards enterprise wide collaboration starts with the Office desktop and Microsoft network servers. SharePoint software makes it possible for employees to share their Office documents and collaborate on projects using Office documents as the foundation.

Microsoft SharePoint is a collection of products and technologies that provide an enterprise-level environment for Web-based collaboration. SharePoint can be used to host Web sites that organize and store information in one central location to enable teams to coordinate work activities, collaborate on and publish documents, maintain task lists, implement workflows, and share information via wikis and blogs. Sharepoint has a Web-based interface and close integration with everyday tools such as Microsoft Office desktop software products. Site content is accessible from both a Web browser and client-supported Web services. Because SharePoint stores and organizes information in one place, users can find relevant information quickly and efficiently while working together closely on tasks, projects, and documents.

Here is a list of SharePoint's major capabilities:

- Provides a single workspace for teams to coordinate schedules, organize documents, and participate in discussions, within the organization or over an extranet.
- Facilitates creation and management of documents with the ability to control versions, view past revisions, and enforce document-specific security and maintain document libraries.
- Provides announcements, alerts, and discussion boards to inform users when actions are required or changes are made to existing documentation or information.
- Supports personalized content and both personal and public views of documents and applications
- Provides templates for blogs and wikis to help teams share information and brainstorm.
- Provides tools to manage document libraries, lists, calendars, tasks, and discussion boards offline, and to synchronize changes when reconnected to the network.
- Provides enterprise search tools for locating people, expertise, and content.

continued

For very large firms (Fortune 1000 and Russell 2000 firms) the most widely used collaboration tool is IBM's Lotus Notes. IBM's strategy is to take advantage of the fact that it dominates the Fortune 1000 data processing and networking environment. IBM's approach to collaboration is therefore to start from the top down through implementation of an enterprise-wide Lotus server solution by the central IS Department. In large multinational corporations with tens of thousands of employees this may be the only enterprise-wide solution and is beyond the capabilities of Microsoft local area networks. Lotus Notes does indeed work with Microsoft Office documents, but has its own proprietary software for other tasks including word processing, spreadsheets, and presentation software.

Lotus Notes is a client-server, collaborative application developed and sold by IBM Software Group. IBM defines the software as an "integrated desktop client option for accessing business e-mail, calendars and applications on an IBM Lotus Domino server." The Notes client is mainly used as an email client, but also acts as an instant messaging client (for Lotus Sametime), browser, notebook, and calendar/resource reservation client, as well as a platform for interacting with collaborative applications. Today Notes also provides blogs, wikis, RSS aggregators, CRM and Help Desk systems.

Thousands of employees at hundreds of large firms use IBM Lotus Notes as their primary collaboration and team work tools. Firmwide installations of Lotus Notes can cost millions of dollars a year for a large Fortune 1000 firm, whereas Google Apps/Google Sites comes in a limited free version or a more sophisticated premium version for $50 per user/per year. A client-server product like Lotus Notes inherently involves the central IS department, and it is a major implementation effort. Online software services are therefore attractive because they do not require any installation on corporate servers, or even the IS Department to be involved. Nevertheless, existing online tools like the Google collaboration services are not as powerful as those found in Lotus Notes, and it is unclear they could scale to the size of a global firm (at least for now).

Very large firms adopt IBM Lotus Notes because of the promised higher level of security, and the sense that the firm retains control over sensitive information. Large firms in general do not feel secure using popular software-as-a-service (SaaS) applications for "strategic" applications because of the implicit security concerns, and the dependency on external servers controlled by, and subject to the fate of, other firms. Most experts agree, however, that these concerns perhaps will lessen as experience with online tools grows, and the sophistication of online software service suppliers increases to protect security and reduce vulnerability.

MAKING SENSE OUT OF COLLABORATION TOOLS

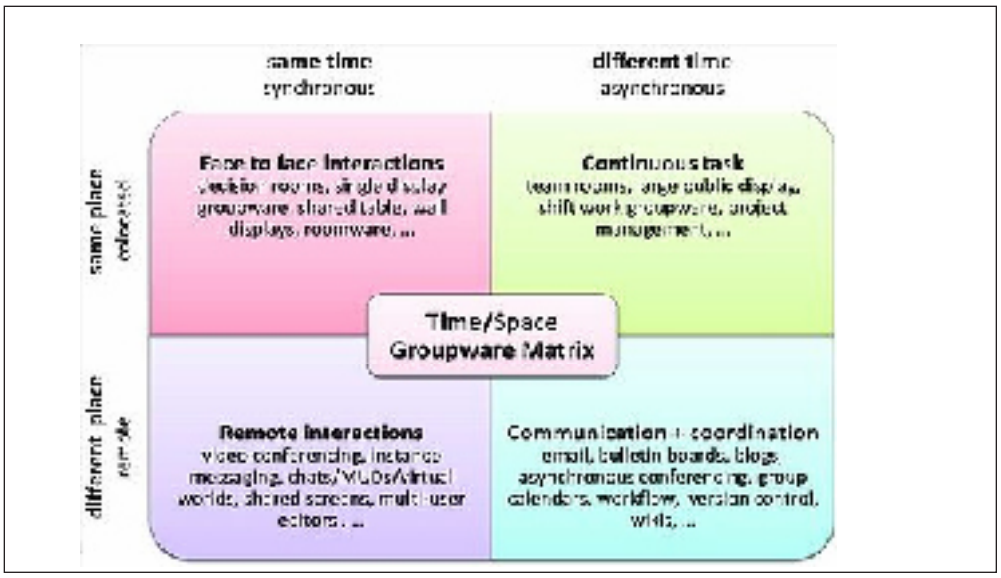
We have avoided trying to formally define contemporary collaboration and team work software tools. Instead we have gathered lists of many popular software tools (both online as a service and as installed client-server applications), and described their capabilities. We have pointed at

continued

examples. While these lists help you understand the broad range of tools that are available in the marketplace, how do you choose the right tool for your firm? Are these software tools just solutions looking for a problem to solve? What problems do they solve?

To answer these questions you need a framework for understanding just what problems these tools help solve. One framework that has been helpful for us to talk about collaboration tools is the time/space groupware matrix developed in the early 1990s by a number of collaborative work scholars (Figure 1-5).

FIGURE 1-5 The Time/Space Groupware Matrix



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 Bombay, so this makes it difficult to have a video conference (the people in New York are too tired). So time is a problem inhibiting collaboration on a global scale.

Place (location) is also a problem that inhibits collaboration in large global or even national and regional firms. Getting people together 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.

One way to think about software collaboration tools is to see them as ways of overcoming the limitations of time and space. Table 1-7 above shows four kinds of time/space scenarios (the intersections of the two dimensions in Figure 1-5).

continued

TABLE 1-7 Collaboration Challenges and Generic Solutions

Scenario	Solution Types
Same time/same place	Face to face meetings; decision rooms; whiteboards; telepresence
Same time/different place	Remote interactions; video conferencing; IM and Twitter; telepresence $5/project/month for premium service.
Different time/same place	Continuous tasks, digital team rooms; project management; asynchronous communication
Different time/different place	Asynchronous communication and coordination; workflow; project management tools; blogs; wikis

You can use this classification scheme to categorize the different collaboration and team work software applications.

8.0 Choosing Collaboration Tools: Management To-Do List

Now let's apply these frameworks. You can use these classification tools to start thinking about how to choose collaboration and team work tools for your firm. As a manager, you will want to purchase and use the tools that solve the issues your firm is facing. Here's a To-Do list to get started:

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 their 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 risk 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?

continued

5. Seek out 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.

If you follow these six steps, you should be led to investing in the correct software for your firm at a price you can afford, and within your risk tolerance.

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Learning Track 3: Challenges of Using Business Systems

Organizations still need different types of information systems serving various organizational levels, functions, and business processes, and they increasingly need systems providing enterprise-wide integration. These needs create both opportunities and challenges.

Opportunities

Businesses face extraordinary opportunities to apply information systems throughout the firm to achieve higher levels of productivity, earnings, and ultimately advance share prices. Today information systems support virtually all levels and functions in the firm. In addition they enhance decision making of both managers and employees, providing information where and when it is needed in a format that is easily integrated into everyday business life.

Management Challenges

There are challenges to achieving these objectives.

INTEGRATION AND THE WHOLE FIRM VIEW

In the past, information systems were built to serve the narrow interests of different business functions (such as marketing, finance, or operations) or to serve a specific group of decision makers (such as middle managers). The problem with this approach is that it results in the building of thousands of systems that cannot share information with one another and, worse, makes it difficult for managers to obtain the information they need to operate the whole firm. Building systems that both serve specific interests in the firm, but also can be integrated to provide firmwide information is a challenge.

MANAGEMENT AND EMPLOYEE TRAINING

With so many systems in a large business firm, and with fairly high employee turnover typical of the last few years, training people how to use the existing systems, and learn new systems, turns out to be a major challenge. Obviously, without training or when training is limited, employees and managers cannot use information systems to maximum advantage, and the result can be a low return on investment in systems.

continued

ACCOUNTING FOR THE COST OF SYSTEMS AND MANAGING DEMAND FOR SYSTEMS

As the cost of information falls because of the power of information technology, demands for information and technology services proliferate throughout the firm. Unfortunately, if employees and managers believe information services are free, their demands will be infinite. One of the challenges facing business managers is understanding which systems are truly necessary, truly productive with high returns on investment, and which are merely conveniences that cost a great deal but deliver little.

Solution Guidelines

A number of solutions exist to the challenges we have just described.

INVENTORYING THE FIRM'S INFORMATION SYSTEMS FOR A 360-DEGREE VIEW OF INFORMATION

You should develop a list of firmwide information requirements to get a 360-degree view of the most important information needs for your company as a whole. Once you have this list developed, examine how your existing systems—most built to service specific groups and levels in the firm—provide this information to corporate-wide systems. You'll need to inventory your firm's existing information systems and those under construction. (Many firms have no idea of all the systems in their firm, or what information they contain.) Identify each system and understand which group or level in the firm benefits from the system.

EMPLOYEE AND MANAGEMENT EDUCATION

Systems are usually not obvious or self-taught for most people. You will need to ensure that you understand how much training is required to support new systems, and budget accordingly. Once you have an inventory of just the major systems in a firm that are used every day by thousands of employees, try to identify how they learn how to use the system, how effective their training is, and how well they use the systems. Do they exploit all the potential value built into the systems?

ACCOUNTING FOR THE COSTS AND BENEFITS OF INFORMATION SYSTEMS

To manage the demand for information services, you'll need an accounting system for information services. It is worthwhile to examine the methods used in your industry and by industry competitors to account for their information systems budgets. Your system should use some method for charging the budgets of various divisions, departments, and groups that directly benefit from a system. And there are other services that should not be charged to any group because they are a part of the firm's general information technology (IT) infrastructure and serve everyone. For instance, you would not want to charge various groups for Internet or intranet services because

continued

they are services provided to everyone in the firm, but you would want to charge the manufacturing division for a production control system because it benefits that division exclusively. Equally important, management should establish priorities on which systems most deserve funding and corporate attention.

Learning Track 4: 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 (see Figure 1-1). 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.

Sometimes you'll see a decentralized arrangement where each functional area of the business has its own information systems department and management that typically reports to a senior manager or chief information officer. In other words, the marketing department would have its own information systems group as would manufacturing and each of the other business functions. The job of the CIO is to review information technology investments and decisions in the functional areas. The advantage of this approach is that systems are built that directly address the business needs of the functional areas. However, central guidance is weak and the danger is high that many incompatible systems will be built, increasing costs as each group makes its own technology purchases.

In another arrangement, the information systems function operates as a separate department similar to the other functional departments with a large staff, a group of middle managers, and a senior management group that fights for its share of the company's resources. You'll see this approach in many large firms. This central information systems department makes technology decisions for the entire company, which is more likely to produce more compatible systems and more coherent long-term systems development plans.

Very large "Fortune 1,000"-size firms with multiple divisions and product lines might allow each division (such as the Consumer Products Division or the Chemicals and Additives Division) to have its own information systems group. All of these divisional information systems groups report to a high-level central information systems group and CIO. The central IS group establishes corporate-wide standards, centralizes purchasing, and develops long-term plans for evolving the corporate computing platform. This model combines some divisional independence with some centralization.

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FIGURE 1-1 Organization of the Information Systems Function

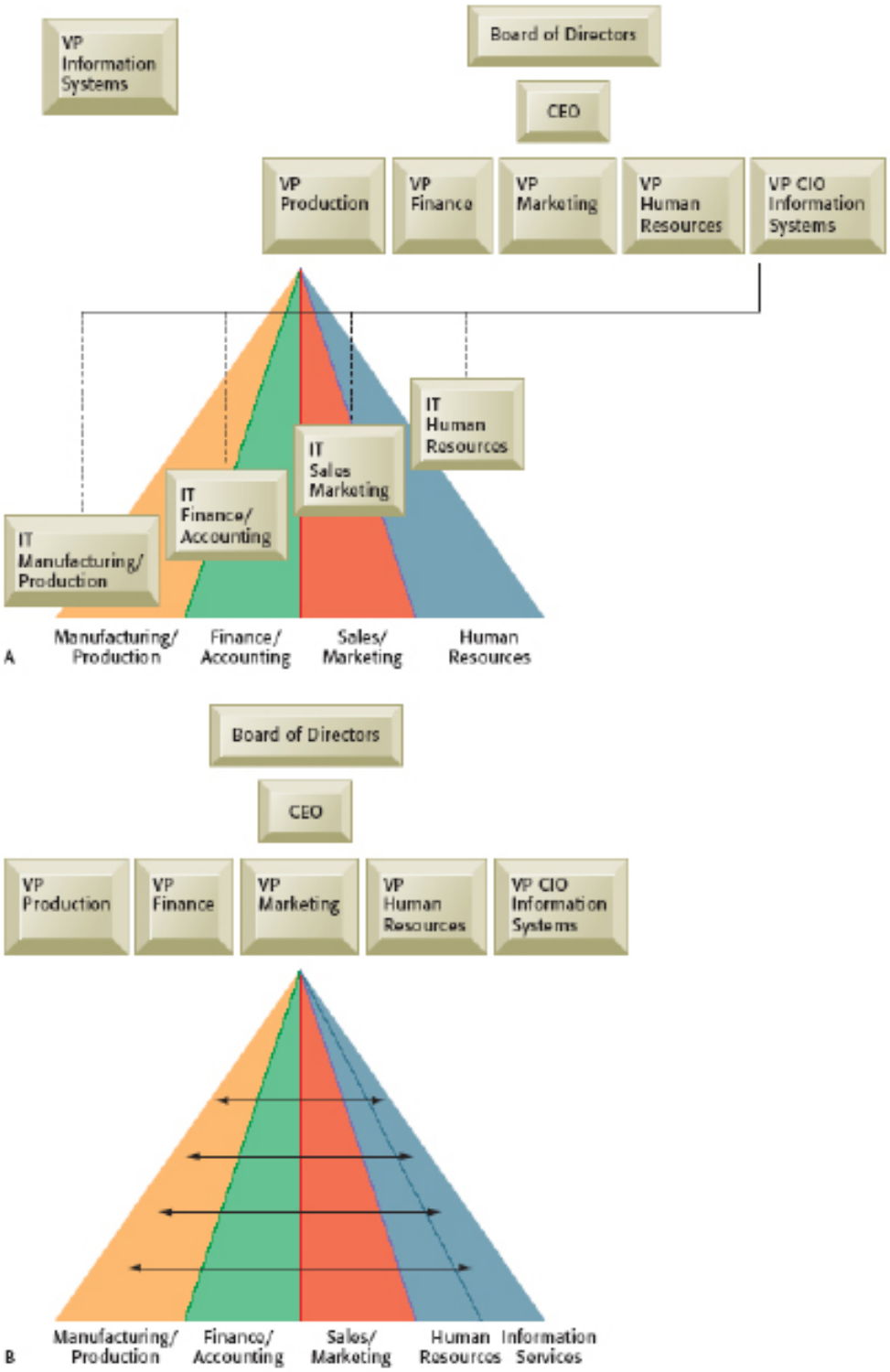

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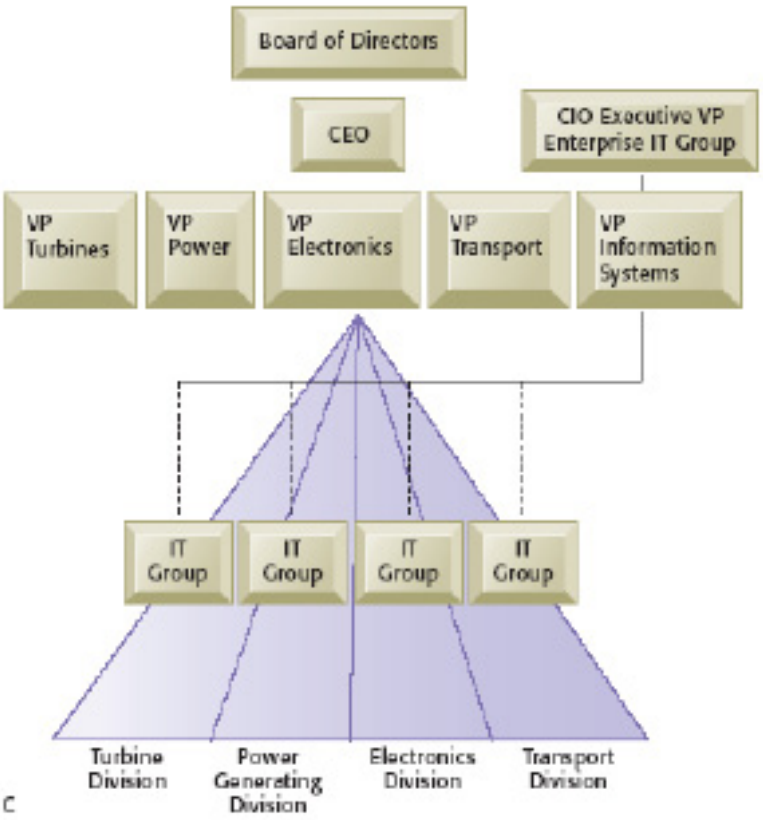
FIGURE 1-1 Organization of the Information Systems Function (continued)



There are alternative ways of organizing the information systems function within the business.: within each functional area (A), as a separate department under central control (B), or represented in each division of a large multidivisional company but under centralized control (C).

Learning Track 5: Occupational and Career Outlook for Information Systems Majors 2010-2020

Total employment in the United States is expected to increase by about seven percent from 2010 to 2020. However, the 20.5 million jobs expected to be added by 2020 will not be evenly distributed across major industry and occupational groups. Changes in consumer demand, improvements in technology, the rise and fall of industries and entire sectors of the economy, and many other factors, will contribute to the changing employment structure of the U.S. economy. Industries and occupations associated with health care, personal care, social assistance, and construction are projected to be the fastest growing. Occupations which do not require a college degree (either two or four-year college degrees) will have the slowest growth in the 2010-2020 forecast period. Also, the labor force is aging, and the labor participation rate will decline, slowing the growth in the labor force.

Employment growth in IS/MIS jobs will be about 50% greater than average job growth in other fields.

Career Satisfaction Among Information Systems Majors

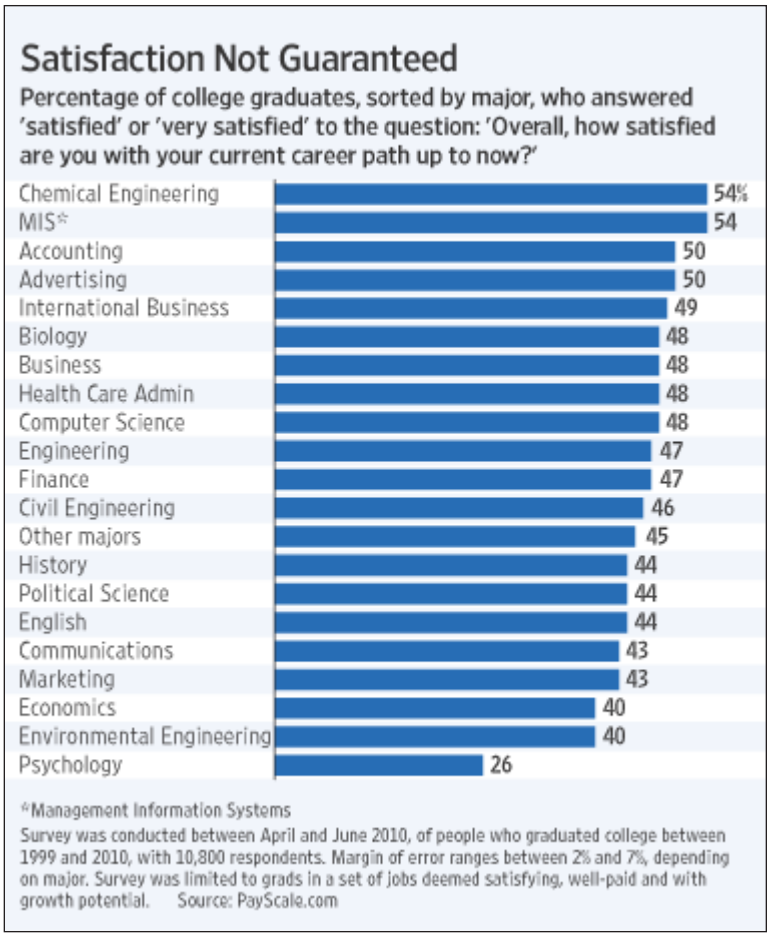
A survey completed in 2010 found that IS majors were among the most satisfied with their career path since graduation when compared to other majors (Figure 1-1). In fact, MIS majors had the highest level of career path satisfaction. 54% of MIS graduates were "satisfied" or "very satisfied" with their career path since graduation. The survey, which was conducted by PayScale.com between April and June of 2010, only included respondents with jobs, but could also include people who went on to earn a graduate degree. It included 10,800 employees who got their bachelor's degrees between 1999 and 2010. The survey was done as part of the Wall Street Journal's Paths to Professions project, which looked at jobs that are satisfying, well-paid and have growth potential. The PayScale survey examined people in a set of jobs that included industries such as health care, finance, and government (Figure 1-1).

The differences among the top half college majors are not huge, but they are interesting and statistically significant. The average for all careers is 46%. It is likely that those college majors with less than "average" satisfaction reflect difficulties in finding jobs in a field for which they have trained, and when found, retaining jobs and having good job experiences. Psychology had the lowest level of satisfaction.

continued

Another factor is pay. MIS is ranked 15th out of 114 occupations in terms of median starting pay ($50,900) and mid-career median pay ($90,300) (Payscale.com, 2010).

FIGURE 1-1 MIS Scores Highest in Career Path Satisfaction



MIS Job Projections to 2020

If MIS college graduates today are among the most satisfied, and if this is in part related to employment prospects and job satisfaction after graduation, then the future for the various IS/MIS careers is quite positive because jobs in MIS will continue to expand over the next eight years at a healthy rate. IS employment in the United States will grow by about 800,000 jobs in the forecast period to 2020.

Figure 1-2 below presents data from the Occupational Outlook Handbook (Bureau of Labor Statistics, 2013) for the period 2010-2020. This table collapses a variety of MIS occupational titles into nine occupational categories: computer and information scientists, database administrators, information systems managers, security analysts/Web developers, network and system administrators, systems analysts, computer support specialists, and software developers/programmers. Figure 1-3 describes the percentage change and salary range in these occupations over the forecast period.

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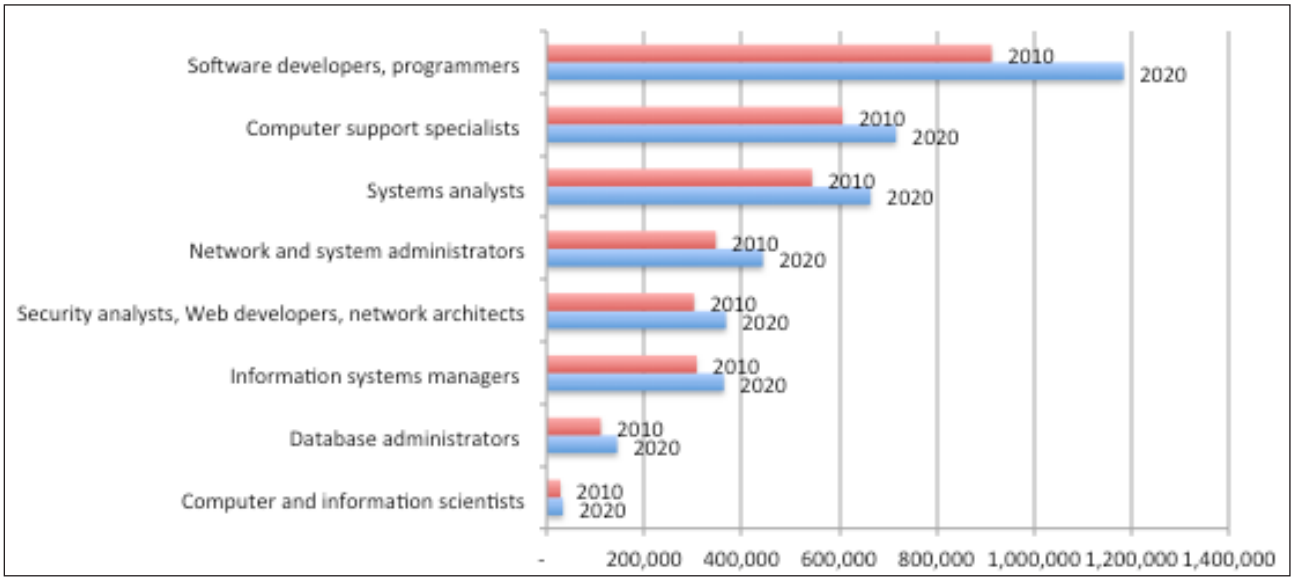
FIGURE 1-2 Job Outlook for Selected IS Occupations 2010-2020



Source: Bureau of Labor Statistics, 2013. Table by author.

Compensation of IS Personnel

IS occupation salaries are generally far above the average compensation for employees in the United States (about $45,000 annually) (Figure 1-3).

FIGURE 1-3 **Percentage Change and Salary Range in Selected IS Occupations, 2010-2020**

	%Change	Median Salary
Computer and information scientists	19%	$100,660
Database administrators	31%	$73,490
Information systems managers	18%	$115,780
Security analysts, Web developers, netw		

Source: Bureau of Labor Statistics, 2013. Table by author.

The top five occupational titles in terms of salary are: information system managers with a median salary of $116,000; computer and information scientists, $100,660; software developers and programmers, $90,500, systems analysts, $77,740; security analysts and Web developers, $75,660. About 518,000 new jobs will develop in these areas by 2020. The largest number of jobs created will be software developers/programmers (about 270,000). Students of MIS with a managerial interest will find significant opportunities in project management, system management, and liaison roles with other corporate managers in marketing and sales, production, general administration, and

continued

finance. Students with an interest in database, data mining, networks and software development will also find significant opportunities.

Fastest Growing IS Occupations

All IS occupations show a far higher rate of growth than the average for all occupations (about 7%). The fastest growing occupations are database administrators (31%) followed by software developers/programmers (30%), network/system administrators (28%). The other IS occupations are growing in the 15%-20% growth range in this ten-year period (Figure 1-4). Computer support specialists will grow by 18%, adding about 110,000 new jobs. Computer support specialists provide technical assistance and advice to company employees, and customers, as well as provide training materials. These are excellent entry-level jobs for recent graduates, and offer many opportunities for advancement to higher paying IS jobs in the future, as well as promotions to corporate divisions and departments like marketing, logistics, and finance. Software developers and programmers, and network occupations tend to be more technically oriented, whereas systems analysts jobs tend to be more management oriented. Systems analysts provide a crucial link between business managers and systems staff by helping managers to define information requirements, system design, and implementation. Both of these occupations require good technical, interpersonal, and problem solving skills. Systems analysts require, in addition, excellent writing and presentation skills.

FIGURE 1-4

	2020	2010	New Jobs
Computer and information scientists	33,500	28,200	5,300
Database administrators	144,700	110,800	33,900
Information systems managers	363,700	307,900	55,800
Security analysts, Web developers, netw	368,000	302,300	65,700
Network and systems administrators	443,800	347,200	96,600
Systems analysts,	664,800	544,400	120,400
Computer support specialists	717,100	607,100	110,000
Software developers, programmers	1,184,000	913,100	270,900

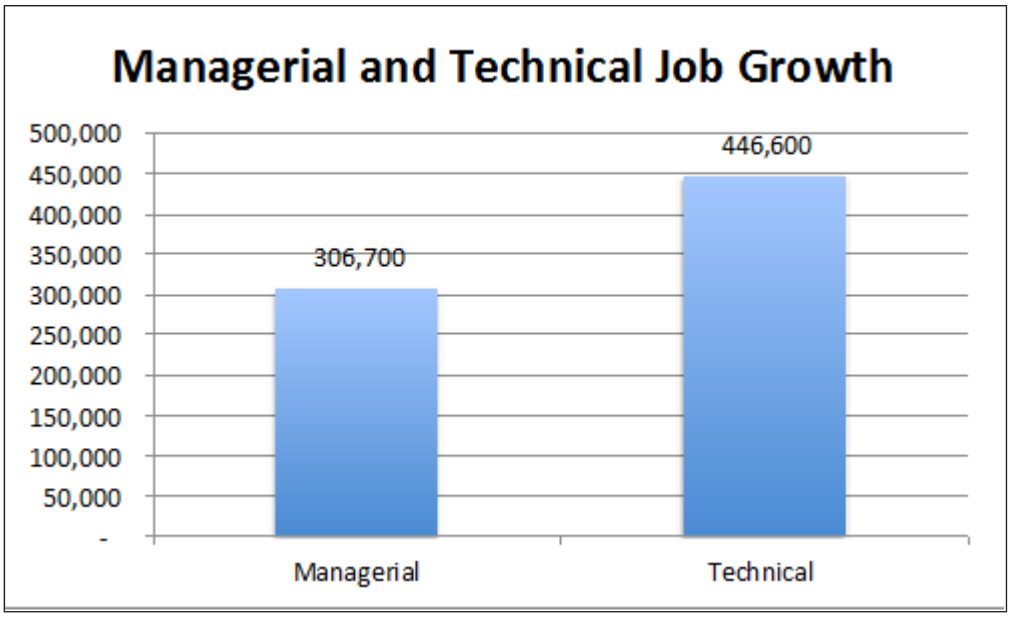
Technical vs. Managerial IT Jobs

One question business students often ask is “How much technology do I need to know to get a good job?” Unfortunately, there is no single answer for this question. From a career perspective, what is better: start out with a strong technology background, and then build on those skills and experiences, seek out additional educational credentials, and seek a higher paying management position? Or, is it better to focus on the management skills while in school, apply for management-oriented IS jobs, and learn a smattering of technology along the way?

continued

Figure 1.5 groups the various IS occupations into two groups: managerial and technical. Managerial occupations include information systems managers, systems analysts, network and system administrators, and database administrators. Technical occupations include software developers and programmers, computer support specialists, and security analysts/Web developers. From what we have said so far, it's clear that the technical jobs are more numerous to begin with and are generating slightly more jobs than the managerial occupations, and that the managerial occupations pay more than the technical occupations on average. Figure 1.5 illustrates that technical IS jobs are more numerous and are growing a bit faster.

FIGURE 1.5 Technical vs. Managerial IT Job Growth 2010-2020



Note: Technical jobs: software developers/programmers, computer support specialists, security analysts/Web developers. Managerial jobs: information systems managers, systems analysts, network and system administrators, and database administrators.

In the history of the MIS profession there are a variety of successful career paths. Some senior IS managers started out in narrow technical jobs and worked their way up to becoming managers and even CIOs (Chief Information Officers). In contrast, there are some CIOs who have very little technology background but a great deal of experience as project managers, dealing with other senior managers, and managing at the Vice-president and C-level (senior management) in other divisions of the company. However, this latter case is rare. Chances are in the first interview students have with potential IS/MIS employers, the question of technical competence will come up. Therefore, it is wise for recent college graduates seeking employment in the IS/MIS field to have a good to strong technical background.

One career strategy is to focus on developing technical skills while in school and then use those skills to obtain an entry-level job. Return to school, or learn on the job, managerial skills to

continued

participate in the higher earnings of this group. Another strategy is to focus on technical skills for an entry level job, then build on those skills staying within the technical track to attain higher paying technical positions.

The optimal career strategy is arguably a mix of strong technical skills with an equally strong set of inter-personal, collaboration, and management skills. If you can't get along with colleagues, have poor project management skills, and are poorly organized in your work, chances are good your technical skills alone may not be enough for a successful career.

The Impact of an Aging Labor Force on IS Careers

The demand for IS and MIS employees will actually be much higher in the next decade and beyond than discussed above because of the aging population and labor force in the United States.

The U.S. civilian population, including individuals aged 16 and older, is expected to increase by 25.2 million to a total of 325 million from 2010 to 2020 (about 8%). The labor force is expected to increase at about the same rate from 157 million in 2010 to 167 million in 2020, an increase of .8% a year, down from greater than 1% in previous decades. Labor force growth is slowing.

As the baby boomers continue to age, the 55 and older age group is projected to increase by 29.7 percent, more than any other age group. Meanwhile, the 45 to 54 age group is expected to decrease by 7.6 percent, reflecting the slower birth rate following the baby-boom generation. The 35 to 44 age group is anticipated to experience little change, with a growth rate of 0.2 percent, while the population aged 16 to 24 will grow at only .3 percent over the projection period. According to the U.S. Census Bureau, the number of people aged 55 and older will increase to 30% by 2020, while the number of younger workers will grow only 5%. By 2030, with the last of the baby boom generation turning age 66, an unprecedented 20% of the population will be over age 65. The share of the youth labor force, workers aged 16 to 24, is expected to decrease from 14.3 percent in 2010 to 12.7 percent by 2020. The primary working-age group, those between 25 and 54 years old, is projected to decline from 67.7 percent of the labor force in 2008 to 63.5 percent by 2018. Workers aged 55 years and older, by contrast, are anticipated to leap from 18.1 percent to 23.9 percent of the labor force during the same period. As baby boomers grow older, so does the U.S. workforce.

In a nutshell, the U.S. population and the labor force are getting older over the foreseeable future, and slowing in growth. Three decades ago the median age of the labor force was 35 years. Today, the median age is estimated to be 41 and by 2030, the median age is expected to be 48. Retirement age had been falling since the turn of the Century (from 74 years down to 62 years), but going forward to 2018, more elderly workers will remain in the labor force and average age at retirement is expected to increase to 67 (for a variety of reasons including better health, extension of the legal age of "full retirement" by the Social Security Administration, and economic necessity).

So far we have been using projections for new openings in the IS field. These projections did not account for replacement positions for those retiring. The number of replacement positions is not

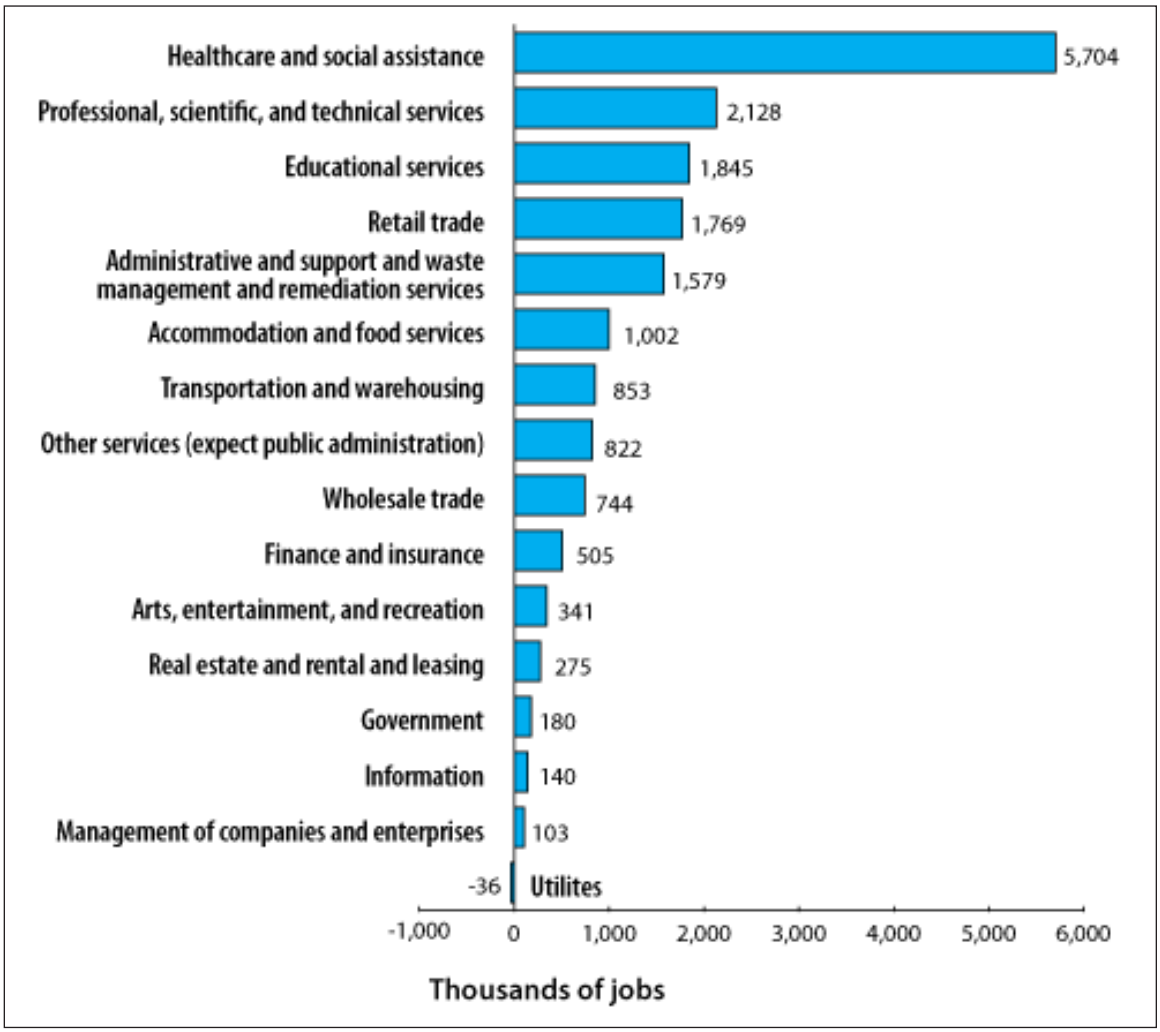
continued

known for the specific IS field, but overall in the labor force, about 25% of today's labor force will retire in the years 2010-2020. Using this ratio and applying it to the IS field suggests actual job growth with be 25% higher than suggested by looking just at "new positions." This means the IS field will actually add about 1.25 million new jobs in the period 2010-2020.

Industry Effects: Choosing The Right Sector

While employment prospects for IS/MIS majors look very good, it certainly will help if students focus on those sectors and industries that are likely to expand. The shift in the U.S. economy away from goods-producing in favor of service-providing is expected to continue. Service-providing industries are anticipated to generate approximately 14.5 million new wage and salary jobs. As with goods-producing industries, growth among service-providing industries will vary (Figure 1-6).

FIGURE 1-6 Numeric Change in Wage and Salary Employment in Service-Providing Industries, 2010–2020 (Projected)



Source: BLS National Employment Matrix

continued

Choosing the right industry for employment is like choosing the right asset class in an investment portfolio. The best opportunities for IS employment both in terms of percentage growth and overall numbers of new jobs can be found healthcare, professional and scientific services, and educational services. In general, employment in the manufacturing sector is not expected to grow as fast as service sector employment although there are local exceptions. In the recession of 2008-2010, and the slow-growth period of 2011-2013 that followed, manufacturing sector growth is larger than service sector growth. And in some regions where manufacturing plays a large role in the local economy, such as Ohio, Michigan, and Indiana, IS employment opportunities will be larger in manufacturing than services. Pay attention to local markets.

The Impact of Outsourcing on IS/MIS Employment: A Riddle

In the last decade, tens of thousands of IS/MIS jobs in the United States have been outsourced to India, as well as other countries. The three leading Indian outsourcing firms (Wipro, InfoSys, and Tata) are growing at about 10% annually, and currently employ about 300,000 IS/IT workers in India, most of whom are working on outsourced projects from the United States, and Europe. Large American global technology firms like Cisco, Microsoft, and IBM have made significant investments in India. IBM has created seven centers in India, and employs over 150,000 Indian workers in 2012. Microsoft has over 5000 employees in India working on products at all stages of the lifecycle from research and development, to support services. Cisco has 7,000 employees in India. Accenture, one of the world's largest IT and business consulting firms which has a large and growing practice called "business process outsourcing" and "management outsourcing," has over 74,000 employees in India working diligently to encourage firms around the world to outsource to India, or other low-wage countries. At the same time, large outsourcing firms like Wipro and Tata send over 100,000 IS workers to the U.S. every year.

There are many reasons that outsourcing to India and other areas has grown so rapidly. Labor costs in India are 10%-20% of labor costs in the U.S. A $60,000 a year programmer in the United States can be employed in India in 2013 for about $8,000-$10,000, and that programmer will live comfortably. Second, the Internet has made it possible and inexpensive to coordinate and manage far flung teams of employees. Third, Indian infrastructure has improved to the point where it can support global business operations (although there are exceptions). Fourth, India and China with 1 billion+ populations and nearly 8% annual GDP growth rates represent significant investment opportunities for American and other global firms. Most investments in China are not made for their outsourcing potential, but for the chance to participate in the growth of China's domestic and export markets. In their own right, India and China are the economies which will grow twice as fast as the U.S. economy in the next decade assuming existing trends continue.

All of this outsourcing would seem to paint a dim picture for IS/MIS careers in the United States. One would expect thousands of IS/MIS workers out of a job, and investment in systems shrinking.

continued

Oddly, after a decade of significant outsourcing, unemployment among American IS/MIS workers is half that of the labor force average of 7.6 % in 2013, and is lower than unemployment among all college graduates and professionals of similar educational levels (about 3.7%). The estimated unemployment rate among IS/IT/MIS workers is less than 3.2%. Whatever the impacts of outsourcing, it clearly has not led to widespread unemployment among U.S. IS workers. Why not?

Oddly, despite all the outsourcing of IT work, investment by U.S. businesses in information technology and systems has expanded in the last decade at an extraordinary rate of about 5% annually (more than twice the rate of growth of the economy as a whole). Investment in information technology, systems, hardware, software and telecommunications equipment was $540 billion in 2012, 52% of all capital investment in the U.S., and up from $366 billion in 1998 (Bureau of Economic Analysis, 2013). Employment levels in the IS/MIS careers and occupations have also expanded in the U.S. over the last decade at about 5% annually.

How is it possible that IS/MIS outsourcing can be proceeding at a very rapid rate, and growth in IS/MIS careers and investments is expanding? The answers are speculative. One possible answer is that outsourcing has largely involved lower level, technical programming and engineering jobs and not higher level, high value-added jobs. As more lower level jobs are outsourced, more higher value jobs replace them. Moreover the demand in the U.S. for technical programming jobs has exceeded the supply, leaving plenty of work for local U.S. technical personnel. Some jobs like technical support specialist cannot be easily outsourced. Higher level management jobs are much less likely to be outsourced because of the need for face-to-face interaction with suppliers, customers, and employees. Sales and marketing are difficult to outsource.

Another possible explanation is that the growth of outsourcing has potentially lowered the costs of system development in the U.S., making systems less expensive to build, and therefore encouraging U.S. firms to invest more in IT/IS and systems in general. The cost of technology has also fallen significantly (in terms of cost/millions of instructions per second). These developments are the equivalent of lowering the price of capital (in this case IT capital). And high levels of IS investment in the U.S. have only encouraged more outsourcing (as well as domestic employment). One result is a virtuous circle: outsourcing leads to lower system development costs, which leads to more investments in systems, which leads to higher demands for skilled IS/MIS labor, some of which will be outsourced. There are of course brakes and limits on the outsourcing process which are beyond the scope of this paper.

Summary: Employment Career Prospects for IS/MIS Majors to 2020

- Recent college graduates report high levels of satisfaction in their IS/MIS careers.
- US IT/IS jobs will grow at 5-6% over the period, about 1.5 times the GDP growth and considerably faster than the overall growth in the labor force.

continued

- Compensation for IS/MIS graduates is above average compensation for college graduates and is likely to remain so for the forecast period.
- Unemployment among IS/IT/MIS workers is extremely low
- The fastest growing IS/MIS jobs are database administrators, software developers/programmers, and network system administrators.
- The highest paid IS/MIS jobs are information systems managers, computer and information scientists, software developers.
- Technical vs. managerial jobs. Technical jobs show large percentage and absolute growth, but managerial jobs pay more, and are far less likely to be outsourced.
- Both technical and managerial knowledge and skills are valued in the marketplace.
- It helps to choose the right economic sector when preparing for the job market. Healthcare, professional and educational services show the highest sector growth rates over the next ten years.
- Outsourcing has had a significant impact on IS/MIS employment and investment in the United States although not in the ways commonly believed. Outsourcing has not led to massive unemployment or under investment in U.S. IT infrastructure. On the contrary, outsourcing may have led to more systems development and more employment than otherwise might have occurred.
- Technical jobs which can become routinized and commoditized suffer the greatest risk of outsourcing to low wage countries.
- Managerial jobs, and those technical jobs which require hands-on, judgmental, creative, and design skills are much less likely to be outsourced.
- Future growth in the U.S. IT/IS sector will be driven by falling capital costs in IT/IS sector, more powerful hardware and software, and relatively stable IS/IT wage rates in the United States. Wages rates in India and China are rapidly increasing, shifting business calculations on where to locate work.

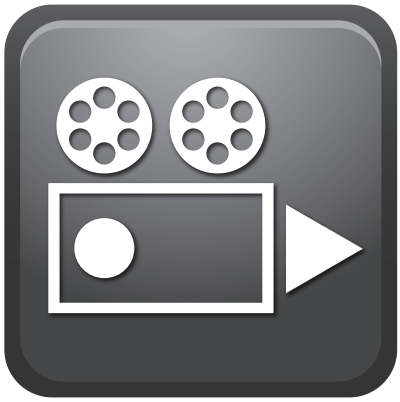
\Chapter 2 Running Case Solution Description

The spreadsheet solution file for this case uses a line chart to show the 5-year trend in Dirt Bikes' total sales and a stacked column chart of 5-year sales trends to show how much international and domestic sales contribute to the total. One can see from these graphs that sales dipped slightly during 2012 but that overall, sales have been growing. The portion of overall sales represented by international sales has not changed significantly, suggesting that there may be opportunities for Dirt Bikes to grow its international sales. The income statement data show a continuing rise in operating expenses and cost of goods sold and combined with declines in gross and net margins. Dirt Bikes needs some way to bring down its costs, and new information systems might help. The balance sheet shows that Dirt Bikes has sufficient assets so that it could afford to invest in new product development and new information systems.

CHAPTER 2 GLOBAL E-BUSINESS: HOW BUSINESSES USE INFORMATION SYSTEMS

CASE 1

Walmart's Retail Link Supply Chain



SUMMARY An introduction to Walmart's Retail Link system, one of the largest B2B supply-chain systems in the world. Retail Link connects consumer purchase data to the Walmart purchasing system and to vendor supply systems. Retail Link plays a key role in Walmart's corporate strategy to become the dominant low-cost provider of retail goods. L=7:13.

URL http://www.youtube.com/watch?v=SUe-tSabKag

CASE Walmart is a well-known leader in the application of network technology to coordinate its supply chain. Walmart's supply chain is the secret sauce behind its claim of offering the lowest prices everyday. It's able to make this promise because it has possibly the most efficient B2B supply chain in the world. It doesn't hurt to also be the largest purchaser of consumer goods in the world. With sales of more than $443 billion for the fiscal year ending January 31, 2012, Walmart has been able to use information technology to achieve a decisive cost advantage over competitors. As you might imagine, the world's largest retailer also has the world's largest supply chain, with more than 60,000 suppliers worldwide. In the next five years, the company plans to expand from around 5,000 retail stores in the United States (including Sam's Clubs) to over 5,500 and increase its selection of goods. Internationally, Walmart has over 5,200 additional stores in 26 countries outside the United States, giving it

continued

a total of over 10,000 retail units. The rapid expansion in Walmart's international operations will require an even more capable private industrial network than what is now in place.

In the late 1980s, Walmart developed the beginnings of collaborative commerce using an Electronic Data Interchange (EDI)-based supply chain management system that required its large suppliers to use Walmart's proprietary EDI network to respond to orders from Walmart purchasing managers. In 1991, Walmart expanded the capabilities of its EDI-based network by introducing Retail Link. This system connected Walmart's largest suppliers to Walmart's own inventory management system, and it required large suppliers to track actual sales by stores and to replenish supplies as dictated by demand and following rules imposed by Walmart. Walmart also introduced financial payment systems that ensure that Walmart does not own the goods until they arrive and are shelved.

In 1997, Walmart moved Retail Link to an extranet that allowed suppliers to directly link over the Internet into Walmart's inventory management system. In 2000, Walmart hired an outside firm to upgrade Retail Link from being a supply chain management tool toward a more collaborative forecasting, planning, and replenishment system. Using demand aggregation software provided by Atlas Metaprise Software, Walmart purchasing agents can now aggregate demand from Walmart's 5,000 separate stores in the United States into a single RFQ from suppliers. This gives Walmart tremendous clout with even the largest suppliers.

In addition, suppliers can now immediately access information on inventories, purchase orders, invoice status, and sales forecasts, based on 104 weeks of online, real-time, item-level data. The system does not require smaller supplier firms to adopt expensive EDI software solutions. Instead, they can use standard browsers and PCs loaded with free software from Walmart. There are now over 20,000 suppliers—small and large—participating in Walmart's Retail Link network.

By 2012, Walmart's B2B supply chain management system had mastered on a global scale the following capabilities: cross docking, demand planning, forecasting, inventory management, strategic sourcing, and distribution management. The future of Walmart's SCM lies in business analytics—working smarter—rather than simply making the movement and tracking of goods more efficient. For instance, in 2012 Walmart purhased Quintiq Inc., a supply chain management tool for improving load assignment and dispatch of trucks for large retailers. Quintiq's software will enable Walmart's managers to optimize the loading of its trucks and to reduce the time required to supply its retail stores.

Despite the economic slowdown in 2011–2012, Walmart's sales grew. In 2011, Walmart's revenues of $443 billion were up 6.4 percent from 2010, and its net income was $15.77 billion, up from $15.36 billion. In the first half of 2012, sales continued to grow by over 4 percent.

continued

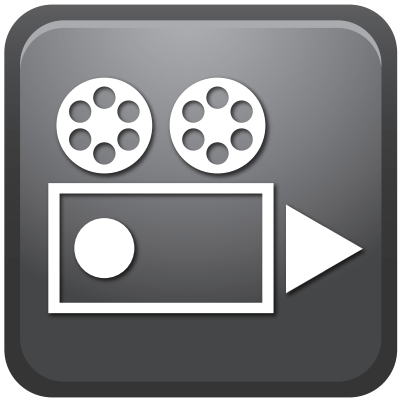
VIDEO CASE QUESTIONS

1. Where does Walmart's supply chain start? What triggers Walmart's Retail Link system to ship goods to local Walmart Stores?
2. Why is a detailed knowledge of consumer purchases at each store important to Walmart's success?
3. Why can't other large retailers easily duplicate Walmart's Retail Link?
4. Why does Walmart encourage its vendors to learn how to use Retail Link?

CHAPTER 2 GLOBAL E-BUSINESS: HOW BUSINESSES USE INFORMATION SYSTEMS

CASE 2

Salesforce.com: The Emerging Social Enterprise



(a) The Comcast Social Enterprise Story; L= 2:50

URL http://www.youtube.com/watch?v=FFOyKnu8INY; L=2:50.

(b) Social Enterprise: Transforming the Firm; L=8:29

URL http://www.youtube.com/watch?v=WxC0X7ypaDQ&feature=relmfu

SUMMARY Salesforce.com is the leading provider of enterprise cloud-computing applications with 2011 revenues of $1.6 billion. It provides a comprehensive customer and collaboration relationship management, or CRM, service to businesses of all sizes and industries worldwide and a technology platform for customers and developers to build and run business applications. Recently they have made a number of acquisitions of social technology firms and now offer cloud-based social enterprise services to their primary customers such as Toyota, Gatorade, and Groupon. Salesforce is building private social networks for large corporations and their customers. In addition, Salesforce.com is attempting to transform itself into a social enterprise. Comcast (the second largest cable television network operator in the United States) has also begun to use social platforms like Twitter to respond to customers, a first step in the process of becoming a social enterprise.

CASE Social enterprise (also "social business") refers to efforts by business firms to integrate social media and social computing tools into their enterprises. The hope is that new social tools and technologies will more closely integrate the firm with its customers, suppliers, and employees, resulting in greater productivity, stronger brands, more innovation, and faster time to market.

continued

Today many firms are rushing to implement social technologies throughout their firms on a global scale and increasingly using external social technologies like Facebook, Twitter, and Google+ to engage their suppliers, employees, and customers. One reason: customers and employees are sometimes spending a majority of their time online at social sites.

A recent McKinsey survey of 4,200 global executives found 72 percent of responding companies are using at least once social technology, and 50 percent are using social networks and blogs. Firms are rapidly improving their mastery of social technologies and using them to enhance operations and exploit new market opportunities. More than 80 percent of responding firms believe that when social technologies are integrated into the work processes of employees, they can boost a company's financial performance and market share.

A key word in the literature on social business is "conversations." As one wag put it, "your business is the sum of all conversations about the business." The idea is that customers, suppliers, employees, and firm managers, even oversight agencies, are having conversations about firms, without the knowledge of the firm or its key actors like employees and managers. Increasingly, these conversations are taking place on social networking sites like Facebook, Twitter, and Google+, or social networking platforms like blogs, online review sites, and online forums.

Supporters of social business argue that, if firms could tune into these conversations, they would strengthen their bonds with consumers, suppliers and employees. And therefore, the centerpiece of social business transformation efforts is to encourage firms to monitor all Web traffic that involves their firms, and to participate in online communities both public and private.

Social enterprise seeks to change three dimensions of firms: involvement, transparency, and velocity of change. The idea is to use social networking platforms, including Facebook, Twitter, LinkedIn, as well as blogs, collaboration environments, and YouTube, to tighten the communication links among consumers, employees, and suppliers and thereby increase their emotional involvement in the firm and the creation of value. In short, everyone involved in value creation within a firm will be more tightly connected to others. Customers will provide feedback on products and services on a social network, and these comments will be read by employees and managers. These are the very people who can make changes to products and improve on them, responding directly to consumer comments.

All of this requires a great deal of information transparency. People need to share their opinions and facts with others quite directly, without intervention from executives or fear of reprisal for saying what they believe. Employees get to know directly what customers think; suppliers will learn very directly what their customers think of them as supply chain partners; and even managers presumably will learn more directly from their employees how

continued

well they are doing. In short, as on Facebook, nearly everyone involved in the creation of value will know a great deal about everyone else.

If such an environment could be created, it is likely that the velocity of business, the transaction rate, but also the rate of innovation and change, will increase. Why? In part because several time-based information impediments to business and innovation will be reduced or eliminated. If product designers can learn directly about how their products are doing in the market in real-time, based on consumer feedback, and comments, then they can start the redesign process faster. If suppliers did not have to wait for an annual evaluation but could learn nearly in real-time how well they are delivering goods to a firm, they might be able to improve faster. Because the information arrives faster in a social business, the decision making can be correspondingly accelerated.

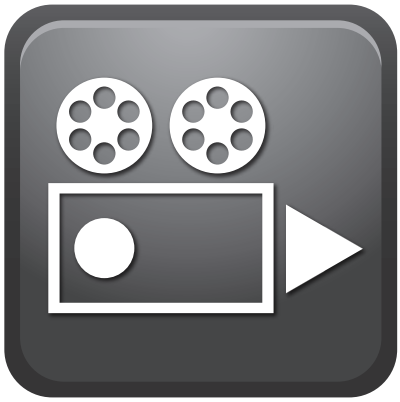
VIDEO CASE QUESTIONS

1. Why did Comcast join public social networks? What difference did it make for Comcast's business? What might be the benefits for a consumer?
2. What issues and challenges is the use of social network monitoring supposed to solve or address at Salesforce.com?
3. Radian 6 (now owned by Salesforce) is described as a "listening and engagement platform." What does this mean and how does it differ from traditional marketing techniques for communicating with the customer?
4. What are some of the measures you can use to measure the success of a social business approach? Name at least four measures of social business impact. What does it mean to measure the success of a company in terms of its "share of conversation"?
5. How did Salesforce organize its social business initiative? Why was it important to make social enterprise a full time job?

CHAPTER 2 GLOBAL E-BUSINESS AND COLLABORATION

CASE 3

How FedEx Works: Inside the Memphis Super Hub



SUMMARY The inside story of how enterprise-wide systems power the FedEx Memphis hub, the world's largest air-cargo facility. This video describes the various business processes and information technologies used to process over 2 million packages a day at the Memphis Hub. . L=2:05.

URL http://www.youtube.com/watch?v=iYzQ7JSBIGU

CASE FedEx was one of the first modern, ground/air, overnight package-delivery companies. Founded in 1971, in 2012 FedEx is a $43 billion company operating in 220 countries, with a labor force of approximately 300,000. In a typical day, FedEx ships over 9 million packages worldwide. FedEx provides transportation, e-commerce, and business services. Founded by Frederick W. Smith, the company was created to remedy what Smith viewed as inefficiency in the distribution system for air freight. Since that time, FedEx has garnered a reputation for revolutionary business practices, speed, and reliability. Their information systems are a critical component of their success. This video illustrates FedEx's business processes and some of those systems in action.

The route a typical package takes from start to finish is as follows: First, a FedEx agent picks up a package and scans it, entering it into the system under a unique identification number. It's then transferred to a local or regional hub, or sorting center, via a truck containing other similar packages. Once it reaches the nearest sorting center, the packages are trucked to a nearby airport and taken to the Memphis Super Hub. The Memphis Super Hub is the largest package sorting facility in the world, handling 2.2 million packages daily with a workforce of

continued

nearly 8,000 people. The packages are scanned and sorted several times, and then placed into air-freight containers and shipped to regional airports and then to local sorting centers, where trucks make the final delivery to clients. Delivery personnel make the final scan after leaving the package with a customer. In the background, FedEx maintains an up-to-the-minute tracking system, available online to customers, which can pinpoint the location of a package anywhere in the FedEx system.

FedEx uses several types of technology to sort the packages it ships. A dimensional scanner records the length, width, height, and weight of the packages to determine their size and cost of shipping. Another multidimensional scanner reads the barcode from any location on the package except the bottom. Then, paddles nudge the packages onto different belts depending on the eventual destination. Some packages require manual sorting instead of this automated method.

VIDEO CASE QUESTIONS

1. List the business processes displayed in the video.
2. List the types of information systems shown in the video. Can you describe how systems that were not shown might be used at FedEx?
3. The system displayed in the video is an enterprise system. Why is this true? Explain your answer.
4. What are the risks and benefits of having a single Super Hub in Memphis coordinate the delivery of packages across the United States?
5. How could FedEx's shipping process be made even more efficient?

CHAPTER 2

How Businesses Use Information

LEARNING OBJECTIVES

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

1. What are business processes? How are they related to information systems?
2. How do information systems serve the various levels of management groups in a business?
3. How do systems that link the enterprise improve organizational performance?
4. Why are systems for collaboration and teamwork so important, and what technologies do they use?
5. What is the role of the information systems function in a business?

Teaching Suggestions

The opening vignette, "TELUS Embraces Social Learning," provides an outstanding example of how the company embraced social business tools to significantly reduce its learning budget all the while it increased the amount of learning and education available to its employees. These technologies are the very same ones every business needs to succeed.

Prior to incorporating the new social business tools, 90 percent of the TELUS learning budget was devoted to formal learning in which employees had to wait until attending a scheduled class before they could learn new techniques. After the company began incorporating new collaboration and social business tools into its employee education, only 60 percent of the budget was devoted to formal learning. Further cost savings will occur as the new learning solutions take hold.

TELUS uses Microsoft SharePoint Server 2010 as a single point of entry to shared knowledge. It has the ability to search all the company's learning assets simultaneously. Employees create their own Web pages to describe their areas of expertise and special skills. It also offers blogging tools to allow employees to locate an expert, discuss his or her experiences, share advice, and find answers to questions without having to take a class or interrupt a colleague.

Document sharing, tagging user-generated content, and videos, all contribute to the social learning and collaboration among employees at TELUS. Along the way, TELUS changed its organizational culture and business processes for knowledge dissemination and employee learning.

Section 2.1, "Business Processes and Information Systems"

Table 2-1 may help students understand that every business, large and small, uses the same basic business processes. Referring back to this table may help as you examine information needs for each functional area. You could have students select a business with which they are familiar and identify some of the business processes involved in each of the basic functional areas.

Another good classroom exercise is to use Figure 2-1 to compare how the order fulfillment process can be accomplished sequentially, as the figure shows, versus simultaneously as a new information system would allow.

Section 2.2, "Types of Information Systems"

This section focuses on how information systems serve various management levels in companies. The ultimate goal is for students to realize that one system helps serve other systems and, working together, all the systems serve the entire organization.

Type of System	Information Inputs	Information Outputs	Users
Transaction Processing Systems (TPS)	Transactions; daily events	Detailed reports; lists; summaries	Operations personnel; first-line supervisors
Management Information Systems (MIS)	Summary transaction data; high-volume data; simple models	Summary and exception reports	Middle managers
Decision Support Systems (DSS)	Optimized for data analysis, analytic models and data analysis tools.	Interactive; simulations; analysis	Professionals, staff managers
Executive Support Systems (ESS)	Aggregate data; external, internal	Projections; responses to queries	Senior managers

It is likely that students' main encounter will be with TPS systems when they first begin their careers. Stress the importance of accurate data at the TPS level because the TPS serves as the initial source for the other systems.

Typically, DSS and ESS systems will be the least familiar. Students may better understand them if you ask these types of questions: Why do national retail chains open stores in certain locations and not others? How can a retail chain determine which type of clothing to stock at different geographic locations?

Most important, students need to understand that each type of information system supports the different kinds of decisions made at each managerial level.

It's quite possible that students feel overwhelmed by all the different kinds of information systems described in the first part of this section. "*Systems for Linking the Enterprise*" helps you tie together all of the information systems into a cohesive package and show how data and information can flow seamlessly through an organization.

Enterprise systems: Central to this section is the need to coordinate activities, decisions, and knowledge across the firm's different levels, functions, and business units. Enterprise systems use a single central data repository in order to supply all users with a consolidated view of employees, customers, suppliers, and vendors. The key to effectively using enterprise systems is to eliminate redundancy and duplication, not just in the information systems but also in business processes.

Supply chain management systems: Students should understand the importance of a business managing its relationships with suppliers through a free-flowing exchange of information. The concept may seem foreign to those students who think a company is a closed entity and shouldn't share data or information with anyone outside the organization. A review of a typical supply chain may be helpful: sourcing, producing, and delivering goods and services. It may also be helpful to engage the students in an exercise that lists all the entities involved in producing and delivering goods and services.

Customer relationship management systems: Ask students how many times they've quit doing business with a company because of poor customer service. Ask them how many times they've had to supply a business with the same information simply because they talked to a different department in the company. Discuss how important it is for every functional area in a business to have the same consolidated view of its customers to avoid these kinds of problems.

Knowledge management systems: Few, if any, students have probably had any experience with these systems. Point out that businesses are beginning to realize how much expertise and experience is locked away in employees' heads and that it's imperative to find a way to capture that information. Moreover, it's important that businesses find a way to make the expertise and experience available to a wide range of users. On the other hand, students should understand that employees are very reluctant to impart with their individual knowledge due to fear or self-preservation.

Intranets and Extranets: As Internet-based technologies continue to expand the basic platforms for disseminating information, smaller businesses that cannot afford to implement enterprise applications can turn to intranets and extranets. Your difficulty will

be getting students to understand the difference between the two since they operate basically the same way. Intranets are limited to internal users; extranets are available to external users as well as internal users. Both are an inexpensive way to quickly disseminate information and data across functional lines and organizational boundaries.

E-business, e-commerce, and e-government: Have students give examples of their own experiences with of each of these. Students are most often confused between e-business and e-commerce. Stress that e-business refers to the use of digital technology and the Internet to execute major business processes while e-commerce is more narrowly centered on the buying and selling of goods and services over the Internet.

WINDOW ON TECHNOLOGY: CAN AIRLINES SOLVE THEIR BAGGAGE HANDLING PROBLEMS?

Case Study Questions

1. What types of transactions are handled by baggage handling systems?

The primary types of transactions handled by baggage handling systems are moving bags from check-in areas to departure gates, moving them from gate to gate and then finally, moving them from arrival gates to baggage claim areas. That's a lot of input data, processing, and output data.

When computers scan the bar code on a piece of baggage, the data is processed quickly. The output determines where and when to send the bags. After being scanned once, the system always knows where the bags are at any point in the system.

2. What are the management, organization, and technology components of baggage handling systems?

Management: Those who tag luggage at check-in counters must enter the data correctly. The tags contain flight information and a bar code that all of the computers in the system can read. Once bags reach the gate, they enter a sorting station where airline employees use computer terminals to send bags to the correct plane. Delta recently added a service that allows passengers to track their checked bags from scanning at check-in, to the flight they're loaded on, and then arrival at baggage claim.

Organization: Paying for often spotty and unreliable baggage handling service was one of the biggest sources of customer dissatisfaction throughout the industry. Baggage handling systems can be extremely expensive, but if implemented successfully, pay for themselves. Lost and mishandled baggage is a major expense for airlines, and reducing the incidence of lost and mishandled baggage creates significant yearly savings.

Technology: Baggage handling systems are among the most complex systems because they involve a wide variety of sensors, actuators, mechanical devices, and computers. The systems use over three million lines of software program code. Advanced technology used in these systems include destination-coded vehicles (DCV), automatic bar code scanners, use of radio frequency identification (RFID) tags, and high-tech conveyors equipped with sorting machines. Because DCVs move at high speed and do not come to a full stop to receive baggage, the conveyors must be extremely precise, depositing bags where they are needed at just the right time for maximum efficiency.

3. **What is the problem these baggage handling systems are trying to solve? Discuss the business impact of this problem. Are today's baggage handling systems a solution to this problem? Explain.**

   The problem baggage handling systems are trying to solve is customer dissatisfaction and to promote customer goodwill as well as reduce costs.

   Business impact: Overall the airline industry rate for lost luggage has improved by 38 percent over similar figures from two years ago when nearly 2.5 million bags were lost or delayed. Lost and mishandled baggage is a major expense for airlines. Reducing the problem creates significant yearly savings. The global airline industry price tag for mishandled baggage is $2.5 billion per year.

   Today's baggage handling systems do appear to be a solution to the problem. US Airways lost nine bags for every 1,000 travelers in 2007. After implementing a new system, that number dropped to three bags for every 1,000 travelers. Even though the company spent $16 million on the system, the airline saved $25 million a year and boosted customer satisfaction.

   Between 2008 and 2010, Delta Airlines installed optical scanners to read baggage tag bar codes, widened and extended its system of baggage conveyor belts, and installed a central control room to monitor conveyor belts and baggage carousels in Atlanta and most of its other airport terminals. The airline recorded a top-notch baggage handling record of just 2.93 mishandled bags per 1,000 passengers. Bags now take less than 10 minutes to travel from terminal to terminal. The process used to take as long as 30 minutes with the older system.

4. **What kinds of management reports can be generated from the data from these systems?**

   All data input into the baggage handling systems are recorded in transaction processing systems. From there, a variety of Management Information Systems (MIS), Decision Support Systems (DSS), and Executive Support Systems (ESS) reports can be generated.

MIS reports may include information about the number of bags at any given time in any given place; how long it takes to move a bag from point A to any other point in the system; the number of bags processed through the baggage handling system that are outside the norms. Equipment management reports can be generated that provide information about the maintenance status of the various system components.

DSS reports can be generated that advise managers when to perform maintenance on equipment or whether equipment should be moved to alternate locations based on baggage loads. These kinds of reports can also provide information to managers about whether the system is meeting its goals and how it can be improved.

ESS reports can advise executives about cost factors and if the system is providing the targeted return on investment. Information about the efficiency of the system is also available to executives based on data generated by the baggage handling systems.

WINDOW ON MANAGEMENT: PILOTING PROCTER & GAMBLE FROM DECISION COCKPITS

Case Study Questions

1. **What management, organization, and technology issues had to be addressed when implementing Business Sufficiency, Business Sphere, and Decision Cockpits?**

   Management: Managers and executives were receiving data and information but only when it was days or weeks old—too late to make on-the-spot decisions and immediately solve problems.

   Organization: A major reason for P&G's success has been its robust information technology and willingness to pursue new IT innovations to maintain a competitive advantage in its industry. P&G has made it its goal to digitize its process from end to end and to fundamentally change the way it gathers, reports, and interprets data. One of its major goals was to eliminate time spent by employees debating the validity of competing versions of data found in emails, spreadsheets, letters, and reports. By providing a one-stop source of accurate and detailed real-time business data, all employees are able to focus instead on decisions for improving the business.

   Technology: The old business model was to figure out what reports people wanted, capture the data, and then deliver them to the key decision-makers days or weeks later. The new model is more instantaneous with people huddling together in person or via video and pulling in the right experts to fix a problem the moment it arises. More real-time data and analytics expertise were required.

2. How did these decision-making tools change the way the company ran its business? How effective are they? Why?

These solutions eliminate time spent debating different data sets, and instead use a system that allows leaders to focus on immediate business decisions using the most accurate data available at that precise moment.

The Business Sufficiency program, furnishes executives with predictions about market share and other key performance metrics six to twelve months into the future. It's based on analytic models that show what is occurring in the business right now, why it's happening, and what actions the company can take to mitigate the situation. By providing the "why," the company can take a more appropriate action.

The Business Sphere interactive system reveals insights, trends and opportunities for leaders, and prompts them to ask focused business questions that can be addressed with the right data on the spot. Thousands of algorithms and analytical models aggregate data, organize them appropriately and then monitor trends. Everyone in the meeting or organization sees the same information.

The Decision Cockpit eliminates time spent by employees debating the validity of competing data versions. Employees are able to focus instead on decisions for improving the business. The Business Sphere and Decision Cockpits encourage P&G employees and managers to manage by exception and devote their time and energy where it is most needed.

3. How are these systems related to P&G's business strategy?

Managers and employees are able to make faster and better decisions than were previously possible. The company enjoys a reduced complexity involved in generating a statistical report, as well as cost reductions from maintaining one standardized set of data across the enterprise instead of duplicated, redundant data. Employee-generated emails have dropped sharply since more workers can answer their own questions and obtain their own information. The company is also able to better anticipate future events affecting the business and more quickly respond to market stimuli.

Section 2.3 "Systems for Collaboration and Social Business

Students have probably used most of these systems without even realizing their business value. Your task is to relate these increasingly common technologies to business processes and needs. Discuss how they can use cell phones, instant messaging, social networking sites, and wikis in a business setting to communicate, collaborate, and share ideas with team members, business partners, customers, and suppliers.

One exercise you can use to reinforce the usefulness of team collaboration is to have small student groups explore social networking sites or Twitter to see how many postings

by businesses they can find. For instance, Twitter has tweets for Free Honey Bunches of Oats at Walmart and a tweet for an article about General Electric's solar technology. McDonalds used Twitter to solicit customer feedback but they were unprepared to address the negative comments.

Businesses also make use of YouTube.com to post videos of their products. This exercise will help demonstrate how businesses must constantly adapt their marketing strategies to reach customers. You can also generate a discussion about students' experience on these kinds of sites in relation to business uses and ask them to relate how effective these new methods of engaging customers are.

Table 2-3 emphasizes the benefits of collaboration while Figure 2-7 highlights the necessity of having the appropriate organization structure and culture, along with the right technology, to successfully use collaboration in an organization. Discuss how the absence of even one of these three can hinder or prevent collaboration. Ask students to draw on their own experiences to compare and contrast firms with a collaborative culture to those without.

Because some of the online collaborative features listed in Table 2-4 are relatively new, you can have teams of students explore one or two of them and then present to the class a list of characteristics, capabilities, advantages and disadvantages, for each one.

Many times people and businesses decide which collaborative tools to use based on which ones they are most familiar with rather than which are the most appropriate tool for the task at hand.

You can have student teams evaluate one or more collaborative programs for an organization to which they belong like a sports team, class group, workplace or even their use in your classroom. Have them use the time/space matrix in Figure 2-8 and the information in the section "*Checklist for Managers: Evaluating and Selecting Collaboration and Social Tools*" to help select the best tool.

Have students explore the use of business wikis first-hand by visiting SAP's Enterprise Solution Wiki at https://wiki.sdn.sap.com/wiki/display/ESpackages/Home or IBM's LotusNotes Wiki at http://www-10.lotus.com/ldd/dominowiki.nsf/dx/wiki-help . Both wikis will help demonstrate the usefulness of having so much knowledge at your fingertips plus the ease with which companies are gathering, storing, and disseminating knowledge. The home page of IBM's LotusNotes Wiki also has a great list of how to perform various wiki tasks. Students can see how easy it is to navigate wikis by reading these instructions.

Section 2.4. "The Information Systems Function in Business"

If possible, arrange a session with the university's information systems department to allow students to see first-hand how such a centre works and who is responsible for running the systems. Have the IS staff and students participate in a Question and Answer forum about how typical processes are handled. Many students have a better appreciation of how these

complex centres work when they actually see one in operation rather than just reading about it. Stress to students that in all but the smallest of firms these systems are critical to the operational efficiency and sheer survival in a very competitive marketplace.

Most important, students should understand that the IS staff is responsible for the well-being of all users in an organization. Users and the IS staff are teammates not polarizing opposites.

Review Summary

1. **What are business processes? How are they related to information systems?**
2. **How do systems serve the various levels of management in a business?**
3. **How do systems that link the enterprise improve organizational performance?**
4. **Why are systems for collaboration and social business so important, and what technologies do they use?**
5. **What is the role of the information systems function in a business?**

Key Terms

The following alphabetical list identifies the key terms discussed in this chapter. The page number for each key term is provided.

Business intelligence 36
Chief information officer (CIO) 54
Chief knowledge officer (CKO) 55
Chief privacy officer (CPO) 55
Chief security officer (CSO) 55
Collaboration 45
Customer relationship management (CRM) systems 43
Cyberlockers 50
Decision-support systems (DSS) 37
Digital dashboard 40
Electronic business (e-business) 44
Electronic commerce (e-commerce) 44
E-government 44
End users 55
Enterprise applications 41
Enterprise systems 42
Executive support systems (ESS) 40
Information systems department 54
Information systems managers 54
Interorganizational system 43
IT governance 55
Knowledge management systems (KMS) 44
Management information systems (MIS) 36
Portal 40
Programmers 54
Social business 46
Supply chain management (SCM) systems 42
Systems analysts 54
Teams 45
Telepresence 49
Transaction processing systems (TPS) 35

Review Questions

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

Define business processes and describe the role they play in organizations.

A business process is a logically related set of activities that define how specific business tasks are performed. Business processes are the ways in which organizations coordinate and organize work activities, information, and knowledge to produce their valuable products or services.

How well a business performs depends on how well its business processes are designed and coordinated. Well-designed business processes can be a source of competitive strength for a company if it can use the processes to innovate or perform better than its rivals. Conversely, poorly designed or executed business processes can be a liability if they are based on outdated ways of working and impede responsiveness or efficiency.

Describe the relationship between information systems and business processes.

Information systems automate manual business processes and make an organization more efficient. Data and information are available to a wider range of decision-makers more quickly when information systems are used to change the flow of information. Tasks can be performed simultaneously rather than sequentially, speeding up the completion of business processes. Information systems can also drive new business models that perhaps wouldn't be possible without the technology.

2. How do systems serve the various levels of management in a business?

Describe the characteristics of transaction processing systems (TPS) and the roles they play in a business.

Transaction processing systems (TPS) are computerized systems that perform and record daily routine transactions necessary in conducting business; they serve the organization's operational level. The principal purpose of systems at this level is to answer routine questions and to track the flow of transactions through the organization.

- At the operational level, tasks, resources, and goals are predefined and highly structured.
- Managers need TPS to monitor the status of internal operations and the firm's relationship with its external environment.
- TPS are major producers of information for other types of systems.
- 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.

Describe the characteristics of management information systems (MIS) and explain how MIS differ from TPS and from DSS.

Middle management needs systems to help with monitoring, controlling, decision-making, and administrative activities.

- 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 the company's basic operations using data supplied by TPSs. The basic transaction data from TPS are compressed and usually presented in reports that are produced on a regular schedule.
- MIS serve managers primarily interested in weekly, monthly, and yearly results, although some MIS enable managers to drill down to see daily or hourly data if required.
- MIS generally provide answers to routine questions that have been specified in advance and have a predefined procedure for answering them.
- MIS 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.

MIS differs from TPS in that MIS deals with summarized and compressed data from the TPS.

While MIS have an internal orientation, DSS will often use data from external sources, as well as data from TPS and MIS. DSS supports "what-if" analyses rather than a long-term structured analysis inherent in MIS systems. MIS are generally not flexible and provide little analytical capabilities. In contrast, DSS are designed for analytical purposes and are flexible.

Describe the characteristics of decision support systems (DSS) and how they benefit businesses.

Decision-support systems (DSS) support nonroutine decision-making for middle managers.

- DSS provide sophisticated analytical models and data analysis tools to support semistructured and unstructured decision-making activities.
- DSS use data from TPS, MIS, and external sources, in condensed form, allowing decision makers to perform "what-if" analysis.
- DSS focus on problems that are unique and rapidly changing; procedures for arriving at a solution may not be fully predefined.
- DSS are designed so that users can work with them directly; these systems include interactive, user-friendly software.

Describe the characteristics of executive support systems (ESS) and explain how these systems differ from DSS.

Executive support systems help senior managers address strategic issues and long-term trends, both in the firm and in the external environment.

- ESS address nonroutine decisions requiring judgment, evaluation, and insight because there is no agreed-on procedure for arriving at a solution.
- ESS provide a generalized computing and communications capacity that can be applied to a changing array of problems.
- 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.
- ESS are designed for ease-of-use and rely heavily on graphical presentations of data.

3. How do systems that link the enterprise improve organizational performance?

Explain how enterprise applications improve organizational performance.

An organization operates in an ever-increasing competitive and global environment. The successful organization focuses on the efficient execution of its processes, customer service, and speed to market. Enterprise applications provide an organization with a consolidated view of its operations across different functions, levels, and business units. Enterprise applications allow an organization to efficiently exchange information among its functional areas, business units, suppliers, and customers.

Define enterprise systems, supply chain management systems, customer relationship management systems, and knowledge management systems and describe their business benefits.

Enterprise systems integrate the key business processes of an organization into a single central data repository. This makes it possible for information that was previously fragmented in different systems to be shared across the firm and for different parts of the business to work more closely together.

Business benefits include:

- Information flows seamlessly throughout an organization, improving coordination, efficiency, and decision making.
- Gives companies the flexibility to respond rapidly to customer requests while producing and stocking only that inventory necessary to fulfill existing orders.
- Increases customer satisfaction by improving product shipments, minimizing costs, and improving a firm's performance.
- Improves decision making by improving the quality of information for all levels of management. That leads to better analyses of overall business performance, more accurate sales and production forecasts, and higher profitability.

In short, **supply chain management (SCM) systems** help businesses better manage relationships with their suppliers. Objective of SCM: Get the right amount of products from the companies' source to their point of consumption with the least amount of time and with the lowest cost. SCM provides information to help suppliers, purchasing firms, distributors, and logistics companies share information about orders, production, inventory levels, and delivery of products and services so that they can source, produce, and deliver goods and services efficiently. SCM helps organizations achieve great efficiencies by automating parts of these processes or by helping organizations rethink and streamline these processes. SCM is important to a business because through its efficiency it can coordinate, schedule, and control the delivery of products and services to customers.

Business benefits include:

- Decide when and what to produce, store, and move
- Rapidly communicate orders
- Track the status of orders
- Check inventory availability and monitor inventory levels
- Reduce inventory, transportation, and warehousing costs
- Track shipments
- Plan production based on actual customer demand
- Rapidly communicate changes in product design

Customer relationship management (CRM) systems enable a business to better manage its relationships with existing and potential customers. With the growth of the Web, potential customers can easily comparison shop for retail and wholesale goods and even raw materials, so treating customers better has become very important.

Business benefits include:

- CRM systems provide information to coordinate all 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.
- CRM systems consolidate customer data from multiple sources and provide analytical tools for answering questions such as: What is the value of a particular customer to the firm over his/her lifetime?
- CRM tools integrate a business's customer-related processes and consolidate customer information from multiple communication channels, giving the customer a consolidated view of the company.
- Detailed and accurate knowledge of customers and their preferences help firms increase the effectiveness of their marketing campaigns and provide higher-quality customer service and support.

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.

Business benefits include:

- KMS support processes for acquiring, storing, distributing, and applying knowledge, as well as processes for creating new knowledge and integrating it into the organization.
- KMS include enterprise-wide systems for managing and distributing documents, graphics, and other digital knowledge objects; systems for creating corporate knowledge directories of employees with special areas of expertise; office systems for distributing knowledge and information; and knowledge work systems to facilitate knowledge creation.
- KMS use intelligent techniques that codify knowledge and experience for use by other members of the organization and tools for knowledge discovery that recognize patterns and important relationships in large pools of data.

Explain how intranets and extranets help firms integrate information and business processes.

Because intranets and extranets share the same technology and software platforms as the Internet, they are easy and inexpensive ways for companies to increase integration and expedite the flow of information within the company (intranets alone) and with customers and suppliers (extranets). They provide ways to distribute information and store corporate policies, programs, and data. Both types of nets can be customized by users and provide a single point of access to information from several different systems. Businesses can connect the nets to transaction processing systems easily and quickly. Interfaces between the nets and TPS, MIS, DSS, and ESS systems provide input and output for users.

4. 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.

Collaboration is working with others to achieve shared and explicit goals. It focuses on task or mission accomplishment and usually takes place in a business, or other organizations, and between businesses. Collaboration can be short-lived or longer term, depending on the nature of the task and the relationship among participants. It can be one-to-one or many-to-many.

Social business is part of an organization's business structure for getting things done in a new collaborative way. It uses social networking platforms to connect employees, customers, and suppliers. The goal of social business is to deepen interactions with groups inside and outside a company to expedite and enhance information-sharing, innovation, and decision-making.

Collaboration and social business are important because:

- *Changing nature of work.* More jobs are becoming "interaction" jobs. These kinds of jobs require face-to-face interaction with other employees, managers, vendors, and customers. They require systems that allow the interaction workers to communicate, collaborate and share ides.
- *Growth of professional work.* Professional jobs in the service sector require close coordination and collaboration.
- *Changing organization of the firm*. Work is no longer organized in a hierarchical fashion as much as it is now organized into groups and teams who are expected to develop their own methods for accomplishing tasks.
- *Changing scope of the firm.* Work is more geographically separated than before.
- *Emphasis on innovation.* Innovation stems more from groups and teams than it does from a single individual.
- *Changing culture of work and business*. Diverse teams produce better outputs, faster, than individuals working on their own.
- *Social business tools* can allow a business to connect with its stakeholders, such as customers, and collect feedback from those stakeholders.
- *Social business tools* allow a business to market their products and services using social media.

List and describe the business benefits of collaboration and social business.

The general belief is that the more a business firm is collaborative in nature, the more successful it will be and that collaboration within and among firms is more essential than in the past. The overall economic benefit of collaboration and social business are significant.

The business benefits of collaboration are listed in Table 2.2:

- *Productivity*: people working together accomplish tasks faster, with fewer errors, than those working alone.
- *Quality*: people can communicate errors and correct them faster when working together versus working alone.
- *Innovation*: people working in groups can generate more innovative ideas than if they were working alone.
- *Customer service*: people working in teams can solve customer complaints and issues faster and more effectively versus working in isolation.
- *Financial performance*: collaborative firms have superior sales, sales growth, and financial performance.

Describe a supportive organization culture and business processes for collaboration.

Historically, organizations were built on hierarchies which did not allow much decision making, planning, and organizing at lower levels of management or by employees. Communications were generally vertical through management levels rather than horizontal between groups of employees.

A collaborative culture relies on teams of employees to implement and achieve results for goals set by senior managers. 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. Rather than employees being rewarded for individual results, they are rewarded based on their performance in a team. The function of middle managers in a collaborative business culture is to build the teams, coordinate their work, and monitor their performance. 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.

List and describe the various types of collaboration and social business systems.

Some of the more common enterprise-wide information systems that businesses can use to support interaction jobs include:

- Internet-based collaboration environments like Lotus Notes, Groove, and WebEx provide online storage space for documents, team communications (separated from email), calendars, and audio-visual tools members can use to meet face-to-face.
- Email and Instant Messaging (IM) are reliable methods for communicating whenever and wherever around the globe.
- Cell phones and wireless handhelds give professionals and other employees an easy way to talk with one another, with customers and vendors, and with managers. These devices have grown exponentially in sheer numbers and in applications available.
- Social networking is no longer just "social." Businesses are realizing the value of providing easy ways for interaction workers to share ideas and collaborate with each other.
- Wikis are ideal tools for storing and sharing company knowledge and insights. They are often easier to use and cheaper than more proprietary knowledge management systems. They also provide a more dynamic and current repository of knowledge than other systems.
- Virtual worlds house online meetings, training sessions, and "lounges" where real-world people meet, interact, and exchange ideas.
- Google Apps/Google sites and cloud collaboration allow users to quickly create online group-editable Web sites that include calendars, text, spreadsheets, and videos for private, group, or public viewing and editing.
- Microsoft SharePoint software makes it possible for employees to share their Office documents and collaborate on projects using Office documents as the foundation.

5. What is the role of the information systems function in a business? Describe how the information systems function supports a business.

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.

Compare the roles played by programmers, systems analysts, information systems managers, the chief information officer (CIO), chief security officer (CSO), and chief knowledge officer (CKO).

- 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. The systems analyst's job is to translate business problems and requirements into information requirements and systems.
- Information systems managers lead teams of programmers and analysts, project managers, physical facility managers, telecommunications mangers, or database specialists.
- Chief information officer (CIO) is a senior manager who oversees the use of information technology in the firm.
- Chief security officer (CSO) is responsible for information systems security in the firm and has the principle responsibility for enforcing the firm's information security policy. The CSO is responsible for educating and training users and IS specialists about security, keeping management aware of security threats and breakdowns, and maintaining the tools and policies chosen to implement security.
- Chief knowledge officer (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.

Discussion Questions

1. **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.**

   Today's systems are built to electronically coordinate all the business functions in an enterprise. The sales function begins the process by completing a sales order, electronically inputting the data into the system. The sales system updates daily sales totals and decreases inventory. The accounting department electronically receives the order and runs a credit check. If the credit is not approved, the system sends an exception notification to an accounting specialist and the sales person. If credit is approved, the order is sent to the manufacturing and production system and product assembly begins. When the product is completed, electronic shipping documents are prepared and logistics is notified. When the product is shipped, electronic notifications are sent to Sales, Manufacturing and Production, Accounting, and the customer. The system electronically bills the customer.

2. **Identify the steps that are performed in the process of selecting and checking a book out from your college library and the information that flows among these**

activities. Diagram the process. Are there any ways this process could be improved to improve the performance of your library or your school? Diagram the improved process.

Students should rely on information from Section 2-1, Business Processes and Information Systems, and specifically the information from "*Business Processes*," to answer this question. Figure 2-2 should serve as a guide for diagramming the library fulfillment process as it currently may exist. Information from "*How Information Technology Enhances Business Processes"* can help students diagram the improved process.

3. **Use the Time/Space Collaboration and Social Tool Matrix to classify the collaboration and social technologies used by TELUS?**

   First, students should use Table 2-5 to evaluate various enterprise social networking software capabilities, and Figure 2-8 to help them choose the most appropriate collaboration and social tools for the tasks. They should then use the "to-do" list to make sure they choose the correct collaboration software at an affordable price and within the team's risk tolerance.

   TELUS employees can take advantage of these social networking capabilities to learn at their own pace and time:
   - Profiles
   - Content sharing
   - Feeds and notifications
   - Tagging and social bookmarking

Hands-on MIS Projects

Management Decision Problems

1. **Ben's Lumber Company**: The prices of lumber and other building materials are constantly changing. When a customer inquires about the price on pre-finished 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 Ben'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. Who would make those decisions?

   Manually updating price sheets leads to slower sales processes, pricing errors if sales reps are using outdated information, and customer dissatisfaction due to delays in obtaining information. By putting the data online using an extranet and updating it as necessary, sales reps consult the most current information immediately. That leads to faster sales and more satisfied customers. Necessary decisions include how much information to make available online, who will have access to it, and how to keep the information secure. Senior management would likely make these decisions.

2. **David's Hardware:** Owners do not keep automated, detailed inventory or sales records. Invoices are not maintained or tracked (other than for tax purposes). 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 the owners run their business? What data should these systems capture? What decisions could the systems improve?

   The business impact includes lost sales, over- and under-ordering products, improper sales accounting and more costly inventory control. An information system could capture data that allows owners to maintain proper inventories, order only those products needed, and ensure proper sales accounting. Decisions on pricing, product levels, and inventory replenishment could be vastly improved based on data and not a best-guess venture.

Improving Decision Making: Using a Spreadsheet to Select Suppliers

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

This exercise requires some student knowledge of spreadsheet database functions. At a minimum, students should know how to sort the database by various criteria such as item description, item cost, vendor number, vendor, name, or A/P terms. Students may need to be told that A/P Terms is expressed as the number of days that the customer has to pay the vendor for a purchase. In other words, 30 designates net 30 days. The vendor that allows customers the longest amount of time to pay for an order would, of course, offer the most favourable payment terms.

Students will need to add additional columns for calculating the actual delivery time for each order and the number of days the delivery is late. The Actual Delivery Time can be calculated by subtracting the Promised Ship Date from the Arrival Date. The number of days late can be calculated by subtracting the Promised Transit Time from the Actual Delivery Time. If the number of days late is negative, it indicates that the order arrived early.

These numbers are useful when trying to determine who is the vendor with the best on-time delivery track record. Students can use the DAVERAGE function to determine the average delivery time for each vendor. Students can also use one of the database functions to determine the vendor with the best accounts payable terms. To determine the vendor with the lowest prices for the same item when it is supplied by multiple vendors, students can filter the database using the item description. This filtered list can then be sorted by item cost and vendor number.

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

Students should compare the shortest amount of time with the shortest difference. Encourage students to use the Advanced Tools option to quickly change back and forth between "shortest time" and "shortest distance." To show how convenient these kinds of online tools are, ask students to use a regular map and calculator to draw out the two routes.

CASE STUDY: SHOULD COMPANIES EMBRACE SOCIAL BUSINESS?

1. **Identify the management, organization, and technology factors responsible for slow adoption rates of internal corporate social networks.**

   Management: Employees that are used to collaborating and doing business in more traditional ways need an incentive to use social software. Most companies are not providing that incentive: Only 22 percent of social software users believe the technology to be necessary to their jobs.

   Organization: Companies that have tried to deploy internal social networks have found that employees are used to doing business in a certain way and overcoming the organizational inertia can prove difficult. Enterprise social networking systems were not at the core of how most of the surveyed companies collaborate. About half of the survey respondents said that internal social networks had "very little impact" on employee retention, the speed of decision-making, or the reduction of meetings.

   Technology: Ease of use and increased job efficiency are more important than peer pressure in driving adoption of social networking technologies. A majority of IT professionals consider their own internal social networks to be merely average or below average and the biggest reason they cite is low adoption rates on the part of employees. 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 out of reach or difficult to reach.

2. **Why have each of the companies described in this case been successful in implementing internal social networks? Explain your answer.**

   One company, CSC, took a very passive approach when it implemented its social business networking software platform. The company allowed users to form groups on their own. Group presidents and other executives set an example by blogging with the social tool. The company also offered a "virtual water cooler" for non-work-related topics to help employees try out the tool in a more relaxed setting. Employee adoption is now at 100 percent, with significant amounts of frequently sought intellectual property generated within the network's communities and groups. Yum! Brands, the world's largest restaurant company, took the opposite implementation approach by marketing the network to its own employees as it would with any of its products. It expects 100 percent adoption within the first year of its rollout. The system has helped eliminate redundant resources and allows users to upload and download documents.

   The third company, Red Robin hamburger restaurant chain, took a viral approach to drive adoption of its social networking system. The company's CIO sees a movement away from email and collaboration portals like SharePoint toward social networking

and texting. He wants to let people create conversations, perform status updates, upload and share files, and set up workgroups for small project teams. Although usage is not as high as executives would like, people are experimenting with the system.

3. **Should all companies implement internal enterprise social networks? Why or why not?**

   Yes, companies should implement internal enterprise social networks, if for no other reason than they are cheaper and easier than other systems to operate and reduce expenses in other areas. The systems also improve productivity, in some cases dramatically. Companies should provide incentives if they must to encourage adoption of the new collaboration methods. Executives should be the first to use them which will speed their adoption. Executives must also tie these networks to financial results. Management must also encourage the necessary organizational cultural changes to help make the social networking tools a success.

Chapter 2 Runing Case Assignment: Analyzing Financial Performance

Software skills: Spreadsheet charts and formulas

Business skills: Financial statement analysis

As part of your analysis of the company for management, you have been asked to analyze data on Dirt Bikes's financial performance. Review Dirt Bikes's selected financial data in the Introduction to Dirt Bikes, which can be found at the Laudon Web site. There you will find Dirt Bikes's income statement and summary balance sheet data from 2010 to 2012, annual sales of Dirt Bikes models between 2008 and 2012, and total domestic versus international sales between 2008 and 2012.

Use your spreadsheet software to create graphs of Dirt Bikes's sales history from 2008 to 2012 and its domestic versus international sales from 2008 to 2012. Select the type of graph that is most appropriate for presenting the data you are analyzing.

Use the instructions at the Laudon Web site and your spreadsheet software to calculate the gross and net margins in Dirt Bikes's income statements from 2010 to 2012. You can also create graphs showing trends in selected pieces of Dirt Bikes's income statement and balance sheet data if you wish. (You may want to rearrange the historical ordering of the data if you decide to do this.)

Prepare an addition to your management report that answers these questions:

- What are Dirt Bikes's best- and worst-performing products? What is the proportion of domestic to international sales? Have international sales grown relative to domestic sales?

- Are sales (revenues) growing steadily, and, if so, at what rate? What is the cost of goods sold compared to revenues? Is it increasing or decreasing? Are the firm's gross and net margins increasing or decreasing? Are the firm's operating expenses increasing or decreasing? Is the firm heavily in debt? Does it have assets to pay for expenses and to finance the development of new products and information systems?

- (Optional) Use electronic presentation software to summarize your analysis of Dirt Bikes's performance for management.

Chapter 13 Hands-on MIS Application Solution Description

Students will have to perform a systems analysis and then design a system solution using database software. They will need to identify information requirements and then map out entities, attributes, and relationships to guide the design of database tables. Ace maintains a very rudimentary customer database that needs to be modified. There are many alternative solutions. This solution has been simplified to only require modification to the Customer Prospect table. Other solutions using multiple tables are possible if students have sufficient Access proficiency. Students will need to generate queries and reports that satisfy management information requirements.

Ace's customer information is primarily paper-based. There is valuable customer information in those paper records but it is of little use to the company because it cannot be easily organized or analyzed. The company cannot easily find out which customer touchpoints are most effective or which prospects were converted into buyers. The dealership is wasting dollars by not being able to channel its advertising and promotions more precisely. By not fully understanding their customers, the overall business performance of both Ace and Subaru may be negatively impacted.

A new system with a better database of customers and prospects could help Ace make better sales and marketing decisions. The system could help Ace find the most important sources of customers, better allocate advertising and promotional budgets, and identify trends in customer preferences and demographics.The company could also have more accurate numbers on customer acquisition costs,

Key information requirements include:
Identifying where potential customers are obtaining information about the dealership
Identifying prospects and buyers

Some organizational changes will be required. Sales associates will need to make sure that customer and prospect information has been entered into the database. Managers will need to learn how to make use of the information in the database to help them run their dealership.

The solution file represents one of many alternative database designs that would satisfy Ace's requirements. It modifies the Customer/Prospect file to capture information about purchases and customer touchpoints. Other designs using multiple tables are also possible for students with some Access proficiency.

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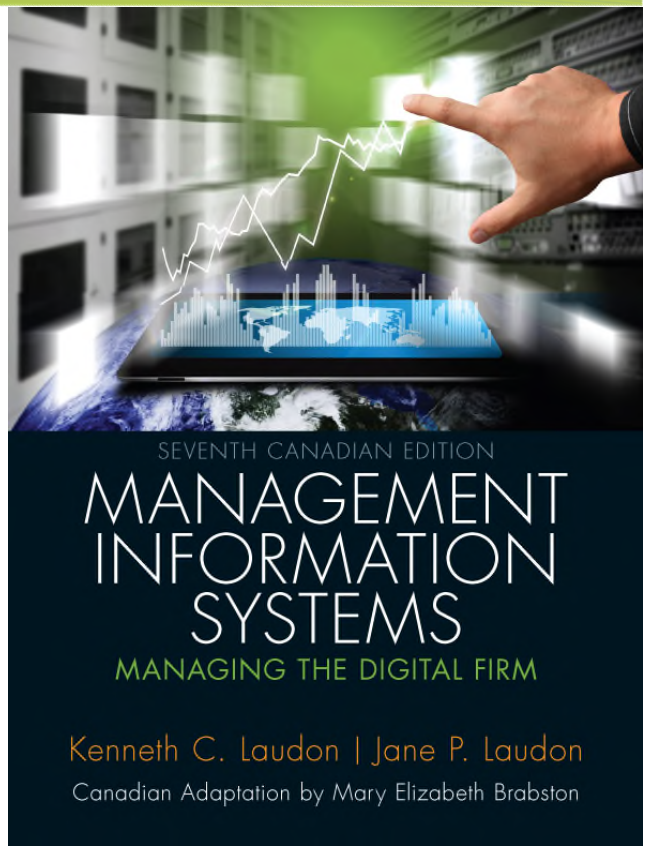

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CHAPTER 2

How Businesses Use Information Systems

Learning Objectives

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

1. What are business processes? How are they related to information systems?
2. How do information systems serve the different management groups in a business?
3. How do systems that link the enterprise improve organizational performance?

Continued …

Learning Objectives (cont.)

4. Why are systems for collaboration and social business so important, and what technologies do they use?

5. What is the role of the information systems function in a business?

Telus Embraces Social Learning

- Problem: Training was expensive; much knowledge was resident in employees, many of whom were expected to retire soon.
- Solutions: used SharePoint to develop team sites and share knowledge
- SharePoint allows groups to share documents and work together

Business Processes and Information Systems

Business processes

- The manner in which work is organized, coordinated, and focused to produce a valuable product or service
- Every business is a collection of business processes

Information technology enhances business processes

- increases efficiency of existing processes
- enables new processes that can transform the business

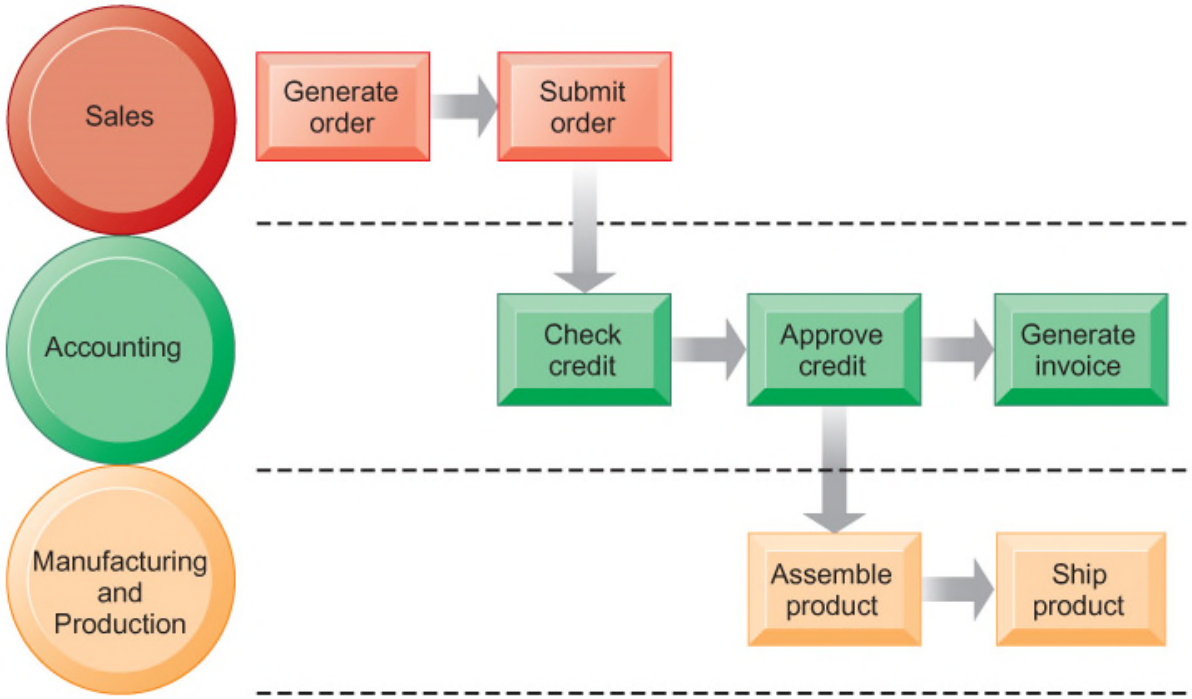
How Information Technology Improves Business Processes

- Business processes:
  - Workflows of material, information, knowledge
  - Sets of activities, steps
  - May be tied to functional area or be cross-functional
- Businesses: Can be seen as collection of business processes
- Business processes may be assets or liabilities

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

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.

How Information Technology Improves Business Processes

Examples of functional business processes

- Manufacturing and production
  - Assembling the product
- Sales and marketing
  - Identifying customers
- Finance and accounting
  - Creating financial statements
- Human resources
  - Hiring employees

How Information Technology Improves Business Processes

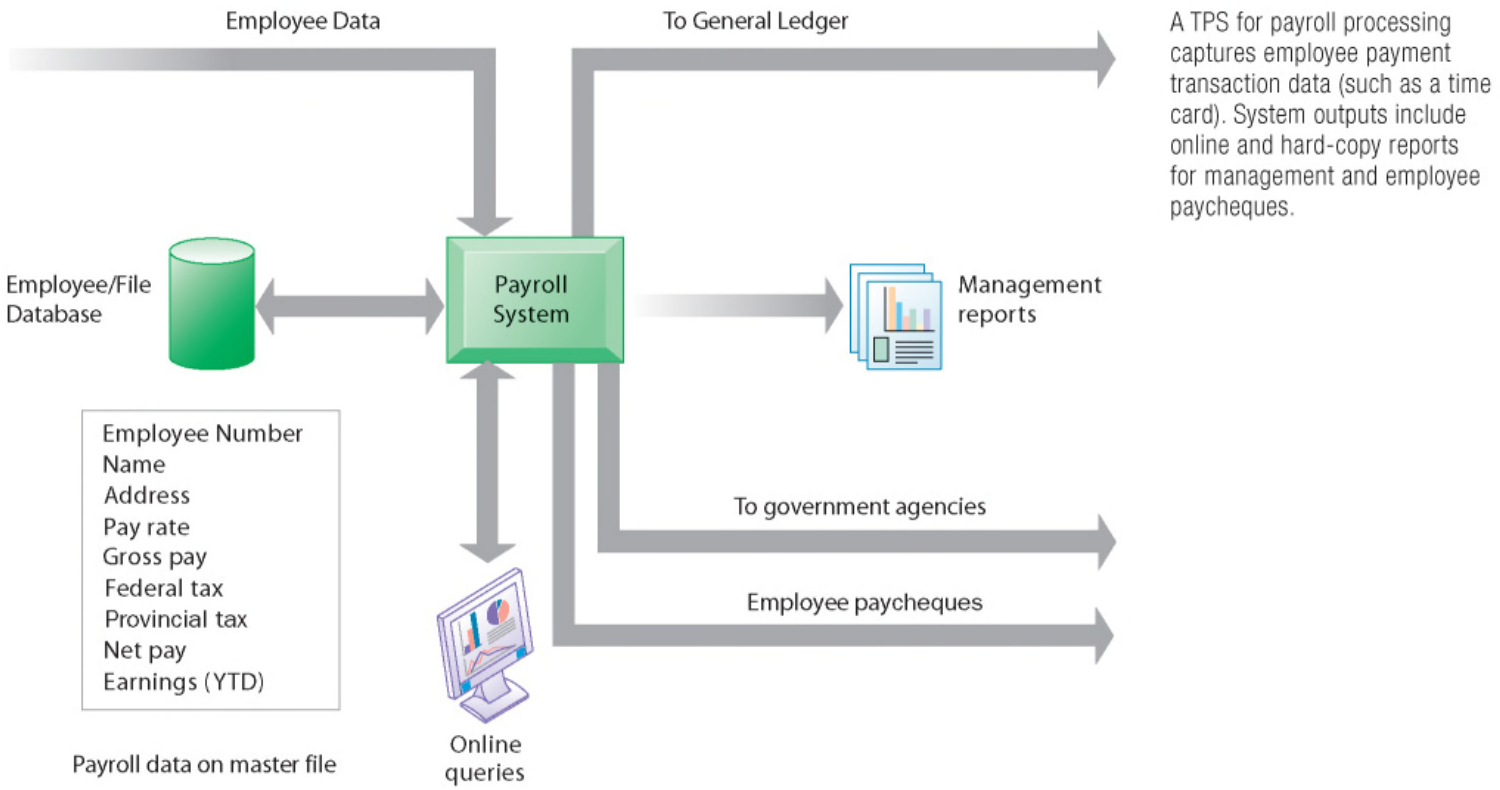
1. Increasing efficiency of existing processes
    - Automating steps that were manual
2. Enabling entirely new processes that are capable of transforming the businesses
    - Change flow of information
    - Replace sequential steps with parallel steps
    - Eliminate delays in decision making

Types of Information Systems

Transaction processing systems

- Perform and record daily routine transactions necessary to conduct business
  - Examples: sales order entry, payroll, shipping
- Allow managers to monitor status of operations and relations with external environment
- Serve operational levels
- Serve predefined, structured goals and decision making

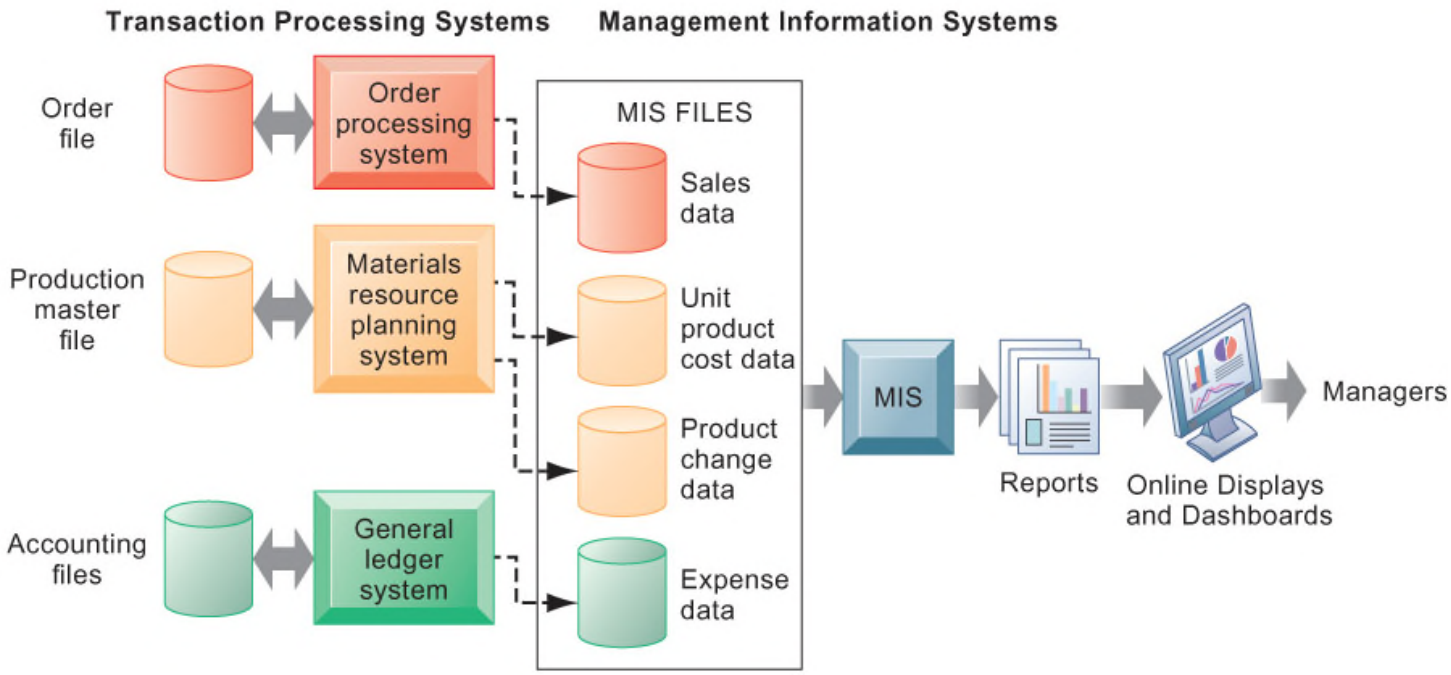
FIGURE 2-2 A Payroll TPS.



Systems for Business Intelligence

- Business Intelligence Systems for Decision Support
  - **Business intelligence:** data and software tools for organizing, analyzing, and providing access to data to help managers and other enterprise users make more informed decisions.
  - Management Information Systems (MIS)
  - Decision Support Systems (DSS)
  - Executive Support Systems (ESS)

FIGURE 2-3 How Management Information Systems Obtain Their Data From the Organization's TPS.



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.

FIGURE 2-4 Sample MIS Report.

Consolidated Consumer Products Corporation Sales by Product and Sales Region: 2011

PRODUCT CODE	PRODUCT DESCRIPTION	SALES REGION	ACTUAL SALES	PLANNED	ACTUAL versus PLANNED
4469	Carpet Cleaner	Maritimes	4 066 700	4 800 000	0.85
		ON/QC	3 778 112	3 750 000	1.01
		Prairies	4 867 001	4 600 000	1.06
		BC	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

This report, showing summarized annual sales data, was produced by the MIS in Figure 2-3.

Can Airlines Solve Their Baggage Handling Problems?

Read the Window on Technology, and then discuss the following questions:

1. What types of transactions are handled by baggage handling systems?
2. What are the management, organization, and technology components of baggage handling systems?
3. What is the problem these baggage handling systems are trying to solve? Discuss the business impact of this problem? Are today's baggage handling systems a solution to this problem? Explain.
4. What kinds of management reports can be generated from the data from these systems?

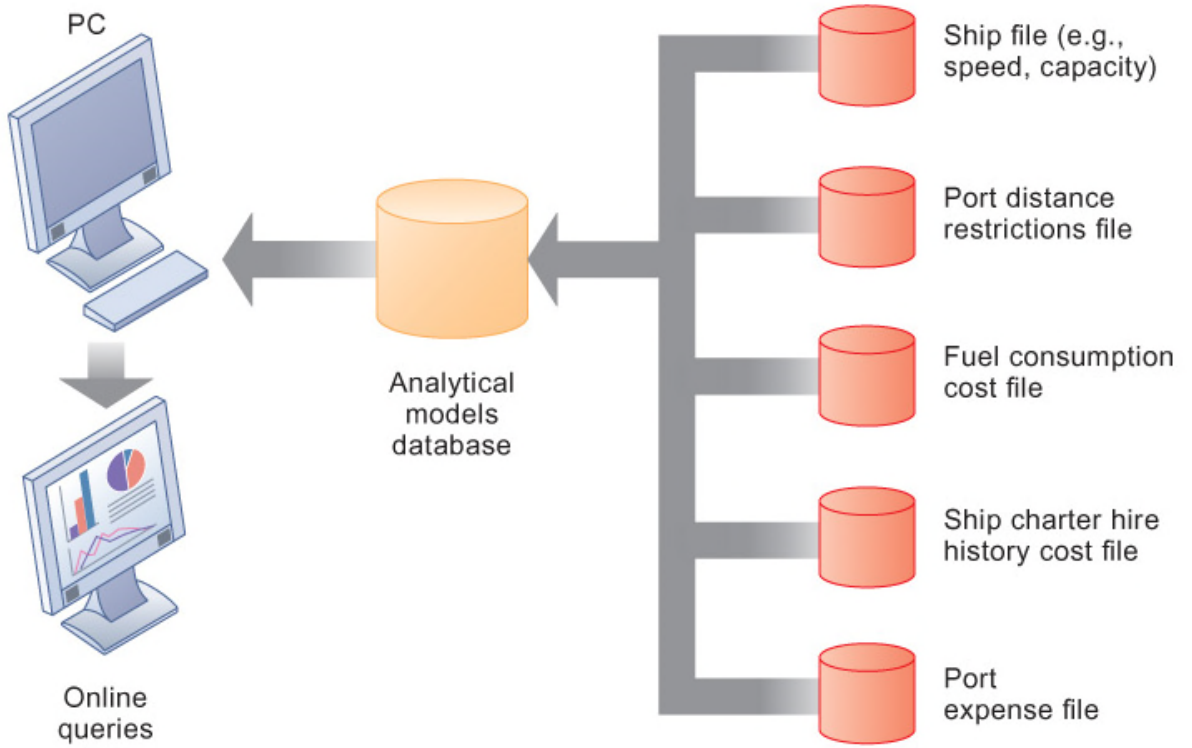
Management Information Systems (MIS)

- Serve middle management
- Provide reports on firm's current performance, based on data from TPS
- Provide answers to routine questions with predefined procedure for answering them
- Typically have little analytic capability

Decision Support Systems (DSS)

- Serve middle management
- Support nonroutine decision making
  - Example: What is impact on production schedule if December sales doubled?
- Often use external information as well as information from TPS and MIS
- Model driven DSS
  - E.g., Voyage-estimating systems
- Data driven DSS
  - E.g., Intrawest's marketing analysis systems

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)

- Support senior management
- Address nonroutine decisions requiring judgment, evaluation, and insight
- Incorporate data about external events (e.g. new tax laws or competitors) as well as summarized information from internal MIS and DSS
  - Example: ESS that provides minute-to-minute view of firm's financial performance as measured by working capital, accounts receivable, accounts payable, cash flow, and inventory

Systems for Linking the Enterprise

- Enterprise applications
  - Enterprise systems (ERP)
  - Supply Chain Management Systems (SCM)
  - Customer Relationship Management Systems (CRM)
  - Knowledge Management Systems (KMS)
  - Intranets and Extranets

Enterprise Systems

- Also known as enterprise resource planning (ERP) systems
- Collect data from different functions and store data in single central data repository
- Resolve problem of fragmented, redundant data
- Enable:
  - Coordination of daily activities
  - Efficient response to customer orders
  - Use of valuable information for improved management decision making

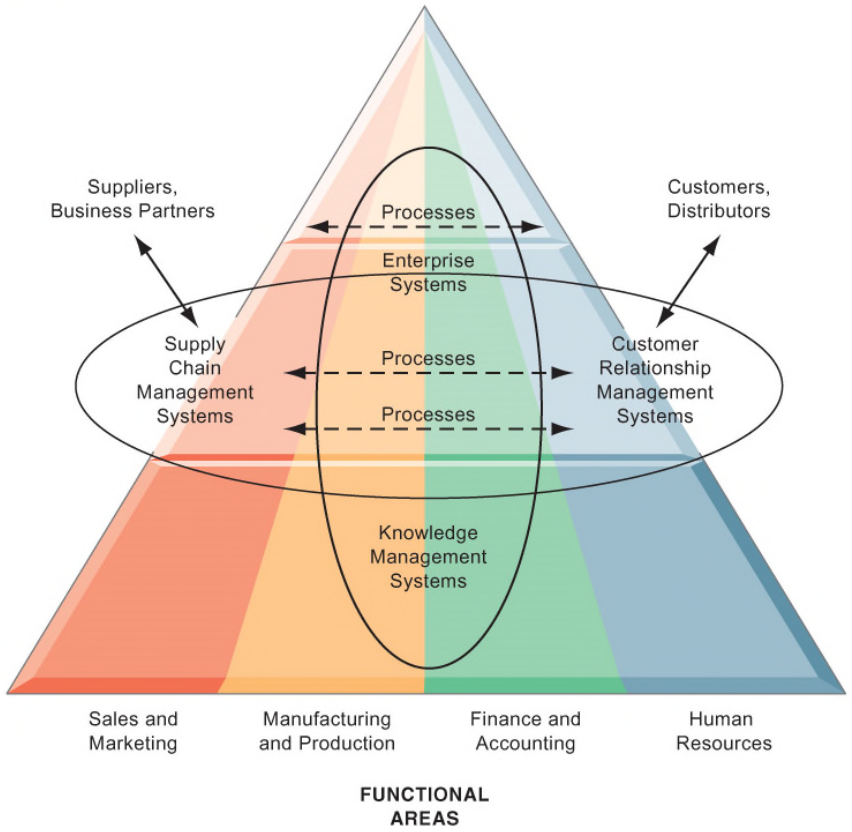
Supply Chain Management (SCM) systems

- Manage firm's relationships with suppliers
- Interorganizational systems
- Share information about
  - Orders, production, inventory levels, delivery of products and services
- Goal: Right amount of products to destination with least amount of time and lowest cost

Customer relationship management (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
- Integrate firm's customer-related processes and consolidate customer information from multiple communication channels

FIGURE 2-6 Enterprise Application Architecture.



Enterprise applications automate processes that span multiple business functions and organizational levels and may extend outside the organization.

Knowledge management systems (KMS)

- Support processes for acquiring, creating, storing, distributing, applying, integrating knowledge
- Collect internal knowledge and link to external knowledge
- Include enterprise-wide systems for:
  - Managing documents, graphics and other digital knowledge objects
  - Directories of employees with expertise

Piloting Procter & Gamble from Decision Cockpits

Read the Window on Management, and then discuss the following questions:

1. What management, organization, and technology issues had to be addressed when implementing Business Sufficiency, Business Sphere, and Decision Cockpits?
2. How did these decision-making tools change the way the company ran its business? How effective are they? Why?
3. How are these systems related to P&G's business strategy?

Intranets and Extranets

- Internal networks built with same tools and standards as Internet
- Used for internal distribution of information to employees
- Typically utilize private portal providing single point of access to several systems
- May connect to company's transaction systems

E-Business, e-commerce, and e-government

- E-business
  - Use of digital technology and Internet to drive major business processes
- E-commerce
  - Subset of e-business
  - Buying and selling goods and services through Internet

Continued …

E-Business, e-commerce, and e-government (cont.)

- E-government:
  - Using Internet technology to deliver information and services to citizens, employees, and businesses

Systems for Collaboration and Social Business

- ‘Interaction’ jobs a major part of global economy
- Methods include:
  - Internet-based collaboration environments
  - E-mail and instant messaging (IM)
  - Cell phones and smartphones
  - Social networking
  - Wikis
  - Virtual worlds

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.

Teams have a specific mission that someone in the business assigned to them.

Collaboration is more important than ever

- Changing nature of work
- Growth of professional work
- Changing organization of the firm
- Changing scope of the firm
- Emphasis on innovation
- Changing culture of work and business

What is Social Business?

- 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.

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 or purchase on social platforms
File sharing	Upload, share, and comment on photos, videos, audio, and text documents
Social marketing	Use social media to interact with customers; derive customer insights
Communities	Discuss topics in open forums; share expertise

Business Benefits

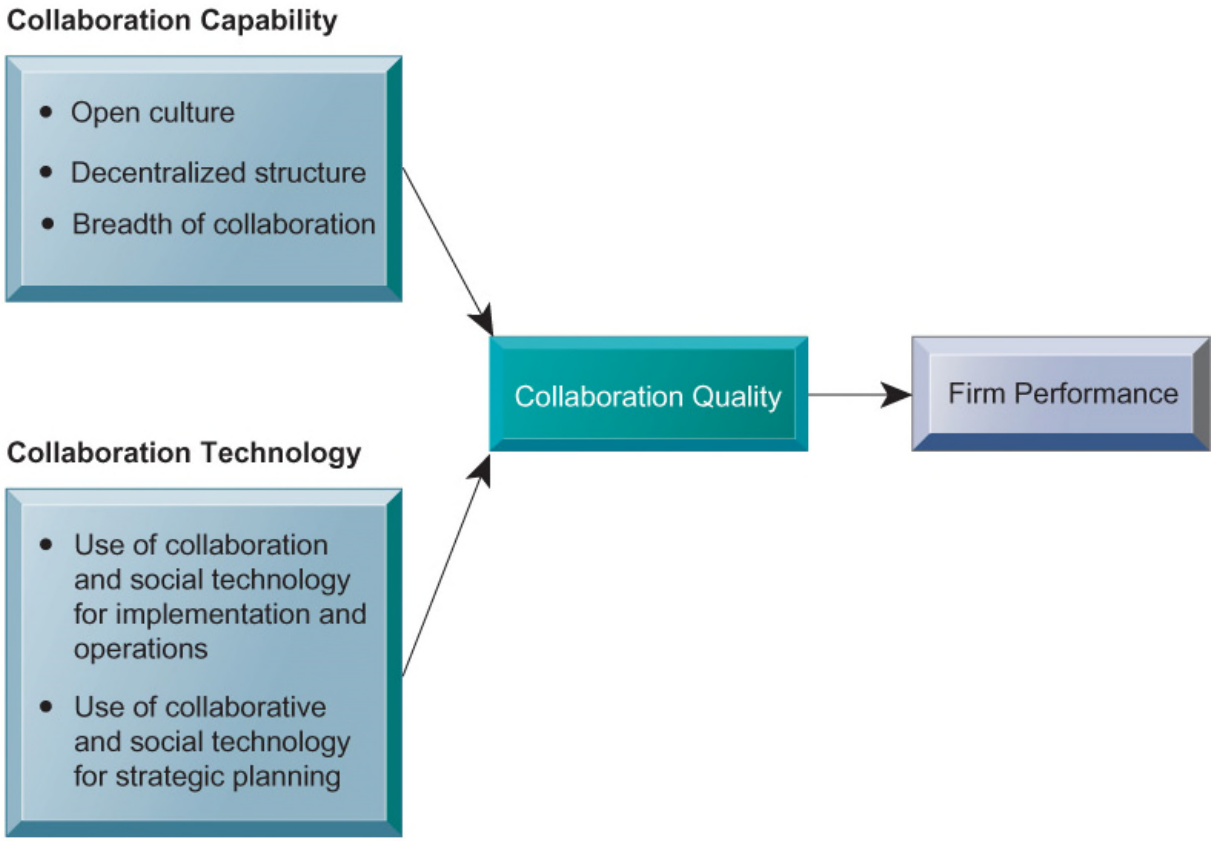
- Investments in collaboration technology can produce organizational improvements returning high ROI
- Benefits:
  - Productivity
  - Quality
  - Innovation
  - Customer service
  - Financial performance
    - Profitability, sales, sales growth

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 and with fewer errors than the same number of people working in isolation from one another.
Quality	People working collaboratively can communicate errors and take 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.



Building a Collaborative Culture and Business Processes

- "Command and control" organizations
  - No value placed on teamwork or lower-level participation in decisions
- Collaborative business culture
  - Senior managers rely on teams of employees
  - Policies, products, designs, processes, systems rely on teams
  - Managers purpose is to build teams

Tools and Technologies for Collaboration and Social Business

- Email and instant messaging
- Wikis
- Virtual worlds
- Collaboration and Social Business Platforms
  - Virtual Meetings
- Google Apps/ Google Sites and Cloud Collaboration Services
- Microsoft SharePoint
- Lotus Notes
- Enterprise Social Networking Tools
- Collaborative writing

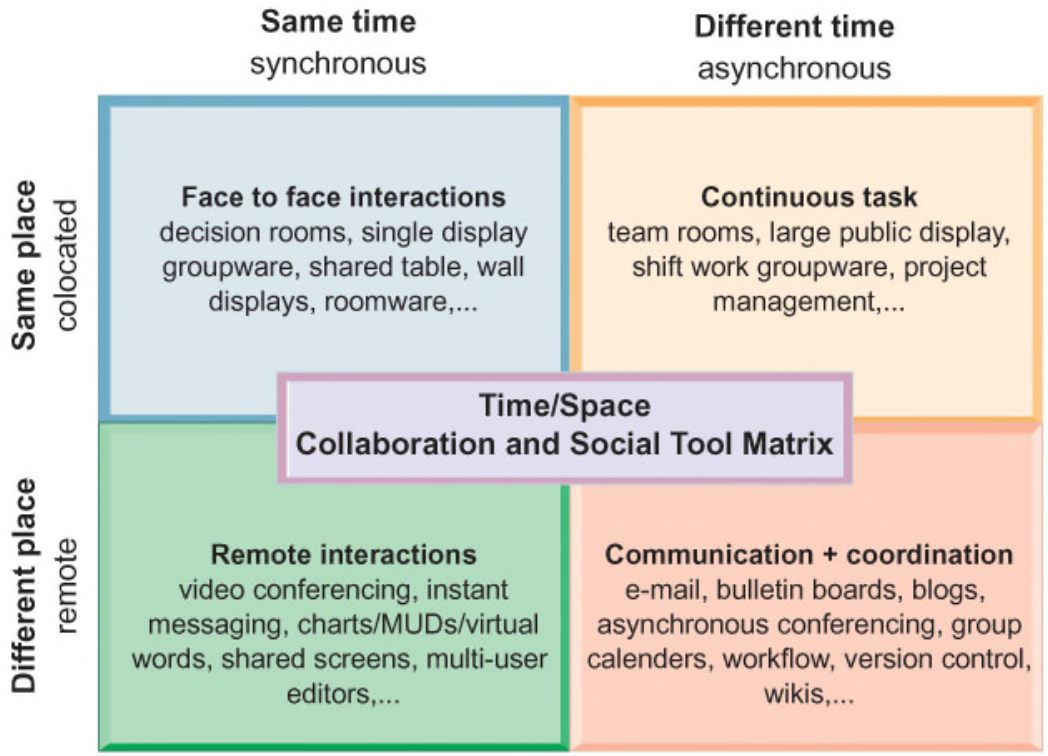
TABLE 2-4 Google Apps/Google Sites Collaboration Features.

Google Apps/Google Sites Capability	Description
Google Calendar	Private and shared calendars; multiple calendars
Google Gmail	Google's free online e-mail service, with mobile access capabilities
Google Talk	Instant messaging; text, voice, and voice chat
Google Docs	Online word processing, electronic presentation software, spreadsheets; drawings; online editing, sharing, publishing
Google Sites	Team collaboration sites for sharing of documents, schedules, calendars, searching documents; creation of group wikis
Google Drive	Offers 5 free gigabytes of online storage for 30 types of documents as well as images and HD video; users can create and edit some types of documents online and synchronize these files with all of their devices; ability to view, comment, or edit files based on different usage rights and to keep the files private

TABLE 2-5 Enterprise Social Networking Software Capabilities.

Social Software Capability	Description
Profiles	Ability to set up member profiles describing who individuals are, educational background, and 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 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.

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.

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

1. What are the collaboration challenges facing the firm in terms of time and space?
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 their cost and benefit to your firm.

Continued …

Checklist For Managers: Evaluating and Selecting Collaboration and Social Software Tools (cont.)

4. Identify the risks to security and vulnerability involved with each of the products.
5. Seek the help of potential users to identify implementation and training issues.
6. Make your selection of candidate tools, and invite the vendors to make presentations.

The Information Systems Department

- Formal organizational unit responsible for information technology services
- Often headed by chief information officer (CIO)
- Other senior positions include chief security officer (CSO), chief knowledge officer (CKO), chief privacy officer (CPO)
- Programmers

Continued …

The Information Systems Department (cont.)

- Systems analysts
- Information systems managers
- End users

Organizing the Information Systems Function

IT Governance:

- Strategies and policies for using IT in the organization
- Decision rights
- Accountability
- Organization of information systems function
  - Centralized, decentralized, etc

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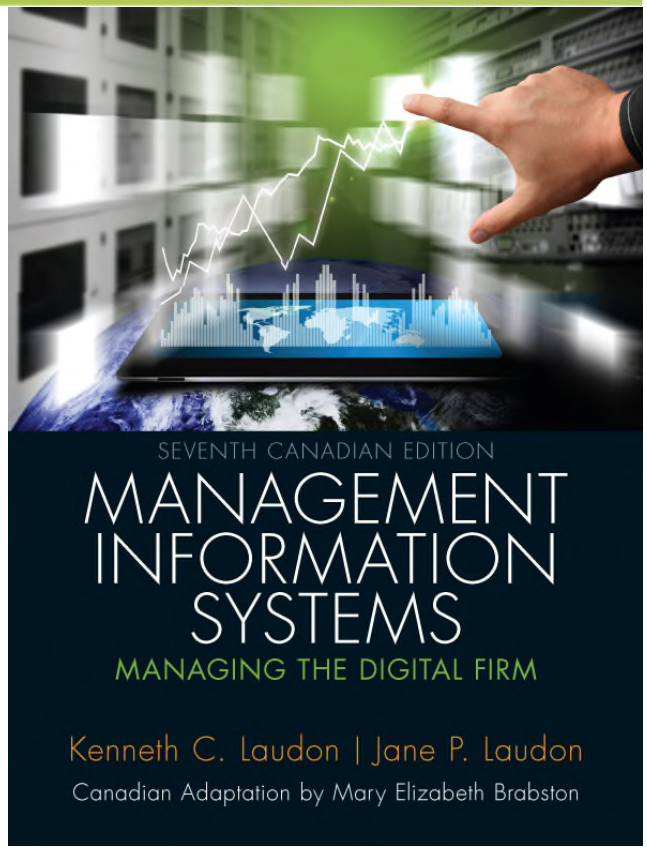

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CHAPTER 2

How Businesses Use Information Systems