Fundamentals of Information Systems 9th edition Stair Solutions Manual

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Solutions – Chapter 1

Critical Thinking Exercise

Kroger's QueVision System Improves Customer Service

Review Questions

1. The QueVision system is an enterprise system.

2. The two components that are missing are well-trained workers and better teamwork.

Critical Thinking Questions

1. To address the concerns of the cashiers and baggers, the store manager should observe the checkout process and performance of cashiers and baggers for a few days before taking action.

2. The manager should identify and put into place the full set of organizational complements. This cannot be done without observing where the system is failing.

Critical Thinking Exercise

Reducing New Product Stockouts at Coles

Review Questions

1. One benefit of virtual teams is that they enable organizations to enlist the best people in different geographical regions to solve important organizational problems. Another benefit is that they provide the ability to staff a team with people who have a range of experience and knowledge that stems from a variety of professional experiences and cultural backgrounds.

2. Virtual organization members must be sensitive to the different cultures and practices of the various team members to avoid misunderstandings that can destroy team chemistry.

Critical Thinking Questions

1. Student responses will vary. Student should provide a paragraph briefly outlining background and experience.

2. Student responses may vary. Communications are greatly improved when participants can see one another and pick up facial expressions and body language. I would recommend initial face-to-face meetings while the team is forming and defining goals, roles, and expectations on how its members will work together. It helps if virtual team members take the time to get to know one another by sharing experiences and personal background information.

Review Questions

1. Data is the raw material from which information is composed. Information includes a context for the data. Knowledge is an awareness of how to apply the information.

2. The student can list any six of the following attributes that describe the quality of data:

Characteristics	**Definitions**
Accessible	Information should be easily accessible by authorized users so they can obtain it in the right format and at the right time to meet their needs.
Accurate	Accurate information is error free. In some cases, inaccurate information is generated because inaccurate data is fed into the transformation process. This is commonly called garbage in, garbage out (GIGO).
Complete	Complete information contains all the important facts. For example, an investment report that does not include all important costs is not complete.
Economical	Information should also be relatively economical to produce. Decision makers must always balance the value of information with the cost of producing it.

Flexible	Flexible information can be used for a variety of purposes. For example, information on how much inventory is on hand for a particular part can be used by a sales representative in closing a sale, by a production manager to determine whether more inventory is needed, and by a financial executive to determine the total value the company has invested in inventory.
Relevant	Relevant information is important to the decision maker. Information showing that lumber prices might drop is probably not relevant to a computer chip manufacturer.
Reliable	Reliable information can be trusted by users. In many cases, the reliability of the information depends on the reliability of the data-collection method. In other instances, reliability depends on the source of the information. A rumor from an unknown source that oil prices might go up may not be reliable.
Secure	Information should be secure from access by unauthorized users.
Simple	Information should be simple, not complex. Sophisticated and detailed information might not be needed. In fact, too much information can cause information overload, whereby a decision maker has too much information and is unable to determine what is really important.
Timely	Timely information is delivered when it is needed. Knowing last week's weather conditions will not help when trying to decide what coat to wear today.
Verifiable	Information should be verifiable. This means that you can check it to make sure it is correct, perhaps by checking many sources for the same information.

3. An information system is a set of interrelated elements or components that collect (input), manipulate and store (process), and disseminate (output) data and information and provide a feedback mechanism to meet an objective. In information systems, feedback is information from the system that is used to make changes to input or processing activities.

4. The components of computer-based information system (CBIS) include hardware, software, databases, networks, people, and procedures.

5. A business's technology infrastructure includes all the hardware, software, databases, telecommunications, people, and procedures that are configured to collect, manipulate, store, and process data into information. The technology infrastructure is a set of shared IS resources that form the foundation of each computer-based information system.

6. The three types of information systems are as follows:

Type	Description
Personal IS	An information system that improves the productivity of individual users in performing stand-alone tasks.
Group IS	An information system that improves communications and support collaboration among members of a workgroup.
Enterprise IS	An information system that an organization uses to define structured interactions among its own employees and/or with external customers, suppliers, government agencies, and other business partners.

7. The organizational complements include:

   - **Well-trained workers.** Employees must be well trained and understand the need for the new system, what their role is in using or operating the system, and how to get the results they need from the system.
   - **System support.** Trained and experienced users who can show others how to gain value from the system and overcome start-up problems.
   - **Better teamwork**. Employees must understand and be motivated to work together to achieve the anticipated benefits of the system.
   - **Redesigned processes.** New systems often require radical redesign of existing work processes as well as the automation of new processes.
   - **New decision rights.** Employees must understand and accept their new roles and responsibilities including who is responsible for making what decisions. Roles and responsibilities often change with introduction of a new system.

8. A value chain is a series (chain) of events that includes inbound logistics, warehouse and storage, production, finished product storage, outbound logistics, marketing and sales, and customer service. A supply chain is a network of suppliers, distributors, and retailers that participate in the production of a product.

9. Supply chain management (SCM) helps determine what supplies are required for the value chain, what quantities are needed to meet customer demand, how the supplies should be processed (manufactured) into finished goods and services,

and how the shipment of supplies and products to customers should be scheduled, monitored, and controlled.

10. The members of a virtual team are distributed geographically, but collaborate and complete work through the use of information systems. Members may seldom meet face to face. Virtual team members must be prepared to do work anywhere, anytime. As a result, members of a virtual team may feel that their work day never ends.

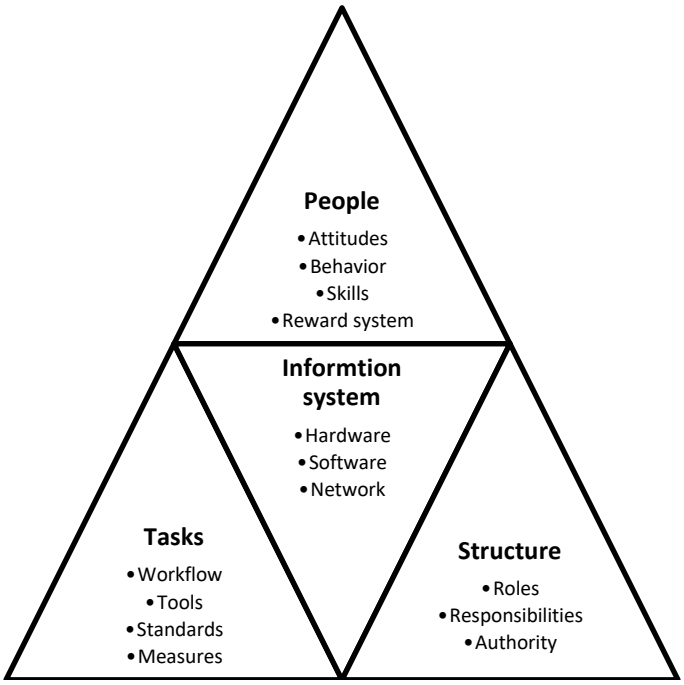
11. Sustaining innovation results in enhancements to existing products, services, and ways of operating. Such innovations are important because they enable an organization to continually increase profits, lower costs, and gain market share. A disruptive innovation is one that initially provides a lower level of performance than the marketplace has grown to accept. Over time, however, the disruptive innovation is improved to provide new performance characteristics, becoming more attractive to users in a new market.

12. Business process reengineering is the radical redesign of business processes, organizational structures, information systems, and values of the organization to achieve a breakthrough in business results.

13. Continuous improvement is a form of innovation that constantly seeks ways to improve business processes and add value to products and services.

14. The soft side of implementing change involves work designed to help employees embrace a new information system and way of working.

15. Leavitt's diamond proposes that every organizational system is made up of four main components—people, tasks, structure, and technology—that all interact; any change in one of these elements will necessitate a change in the other three elements. Thus, to successfully implement a new information system, appropriate changes must be made to the people, structure, and tasks affected by the new system.



16. Student responses will vary. Three sites might include:

    a. CareerBuilder: This site is one of the biggest job boards, and its robust search function allows you to filter by several criteria, including location, degree required and pay range. CareerBuilder partners with news media around the country and collects job listings from them. It also provides career advice and resources for candidates.
    b. TheLadders: This site focuses on job openings for upper-level executives and professionals who are aiming for the management suite.
    c. Glassdoor: This site promotes itself as giving job seekers insights into a company's work conditions, interview processes, salaries and benefits. In addition to providing job listings, Glassdoor allows employers to identify job candidates and market their companies to job seekers.

    Source: https://www.roberthalf.com/job-seekers/career-center/job-hunting-tips/10-best-job-search-websites

17. The role of CIO is to employ an IS department's equipment and personnel to help the organization attain its goals. CIOs also understand the importance of finance, accounting, and return on investment. They can help companies avoid damaging ethical challenges by monitoring how their firms are complying with a large number of laws and regulations.

18. Shadow It is the term used to describe the information systems and solutions built and deployed by departments other than the information systems department. In

many cases, the information systems department may not even be aware of these efforts.

Discussion Questions

1. Regardless of major or interest areas, information systems will play a central role in all business careers. Even now, students use information technology daily ranging from grocery purchases to filing taxes to using the postal system. Information technology is present in all aspects of life and business. Information systems improve planning, communication, data management, report formatting and generation, input collection, and decision-making. A student may respond with a statement similar to this, "By becoming information systems literate, I hope to be competitive in the work force and develop skills that enhance my career and make me an asset to the business I join."

2. Students answers will vary. Examples of how information systems can be used by teachers:
    - Teachers can post lesson plans and grades for parents and other staff to view
    - Student and teacher information can be kept in a database to be accessed by the county schools

3. Student's answers will vary. As mentioned above, information systems improve planning, communication, data management, report formatting and generation, input collection, and decision-making. These are all important aspects of any course taken in any subject.

4. Student responses may vary. As an example of a simple value chain, the gift wrapping department of an upscale retail store takes packages from customers, covers them with appropriate, decorative wrapping paper, and gives the package back to the customer, thus increasing the customer's (and the recipient's) perceived value of the gift.

5. Student answers will vary. Students should detail a virtual team they are a member of.

6. Student answers may vary, but some examples might include the failure to promote creativity among the employees and failure to receive employee input prior to decisions. To encourage innovation, some IS departments are creating separate groups that explore new, innovative ideas. Innovative companies include Apple, Facebook, Google, Amazon, Twitter, Kickstarter, and PayPal.

7. Student answers will vary.

8. Student responses will vary. Perceived usefulness and ease of use can influence an individual's attitude toward the system, which also affects the worker's behavioral intention to use the system.

9. Technology diffusion is a measure of how widely technology is spread throughout an organization. An organization in which computers and information systems are located in most departments and areas has a high level of technology diffusion. Therefore, you would need to measure the use of the new system across the organization.

10. Students who use the Internet and other nontraditional sources to find IS jobs have more opportunities to land a job. Most large companies list job opportunities on their Web sites. These sites allow prospective job hunters to browse job opportunities, locations, salaries, benefits, and other factors. In addition, some sites allow job hunters to post their résumés.

    Note that students are often warned to be careful of what they post on social media sites, including Facebook. Employers often search the Internet to get information about potential employees before they make hiring decisions.

11. The CIO should be a customer relationship manager, a strategic communicator, and a project manager, delicately balancing project portfolios, available resources, and governance. He/she should also be a leader, not a dictator; a technologist, not a technician; a business person, not an accountant; and finally, a diplomat, not a politician.

12. Student responses will vary.

Problem-Solving Exercises

1. Student should create a spreadsheet similar to Figure 1.13 using five occupations of his choice.

2. Students should create a table that lists 10 or more possible career areas, annual salaries, and brief job descriptions, and rate how much they would like the career area on a scale from 1 (don't like) to 10 (like the most).

3. Students should use presentation software to create three slides identifying what he hopes to learn from this course.

Team Activities

1. Students should form teams and find out one interesting fact about each member.

2. Students should develop interview questions and an assessment process to evaluate user satisfaction or a new system.

3. Students should search through several business periodicals (Bloomberg, Businessweek, Computerworld, PC Week, etc.) or use an Internet search engine to find recent articles that describe potential social or ethical issues related to the use of an information system.

Web Exercises

1. Students should search for information on the top-ranked places to work.

2. Students should research how recruiters use social network data to screen applicants. Recruiters can use social media data in a number of ways. Some examples might include:

    - Interested in seeing which candidates are the most (or least) connected
    - Use a candidate's social media pages to test the candidate's professionalism.
    - Look for specific traits of interest to the company.

3. Students should use a graphics program to illustrate the growth of the 10 fastest growing occupations and provide a summary on his findings.

Career Exercises

1. Students should identify 10 job characteristics that are important to them in selecting a career.

2. Student response will vary.

3. Student response will be based on ideal job.

Case Studies

Case One: BMW: Automaker Competes on the Digital Front

Critical Thinking Questions

1. Student response will vary. Connected-car technologies can increase customer loyalty.

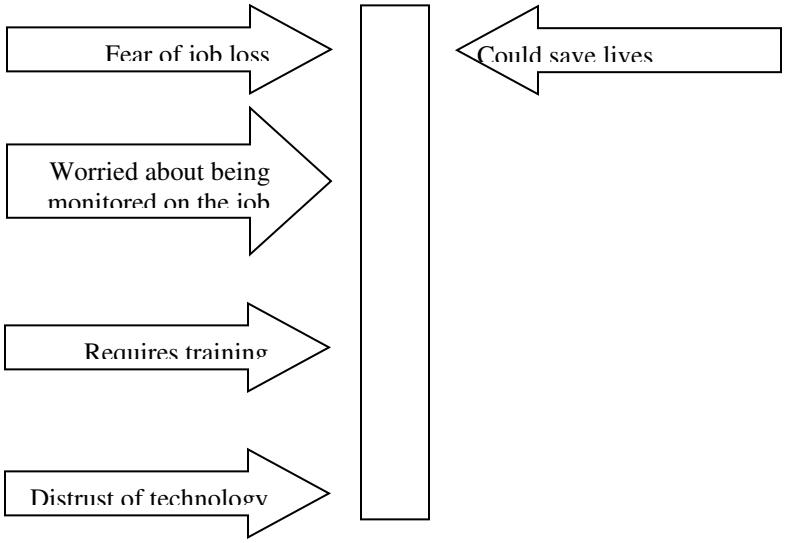
2. BMW has the responsibility of keeping its customer data safe.

3. Supply chain management and product lifecycle management would be important components in the ERP system. These tools would have to shift their focus and goal if BMW establishes a partnership with a technology company, as it will no longer need to develop technology in-house.

Case Two: Railroads struggle to Implement Positive Train Control

Critical Thinking Questions

1. Student answers may vary. This is an example of a simple analysis.



2. Responses will vary. Arguments for PTC might include:
   - Rail worker safety
   - Passenger safety
   - Enforcement of line speeds/monitor trains

   Arguments against PTC might include:
   - High cost
   - High time commitment
   - Frequency conflicts

3. Students should research the current status of PTC. They should note that congress extended the original PTC implementation deadline from December 31, 2015 to at least December 31, 2018. In addition, in August 2016, the U.S.

Department of Transportation's (DOT) Federal Railroad Administration (FRA) awarded $25 million in grants for 11 projects in six states and the District of Columbia to assist in implementing PTC.

Source: https://www.transportation.gov/briefing-room/fra-awards-25-million-grants-positive-train-control-implementation

Chapter 1

An Introduction to Information Systems in Organizations

At a Glance

Instructor's Manual Table of Contents

Overview

Information systems have changed the way organizations work in recent years. While information systems were once used primarily to automate manual processes, they have transformed the nature of work and the shape of organizations themselves. Use this chapter to explore the benefits and issues associated with the use of information systems in today's organizations around the globe.

Principles and Objectives

Principles	Learning Objectives
The value of information is directly linked to how it helps decision makers achieve the organization's goals.	• Distinguish data from information and knowledge, and describe the characteristics of quality data.
Information systems are composed of fundamental components that must be carefully assembled and integrated to work well together.	• Identify the fundamental components of an information system and describe their function.
Managers have an essential role to play in the successful implementation and use of information systems—that role changes depending on which type of IS system is being implemented.	• Identify the three fundamental information system types and explain what organizational complements must be in place to ensure successful implementation and use of the system.
Information systems must be implemented in such a manner that they are accepted and work well within the context of an organization and support its fundamental business goals and strategies.	• Define the term "the soft side of implementing change," and explain why it is a critical factor in the successful adoption of any major change. • Identify and briefly describe five change models that can be used to increase the likelihood of successfully introducing a new information system into an organization.

The information system worker functions at the intersection of business and technology and designs, builds, and implements solutions that allow organizations to effectively leverage information technology systems.	• Define the types of roles, functions, and careers available in the field of information systems.

Teaching Tips

An Introduction to Information Systems

1. This section introduces the central concept of this course: information.

Teaching Tip	As class begins, reassure students that you are here to help them understand technology. Many less technically oriented students will feel intimidated by this course. Get off to a good start!

Data, Information, and Knowledge

1. Introduce the terms **data**, **information**, **process**, and **knowledge**. Use Table 1.1 to aid the discussion.

The Value of Information

1. Explain that the value of information is directly linked to how it helps decision makers achieve their organization's goals and can help people perform tasks more efficiently and effectively. Use Figure 1.1 to aid the discussion.

Characteristics of Quality Information

1. Stress that fundamental to the quality of a decision is the quality of the information used to reach that decision.

2. Students should understand that in order to be valuable to managers and decision makers, information should have the characteristics described in Table 1.2. Note that

quality information can vary widely in the value of each of these attributes depending on the situation and the kind of decision you are trying to make.

What Is an Information System?

1. Define an information system (IS) as a set of interrelated components that collect, process, store, and disseminate data and information; an information system provides a feedback mechanism to monitor and control its operation to make sure it continues to meet its goals and objectives.

2. Define a computer-based information system (CBIS) as a single set of hardware, software, databases, networks, people, and procedures that are configured to collect, manipulate, store, and process data into information. The components of a CBIS are illustrated in Figure 1.2.

Three Fundamental Types of Information Systems

1. Highlight that most organizations have a number of different information systems and it is useful to divide information systems into three types: personal IS, group IS, and enterprise IS. Use Table 1.3 to aid the discussion.

    - Personal IS includes information systems that improve the productivity of individual users in performing stand-alone tasks.
    - Group IS includes information systems that improve communications and support collaboration among members of a workgroup.
    - Enterprise IS includes information systems that organizations use to define structured interactions among their own employees and/or with external customers, suppliers, government agencies, and other business partners.

2. Mention that for each type of IS, certain key organizational complements must be in place to ensure successful implementation and use of the system.

Teaching Tip	Pass a list around class and ask students to list their experience in information systems. Does anyone have familiarity with the field? If so, speak with them about sharing their knowledge with the class. This list will also help you organize your lectures with a focus specific to your class's needs.

Information Systems in Organizations

1. Explain that an organization is a group of people that is structured and managed to meet its mission or set of group goals. Structured means that there are defined relationships between members of the organization and their various activities, and that processes are defined that assign roles, responsibilities, and authority to complete the various activities. Use Figure 1.3 to aid the discussion.

2. Pose the following question to students: *How does the organizational system increase the value of resources?*

Value Chains

1. Introduce the term **value chain**. The value chain is a series (chain) of activities that an organization performs to transform inputs into outputs in such a way that the value of the input is increased.

2. Introduce and discuss the term **supply chain management**. Supply chain management (SCM) encompasses all the activities required to get the right product into the right consumer's hands in the right quantity at the right time and at the right cost—from the identification of suppliers and the acquisition of raw materials through manufacture and customer delivery. Use Figure 1.4 to aid the discussion.

Teaching Tip	When introducing the material in this section, be sure to use a number of case studies and examples to show how different companies are using various types of information systems to achieve their goals.

Change in the Organization

1. Stress that an organization's current products, services, and ways of accomplishing work are doomed to obsolescence. Fail to change and your competition will take away your customers and your profits.

Innovation

1. Define innovation is the application of new ideas to the products, processes, and activities of a firm, leading to increased value. Innovation is the catalyst for the growth and success of any organization.

2. Mention that sustaining innovation results in enhancements to existing products, services, and ways of operating. Such innovations are important because they enable an organization to continually increase profits, lower costs, and gain market share.

3. Mention that a disruptive innovation is one that initially provides a lower level of performance than the marketplace has grown to accept.

Reengineering and Continuous Improvement

1. Introduce the terms **reengineering,** also called **process redesign** and **business process reengineering (BPR)**, which involves the radical redesign of business processes, organizational structures, information systems, and values of the organization to achieve a breakthrough in business results.

2. Note the idea of continuous improvement (often referred to by the Japanese word "Kaizen") is a form of innovation that constantly seeks ways to improve business processes and add value to products and services.

Teaching Tip	When introducing the material in this section discuss Table 1.4 and use it to compare business process reengineering with continuous improvement.

Quick Quiz 1

1. Which of the following is a set of interrelated components that collect, manipulate, store, and disseminate data and information and provide a feedback mechanism to meet an objective?

    a. data
    b. information system
    c. knowledge
    d. organization
    Answer: b. information system

2. ____ is a collection of facts organized so that they have additional value beyond the value of the facts themselves.

    Answer: Information

3. Which of the following is the awareness and understanding of a set of information and the ways that information can be made useful to support a specific task or reach a decision?

    a. information
    b. statistics
    c. knowledge
    d. database
    Answer: c. knowledge

4. A(n) ____ is a group of people that is structured and managed to meet its mission or set of group goals.
   Answer: organization

5. Which of the following is a series of activities that an organization performs to transform inputs into outputs in such a way that the value of the input is increased?

   a. value chain
   b. supply chain
   c. SCM
   d. process chain

   Answer: a. value chain

Soft Side of Implementing Change

1. Discuss that the **soft side of implementing change** involves work designed to help employees embrace a new information system and way of working.

2. Point out that a **change management model** describes the phases an individual or organization goes through in making a change and provides principles for successful implementation of change.

Lewin's Change Model

1. Introduce and discuss the three-stage approach for change called **Lewin's change model**. Use Figure 1.7 to aid the discussion.

Lewin's Force Field Analysis

1. State that a frequently encountered stumbling block to the successful implementation of change, including the implementation of a new system, is negative user reaction.

2. Point out that Lewin extended his change model theory to include **force field analysis**, which identifies both the driving (positive) and restraining (negative) forces that influence whether change can occur.

3. Introduce and discuss the terms **driving forces** and **retraining forces**. Use Figure 1.9 to aid the discussion.

Teaching Tip	When introducing the material related to Lewin's force field analysis have your students openly discuss how restraining forces influence whether change can occur.

Leavitt's Diamond

1. Introduce and discuss Leavitt's diamond. **Leavitt's diamond** proposes that every organizational system is made up of four main components—people, tasks, structure, and technology—that all interact; any change in one of these elements will necessitate a change in the other three elements. Use Figure 1.10 to aid the discussion.

User Satisfaction and Technology Acceptance

1. Introduce and discuss the **technology acceptance model (TAM)**, which specifies the factors that can lead to better attitudes about the use of a new information system, along with its higher acceptance and usage. Use Figure 1.11 to aid the discussion.

Diffusion of Innovation Theory

1. Explain that the **diffusion of innovation theory** was developed by E.M. Rogers to explain how a new idea or product gains acceptance and diffuses (or spreads) through a specific population or subset of an organization.

2. Highlight that a key point of this theory is that adoption of any innovation does not happen all at once for all members of the targeted population; rather, it is a drawn-out process, with some people quicker to adopt the innovation than others. Use Figure 1.12 to aid your explanation.

Quick Quiz 2

1. ____ is the work designed to help employees embrace a new information system and way of working.
   Answer: soft side of implementing change

2. Which of the following identifies both the driving (positive) and restraining (negative) forces that influence whether change can occur?

   a. Lewin's change model
   b. force field analysis
   c. driving forces
   d. restraining forces

   Answer: b. force field analysis

3. The____ is the description of the phases an individual or organization goes through in making a change and principles for successful implementation of change.
   Answer: change management model

4. Which of the following best describes an organizational change model that proposes that every organizational system is made up of four main components—people, tasks, structure, and technology—that all interact; any change in one of these elements will necessitate a change in the other three elements?

    a. Leavitt's force field
    b. Standard's diamond
    c. Leavitt's diamond
    d. Driving forces

    Answer: c. Leavitt's diamond

Careers in Information Systems

1. Students may find it interesting to learn that technology is one of the fastest-growing areas in the U.S. economy, and information systems professionals are in high demand. The U.S. Bureau of Labor Statistics (BLS) forecasts an increase of 1.2 million new computing jobs in the time period 2012 to 2022. Use Figure 1.13 to aid the discussion.

2. Stress that a career in information systems can be challenging, exciting, and rewarding, there are also some drawbacks to such a career. As reliance on technology increases, organizations have increasing expectations of their information system workers

Roles, Functions, and Careers in IS

1. Explain that professionals with careers in information systems can work in an IS department or outside a traditional IS department as Web developers, computer programmers, systems analysts, computer operators, and many other positions.

2. Note that the typical IS organization is divided into three main functions: operations, development, and support. Use Figure 1.14 to aid the discussion.

Typical IS Titles and Functions

1. Point out that the organizational chart shown in Figure 1.14 is a simplified model of an IS department in a typical medium-sized or large organization.

2. The following topics should also be discussed:

    - **Chief Information Officer**: The role of the CIO is to employ an IS department's equipment and personnel to help the organization attain its goals. CIOs also understand the importance of finance, accounting, and return on investment.

    - **Senior IS Managers**: Job titles associated with IS management include vice president of information systems, manager of information systems, and chief technology officer (CTO).

- **Operations Roles**: Professionals in the operations group include data center managers, system operators, information systems security analysts, and LAN administrators.

- **Development Roles**: Professionals in the development group include software developers, systems analysts, programmers, and Web developers.

- **Support:** Professionals in the support group include database administrators and help desk support specialists.

Other IS Careers

1. Explain that in addition to working for an IS department in an organization, IS personnel can work for large consulting firms, such as Accenture, IBM, and Hewlett- Packard. Some consulting jobs entail frequent travel because consultants are assigned to work on various projects, wherever the client is.

2. Point out that other IS career opportunities include being employed by technology companies, such as Oracle, IBM, HP, Microsoft, Google, and Dell. Such a career enables an individual to work on the cutting edge of technology, which can be challenging and exciting.

IS-Related Roles outside the IS Organization

1. Explain that in addition to IS workers placed within the IS organization; some companies have people who take on IS-related roles but reside outside the IS organization. For example, data scientists, can be found in the marketing, sales, and supply chain management departments of large organizations. Data scientists are responsible for understanding the business analytics technology as well as the business, and then putting all of that together to deliver improvements in decision making.

2. Point out that **shadow IT** is a term used to describe the information systems and solutions built and deployed by departments other than the information systems department. In many cases, the information systems department may not even be aware of these efforts.

3. Discuss that shadow IT enables business managers to quickly create highly innovative solutions to real business problems and to test out these solutions. Such systems may serve as prototypes that evolve into future approved IT solutions. However, shadow IT solutions frequently employ nonapproved vendors, software, or hardware and may not meet the IS department standards for control, documentation, security, support, and reliability. Use Table 1.6 to aid the discussion.

Working in Teams

1. Briefly, mention that most IS careers involve working in project teams that can consist of many of the positions and roles discussed earlier. Thus, it is always good for IS professionals to have good communication skills and the ability to work with other people.

Finding a Job in IS

1. Briefly mention and discuss that traditional approaches to finding a job in the information systems area include attending on-campus visits from recruiters and getting referrals from professors, friends, and family members.

2. Highlight that many professional organizations and online user groups can be helpful in finding a job, staying current once employed, and seeking new career opportunities. Many companies use Twitter to advertise job openings in industries such as advertising and public relations, consulting, consumer products, and education, among others.

Certification

1. It is important for students to understand that the people-filling IS roles have usually completed some form of certification. Certification is a process for testing skills and knowledge; successful completion of a certification exam results in an endorsement by the certifying authority that an individual can perform specific tasks or jobs.

2. Point out that according to a recent survey, 65 percent of employers use IT certifications to differentiate between equally qualified candidates, while 72 percent of employers require some form of IT certification as a requirement for certain job roles.

Quick Quiz 3

1. Which professional in the operations group sets up and manages the network hardware, software, and security processes?

    a. LAN administrator
    b. System operator
    c. Data center manager
    d. IS security analysts

    Answer: a. LAN administrator

2. The role of the ____ is to employ an IS department's equipment and personnel to help the organization attain its goals.
   Answer: chief information officer (CIO)

3. ____ run and maintain IS equipment. They are responsible for efficiently starting, stopping, and correctly operating mainframe systems, networks, tape drives, disk devices, and printers.

Answer: System operators

4. Which professional in the development group designs and maintains Web sites, including site layout and function, to meet the client's requirements?

   a. Programmer
   b. Web developer
   c. Software developer
   d. System support

   Answer: b. Web developer

Class Discussion Topics

1. Discuss a specific computerized information system. If possible, get a representative from the university's computing services to come in as a guest speaker.

2. What are some of the systems development methodologies used by specific corporations?

3. What are the implications of using reengineering versus continuous improvement in a systems development effort?

4. What are the four components of Leavitt's diamond, and how do they interact?

Additional Projects

1. Choose a company that has a Web site. By exploring the Web site, determine the goals of the company. How does the company use the Internet to accomplish these goals? Report your findings in one to two paragraphs.

2. After choosing a well-known company, use the Internet to research the strategies the company is using to achieve competitive advantage. Summarize your findings in two to three paragraphs.

3. Choose a position in an IS department to research. Find out what qualifications are required to work in this position. Is certification required or helpful? What are the responsibilities of someone working in this position? Write a two- to three-paragraph report summarizing your findings.

Additional Resources:

1. MISQ Central:
   http://www.misq.org/

2. E-Commerce Times:
   http://www.ecommercetimes.com/

3. Computer Certification:
   http://certification.about.com/index.htm

4. Decision support system:
   http://www.techopedia.com/definition/770/decision-support-system-dss

5. Supply Chain Management:
   http://logistics.about.com/od/supplychainintroduction/a/into_scm.htm

6. Virtual team collaboration tools: http://www.thecouchmanager.com/the-ultimate-list-of-virtual-team-technology-tools/

7. Force field analysis:
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Key Terms

- **business process reengineering (BPR, reengineering, process redesign)** The radical redesign of business processes, organizational structures, information systems, and values of the organization to achieve a breakthrough in business results.
- **certification** A process for testing skills and knowledge; successful completion of a certification exam results in a statement by the certifying authority that confirms an individual can perform specific tasks.
- **change management model** A description of the phases an individual or organization goes through in making a change and principles for successful implementation of change.
- **computer-based information system (CBIS)** A single set of hardware, software, databases, networks, people, and procedures that are configured to collect, manipulate, store, and process data into information.
- **continuous improvement** Constantly seeking ways to improve business processes and add value to products and services.
- **data** Raw facts such as an employee number or total hours worked in a week.
- **diffusion of innovation theory** A theory developed by E.M. Rogers to explain how a new idea or product gains acceptance and diffuses (or spreads) through a specific population or subset of an organization.
- **driving forces** The beliefs, expectations, and cultural norms that tend to encourage a change and give it momentum.
- **enterprise information system** An information system that an organization uses to define structured interactions among its own employees and/or with external customers, suppliers, government agencies, and other business partners.
- **force field analysis** An approach to identifying both the driving (positive) and restraining (negative) forces that influence whether change can occur.

- **group information system** An information system that improves communications and support collaboration among members of a workgroup.
- **information** A collection of data organized and processed so that it has additional value beyond the value of the individual facts.
- **information system (IS)** A set of interrelated components that collect, process, store, and disseminate data and information; an information system provides a feedback mechanism to monitor and control its operation to make sure it continues to meet its goals and objectives.
- **innovation** The application of new ideas to the products, processes, and activities of a firm, leading to increased value.
- **knowledge** The awareness and understanding of a set of information and the ways that information can be made useful to support a specific task or reach a decision.
- **Leavitt's diamond** An organizational change model that proposes that every organizational system is made up of four main components—people, tasks, structure, and technology—that all interact; any change in one of these elements will necessitate a change in the other three elements.
- **Lewin's change model** A three stage approach for implementing change that involves unfreezing, moving, and refreezing.
- **organization** A group of people that is structured and managed to meet its mission or set of group goals.
- **organizational complement** A key component that must be in place to ensure successful implementation and use of an information system.
- **personal information system** An information system that improves the productivity of individual users in performing stand-alone tasks.
- **procedure** A set of steps that need to be followed to achieve a specific end result, such as enter a customer order, pay a supplier invoice or request a current inventory report.
- **process** A set of logically related tasks performed to achieve a defined outcome.
- **process redesign (reengineering, business process reengineering, BPR)** The radical redesign of business processes, organizational structures, information systems, and values of the organization to achieve a breakthrough in business results.
- **reengineering (process redesign/business process reengineering, BPR)** The radical redesign of business processes, organizational structures, information systems, and values of the organization to achieve a breakthrough in business results.
- **restraining forces** Forces that make it difficult to accept a change or to work to implement a change.
- **shadow IT** The information systems and solutions built and deployed by departments other than the information systems department. In many cases, the information systems department may not even be aware of these efforts.
- **soft side of implementing change** The work designed to help employees embrace a new information system and way of working.
- **supply chain** A key value chain whose primary activities include inbound logistics, operations, outbound logistics, marketing and sales, and service.
- **supply chain management (SCM)** The management of all the activities required to get the right product into the right consumer's hands in the right quantity at the right time and at the right cost—from the identification of suppliers and the acquisition of raw materials through manufacture and customer delivery.

- **technology acceptance model (TAM)** A model that specifies the factors that can lead to better attitudes about an information system, along with higher acceptance and usage of it.
- **technology infrastructure** All the hardware, software, databases, networks, people, and procedures that are configured to collect, manipulate, store, and process data into information.
- **value chain** A series (chain) of activities that an organization performs to transform inputs into outputs in such a way that the value of the input is increased.
- **virtual team** A group of individuals whose members are distributed geographically, but who collaborate and complete work using information systems.