**Chapter 2**

##### Information Systems in Organizations

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| At a Glance |

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##### 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

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| **Principles** | **Learning Objectives** |
| Organizations are open systems that affect and are affected by their surrounding environment. | * Sketch a general model of an organization showing how information systems support and work within the automated portions of an organizational process. * Define the term value chain and identify several examples within a typical manufacturing or service organization. |
| Positive change is a key ingredient for any  successful organization. | * Define the term innovation and identify two types. * Define reengineering and continuous improvement and explain how they are different. * Discuss the pros and cons outsourcing, offshoring, and downsizing. |
| 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 four 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

**Organizations and Information Systems**

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 2.1 to aid the discussion.
2. Pose the following question to students: *How does the organizational system increase the value of resources?*
3. 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. Use Figure 2.2 to aid the discussion.
4. 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 2.4 to aid the discussion.

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| *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. |

**Virtual Teams and Collaborative Work**

1. Define a virtual team as a group of individuals whose members are distributed geographically, but who collaborate and complete work through the use of information systems.
2. Point out that virtual team members must be prepared to do work anywhere, anytime.
3. Stress that communications are greatly improved when participants can see one another and pick up facial expressions and body language. Thus, even with sophisticated information system tools, virtual teams still benefit from occasional face-to-face meetings.

**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.

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| *Teaching* ***Tip*** | When introducing the material in this section discuss table 2.1 and use it to compare business process reengineering with continuous improvement. |

**Outsourcing, Offshoring, and Downsizing**

1. Define **outsourcing** is a long-term business arrangement in which a company contracts for services with an outside organization that has expertise in providing a specific function.
2. Point out that **offshore outsourcing** (also called **offshoring**) is an outsourcing arrangement in which the organization providing the service is located in a country different from the firm obtaining the services.
3. Highlight that companies considering outsourcing need to take into account many factors. A growing number of organizations are finding that outsourcing does not necessarily lead to reduced costs.
4. Make it clear that outsourcing part or all of a business process introduces significant risks that the service provider will introduce quality problems into the supply chain.
5. Explain downsizing, a term frequently associated with outsourcing, involves reducing the number of employees to cut costs.

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| ***Teaching***  ***Tip*** | For an interesting article about offshoring, visit: <http://www.economist.com/blogs/freeexchange/2014/03/offshoring> |

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| *Teaching* ***Tip*** | Outsourcing is a controversial issue because many companies outsource existing jobs to other countries where labor costs are much lower. Ask students to discuss whether outsourcing is beneficial or harmful to a country. What are the benefits of outsourcing? Who gets to enjoy these benefits—the company, the workers, and/or the consumers? What are the disadvantages of outsourcing? |

Quick Quiz 1

1. A(n) \_\_\_\_ is a group of people that is structured and managed to meet its mission or set of group goals.

Answer: organization

1. 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?
2. value chain
3. supply chain
4. SCM
5. process chain

Answer: a. value chain

1. \_\_\_\_ 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 acquisition of raw materials through customer delivery.

Answer: Supply chain management

1. Which of the following best describes the application of new ideas to the products, processes, and activities of a firm, leading to increased value?
2. growth
3. innovation
4. reengineering
5. process redesign

Answer: b. innovation

**Organizational Culture and Change**

1. Define **culture** as a set of major understandings and assumptions shared by a group, such as within an ethnic group or a country.
2. Highlight that **organizational culture** consists of the major understandings and assumptions for an organization. The understandings, which can include common beliefs, values, and approaches to decision making, are often not stated or documented as goals or formal policies.
3. Discuss how **organizational change** deals with how organizations successfully plan for, implement, and handle change.
4. Mention that the **soft side of implementing change** involves work designed to help employees embrace a new information system and way of working.
5. 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 2.6 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 2.7 to aid the discussion.

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| *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 2.9 to aid the discussion.
2. Highlight that organizational learning is closely related to organizational change. All organizations adapt to new conditions or alter their practices over time. Collectively, these adaptations and adjustments based on experience and ideas are called **organizational learning**.

**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 2.10 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 2.11 to aid your explanation.

Quick Quiz 2

1. \_\_\_\_ is a set of major understandings and assumptions shared by a group, such as within an ethnic group or a country.

Answer: culture

1. Which of the following identifies both the driving (positive) and restraining (negative) forces that influence whether change can occur?
2. Lewin’s change model
3. force field analysis
4. driving forces
5. restraining forces

Answer: b. force field analysis

1. 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

1. 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?
2. Leavitt’s force field
3. Standard’s diamond
4. Leavitt’s diamond
5. 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 Table 2.3 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
3. Briefly, mention that some of the best places to work as an IS professional are listed in Table 2.5.

**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 2.14 to aid the discussion.

**Typical IS Titles and Functions**

1. Point out that the organizational chart shown in Figure 2.14 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.

**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 2.6 to aid the discussion.

**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.

**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.

**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.

Quick Quiz 3

1. Which professional in the operations group sets up and manages the network hardware, software, and security processes?
2. LAN administrator
3. System operator
4. Data center manager
5. IS security analysts

Answer: a. LAN administrator

1. 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)

1. \_\_\_\_ 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

1. Which professional in the development group designs and maintains Web sites, including site layout and function, to meet the client’s requirements?
2. Programmer
3. Web developer
4. Software developer
5. System support

Answer: b. Web developer

##### Class Discussion Topics

1. What are the implications of using reengineering versus continuous improvement in a systems development effort?
2. What steps would you take to align the IS functions of an organization with its organizational mission?
3. What are the four components of Leavitt’s triangle, and how do they interact?

##### Additional Projects

1. 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.
2. 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. Supply Chain Management:  
   <http://logistics.about.com/od/supplychainintroduction/a/into_scm.htm>
2. Computer Certification:  
   <http://certification.about.com/index.htm>
3. Virtual team collaboration tools: <http://www.thecouchmanager.com/the-ultimate-list-of-virtual-team-technology-tools/>
4. Force field analysis:  
   <https://www.mindtools.com/pages/article/newTED_06.htm>
5. Offshoring:  
   <http://www.economist.com/blogs/freeexchange/2014/03/offshoring>

##### Key Terms

* **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.
* **continuous improvement:** Constantly seeking ways to improve business processes and add value to products and services.
* **culture**: A set of major understandings and assumptions shared by a group, such as within an ethnic group or a country.
* **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.
* **downsizing:** Reducing the number of employees to cut costs.
* **driving forces:** The beliefs, expectations, and cultural norms that tend to encourage a change and give it momentum.
* **force field analysis:** An approach to identifying both the driving (positive) and restraining (negative) forces that influence whether change can occur.
* **innovation:** The application of new ideas to the products, processes, and activities of a firm, leading to increased value.
* **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.
* **offshore outsourcing (offshoring):** An outsourcing arrangement where the organization providing the service is in a country different from the firm obtaining the services.
* **organization:** A group of people that is structured and managed to meet its mission or set of group goals.
* **organizational change:** How for profit and nonprofit organizations plan for, implement, and handle change.
* **organizational culture:** The major understandings and assumptions for a business, corporation, or other organization.
* **organizational learning:** The adaptations and adjustments made within an organization based on experience and ideas over time.
* **outsourcing:** A long-term business arrangement in which a company contracts for services with an outside organization that has expertise in providing a specific function.
* **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 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.
* **supply chain:** A key value chain whose primary activities include inbound logistics, operations, outbound logistics, marketing and sales, and service.
* **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.
* **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.