# 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** |
| 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 “value chain” and describe the role that information systems play in an organization’s supply chain. * 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. |
| Because information systems are so important, businesses need to be sure that improvements or completely new systems help lower costs, increase profits, improve service, or achieve a competitive advantage. | * Define the term “competitive advantage” and identify the factors that lead firms to seek competitive advantage. * Discuss strategic planning for competitive advantage. * Describe three methods for assessing the financial attractiveness of an information system project. |
| 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 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**. Use Figure 2.2 to aid the discussion.
4. Introduce the terms **supply chain management**. 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. |

**Organizational Structures**

1. Note that an organization’s structure depends on its goals and approach to management and can affect how it views and uses information systems.
2. The following topics should also be discussed:

* **Traditional Organizational Structure**:Introduce the terms **flat organizational structure** and **empowerment**. Use Figures 2.5, 2.6, and Table 2.1 to aid the discussion.
* **Matrix Organization Structure**: In a matrix organization structure, an individual has two reporting superiors (managers)—one functional and one operational. Use Figure 2.8 to aid the discussion.
* **Project Organizational Structures**: This structure is focused on major products or services, with program managers responsible for directing one or more projects. Use Figure 2.9 to aid the discussion.
* **Virtual Teams and Collaborative Work**: Use Table 2.2 to discuss the strengths and weaknesses of various organizational structures.

**Innovation**

1. Innovation is the catalyst for the growth and success of any organization. It can build and sustain profits, create new challenges for the competition, and provide added value for customers. Note that innovation and change are absolutely required in today’s highly competitive global environment, or the organization is at risk of losing its competiveness and becoming obsolete.

**Reengineering and Continuous Improvement**

1. Introduce the terms **reengineering** and **continuous improvement**.
2. Explain that reengineering can reduce delivery time, increase product and service quality, enhance customer satisfaction, and increase revenues and profitability. Use Figure 2.13 to aid the discussion.
3. Use Table 2.3 to compare the two strategies of business process reengineering and continuous improvement.

**Organizational Culture and Change**

1. Introduce the terms **culture**, **organizational culture**, and **organizational change**.
2. Note that change can be caused by internal factors, such as those initiated by employees at all levels, or by external factors, such as those wrought by competitors, stockholders, federal and state laws, community regulations, natural occurrences (such as hurricanes), and general economic conditions. Organizational change also occurs when two or more organizations merge.
3. Introduce the terms **change model, Leavitt’s diamond,** and **organizational learning**. Use Figures 2.15 and 2.16 to aid the discussion.

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| *Teaching* ***Tip*** | Ask a local businessperson involved with strategic planning and information technology to come and speak with the class. |

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| *Teaching* ***Tip*** | To learn more about Leavitt’s diamond, visit: <http://www.brighthubpm.com/change-management/122495-a-look-at-the-components-of-leavitts-diamond/> |

**User Satisfaction and Technology Acceptance**

1. Introduce the term **technology acceptance model**. Use Figure 2.17 to aid the discussion.

**Diffusion of Innovation Theory**

1. 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. Note 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 2.18 and Table 2.4 to aid the discussion.

**Quality**

1. Introduce the following approaches that have been developed to help organizations improve quality and introduce change: **lean enterprise management, total quality management (TQM)**, and **Six Sigma**.

**Outsourcing, Offshoring, and Downsizing**

1. Point out that a significant portion of an organization’s expenses is used to hire, train, and compensate employees. Naturally, organizations try to control costs by determining the number of employees they need to maintain high-quality goods and services. Strategies to contain these personnel costs include outsourcing, offshoring, and downsizing.
2. Introduce the terms **offshoring** and **downsizing**.

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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 as a whole. 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? |

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

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. The \_\_\_\_ 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.

Answer: 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. \_\_\_\_ gives employees and their managers more responsibility and authority to make decisions, take action, and have more control over their jobs.

Answer: Empowerment

Competitive Advantage

1. In his book, *Good to Great*, Jim Collins outlines how technology can be used to accelerate companies to greatness. Use Table 2.5 to discuss how a few companies accomplished this.

**Factors That Lead Firms to Seek Competitive Advantage**

1. Explain that the five forces include:

* **Rivalry among Existing Competitors**:To gain an advantage over competitors, companies constantly analyze how they use their resources and assets.
* **Threat of New Entrants**: Explain that a threat appears when entry and exit costs to an industry are low and the technology needed to start and maintain a business is commonly available.
* **Threat of Substitute Products and Services**: Note that the more consumers can obtain similar products and services that satisfy their needs, the more likely firms are to try to establish competitive advantage.
* **Bargaining Power of Customers and Suppliers**: When customers have a lot of bargaining power, companies increase their competitive advantage to retain their customers. Similarly, when the bargaining power of suppliers is strong, companies need to improve their competitive advantage to maintain their bargaining position.

**Strategic Planning for Competitive Advantage**

1. Explain that given the five market forces previously mentioned, Porter and others have proposed a number of strategies to attain competitive advantage, including cost leadership, differentiation, niche strategy, altering the industry structure, creating new products and services, and improving existing product lines and services.

Quick Quiz 2

1. \_\_\_\_ is often achieved by reducing the costs of raw materials through aggressive negotiations with suppliers, becoming more efficient with production and manufacturing processes, and reducing warehousing and shipping costs.

Answer: Cost leadership

1. A(n) \_\_\_\_ is an agreement between two or more companies that involves the joint production and distribution of goods and services.  
   Answer: strategic alliance, strategic partnership
2. A(n) \_\_\_\_ is a significant and (ideally) long-term benefit to a company over its competition and can result in higher-quality products, better customer service, and lower costs.

Answer: competitive advantage

###### Financial Evaluation of Information System Projects

1. Introduce the terms **cash flow** and **time value of money**. Use Table 2.6 to aid the discussion.

**Payback Period**

1. Note that the payback period is the number of years required to recover the initial cost of an investment. The shorter the payback period, the more attractive is the project.

**Internal Rate of Return**

1. Explain that the internal rate of return of an investment is the rate of return that makes the net present value of all cash flows (benefits and costs) generated by a project equal to zero.

**Net Present Value Method**

1. The net present value method of evaluating a project is the sum of the present value of the net cash flow for each time period. The higher the net present value, the more financially attractive the project is. Introduce the equation for determining the net present value.

###### 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 Association for Computing Machinery forecasts 150,000 new computing jobs per year from 2012 to 2020. Use Figures 2.23, 2.24, and Table 2.8 to aid the discussion.

**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 2.25 to aid the discussion.

**Typical IS Titles and Functions**

1. Point out that the organizational chart shown in Figure 2.25 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.
* **Certification:**  Popular certification programs include Microsoft Certified Systems Engineer, Certified Information Systems Security Professional (CISSP), Oracle Certified Professional, and Cisco Certified Security Professional (CCSP).

**Other IS Careers**

1. 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. Note that some consulting jobs can entail frequent travel because consultants are assigned to work on various projects wherever the client is.

**Working in Teams**

1. It is important for students to understand that most IS careers involve working in project teams that can consist of many of the positions and roles discussed above. Thus, it is always good for IS professionals to have good communications skills and the ability to work with other people.

**Finding a Job in IS**

1. There are many traditional approaches to finding a job in the information systems area, including on-campus visits from recruiters and referrals from professors, friends, and family members. Note that students who use the Internet and other nontraditional sources to find IS jobs have more opportunities to land a job.

Quick Quiz 3

1. \_\_\_\_ administrators set up and manage the network hardware, software, and security processes.  
   Answer: Local area network (LAN)
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)

1. \_\_\_\_ primarily run and maintain IS equipment and are typically trained at technical schools or through on-the-job experience.

Answer: System operators

1. \_\_\_\_ design and maintain Web sites, including site layout and function, to meet the client’s requirements.

Answer: Web developers

**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. Should technology drive an organization's strategic planning or should strategic planning drive an organization's technology adoption plans?

##### 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. Competitive advantage: <http://homebusiness.about.com/od/growing/a/comp_advantage.htm>
4. Five-forces model:  
   <http://www.mindtools.com/pages/article/newTMC_08.htm>
5. Offshoring:  
   <http://www.economist.com/blogs/freeexchange/2014/03/offshoring>

##### Key Terms

* **cash flow—**takes into account all the increases and decreases in cash flow associated with the project.
* **certification**—a process for testing skills and knowledge, which results in a statement by the certifying authority that states an individual is capable of performing a particular kind of job.
* **change model**—a representation of change theories that identifies the phases of change and the best way to implement them.
* **competitive advantage**—a significant and (ideally) long-term benefit to a company over its competition.
* **continuous improvement**—constantly seeking ways to improve the business processes to add value to products and services.
* **culture**—a set of major understandings and assumptions shared by a group.
* **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.
* **empowerment**—giving employees and their managers more responsibility and authority to make decisions, take certain actions, and have more control over their jobs.
* **five-forces model**—a widely accepted model that identifies five key factors that can lead to attainment of competitive advantage, including (1) the rivalry among existing competitors, (2) the threat of new entrants, (3) the threat of substitute products and services, (4) the bargaining power of buyers, and (5) the bargaining power of suppliers.
* **flat organizational structure**—an organizational structure with a reduced number of management layers.
* **functional structure**—an organizational structure in which the hierarchy of decision making and authority flows from the strategic management at the top down to operational management and non-management employees.
* **internal rate of return**—the rate of return that makes the net present value of all cash flows (benefits and costs) generated by a project equal to zero.
* **lean enterprise management**—a philosophy that considers the use of resources for any purpose other than to create value for the customer to be wasteful and therefore a target for elimination.
* **Leavitt’s diamond**—a theory that proposes that every organizational system is made up of four main components—people, tasks, structure, and technology—with an interaction among the four components so that any change in one of these elements will necessitate a change in the other three elements.
* **matrix organization structure**—an organization structure in which an individual has two reporting superiors (managers)—one functional and one operational.
* **net present value**—a method of evaluating a project is the sum of the present value of the net cash flow for each time period.
* **offshore outsourcing (offshoring)** —an outsourcing arrangement where the organization providing the service is located in a country different than the firm obtaining the services.
* **organization**—a formal collection of people and other resources established to accomplish a set of goals.
* **organizational change**—the responses that are necessary for profit and nonprofit organizations to plan for, implement, and handle change.
* **organizational culture**—the major understandings and assumptions for a business, a corporation, or an organization.
* **organizational learning**—adaptations to new conditions or alterations of organizational practices over time.
* **organizational structure**—organizational subunits and the way they relate to the overall organization.
* **outsourcing**—contracting with outside professional services to meet specific business needs.
* **payback period**—takes into account all the increases and decreases in cash flow associated with the project.
* **project organizational structure**—a structure focused on major products or services, with program managers responsible for directing one or more projects.
* **quality**—the ability of a product (including services) to meet or exceed customer expectations.
* **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.
* **Six Sigma—**a measurement-based strategy to improve processes and reduce variation through completion of Six Sigma projects.
* **strategic alliance (strategic partnership)**—an agreement between two or more companies that involves the joint production and distribution of goods and services.
* **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 acquisition of raw materials through customer delivery.
* **technology acceptance model (TAM)**—a model that describes the factors that lead to higher levels of acceptance and usage of technology.
* **time value of money**—takes into account the fact that a dollar today is worth more than a dollar paid in the future.
* **total quality management**—a management approach to long-term organizational success through satisfying customer needs.
* **traditional hierarchical organizational structure**—an organizational structure in which the hierarchy of decision making and authority flows from the strategic management at the top down to operational management and non-management employees.
* **value chain**—a series (chain) of activities that includes inbound logistics, warehouse and storage, production, finished product storage, outbound logistics, marketing and sales, and customer service.
* **virtual team—**a group of individuals whose members are distributed geographically, but who work as a coherent unit through the use of information systems technology.