Principles of Information Systems Eighth Edition

Chapter 2

Information Systems in Organizations

Principles and Learning Objectives

- The use of information systems to add value to the organization is strongly influenced by organizational structure, culture, and change
  - Identify the value-added processes in the supply chain and describe the role of information systems within them
  - Provide a clear definition of the terms *organizational structure*, *culture*, and *change* and discuss how they affect the implementation of information systems

Principles and Learning Objectives (continued)

- 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
  - Identify some of the strategies employed to lower costs or improve service
  - Define the term *competitive advantage* and discuss how organizations are using information systems to gain such an advantage
  - Discuss how organizations justify the need for information systems

Principles and Learning Objectives (continued)

- Cooperation between business managers and IS personnel is the key to unlocking the potential of any new or modified system
  - Define the types of roles, functions, and careers available in information systems

Why Learn About Information Systems in Organizations?

- Information systems (ISs) can cut costs and increase profits
- Students in most fields need to know ISs
  - Management major might be hired to design a system to improve productivity
  - Biochemistry major might be hired to conduct drug research using computer techniques

Organizations and Information Systems

- **Organization:** a formal collection of people and other resources established to accomplish a set of goals
- An organization is a system - has inputs, processing mechanisms, outputs, and feedback
  - Inputs to the system: resources such as materials, people, and money
  - Outputs to the environment: goods or services

Organizations and Information Systems (continued)

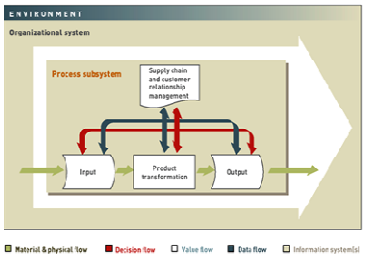

Figure 2.1: A General Model of an Organization

Organizations and Information Systems (continued)

- **Value chain:** series (chain) of activities that includes inbound logistics, warehouse and storage, production, finished product storage, outbound logistics, marketing and sales, and customer service
- **Upstream management:** management of raw materials, inbound logistics, and warehouse and storage facilities
- **Downstream management:** management of finished product storage, outbound logistics, marketing and sales, and customer service

Organizations and Information Systems (continued)

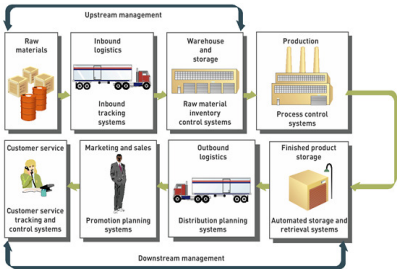

Figure 2.2: The Value Chain of a Manufacturing Company

Organizational Structures

- **Organizational structure:** organizational subunits and the way they relate to the overall organization
- Categories of organizational structure
  - Traditional
  - Project
  - Team
  - Virtual

Traditional Organizational Structure

- A hierarchical structure
- Major department heads report to a president or top-level manager
- Managerial pyramid shows the hierarchy of decision making and authority

Traditional Organizational Structure (continued)

Figure 2.4: A simplified model of the organization, showing the managerial pyramid from top-level managers to nonmanagement employees

Traditional Organizational Structure (continued)

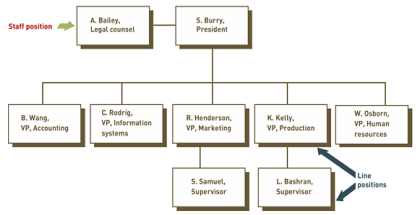

Figure 2.5: A Traditional Organizational Structure

Project and Team Organizational Structures

- **Project organizational structure:** centered on major products or services
  - Many project teams are temporary
- **Team organizational structure:** centered on work teams or groups
  - Team can be temporary or permanent, depending on tasks

Project and Team Organizational Structures (continued)

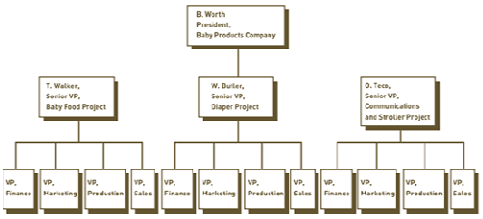

Figure 2.6: A Project Organizational Structure

Virtual Organizational Structure and Collaborative Work

- Virtual organizational structure
  - Employs business units in geographically dispersed areas
  - People may never meet face to face
  - Allows collaborative work
    - Managers and employees can effectively work in groups, even those composed of members from around the world

Organizational Culture and Change

- Organizational culture
  - Major understandings and assumptions
  - Influences information systems
- Organizational change
  - How organizations plan for, implement, and handle change

Reengineering and Continuous Improvement

- Reengineering
  - Process redesign
  - Radical redesign of business processes, organizational structures, information systems, and values of the organization to achieve a breakthrough in business results

Reengineering and Continuous Improvement (continued)

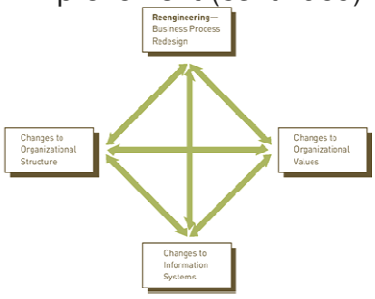

Figure 2.8: Reengineering

Reengineering and Continuous Improvement (continued)

- Continuous improvement
  - Constantly seeking ways to improve business processes
  - Benefits
    - Increased customer loyalty
    - Reduction in customer dissatisfaction
    - Reduced opportunity for competitive inroads

Reengineering and Continuous Improvement (continued)

Business Process Reengineering	Continuous Improvement
Strong action taken to solve serious problem	Routine action taken to make minor improvements
Top-down change driven by senior executives	Bottom-up change driven by workers
Broad in scope; cuts across departments	Narrow in scope; focus is on tasks in a given area
Goal is to achieve a major breakthrough	Goal is continuous, gradual improvements
Often led by outsiders	Usually led by workers close to the business
Information system integral to the solution	Information systems provide data to guide the improvement team

Table 2.2: Comparing Business Process Reengineering and Continuous Improvement

User Satisfaction and Technology Acceptance

- **Technology acceptance model (TAM):** describes factors that lead to higher levels of acceptance and usage of technology
- **Technology diffusion:** measure of how widely technology is spread throughout an organization
- **Technology infusion:** extent to which technology permeates a department

Quality

- **Quality:** ability of a product or service to meet or exceed customer expectations
- Techniques used to ensure quality
  - Total quality management
  - Six sigma

Outsourcing, On-Demand Computing, and Downsizing

- **Outsourcing:** contracting with outside professional services
- **On-demand computing:** contracting for computer resources to rapidly respond to an organization's varying workflow
  - On-demand business
  - Utility computing
- **Downsizing:** reducing number of employees

Competitive Advantage

- Significant and (ideally) long-term benefit to a company over its competition
- Ability to establish and maintain competitive advantage is vital to the company's success

Factors That Lead Firms to Seek Competitive Advantage

- Rivalry among existing competitors
- Threat of new entrants
- Threat of substitute products and services
- Bargaining power of customers and suppliers

Strategic Planning for Competitive Advantage

- Cost leadership
- Differentiation
- Niche strategy
- Altering the industry structure

Strategic Planning for Competitive Advantage (continued)

- Creating new products and services
- Improving existing product lines and service
- Other strategies
  - Growth in sales
  - First to market
  - Customizing products and services
  - Hiring the best people

Performance-Based Information Systems

- Consider both strategic advantage and costs
- Use productivity, return on investment (ROI), net present value, and other measures of performance

Performance-Based Information Systems (continued)

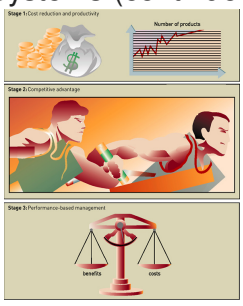

Figure 2.9: Three Stages in the Business Use of Information Systems

Productivity

- A measure of output achieved divided by input required
- Higher level of output for a given level of input means greater productivity

Return on Investment and the Value of Information Systems

- Earnings growth
- Market share
- Customer awareness and satisfaction
- Total cost of ownership

Risk

- Managers must consider risks of designing, developing, and implementing information systems
- Information system may be a failure
- Costs of development and implementation of a system can be greater than the returns from it

Careers in Information Systems

- Degree programs
  - Degrees in information systems
  - Business degrees with a global or international orientation
- Computer systems are making IS professionals' work easier
- Opportunities in information systems are not confined to single countries

Roles, Functions, and Careers in the IS Department

- Primary responsibilities in information systems
  - **Operations:** focuses on the efficiency of IS functions
  - **Systems development:** focuses on specific development projects and ongoing maintenance and review
  - **Support:** provides user assistance, data administration, user training, and Web administration

Typical IS Titles and Functions

- Chief Information Officer (CIO)
  - Employs the IS department's equipment and personnel to help the organization attain its goals
- LAN administrators
  - Set up and manage the network hardware, software, and security processes

Typical IS Titles and Functions (continued)

- Internet careers
  - Internet strategists and administrators
  - Internet systems developers
  - Internet programmers
  - Internet or Web site operators
- Certification
  - Examples: Microsoft Certified Systems Engineer, Certified Information Systems Security Professional (CISSP), and Oracle Certified Professional

Other IS Careers

- Information security
- Privacy
- Cybersecurity
- Online fraud-fighting
- Video-game development

Other IS Careers (continued)

- Working from home
- Working for a consulting firm
- Working for a hardware or software vendor developing or selling products

Summary

- An organization is a system - has inputs, processing mechanisms, outputs, and feedback
- Categories of organizational structure: traditional, project, team, and virtual
- Organizational culture: major understandings and assumptions
- Reengineering: radical redesign of business processes, organizational structures, information systems, and values of the organization to achieve a breakthrough in business results

Summary (continued)

- Continuous improvement: constantly seeking ways to improve business processes
- Outsourcing: contracting with outside professional services
- Downsizing: reducing number of employees
- Competitive advantage: significant, and (ideally) long-term benefit to a company over its competition
- Performance-based information systems: consider both strategic advantage and costs

Summary (continued)

- Productivity: a measure of output achieved divided by input required
- Primary responsibilities in information systems: operations, systems development, and support
- Typical IS titles: Chief Information Officer (CIO), LAN administrators, Internet strategists and administrators, Internet systems developers, Internet programmers, and Internet or Web site operators