

Chap-01, Information Systems in Perspective

This Chapter is essentially an overview of the remainder of the textbook which will elaborate further. What to expect from this discussion:

- The value of information is directly linked to how it helps decision makers achieve the organization's goals. We will:
 - distinguish data from information and describe characteristics used to evaluate the quality of data.
- Knowing the potential impact of information systems and having the ability to put this knowledge to work can result in a successful personal career, organizations that reach their goals, and a society with a higher quality of life. We will
 - identify the basic types of business information systems and discuss who uses them, how they are used, and what kinds of benefits they deliver.
- System users, business managers, and information systems professionals must work together to build a successful information system. We will:
 - identify the major steps of the systems development process and state the goal of each.
- The use of information systems to add value to the organization can also give an organization a competitive advantage. We will:
 - Identify the value-added processes in the supply chain and describe the role of information systems within them;
 - 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.
- Information systems personnel are the key to unlocking the potential of any new or modified system
 - We will define the types of roles, functions, and careers available in information systems

Information Concepts

- Information system (IS)** can be a manual or automated process
 - Set of interrelated components: collect, manipulate, disseminate data and information
 - Provide feedback to meet an objective
 - Examples: airline reservation systems, course enrollment systems, payroll

Data Versus Information

- Data:** raw facts (p.5 – Table 1.1)
 - Alphanumeric, image, audio, and video
- Information**
 - Organized collection of facts of value to the user → Decision Making
 - Have value beyond the facts themselves

The Characteristics of Valuable Information (p.7 – Table 1.2) Accurate, Compete/concise, Timely...

What Is an Information System? **INPUT → Process → OUTPUT with Feedback & Control**

- Manual versus computerized information systems
 - Computer-based information system (CBIS)** –“Technology Infrastructure”
 - Hardware, software, databases, telecommunications, people, and procedures (computerizing a manual information system does not guarantee improved system performance.)
 - Collect, manipulate, store, and process data into information

Business Information Systems

•**Electronic and Mobile Commerce (E-commerce):**

any business transaction executed electronically between parties:

- Companies (B2B)
- Companies and consumers (B2C) “Web Shopping”
- Consumers and other consumers (C2C) “ebay”
- Business and the public sector (B2G)
- Consumers and the public sector

•**Transaction:** = a business-related exchange

- Payments to employees
- Sales to customers
- Payments to suppliers

Management Levels and Information Systems

(The Manager’s Job: To Plan. To Organize. To Staff. To Control)

•**Transaction processing system (TPS) - Operational Management Level**

- A collection of people, procedures, software, databases, devices
- Records completed business transactions

•**Management information system (MIS) – Tactical Management Level**

- A collection of people, procedures, software, databases, devices
- Provides information to managers/decision makers
- Primary focus is operational efficiency
- MIS outputs
 - Scheduled reports
 - Demand reports
 - Exception reports

•**Decision support system (DSS) – Strategic Management Level**

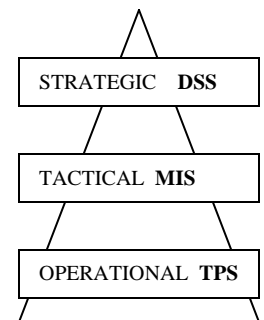
- A collection of people, procedures, software, databases, devices
- Supports problem-specific decision making
- Focus is on decision-making effectiveness

•**Specialized Business Information Systems:**

- Artificial intelligence (AI) systems
- Expert systems
- Virtual reality systems

•**Enterprise Resource Planning**

- Integrated programs that manage all business operations
- Coordinate planning, inventory control, production, and ordering



Systems Development

–Creating or modifying existing business systems

•**Systems investigation:** gain an understanding of the problem to be solved or opportunity to be addressed

•**Systems analysis:** define problems and opportunities of the existing system

•**Systems design:** determine how the new system will work to meet the business needs defined during systems analysis

•**Systems implementation:** create or acquire the various system components defined in the design step, assembling them, and putting the new system into operation

•**Systems maintenance and review:** check and modify the system so that it continues to meet changing business needs

Organizations and Information Systems

Organizations: a collection of people and other resources established to accomplish a set of goals

- An organization is a system
 - Inputs: resources (materials, people, money)
 - Outputs: goods or services
- **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
- **Upstream management:** management of raw materials, inbound logistics, and warehouse and storage facilities (“up” from the raw materials)
- **Downstream management:** management of finished product storage, outbound logistics, marketing and sales, and customer service (“down from the Finished Product”)

Organizational Culture and Change

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

Technology Diffusion, Infusion, and Acceptance

- **Technology diffusion:** measure of widespread use of technology
- **Technology infusion:** extent to which technology permeates a department
- **Technology acceptance model (TAM):** specifies factors that can lead to higher acceptance and usage of technology

Organizations in a Global Society

- As companies rely on virtual structures and outsourcing to a greater extent, businesses can operate around the world
- Challenges to operating in a global society
 - Every country has a set of customs, cultures, standards, politics, and laws
 - Language barriers
 - Difficulty in managing and controlling operations in different countries

Competitive Advantage

- Significant, long-term benefit that a company can have over its competition
- Ability to establish and maintain a competitive advantage is vital to a company’s success

Factors That Lead Firms to Seek Competitive Advantage

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

Strategic Planning for Competitive Advantage

- Change the structure of the industry
- Create new products or services
- Improve existing products or services
- Use information systems for strategic purposes

Performance-Based Information Systems

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

Productivity

- 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

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 information
 - Systems development: focuses on development projects and ongoing maintenance and review
 - Support: provides user assistance

Typical IS Titles and Functions

- Chief information officer (CIO): uses IS department equipment and personnel
- LAN administrators: set up and manage the network hardware, software, and security processes
- Internet careers
 - Strategists
 - Programmers
 - Web site operators
 - Chief Internet officer
- Other IS careers

Summary

- Data: raw facts
- Information: organized collection of facts
- System components: input, processing, output, and feedback
- Computer-based information system (CBIS)
 - Hardware, software, databases, telecommunications, people, and procedures
 - Collect, manipulate, store, and process data into information
- Transaction processing system (TPS): a collection of people, procedures, software, databases, and devices used to record completed business transactions
- Management information system (MIS): a collection of people, procedures, software, databases, and devices used to provide routine information to managers and decision makers
- Decision support system (DSS): a collection of people, procedures, software, databases, and devices used to support problem-specific decision making
- Systems development: creating or modifying existing business systems
- Competitive advantage: significant, long-term benefit to a company over its competition
- Primary responsibilities in information systems: operations, systems development, and support

Key Terms

- **Artificial intelligence (AI):** A field in which the computer system takes on the characteristics of human intelligence
- **Certification:** A process for testing skills and knowledge that results in a statement by the certifying authority that says an individual is capable of performing a particular kind of job
- **Competitive advantage:** A significant and (ideally) long-term benefit to a company over its competition
- **Computer-based information system (CBIS):** A single set of hardware, software, databases, telecommunications, people, and procedures configured to collect, manipulate, store, and process data into information
- **Culture:** A set of major understandings and assumptions shared by a group
- **Data:** The raw facts, such as an employee's name and number of hours worked in a week, inventory part numbers, or sales orders
- **Database:** An organized collection of facts and information
- **Decision support system (DSS):** An organized collection of people, procedures, software, databases, and devices used to support problem-specific decision making
- **E-commerce:** Any business transaction executed electronically between parties, such as companies (business-to-business, B2B), companies and consumers (business-to-consumer, B2C), consumers and other consumers (consumer-to-consumer, C2C), businesses and the public sector, or consumers and the public sector
- **Enterprise resource planning (ERP) system:** A set of integrated programs capable of managing a company's vital business operations for an entire multisite, global organization
- **Expert system:** A system that gives a computer the ability to make suggestions and act like an expert in a particular field
- **Extranet:** A network based on Web technologies that allows selected outsiders, such as business partners and customers, to access authorized resources of the intranet of a company
- **Feedback:** The output that is used to make changes to input or processing activities
- **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
- **Forecasting:** The process of predicting future events to avoid problems
- **Hardware:** The computer equipment used to perform input, processing, and output activities
- **Information:** A collection of facts organized in such a way that they have additional value beyond the value of the facts themselves
- **Information center:** A support function that provides users with assistance, training, application development, documentation, equipment selection and setup, standards, technical assistance, and troubleshooting
- **Information service unit:** A miniature IS department
- **Information system (IS):** A set of interrelated components that collect, manipulate, and disseminate data and information and provide a feedback mechanism to meet an objective
- **Input:** The activity of gathering and capturing raw data
- **Internet:** The world's largest computer network, actually consisting of thousands of interconnected networks, all freely exchanging information
- **Intranet:** An internal network based on Web technologies that allows people within an organization to exchange information and work on projects
- **Knowledge:** The awareness and understanding of a set of information and the ways it can be used

- **Knowledge base:** The collection of data, rules, procedures, and relationships that must be followed to achieve value or the proper outcome
- **Management information system (MIS):** An organized collection of people, procedures, software, databases, and devices used to provide routine information to managers and decision makers
- **Mobile commerce (m-commerce):** Transactions conducted anywhere, anytime
- **Networks:** The connected computers and computer equipment in a building, around the country, or around the world that enable electronic communications
- **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
- **Output:** The production of useful information, usually in the form of documents and reports
- **Procedures:** The strategies, policies, methods, and rules for using a CBIS
- **Process:** A set of logically related tasks performed to achieve a desired outcome
- **Processing:** The activity of converting or transforming data into useful outputs
- **Productivity:** A measure of the output achieved divided by the input required
- **Return on investment (ROI):** One measure of IS value that investigates the additional profits or benefits that are generated as a percentage of the investment in information systems technology
- **Software:** The computer programs that govern the operation of the computer
- **Strategic alliance (strategic partnership):** An agreement between two or more companies that involves the joint production and distribution of goods and services
- **Systems development:** The activity of creating or modifying existing business systems
- **Technology acceptance model (TAM):** A model that describes the factors that can lead to higher acceptance and usage of technology
- **Technology diffusion:** A measure of how widely technology is spread throughout the organization
- **Technology infrastructure:** All the hardware, software, databases, telecommunications, people, and procedures that are configured to collect, manipulate, store, and process data into information
- **Technology infusion:** The extent to which technology is deeply integrated into an area or department
- **Telecommunications:** The electronic transmission of signals for communications; enables organizations to carry out their processes and tasks through effective computer networks
- **Total cost of ownership (TCO):** The measurement of the total cost of owning computer equipment, including desktop computers, networks, and large computers
- **Transaction:** Any business-related exchange, such as payments to employees, sales to customers, and payments to suppliers
- **Transaction processing system (TPS):** An organized collection of people, procedures, software, databases, and devices used to record completed business transactions
- **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 reality:** The simulation of a real or imagined environment that can be experienced visually in three dimensions