

Lecture Five

Information Systems

Information Systems

- ▶ Why Do People Need Information?
- ▶ Support Business Processes
 - ▶ Efficiently running their departments (control).
 - ▶ Resources Evaluation.
- ▶ To ensure effective and efficient decision - making
- ▶ Support Competitive Advantage

Data, Information and Systems

▶ Data vs. Information

▶ Data

- ▶ A fact; a number, a statement, or a picture represents something in the real world
- ▶ The raw materials in the production of information

▶ Information

- ▶ Data in relationships
- ▶ Data after manipulation

Data, Information and Systems

- ▶ Generating Information

- ▶ Computer-based ISs take data as raw material, process it, and produce information as output.

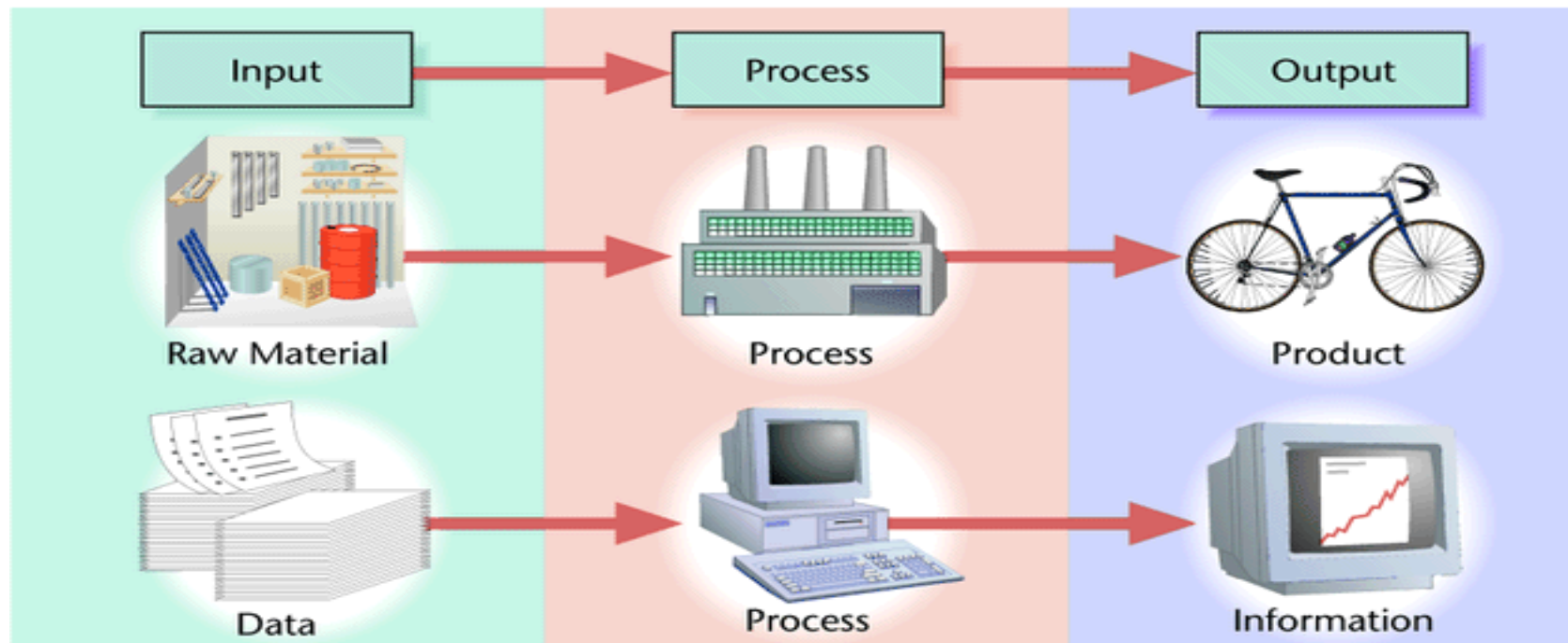


Figure 1.1 Input-process-output

Data, Information and Systems

► Information in Context






 Relevant	Information must pertain to the problem at hand. For example, the total number of years of education may not be relevant to a person's qualifications for a new job. Relevant information might be that the person has so many years of education in mechanical engineering, and so many years of experience. The information must also be presented in a way that helps a person understand it in a specific context.
 Complete	Partial information is often worse than no information. For example, marketing data about household incomes may lead to bad decisions if not accompanied by vital information on the consumption habits of the targeted population.
 Accurate	Erroneous information may lead to disastrous decisions. For example, an inaccurate record of a patient's reaction to penicillin may lead a doctor to harm the patient while believing that she is helping him.
 Current	Decisions are often based upon the latest information available, but what was a fact yesterday may no longer be one today. For example, a short-term investment decision to purchase a stock today based on yesterday's stock prices may be a costly mistake if the stock's price has risen in the interim.
 Economical	In a business setting, the cost of obtaining information must be considered as one cost element involved in any decision. For example, demand for a new product must be researched to reduce risk of marketing failure, but if market research is too expensive, the cost of obtaining the information may diminish profit from sales.

Figure 1.2 Characteristics of useful information

Data, Information and Systems

▶ What Is a System?

- ▶ System: A set of components that work together to achieve a common goal
- ▶ Subsystem: One part of a system where the products of more than one system are combined to reach an ultimate goal
- ▶ Closed system: Stand-alone system that has no contact with other systems
- ▶ Open system: System that interfaces with other systems

Data, Information and Systems

▶ Information and Managers

▶ Systems thinking

- ▶ Creates a framework for problem solving and decision making.
- ▶ Keeps managers focused on overall goals and operations of business.

Data, Information and Systems



Humans

Think

Have common sense

Can make decisions

Can instruct the computer what to do

Can learn new methods and techniques

Can accumulate expertise



Computers

Calculate and perform programmed logical operations extremely rapidly

Store and retrieve data and information extremely rapidly

Perform complex logical and arithmetical functions accurately

Execute long, tedious operations

Perform routine tasks less expensively than humans

Are adaptable (can be programmed and reprogrammed)

Figure 1.5 Qualities of humans and computers that contribute to synergy

Data, Information and Systems

Data	Input that the system takes to produce information.
Hardware	A computer and its peripheral equipment: input, output, and storage devices. Hardware also includes data communication equipment.
Software	Sets of instructions that tell the computer how to take data in, how to process it, how to display information, and how to store data and information.
Telecommunications	Hardware and software that facilitate fast transmission and reception of text, pictures, sound, and animation in the form of electronic data.
People	Information systems professionals and users who analyze organizational information needs, design and construct information systems, write computer programs, operate the hardware, and maintain software.
Procedures	Rules for achieving optimal and secure operations in data processing. Procedures include priorities in running different applications on the computer and security measures.

Figure 1.6 Components of an information system

Data, Information and Systems

▶ The Four Stages of Data Processing

- ▶ Input: Data is collected and entered into computer.
- ▶ Data processing: Data is manipulated into information using mathematical, statistical, and other tools. (use programs)
- ▶ Output: Information is displayed or presented.
- ▶ Storage: Data and information are maintained for later use.