

## **Chap-06, Information and Decision Support Systems**

### Principles and Learning Objectives

- The management information system (MIS) must provide the right information to the right person in the right fashion at the right time.
  - Explain the uses of MISs and describe their inputs and outputs.
  - Discuss information systems in the functional areas of business organizations.
- Good decision-making and problem-solving skills are the key to developing effective information and decision support systems.
  - Define the stages of decision making.
  - Discuss the importance of implementation and monitoring in problem solving.
- Decision support systems (DSSs) are used when the problems are unstructured.
  - List and discuss important characteristics of DSSs that give them the potential to be effective management support tools.
  - Identify and describe the basic components of a DSS.
- Specialized support systems, such as group support systems (GSSs) and executive support systems (ESSs), use the overall approach of a DSS in situations such as group and executive decision making.
  - State the goals of a GSS and identify the characteristics that distinguish it from a DSS.
  - Identify the fundamental uses of an ESS and list the characteristics of such a system.

### **Decision Making and Problem Solving:**

#### **Decision Making as a Component of Problem Solving**

**Problem solving:** a process that goes beyond decision making to include the implementation stage

- Decision-making phase:** first part of problem-solving process
  - Intelligence stage:** potential problems or opportunities are identified and defined
  - Design stage:** alternative solutions to the problem are developed
  - Choice stage:** a course of action is selected
- Implementation phase:** a solution is put into effect
- Monitoring phase:** decision makers evaluate the implementation

#### **Programmed Versus Nonprogrammed Decisions**

- Programmed decisions**
  - Decisions made using a rule, procedure, or quantitative method**
  - Easy to computerize using traditional information systems**
- Nonprogrammed decisions**
  - Decision that deals with unusual or exceptional situations**
  - Not easily quantifiable**

#### **Optimization, Satisficing, and Heuristic Approaches**

- Optimization model:** a process that finds the best solution, usually the one that will best help the organization meet its goals
- Satisficing model:** a process that finds a good—but not necessarily the best—problem solution
- Heuristics:** commonly accepted guidelines or procedures that usually find a good solution

### **An Overview of Management Information Systems:**

#### **Management Information Systems in Perspective**

- A management information system (MIS) provides managers with information that supports effective decision making and provides feedback on daily operations
- The use of MISs spans all levels of management

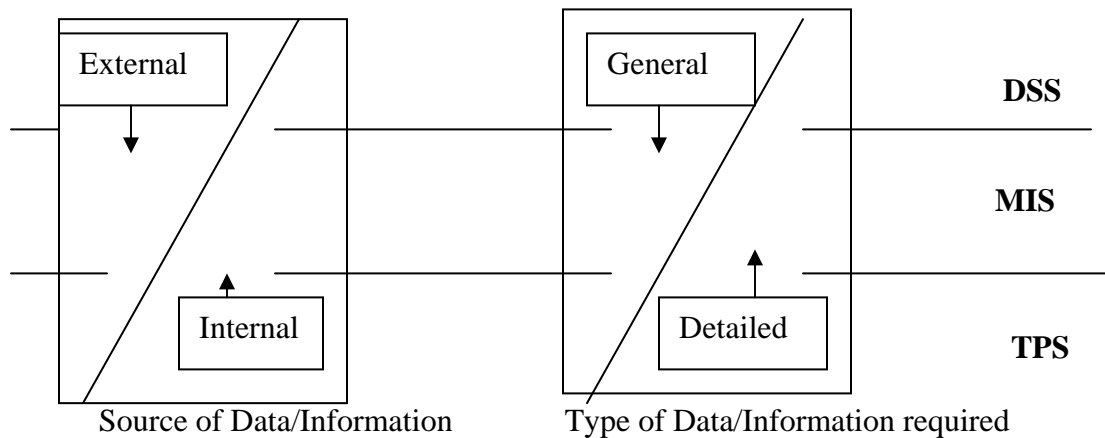
## Inputs to a Management Information System

- **Internal data sources**

- TPS and ERP systems and related databases; data warehouses and data marts; specific functional areas throughout the firm

- **External data sources**

- Customers, suppliers, competitors, and stockholders, whose data is not already captured by the TPS; the Internet; extranets



## Sources and Types of Data & Information for the Levels of Management

### Outputs of a Management Information System

- **Scheduled report:** produced periodically, or on a schedule
- **Key-indicator report:** summary of the previous day's critical activities
- **Demand report:** developed to give certain information at someone's request
- **Exception report:** automatically produced when a situation is unusual or requires management action
- **Drill-down report:** provides increasingly detailed data about a situation

*[Student Note: Review "Guidelines", table 6.1, page 236]*

### Functional Aspects of the MIS

Most organizations are structured along functional lines or areas

- The MIS can be divided along functional lines to produce reports tailored to individual functions

#### Financial Management Information Systems

- Financial MIS:** provides financial information to all financial managers within an organization

Profit/loss and cost systems	Auditing
Uses and management of funds	

#### Manufacturing Management Information Systems

- The manufacturing MIS subsystems and outputs monitor and control the flow of materials, products, and services through the organization

Design and engineering	Production scheduling
Inventory control	MRP and MRPII
Just in time	Process control
Quality control	

#### Marketing Management Information Systems

- Marketing MIS:** supports managerial activities in product development, distribution, pricing decisions, promotional effectiveness, and sales forecasting

Marketing research	Product development
Promotion and advertising	Product pricing

## Human Resource Management Information Systems

- **Human resource MIS:** concerned with activities related to employees and potential employees

Needs and planning assessments	Recruiting
Training and skills development	Scheduling and assignment
Employee benefits	Outplacement

## Other Management Information Systems

- **Accounting MIS:** provides aggregate information on accounts payable, accounts receivable, payroll, and many other applications
- **Geographic information system (GIS):** capable of assembling, storing, manipulating, and displaying geographic information

## An Overview of Decision Support Systems

- A DSS is an organized collection of people, procedures, software, databases, and devices used to support problem-specific decision making and problem solving
- DSSs are generally structured for use at all levels within an organization, although upper managers are more likely to find a need for these systems.
- The focus of a DSS is on decision-making effectiveness when faced with unstructured or semistructured business problems

### Capabilities of a Decision Support System

Support all problem-solving phases	Support different decision frequencies
Support different problem structures	Support various decision-making levels

## A Comparison of DSS and MIS (Table 8.3, p245)

### Components of a Decision Support System

- **Database**
- **Model base:** provides decision makers access to a variety of models and assists them in decision making
- **Dialogue manager:** allows decision makers to easily access and manipulate the DSS and to use common business terms and phrases
- **External database access**
- **Access to:** the Internet and corporate intranet, networks, and other computer systems

### Group support system (GSS)

- Consists of most elements in a DSS, plus software to provide support in group decision making
- Also called group decision support system or computerized collaborative work system

### Characteristics of a GSS That Enhance Decision Making

Special design	Ease of use
Flexibility	Decision-making support
Anonymous input	Reduction of negative group behavior
Parallel communication	Automated record keeping

### GSS Software

- Often called groupware or workgroup software
- Helps with joint workgroup scheduling, communication, and management
- Examples: Lotus Notes, Microsoft's NetMeeting, Microsoft Exchange, NetDocuments Enterprise, Collabra Share, OpenMind, TeamWare
- Some transaction processing and enterprise resource planning pkgs. include collaboration software

### GSS Alternatives

Decision Room	Teleconference
Local Area decision network	Wide Area decision network

**Executive support system (ESS):** specialized DSS that includes all hardware, software, data, procedures, and people used to assist senior-level executives within the organization

**Executive Support Systems in Perspective**

Tailored to individual executives	Easy to use
Drill-down capable	Support the need for external data
Can help when uncertainty is high	Future-oriented
Linked to value-added processes	

**Capabilities of Executive Support Systems**

Support for defining an overall vision	Support for strategic planning
Support for strategic organizing and staffing	Support for strategic control
Support for crisis management	

**Summary**

- The decision-making phase of the problem-solving process includes three stages: intelligence, design, and choice
- A management information system (MIS) provides managers with information that supports effective decision making and provides feedback on daily operations
- A financial MIS provides financial information to all financial managers within an organization
- The manufacturing MIS subsystems and outputs monitor and control the flow of materials, products, and services through the organization
- A marketing MIS supports managerial activities in product development, distribution, pricing decisions, and promotional effectiveness
- A human resource MIS is concerned with activities related to employees and potential employees of an organization
- A DSS is an organized collection of people, procedures, software, databases, and devices used to support decision making and problem solving
- A group support system (GSS) consists of most elements in a DSS, plus software to provide effective support in group decision making
- An executive support system (ESS) is a specialized DSS that includes all hardware, software, data, procedures, and people used to assist senior-level executives within the organization

**Key Terms**

See pages 5 & 6

## Key Terms

- **Accounting MIS:** An information system that provides aggregate information on accounts payable, accounts receivable, payroll, and many other applications
- **Ad hoc DSS:** A DSS concerned with situations or decisions that come up only a few times during the life of the organization
- **Brainstorming:** A decision-making approach that often consists of members offering ideas “off the top of their heads”
- **Choice stage:** The third stage of decision making, which requires selecting a course of action
- **Decision room:** A room that supports decision making among decision makers in the same building, combining face-to-face verbal interaction with technology to make the meeting more effective and efficient
- **Decision-making phase:** The first part of problem solving, including three stages: intelligence, design, and choice
- **Delphi approach:** A decision-making approach in which group decision makers are geographically dispersed; this approach encourages diversity among group members and fosters creativity and original thinking in decision making
- **Demand reports:** The reports that are developed to give certain information at a person’s request
- **Design stage:** The second stage of decision making, in which alternative solutions to the problem are developed
- **Dialogue manager:** The user interface that allows decision makers to easily access and manipulate the DSS and to use common business terms and phrases
- **Drill-down reports:** The reports that provide increasingly detailed data about a situation
- **Exception reports:** The reports that are automatically produced when a situation is unusual or requires management action
- **Executive support system (ESS):** A specialized DSS that includes all hardware, software, data, procedures, and people used to assist senior-level executives within the organization
- **Financial MIS:** An information system that provides financial information to all financial managers within an organization
- **Geographic information system (GIS):** A computer system capable of assembling, storing, manipulating, and displaying geographic information—that is, data identified according to their locations
- **Group consensus approach:** A decision-making approach that forces members in the group to reach a unanimous decision
- **Group support system (GSS):** The software application that consists of most of the elements in a DSS, plus software to provide effective support in group decision-making settings; also called group decision support system or computerized collaborative work system
- **Heuristics:** Commonly accepted guidelines or procedures that usually find a good solution
- **Highly structured problems:** Problems that are straightforward and require known facts and relationships
- **Human resource MIS:** An information system that is concerned with activities related to employees and potential employees of an organization; also called a personnel MIS
- **Implementation stage:** A stage of problem solving in which a solution is put into effect
- **Institutional DSS:** A DSS that handles situations or decisions that occur more than once, usually several times a year or more. An institutional DSS is used repeatedly and refined over the years
- **Intelligence stage:** The first stage of decision making, in which potential problems or opportunities are identified and defined
- **Key-indicator report:** A summary of the previous day’s critical activities; typically available at the beginning of each workday

- **Marketing MIS:** An information system that supports managerial activities in product development, distribution, pricing decisions, promotional effectiveness, and sales forecasting
- **Model base:** A part of a DSS that provides decision makers access to a variety of models and assists them in decision making
- **Model management software (MMS):** The software that coordinates the use of models in a DSS
- **Monitoring stage:** The final stage of the problem-solving process, in which decision makers evaluate the implementation
- **Nominal group technique:** A decision-making approach that encourages feedback from individual group members; the final decision is made by voting, similar to the way public officials are elected
- **Nonprogrammed decisions:** The decisions that deal with unusual or exceptional situations
- **Optimization model:** A process to find the best solution, usually the one that will best help the organization meet its goals
- **Problem solving:** A process that goes beyond decision making to include the implementation stage
- **Programmed decisions:** The decisions made using a rule, procedure, or quantitative method
- **Satisficing model:** A model that will find a good—but not necessarily the best—problem solution
- **Scheduled reports:** The reports that are produced periodically, or on a schedule, such as daily, weekly, or monthly
- **Semistructured or unstructured problems:** Complex problems in which the relationships among the pieces of data are not always clear, the data may be in a variety of formats, and the data is often difficult to manipulate or obtain
- **Strategic planning:** The process of determining long-term objectives by analyzing the strengths and weaknesses of the organization, predicting future trends, and projecting the development of new product lines
- **Virtual workgroups:** Teams of people located around the world working on common problems