COURSE TECHNOLOGY
CENGAGE Learning™

Fundamentals of Information Systems, Fifth Edition

Chapter 6

Information and Decision Support Systems

Decision Making as a Component of Problem Solving

- Decision-making phase
  - **Intelligence stage:** Identify and define potential problems or opportunities
  - **Design stage:** Develop alternative solutions to the problem
  - **Choice stage:** Select a course of action

Decision Making as a Component of Problem Solving (continue)

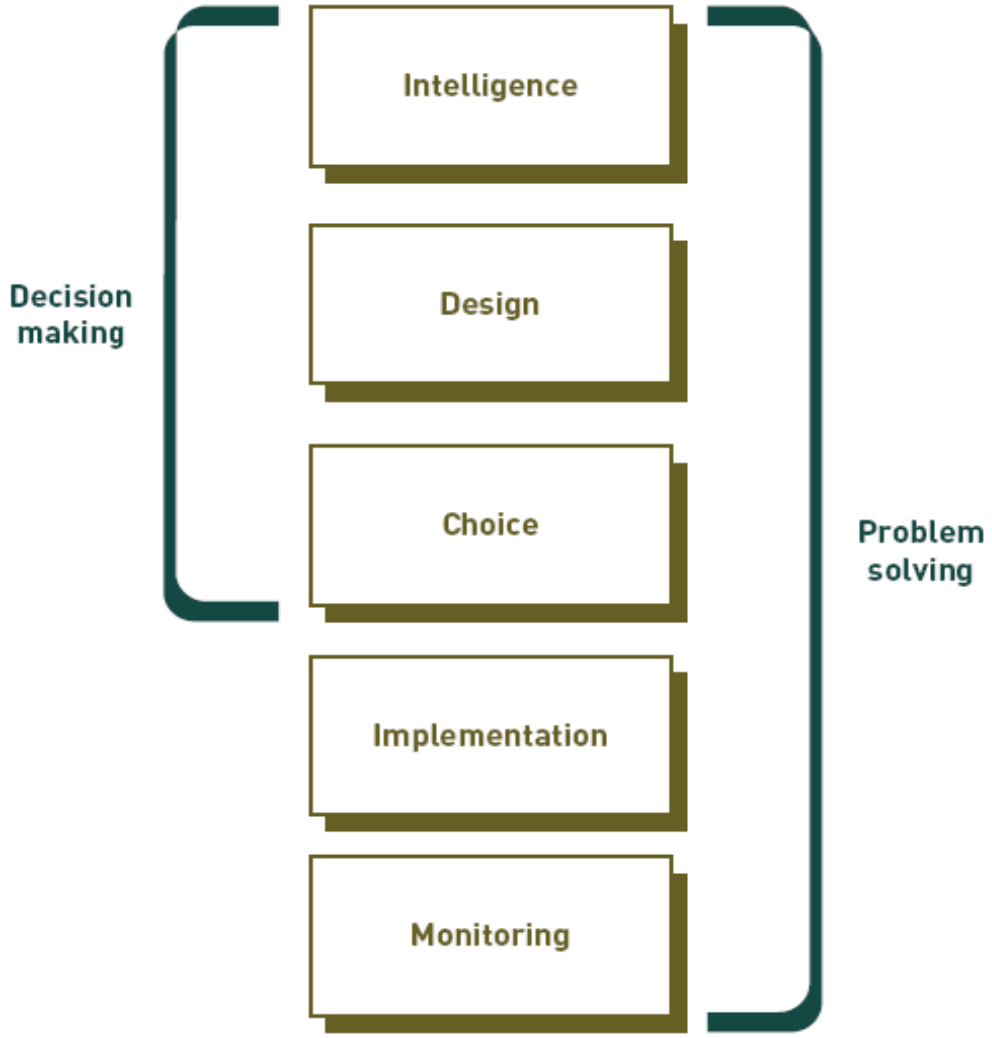

Figure 6.1

How Decision Making Relates to Problem Solving

The three stages of decision making—intelligence, design, and choice—are augmented by implementation and monitoring to result in problem solving.

Decision Making as a Component of Problem Solving (continued)

- Problem solving
  - Goes beyond decision making to include the implementation stage
- Implementation stage
  - Solution is put into effect
- Monitoring stage
  - Decision makers evaluate the implementation

Programmed Versus Nonprogrammed Decisions

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

Optimization, Satisficing, and Heuristic Approaches

- Optimization model
  - Finds the **best solution**, usually the one that will best help the organization meet its goals
- Satisficing model
  - Find **a good—but not necessarily the best**—problem solution
    (i.e., attempts to meet criteria for adequacy, rather than to identify an optimal solution)
- Heuristics
  - ***Commonly accepted guidelines or procedures*** that usually find a good solution
    (i.e., using a **rule of thumb**, an **educated guess**, an **intuitive judgment**, or **common sense**)

The Benefits of Information and Decision Support Systems

- Performance of these systems is:
  - Typically a function of decision quality and problem complexity
- Decision quality can result in:
  - Increased effectiveness
  - Increased efficiency
  - Higher productivity

An Overview of Management Information Systems

- Management information system (MIS)
  - Integrated collection of people, procedures, databases, and devices
  - Provides managers and decision makers with information to help achieve organizational goals
  - Can give companies a competitive advantage

Management Information Systems in Perspective

- MIS provides managers with information that supports effective decision making and provides feedback on daily operations
- Use of MISs spans all levels of management

Inputs to a Management Information System

- Internal data sources
  - TPSs 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

Outputs of a Management Information System

- Scheduled reports
  - Produced periodically, or on a schedule
- Key-indicator report
  - Summary of previous day's critical activities
- Demand reports
  - Developed to give certain information upon request
- Exception reports
  - Automatically produced when a situation is unusual or requires management action
- Drill-down reports
  - Provide increasingly detailed data about a situation

Characteristics of a Management Information System

- MISs perform the following functions
  - Provide reports with fixed and standard formats
  - Produce hard-copy and soft-copy reports
  - Use internal data stored in the computer system
  - Allow users to develop their own custom reports

Financial Management Information Systems

- Financial MIS
  - Provides financial information
- Functions of a financial MIS include:
  - Integrate financial and operational information from multiple sources
  - Provide easy access to data for both financial and nonfinancial users
  - Make financial data immediately available
  - Analyze historical and current financial activity

Human Resource Management Information Systems

- Concerned with activities related to employees and potential employees of an organization
- Outputs include:
  - Human resource planning
  - Personnel selection and recruiting
  - Training and skills inventory
  - Scheduling and job placement
  - Wage and salary administration
  - Outplacement

An Overview of Decision Support Systems

- DSS
  - Organized collection of people, procedures, software, databases, and devices used to help make decisions that solve problems
  - Focus is on decision-making effectiveness when faced with unstructured or semistructured business problems

Capabilities of a Decision Support System

- Support for problem-solving phases
- Support for different decision frequencies
- Support for different problem structures
  - Highly structured, semistructured, or unstructured
- Support for various decision-making levels
  - Operational, tactical, strategic

Components of a Decision Support System

- Database and a model base
  - Core of a DSS
- Dialogue manager
  - Allows decision makers to easily access and manipulate the DSS

Components of a Decision Support System (continued)

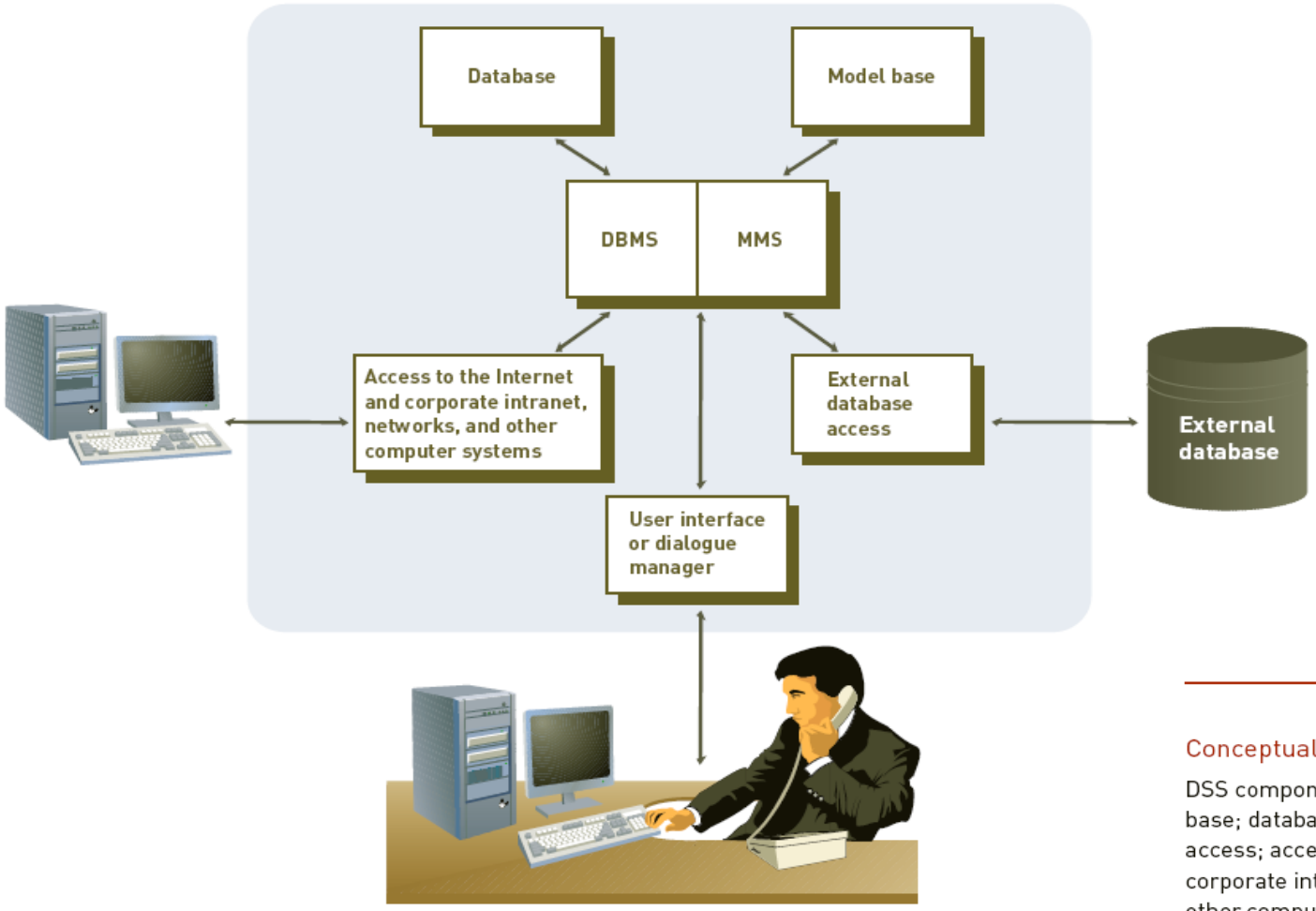

Figure 6.15

Conceptual Model of a DSS

DSS components include a model base; database; external database access; access to the Internet and corporate intranet, networks, and other computer systems; and a user interface or dialogue manager.

The Model Base

- Model base
  - Allows managers and decision makers to perform quantitative analysis on both internal and external data
- Model management software
  - Can coordinate the use of models in a DSS

The User Interface or Dialogue Manager

- Allows users to interact with the DSS to obtain information
- Assists with all aspects of communications between the user and the hardware and software that constitute the DSS

Group Support Systems

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

Group Support Systems (continued)

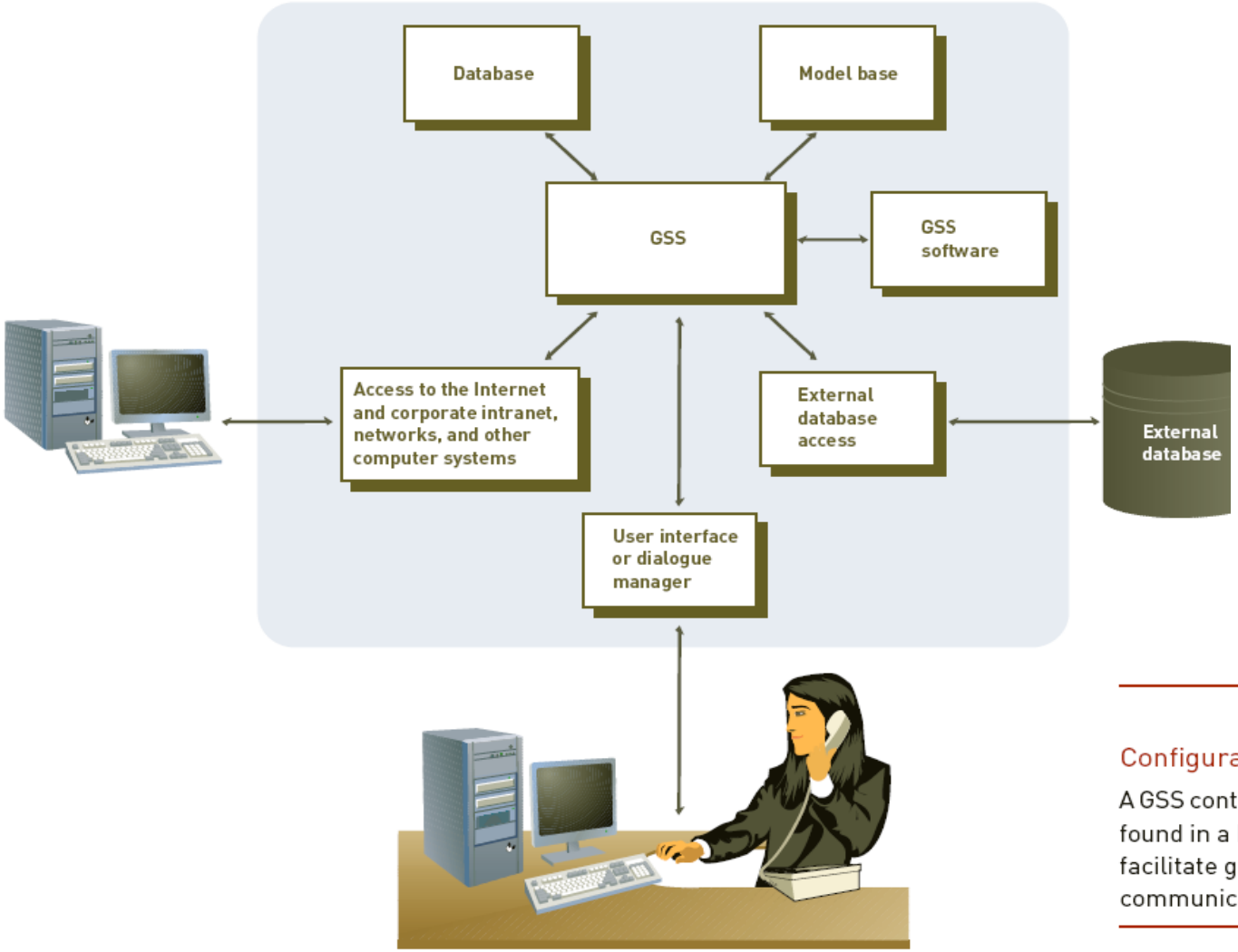

Figure 6.16

Configuration of a GSS

A GSS contains most of the elements found in a DSS, plus software to facilitate group member communications.

Characteristics of a GSS That Enhance Decision Making

- Special design
  - Procedures, devices, and approaches for creative thinking and effective communication
- Ease of use
  - Complex systems will seldom be used by groups
- Flexibility
  - Takes different decision-making styles and preferences into account
- Decision-making support for different approaches
  - Delphi, brainstorming, group consensus, nominal group technique

Characteristics of a GSS That Enhance Decision Making (continued)

- Anonymous input
  - Helpful in ranking performance of managers
- Reduction of negative group behavior
  - Avoids dominance of one member
- Unified communication
  - Integrates different communication systems
- Automated record keeping
  - Detailed records of meetings are automatically generated

GSS Software

- Helps with joint work group scheduling, communication, and management
- Software from Autodesk
  - Has GSS capabilities that allow groups to work together on design

GSS Alternatives

- Decision room
- Local area decision network
- Teleconferencing
- Wide area decision network

GSS Alternatives (continued)

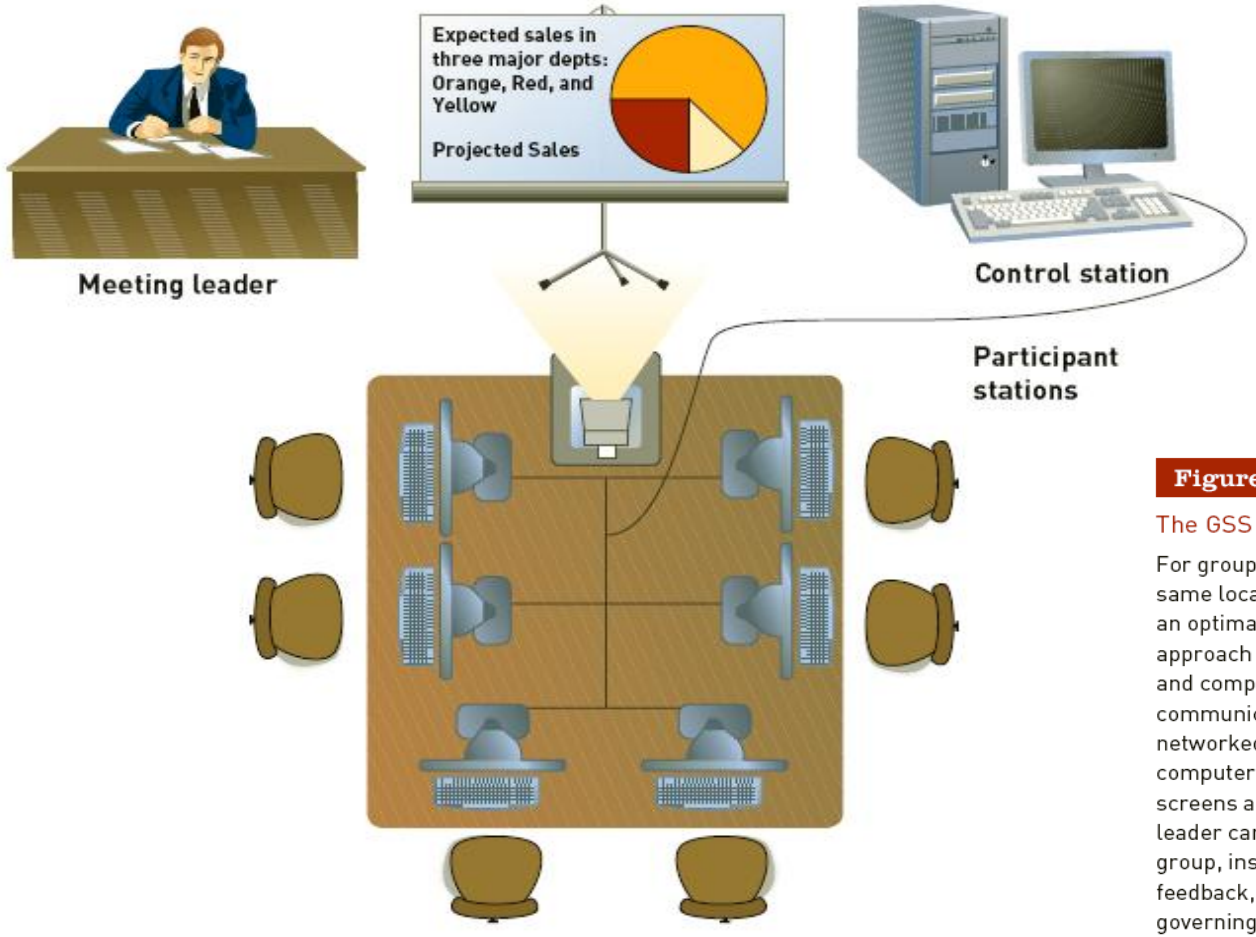

Figure 6.18

The GSS Decision Room

For group members who are in the same location, the decision room is an optimal GSS alternative. This approach can use both face-to-face and computer-mediated communication. By using networked computers and computer devices, such as project screens and printers, the meeting leader can pose questions to the group, instantly collect their feedback, and, with the help of the governing software loaded on the control station, process this feedback into meaningful information to aid in the decision-making process.

Executive Support Systems

- Specialized DSS that includes:
  - All hardware, software, data, procedures, and people used to assist senior-level executives within the organization
- Can be used by individuals at middle levels in the organizational structure

Executive Support Systems in Perspective

- Characteristics of an ESS:
  - Tailored to individual executives
  - Easy to use
  - Drill-down abilities
  - Support need for external data
  - Can help when uncertainty is high
  - Future-oriented
  - Linked with value-added business 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

- Decision-making phase of the problem-solving process
  - Intelligence, design, and choice
- Management information system (MIS)
  - Integrated collection of people, procedures, databases, and devices
- Financial MIS
  - Provides financial information to all financial managers within an organization

Summary (continued)

- Manufacturing MIS
  - Accepts inputs from the strategic plan, the ERP system and TPS, and external sources
- Marketing MIS
  - Supports managerial activities in product development, distribution, and pricing decisions
- Human resource MIS
  - Concerned with activities related to employees of the organization

Summary (continued)

- Decision support system (DSS)
  - Organized collection of people, procedures, software, databases, and devices
- Group support system (GSS)
  - Includes elements in a DSS, plus software to provide effective support in group decision making
- Executive support system (ESS)
  - Specialized decision support systems designed to meet the needs of senior management