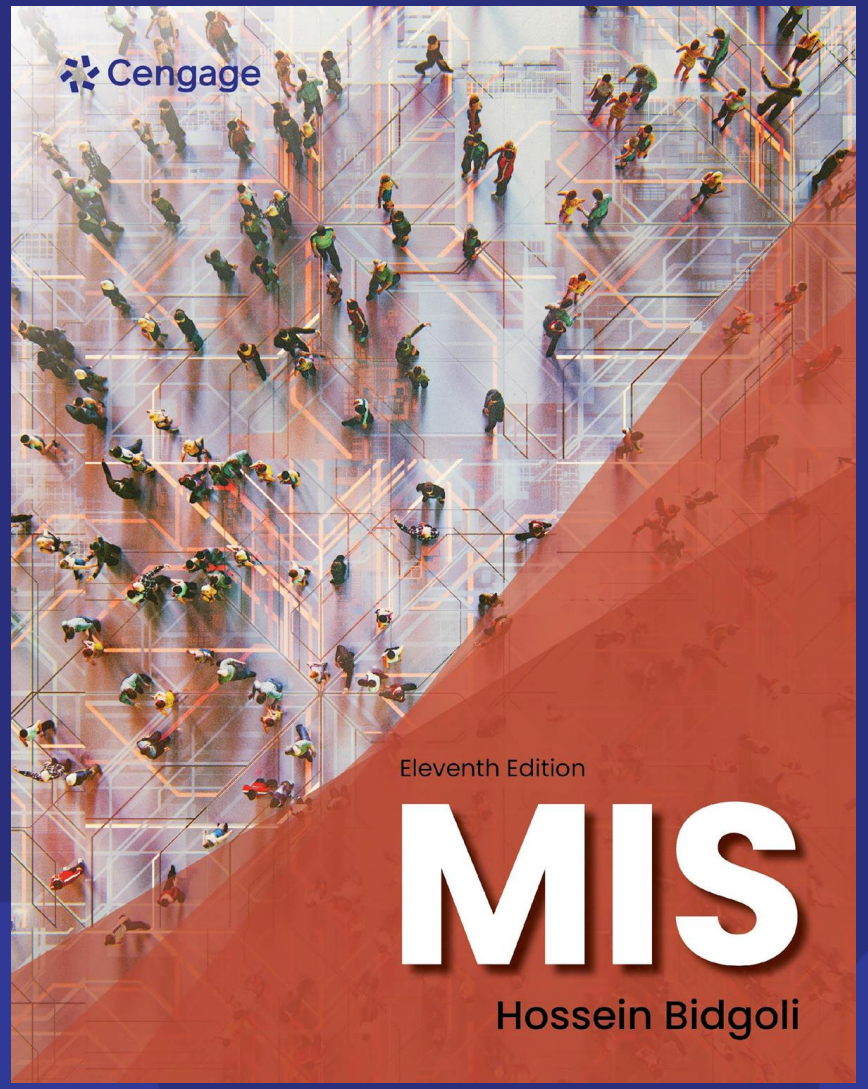


MIS, 11e

Module 12: Supporting Decisions and Processes

Module Objectives

By the end of this module, you should be able to:

12.1 Examine the types of decisions made in each phase of the decision-making process

12.2 Describe a decision support system

12.3 Explain an executive information system's importance in decision making

12.4 Summarize the uses for a geographic information system

12.5 Describe collaboration systems or software including their types and criteria for their selection

12.6 Apply the eight guidelines for designing a management support system

Suggest to-watch list

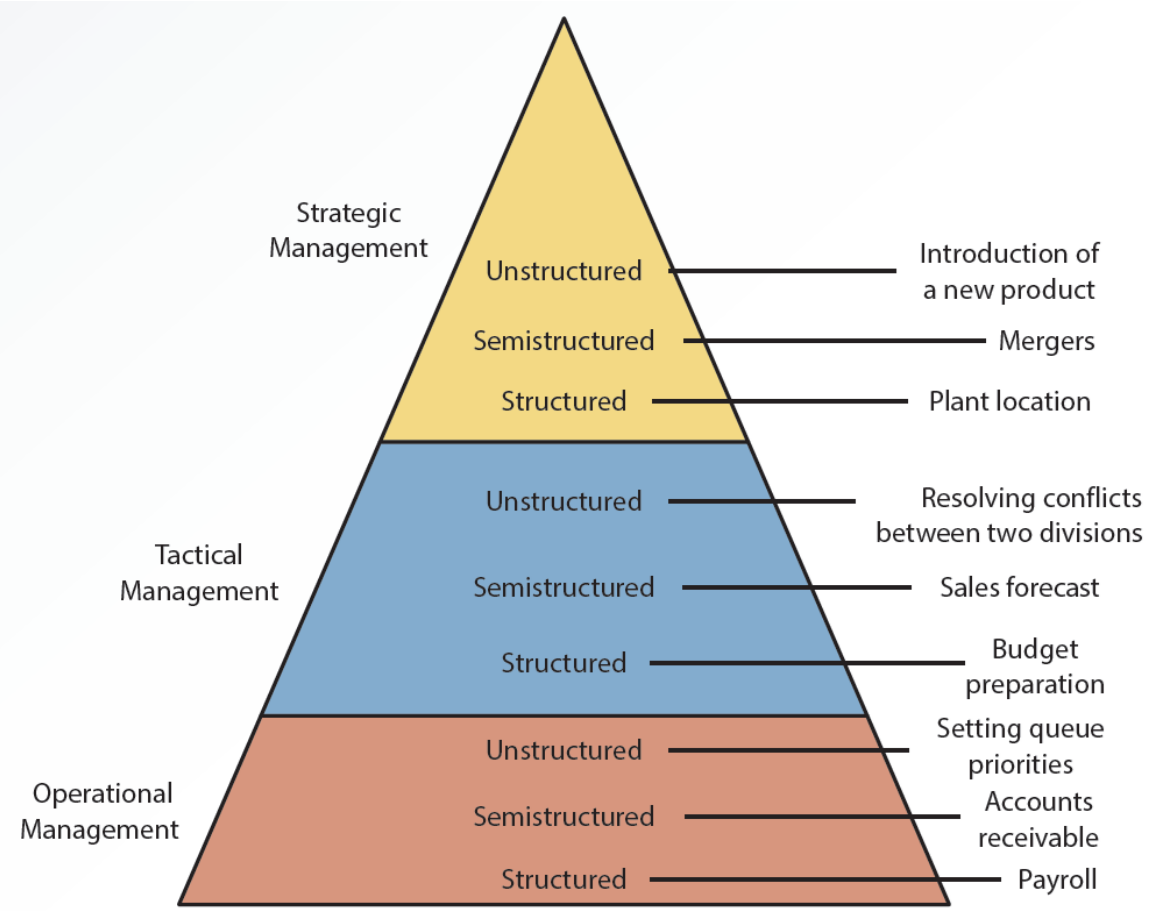
- https://www.youtube.com/watch?v=nQ4Q3iN7TMM
- https://www.youtube.com/watch?v=k31CSoO7wC4
- https://www.youtube.com/watch?v=114DipNd1n8

Types of Decisions in an Organization (1 of 2)

- Structured decisions
  - Can be automated because a well-defined standard operating procedure exists
  - Examples: record keeping, payroll
- Semistructured decisions
  - Not as well-defined but include a structured aspect
  - Examples: sales forecasting, budget preparation
- Unstructured decisions
  - One-time decisions with no standard operating procedure
  - Decision maker's intuition plays an important role
  - Example: Hiring and firing, research and development

Types of Decisions in an Organization (2 of 2)

- Challenges in semistructured and unstructured decisions
  - Multiple criteria and users have to choose between conflicting objectives
- Management support systems (MSSs)
  - Different types of information systems that have been developed to support certain aspects and types of decisions
  - Each type is designed with unique goals and objectives



Phases of Decision Making

- Economist Herbert Simon defined three phases:
  - Intelligence phase
  - Design phase
  - Choice phase
- A fourth phase can be added:
  - Implementation phase

Intelligence Phase

- Examine the organization’s environment for conditions that need decisions
- Collect and process data from a variety of sources
  - Allows decision maker to discover ways to approach the problem
- Identify what is going on, then get a better understanding, and finally identify alternative solutions

Design Phase

- Define the criteria for making a decision
  - Generate alternatives for meeting the criteria
- Define associations between the criteria and the alternatives
  - Requires understanding how each alternative affects the criteria
- Information technology does not support this phase
- Collaboration and video-conferencing systems can be helpful

Choice Phase

- Select the best and most effective course of action
  - Requires analyzing each alternative and its relationship to the criteria
- A decision support system (DSS) can support this phase
  - Helps sort through possible solutions to choose the best one for the organization
  - Includes tools for calculating cost-benefit ratios

Implementation Phase

- Devise a plan for carrying out the selected choice and obtain resources to implement
  - Ideas are converted into actions
  - DSS does a follow-up assessment on how well a solution is performing

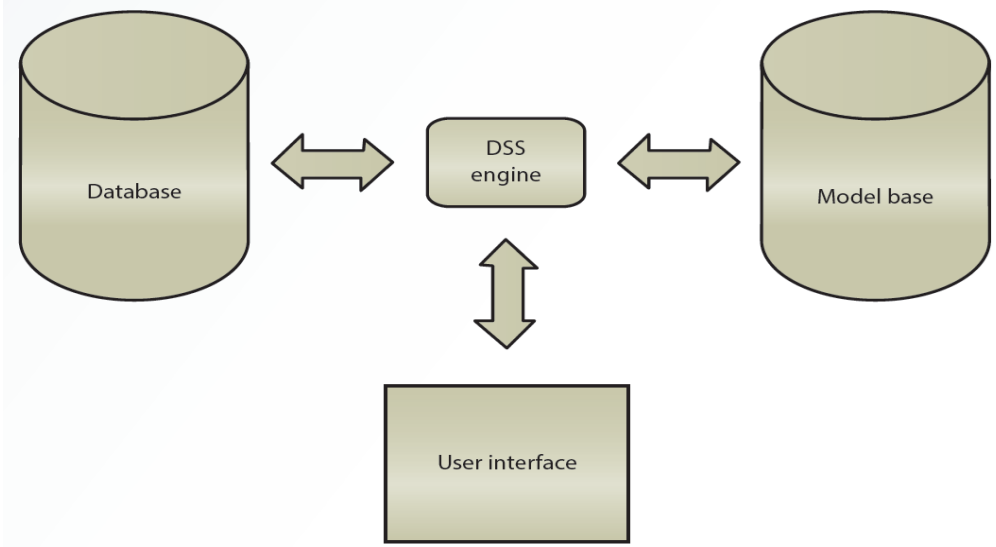
Decision Support Systems (1 of 2)

- Decision support system (DSS): an interactive information system designed to assist decision makers in an organization
  - Hardware
  - Software
  - Data
  - Mathematical and statistical models

- Requirements of decision support systems
  - Be interactive
  - Incorporate human element as well as hardware and software
  - Use internal and external data
  - Include mathematical and statistical models
  - Support decision makers at all levels
  - Emphasize semistructured and unstructured tasks

Components of Decision Support Systems

- Database
  - Includes internal and external data and a database management system (DBMS)
    - Enables a DSS to perform data analysis
- Model base
  - Includes mathematical and statistical models
    - Enable a DSS to analyze information
- User interface
  - Allow users to access the DSS



DSS Capabilities

- DSS includes features to support decision making
  - What-if analysis : https://www.youtube.com/watch?v=STTYxT6iFio
  - Goal-seeking: https://www.youtube.com/watch?v=OhnkuBVTcg8
  - Sensitivity analysis: https://www.youtube.com/watch?v=OhnkuBVTcg8
  - Exception reporting analysis: https://www.youtube.com/watch?v=Di7cvfPnqwo
- Other capabilities
  - Optimization analysis, Graphical analysis, forecasting, simulation, statistical analysis, and modeling analysis

Roles in the DSS Environment (1 of 2)

- Users
  - Crucial because they use the DSS
  - May include department or organizational units in addition to people
- Managerial designer
  - Defines the management issues in designing and using a DSS
  - Addresses questions
    - Type of data to collect and from what sources
    - How to organize data
    - How recent should data should be and how to update
    - Balance between aggregated and disaggregated data

Roles in the DSS Environment (2 of 2)

- Technical designer
  - Focuses on how the DSS is implemented
  - Addresses questions
    - Data storage
    - File structure
    - User access
    - Response time
    - Security measures

- Model builder
  - Liaison between users and designers
  - Responsible for supplying information
    - What the model does
    - What data inputs the model accepts
    - How the model's output should be interpreted
    - What assumptions go into creating and using the model

Benefits of DDSs (mostly intangible)

- Value may be a more useful measure than cost
- Benefits
  - Increase in the number of alternatives examined
  - Fast response to unexpected situations
  - Ability to make one-of-a-kind decisions
  - New insights and learning
  - Improved communication, control, and decisions
  - Cost and time savings
  - Effective teamwork and use of data resources

Executive Information Systems

- Executive information system (EIS): gives executives easy access to DDS data
- Most include a digital dashboard: integrates information from multiple sources and presents it in a unified, understandable format
- Important characteristics
  - Tailored to management's information needs
  - Can track and present critical data in multiple formats
  - Provides online access and analysis tools
  - Accesses both internal and external data
  - Customized application development tools
  - Supports electronic communication

- Provide managers with analytical and decision-making tools
- Include graphical representations of data that help executives make critical decisions
- Let executives share information with others quickly and easily
- Enable managers to improve efficiency and effectiveness in decision making

Geographic Information System (GIS)

- Captures, stores, and analyses data to inform location-related decision making
- Two major component of a GIS
  - Digitized maps
  - Spatially oriented databases
- Performs tasks that require complex geographical context
  - Associating spatial attributes with places on a map
  - Integrate map data with a query
- GIS with analytical capability interprets spatial data to evaluate impact of a decision
  - Example: Google Maps

- **Watch**: https://www.youtube.com/watch?v=Mw2KH1WQ8oA

Collaboration Systems

- Type of software that assists group decision-makers by providing access to shared environment and information
- Potential advantages
  - Enables a decision maker to easily communicate and coordinate with team
  - Increases productivity and effectiveness
  - Facilitates teamwork
  - Saves time
  - Reduces travel-related costs and stress
- Potential disadvantages
  - Lack of human touch and other nonverbal cues
  - Unnecessary meetings
  - Security problems
- Success depends on:
  - Matching the GSS's level and sophistication to the group's size and the scope of the task
  - Providing supportive management that is willing to champion using a GSS in the organization

Types of Collaboration Software

- Can be either synchronous or asynchronous
- Three broad groups
  - Communication software
    - Lets participants communicate and share files
  - Task management software
    - Lets participants prioritize and track tasks
  - Document and content management software
    - Lets participants share and work together on different files

Knowledge Check Activity 1-1

Which of the following is an example of an unstructured decision?

a. Processing monthly pay-cheques of employees

b. Planning budget for each department for the upcoming year

c. Purchasing inventory to replenish stock

d. Adding a new feature to an existing software to test its effectiveness

Knowledge Check Activity 1-1: Answer

Which of the following is an example of an unstructured decision?

Answer: d. Adding a new feature to an existing software to test its effectiveness

An unstructured decision is based on intuition that is not determined by standard operating procedures. When adding a new untested feature, the programmer or designer is experimenting based on intuition.

Polling Activity 1-1

It’s time to take a poll! Get your devices ready and open your [Kahoot] app. You can join the poll using this link/PIN: [enter link or PIN]

Which of the following is one of the duties of a model builder?

a. Determining data organization
b. Determining storage device to use
c. Determining security measures to protect sensitive information
d. Determining system interface for end-users

Polling Activity 1-1: Answer

Which of the following is one of the duties of a model builder?

Answer: d. Determining system interface for end-users

A model builder communicates user requirements to designers, which includes suggesting an interface for users of a software.

Discussion Activity 1-1

You have collected a large set of survey data from customers for a retailer. The management would like to analyze sales and demand trends from the collected data. You are trying to select an information management system to meet this request.

Discuss possible solutions with your classmates.

Discussion Activity 1-1: Answer

You have collected a large set of survey data from customers for a retailer. The management would like to analyze sales and demand trends from the collected data. You are trying to select an information management system to meet this request.

Discuss possible solutions with your classmates.

Answer: Executive Information System

Explanation: An Executive Information System (EIS) facilitates data analysis using graphical representation, which would be suited to the management requirement.

Self Assessment

Suppose you are setting up a stall at your school fair to sell baked goods.

Discuss the different stages of the decision-making process for this initiative. What would be the steps in the intelligence, design, choice, and implementation phases?

Summary

- There are three types of decisions in an organization—structured, semistructured, and unstructured
- A management information systems (MSS) is any type of information system that supports certain aspects and types of decisions
- A decision support system (DSS) is designed to assist decision makers in an organization
- An executive information system (EIS) provides easy access to internal and external data
  - EIS designers should focus on simplicity when developing a user interface
- A geographic information system (GIS) uses spatial and nonspatial data and techniques to support location-related decision making
- A collaboration system supports teams in group decision making and task completion.
- Follow eight guidelines to design a successful MSS