Management Support Systems

Overview Of Management Information Systems

Course Code: CIS414

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Introduction

- Management support systems focus on managerial uses of information resources. These systems provide information to manage for **planning** and **decision making**. The information provided by these systems is based on both the internal and external data using various data **analysis tools.**

- They also offer a choice to the user to select out of these tools for the purpose of data analysis. These systems serve the information needs of managers at middle and top levels in the managerial hierarchy.

- **There are three types of management support systems, namely:**
  - a) Decision Support Systems,
  - b) Executive Information (support) Systems and
  - c) Expert Systems.

Types of Decisions in an Organization

- **Structured decisions**
  - Can be automated because a well-defined standard operating procedure exists for these types of decisions
    - Known as programmable tasks
- **Semistructured decisions**
  - Include a structured aspect that benefits from information retrieval, analytical models, and information systems technology

Types of Decisions in an Organization

- **Unstructured decisions**
  - One-time decisions with no standard operating procedure
  - Decision maker's intuition plays a important role as information technology offers less support for the decisions
- Challenges in semistructured and unstructured decisions
  - Involve multiple criteria
  - Users have to choose between conflicting objectives

Types of Information System

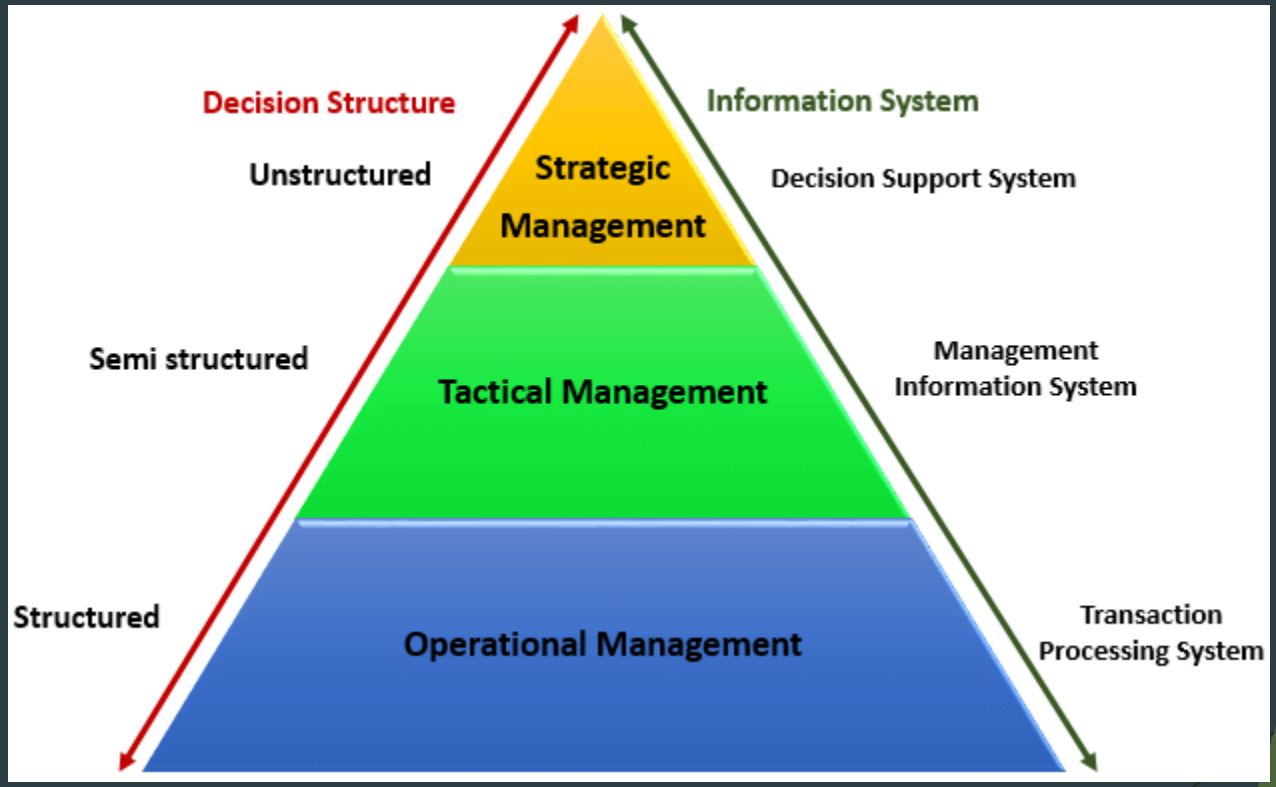
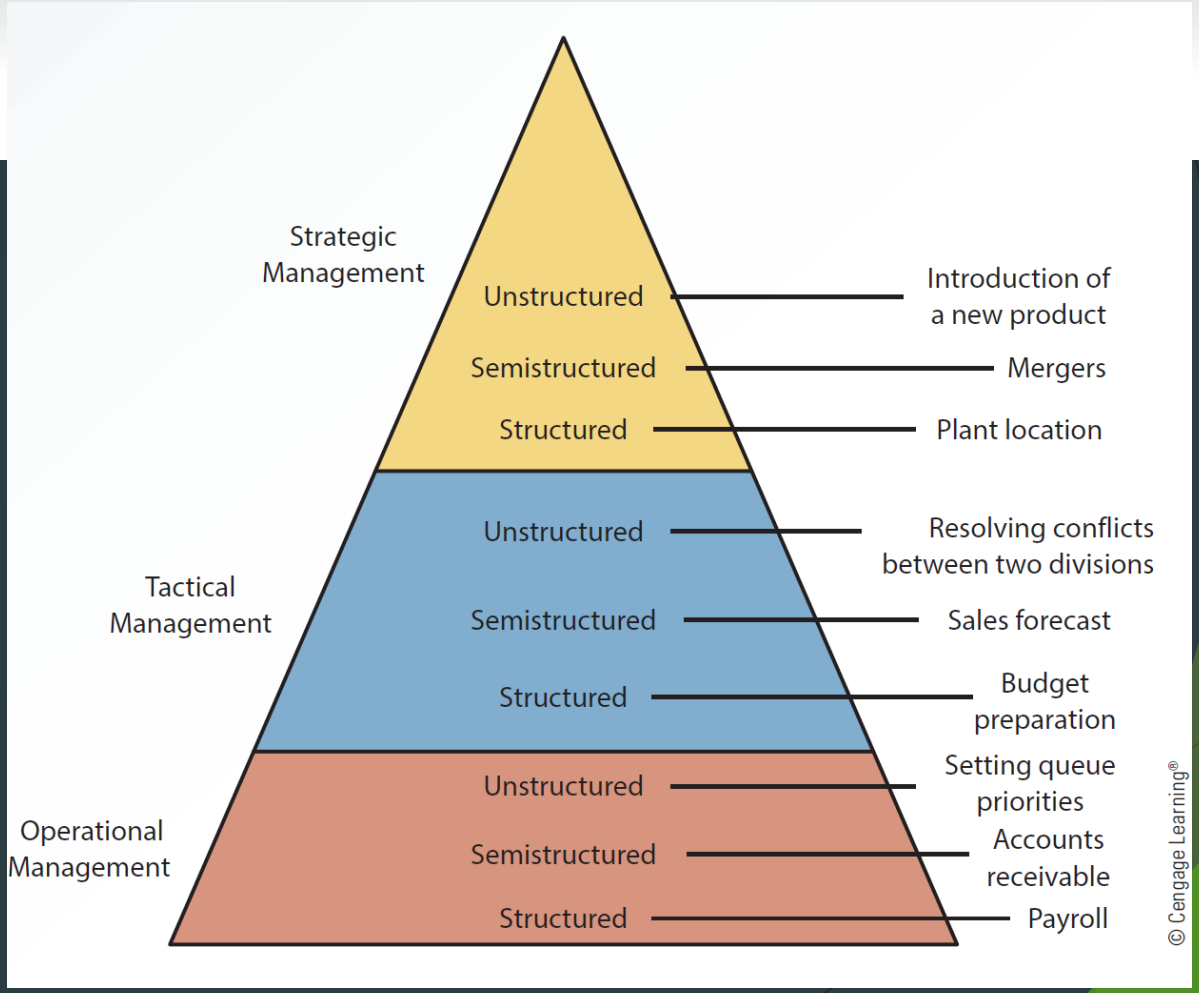


Exhibit 12.1

Organizational Levels and Types of Decisions

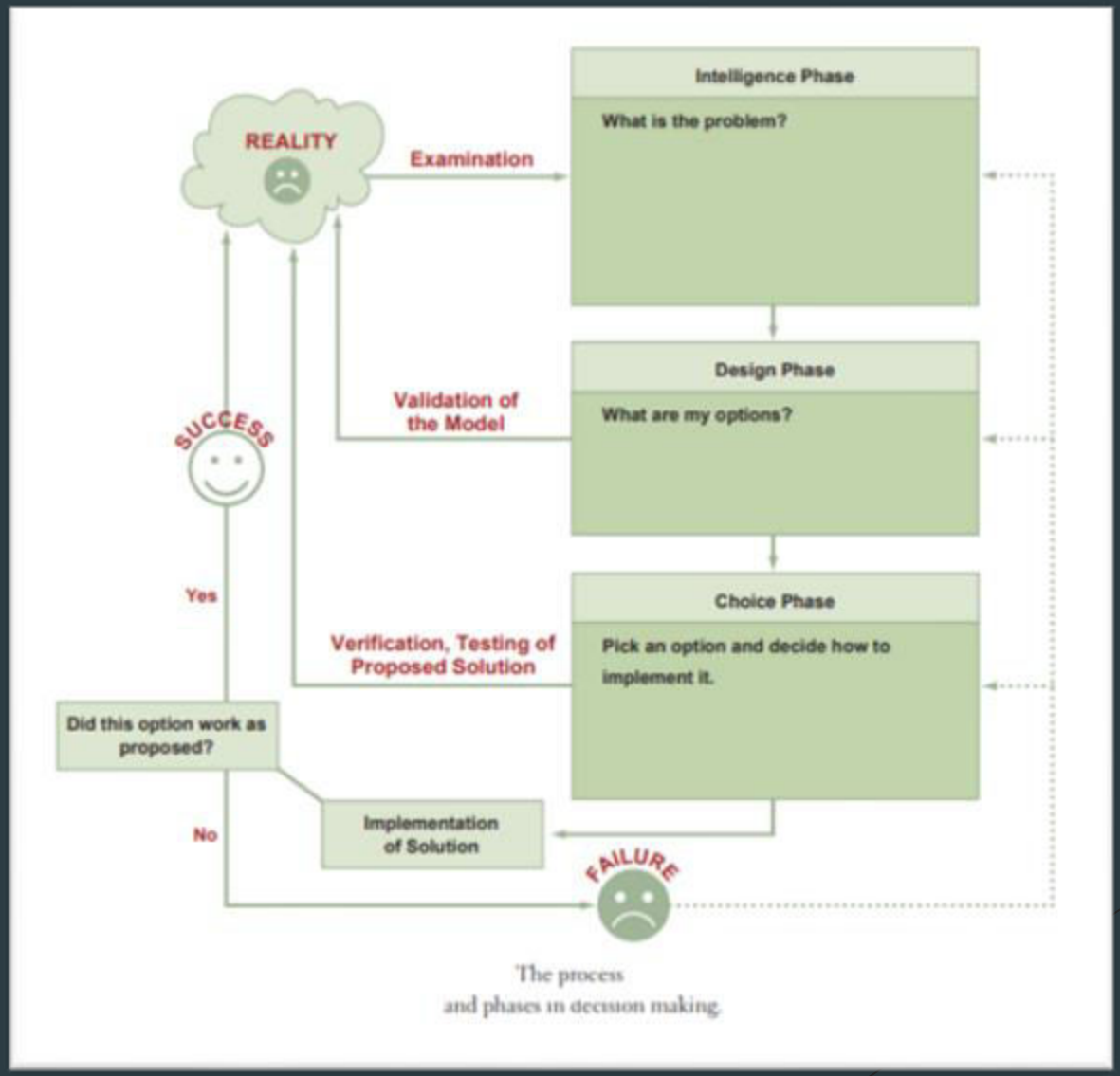


Management Support Systems (MSSs)

- 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

Phases of Decision-Making



The process and phases in decision making

Phases of Decision Making

- Intelligence Phase
- Design Phase
- Choice Phase
- Implementation Phase

Intelligence Phase

- Decision maker examines the organization's environment for conditions that need decisions
- Data is collected from a variety of sources and processed
  - Allows decision maker to discover ways to approach the problem

Design Phase

- Defines criteria for the decision
- Generates alternatives for meeting the criteria
- Defines associations between the criteria and the alternatives
  - Requires understanding how each alternative affects the criteria
- Information technology does not support this phase of decision making

Choice Phase

- Involves selecting best and most effective course of action is from the alternatives
- Analyzes each alternative and its relationship to the criteria to determine whether it is feasible
- Decision support system (DSS)
  - Helps sort through possible solutions to choose the best one for the organization
  - Includes tools for calculating cost-benefit ratios

Implementation Phase

- Organization devises a plan for carrying out the alternative selected in the choice phase and obtains the resources to implement the plan
- DSS does a follow-up assessment on how well a solution is performing

Decision Support Systems (DSS)

- Interactive information system designed to assist decision makers in an organization
- Consists of:
  - Hardware
  - Software
  - Data
  - Mathematical and statistical models

Decision Support Systems (DSS)

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

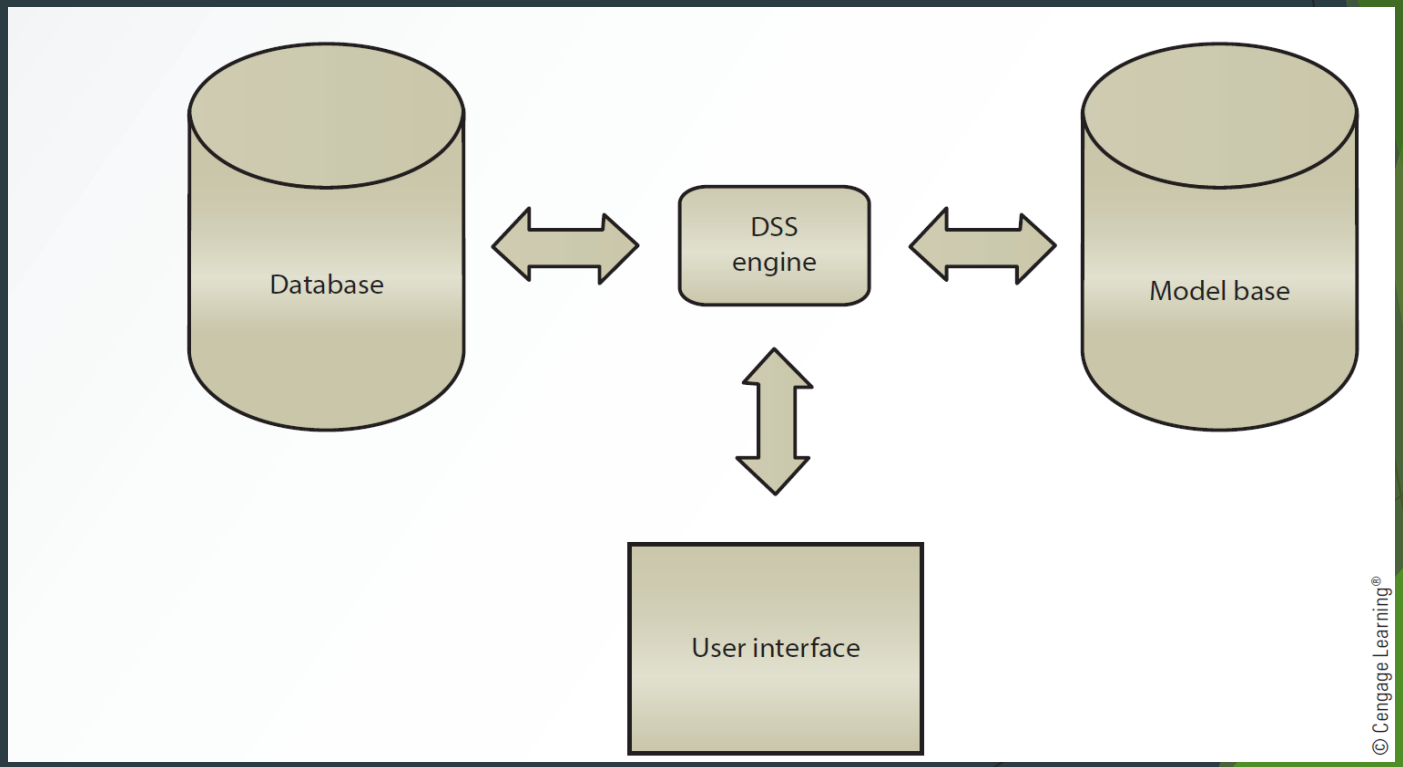
Components of a Decision Support System

- Database
  - Includes internal and external data, and a database management system (DBMS)
  - Enables a DSS to perform data analysis operations
- **Model base**
  - Includes mathematical and statistical models that enable a DSS to analyze information

Components of a Decision Support System

- Users access the DSS through user interface
- DSS engine manages and coordinates the major components

Exhibit 12.2 Components of a DSS



DSS Capabilities

- DSS includes following features to support decision making
  - What-if analysis
  - Goal-seeking
  - Sensitivity analysis
  - Exception reporting analysis
- Other capabilities
  - Graphical analysis, forecasting, simulation, statistical analysis, and modeling analysis

Roles in the DSS Environment

- User
  - Crucial because they use the DSS
  - Include department or organizational units in addition to people
- **Managerial designer**
  - Defines the management issues in designing and using a DSS
  - Issues are related to management's goals and needs

Roles in the DSS Environment

- **Technical designer**
  - Focuses on how the DSS is implemented
  - Addresses questions about data storage, file structure, user access, response time, and security measures

Roles in the DSS Environment

- **Model builder**
  - Liaison between users and designers
  - Responsible for supplying information on:
    - 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 a DSS Outlined by Peter G. Keen

- 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 and control over operations

Benefits of a DSS Outlined by Peter G. Keen

- Cost savings from making better decisions and analyze several scenarios in a short period
- Better decisions
- Effective teamwork
- Time savings
- Better use of data resources

Executive Information Systems (EISs)

- Branch of DSSs
- Interactive information systems that give executives easy access to internal and external data
- Include drill-down features and a digital dashboard for examining and analyzing information
- Designers should focus on simplicity when developing a user interface

Executive Information Systems (EISs)

- Adding features such as multimedia, virtual reality, and voice input and output increases ease of use
- Require access to both internal and external data
- Designed to provide information related to an organization's critical success factors
- Includes a digital dashboard

Digital Dashboard

- Integrates information from multiple sources and presents it in a unified, understandable format as charts and graphs
- Offers up-to-the minute snapshots of information
- Assists decision makers in identifying trends and potential problems
- Example of Web-based digital dashboard
  - Microsoft SharePoint

Reasons for Using EISs

- Provides managers with analytical and decision-making tools
- Includes graphical representations of data that helps executives make critical decisions
- Used by executives to share information with others quickly and easily
- Used by managers to improve efficiency and effectiveness of decision making

Factors Leading to a Failed EIS

- Organizational resistance to the project or perception that the project is unimportant
- Lack of interest or commitment from management
- Inability to define objectives and information requirements clearly
- System's objectives are not linked to factors critical to the organization's success
- Project's costs can not be justified

Factors Leading to a Failed EIS

- Developing applications takes too much time or the system is too complicated
- Vendor support has been discontinued
- Senior executives lack computer proficiency
- Senior executives being unlikely to use systems that need training and regular use to learn
- Lack of understanding about what executives' work involves

EIS Packages and Tools

- Consist of following components:
  - Administrative module for managing data access
  - Builder module for developers to configure data mapping and screen sequencing
  - Runtime module for using the system

Tasks Performed by Managers Using EIS

- Tracking performance
- Flagging exceptions
- Ranking
- Comparing
- Spotting trends
- Investigating or exploring

Group Support Systems (GSSs)

- Assist decision makers working in groups
- Use computer and communication technologies to formulate, process, and implement a decision-making task
- Help overcome the limitations of group interactions
  - Reduce communication barriers
  - Introduce order and efficiency into situations that are inherently unsystematic and inefficient

Group Support Systems (GSSs)

- Success depends on following factors
  - Matching the GSS's level and sophistication to the group's size and the scope of the task
  - Management support

Group Support Systems (GSSs)

- Useful for:
  - Committees
  - Review panels
  - Board meetings
  - Task forces
  - Decision-making sessions that require input from several decision makers

Groupware

- Assist groups in communicating, collaborating, and coordinating their activities
- Collection of applications that supports decision makers by providing access to a shared environment and information

Groupware

- Intended for teamwork than for decision support
- Software that helps a group of decision makers work with the same application
  - Regardless of their location

Capabilities of Groupware (GSSs)

- Audio and video conferencing
- Automated appointment books
- Brainstorming
- Database access
- E-mail
- Online chat
- Scheduling
- To-do lists
- Workflow automation

Electronic Meeting Systems

- Enable decision makers in different locations to participate in a group decision-making process
- Features
  - Real-time computer conferencing
  - Video teleconferencing
  - Desktop conferencing

Advantages of GSSs

- Costs and stress are reduced due to less travel by decision makers
- Increased time to talk with each other and solve problems since:
  - Decision makers do not travel long distances
- Increasing collaboration improves the effectiveness of decision makers

Disadvantages of GSSs

- Lack of the human touch
- Unnecessary meetings
- Security problems
- Costs of implementation are high

Geographic Information Systems (GIS)

- Captures, stores, processes, and displays geographic information
  - Shows the location of all city streetlights on a map
- Uses spatial and nonspatial data
- Uses geographic objects
  - Points
  - Lines
  - Areas

Geographic Information Systems (GIS)

- Example of a GIS: Getting driving directions from Google Maps
  - Interactive GIS that identifies routes from start to destination
  - User-friendly interface that helps you visualize the route

GIS Applications

- Education planning
- Urban planning
- Government
- Insurance
- Marketing
- Real estate
- Transportation and logistics

Factors in Designing a Management Support System

- Support from the top management
- Objectives and benefits clearly defined
- Identifying executives' information needs
- Keeping lines of communication open
- System's complexity hidden; interface kept simple
- Maintaining consistency in the approach of designing
- Designing a flexible system