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- DSS Characteristics and Capabilities
- DSS architecture
- Data Management Subsystem
- The Model Management Subsystem
- The Dialog (User Interface) Subsystem
- Other components
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DSS Characteristics and Capabilities

Key characteristics and capabilities of DSS

- Support for decision makers, mainly in semistructured and unstructured situations, by bringing together human judgment and computerized information
- Support for all managerial levels, ranging from top executives to line managers
- Support for individuals as well as groups
- Support for interdependent and/or sequential decisions
- Support in all phases of the decision-making process
- Support for a variety of decision-making processes and styles
DSS Characteristics and Capabilities

Key characteristics and capabilities of DSS

- DSS are flexible, so users can add, delete, combine, change, or rearrange basic elements; DSS can be readily modified to solve other, similar problems
- User-friendliness, strong graphical capabilities, and a natural language interactive human–machine interface can greatly increase the effectiveness of DSS
- Improved effectiveness of decision making
- The decision maker has complete control over all steps of the decision-making process in solving a problem
- End users are able to develop and modify simple systems by themselves

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DSS architecture

**DSS Components:**

- The data management subsystem
  - Database management system (DBMS): software for establishing, updating, and querying a database
  - Database: the organization data organized into related units that are then viewed as a single storage concept. The data in the database are generally made available to a wide range of users
  - Data warehouse: a physical repository where relational data are organized to provide clean, enterprise-wide data in a standardized format

- The model management subsystem
  - Software for establishing, updating and combining a DSS model base
DSS architecture

DSS Components:
- User interface: the component of a computer system that allows bidirectional communication between the system and its user
- Knowledge-based management subsystem
  - The knowledge-based management subsystem can support any of the other subsystems or act as an independent component
  - Organizational knowledge base: an organization’s knowledge repository
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Data Management Subsystem

- The data management subsystem is made up by
  - DSS database
  - DBMS
  - Data directory
  - Query facility
Data Management Subsystem

The database management system (DBMS) is a software for establishing, updating, and querying (e.g., managing) a database.

Query Facility: the (database) mechanism that accepts requests for data, accesses them, manipulates them, and queries them.

Directory: a catalog of all the data in a database or all the models in a model base.

The Database

- Internal data come mainly from the organization’s transaction processing system.
- External data include industry data, market research data, census data, regional employment data, government regulations, tax rate schedules, and national economic data.
- Private data can include guidelines used by specific decision makers and assessments of specific data and/or situations.
- Data extraction: The process of capturing data from several sources, synthesizing them, summarizing them, determining which of them are relevant, and organizing them, resulting in their effective integration.
Data Management Subsystem

- Key database and database management system issues
  - Data quality
  - Data integration
  - Scalability
  - Data security

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The Model Management Subsystem

- Model base: a collection of preprogrammed quantitative models (e.g., statistical, rules, financial, optimization) organized as a single unit

- Four categories of models with the model base
  - Strategic models: models that represent problems for the strategic level (i.e., executive level) of management
  - Tactical models: models that represent problems for the tactical level (i.e., midlevel) of management
  - Operational models: models that represent problems for the operational level of management
  - Analytical models: mathematical models into which data are loaded for analysis
The Model Management Subsystem

- Model base management system: MBMS software has four main functions
  - Model creation, using programming languages, DSS tools and/or subroutines, and other building blocks
  - Generation of new routines and reports
  - Model updating and changing
  - Model data manipulation

The Model Management Subsystem

- Model directory is a directory that contains all the available models
- Model execution is the process of controlling the actual running of the model
- Model integration involves combining the operations of several models when needed
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The Dialog (User Interface) Subsystem
The Dialog (User Interface) Subsystem

- User interface is the component of a computer system that allows bidirectional communication between the system and its user.
- Graphical user interface (GUI): an interactive, user-friendly interface in which, by using icons and similar objects, the user can control communication with a computer.
- User interface management system (UIMS): the DSS component that handles all interaction between users and the system.

Web-based DSS have made it easier and less costly to make decision-relevant information and model-driven DSS available to users in geographically distributed locations, especially through mobile devices.
- Artificial intelligence continues to make inroads in improving DSS
  - Faster, intelligent search engines
  - Intelligent agents promise to improve the interface in areas such as direct natural language processing and creating facial gestures.
- The development of ready-made (or near-ready-made) DSS solutions for specific market segments has been increasing.
Knowledge-Based Management Subsystem

Advanced DSS are equipped with a component called a knowledge-based management subsystem that can supply the required expertise for solving some aspects of the problem and provide knowledge that can enhance the operation of other DSS components.
The User

- The person faced with a decision that an DSS is designed to support is called the user, the manager, or the decision maker.
- DSS may have other classes of users besides managers:
  - Staff specialists use the system much more frequently than managers and tend to be more detail-oriented.
  - Staff analysts are often intermediaries between managers and the DSS.
  - A third class is Staff assistant: Intermediaries who use a computer to fulfill requests made by other people (e.g., a financial analyst who uses a computer to answer questions for top management).

DSS Hardware

- Hardware affects the functionality and usability of the DSS.
- The choice of hardware can be made before, during, or after the design of the DSS software.
- Major hardware options:
  - Organization’s servers
  - Mainframe computers with legacy DBMS,
  - Workstations
  - Personal computers
  - Client/server systems
DSS Hardware

- Portability has become critical for deploying decision-making capability in the field, especially for salespersons and technicians.
- The power and capabilities of the World Wide Web have a dramatic impact on DSS:
  - Communication and collaboration.
  - Download DSS software.
  - Use DSS applications provided by the company.
  - Buy online from application service providers (ASPs).

References