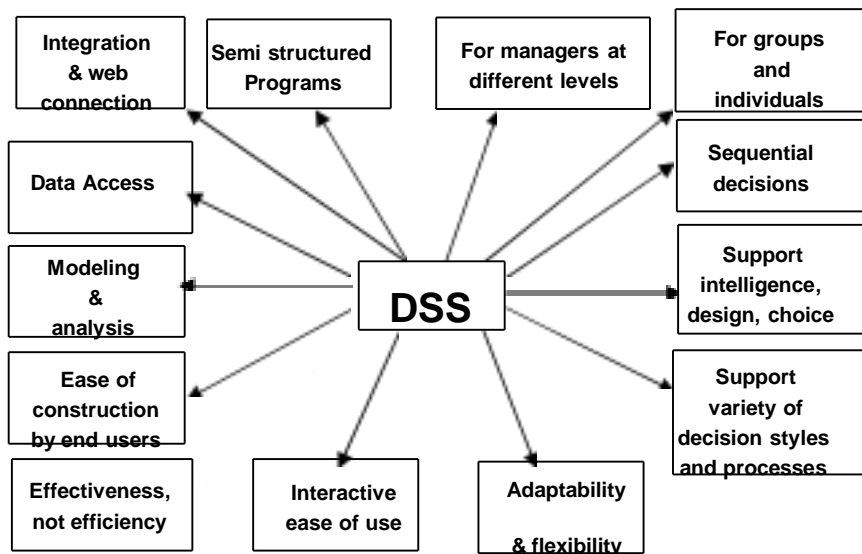


# Decision Support System (DSS)

*Decision support systems are computer based information systems that provide interactive information support to managers and business professionals during the decision making process.*

Decision support systems use (1) analytical models, (2) specialized database, (3) a decision maker's own insights and judgments, and (4) an interactive, computer based modeling process to support the making of semi structured business decisions.



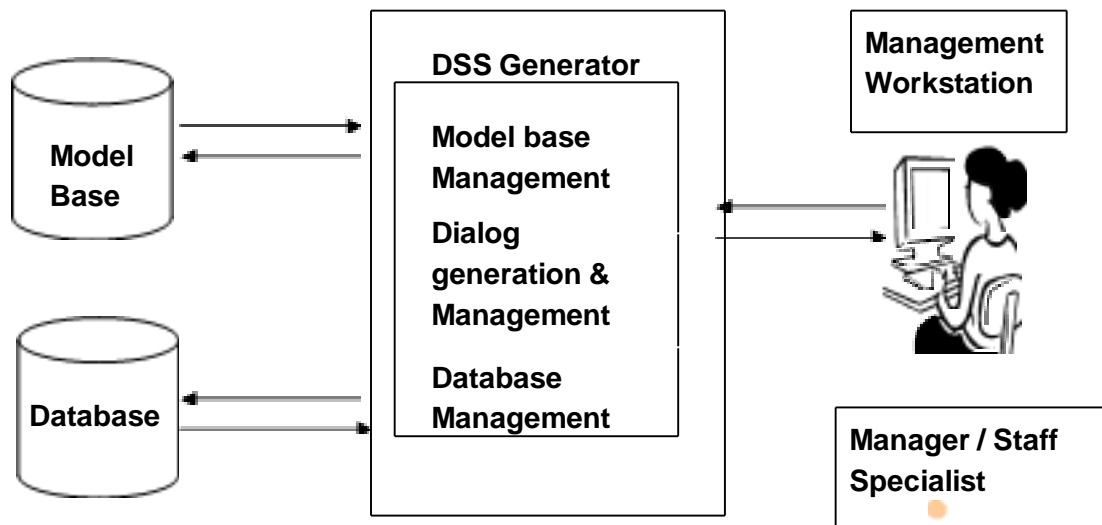
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# Characteristics & Capabilities of a DSS

- DSS provide support for decision makers mainly in semi structured and unstructured situations by bringing together human judgment and computerized information.
- Support is provided for various managerial levels, ranging from top executives to line managers.
- Support is provided to groups as well as individuals. Less structured problems often require the involvement of several individuals from different departments and organizational levels or even from different organizations.
- DSS provide support to several interdependent and /or sequential decisions. The decisions may be made once or several times repeatedly
- DSS support all phases of the decision making process: intelligence, design, choice and implementation.
- DSS support a variety of decision making processes and styles.
- DSS are adaptive over time. The decision maker should be reactive, able to confront changing conditions quickly, and able to adapt the DSS to meet these changes. DSS are flexible, and users can add, delete, combine, change or rearrange basic elements.
- Users must feel at home with DSS. User-friendliness, strong graphical capabilities, and English like interactive human-machine interface can greatly increase the effectiveness of DSS.
- DSS attempt to improve the effectiveness of decision making (accuracy, timeliness, quality) rather than its efficiency (the cost of making decisions).
- The decision maker has complete control over all steps of the decision-making process in solving a problem. A DSS specifically aims to support and not to replace the decision maker.
- End users should be able to construct and modify simple systems by themselves. Larger systems can be built with assistance from information system specialists.
- A DSS usually utilizes models for analyzing decision-making situations.

A DSS can be employed as a stand-alone tool used by an individual decision maker in one location, or it can be distributed throughout an organization and in several organizations along the supply chain. It can be integrated with other DSS or applications, and it can be distributed internally or externally, using networking and Web technologies.

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### Components of a DSS

A DSS application can be composed of the following components.

#### Hardware Resources:

Executive workstations connected by telecommunication networks to other computers and devices in the organization, and provide the primary hardware resource for a DSS. Personal computers can be used on a stand-alone basis, or they can be connected by telecommunications networks to large computer systems for access other DSS software, model and data resources.

#### Software Resources:

- DSS s/w packagers are called DSS generators.
- A Database Management module provides the platform for creating, interrogating and maintaining the DSS database using capabilities typically found in DBMS packages.

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- A model base management module provides the ability to create, maintain, and manipulate the mathematical models in the model base using capabilities

provided by modeling packages like electronic spreadsheet packages, and user-written programs.

- A dialogue generation and management module provides an attractive user interface that supports interactive i/p and o/p by managers.

## DSS Evaluation / Analytical Modeling:

Evaluation or analysis modeling is the first step that leads to a recommended solution. It basically involves 4 types of activities.

### 1) What-if-Analysis:

What-if-analysis is structured as What will happen to the solution if an input variable, an assumption, or a parameter value is changed?

**For example,**

*What will be the market share if the advertising budget increases by 5%?*

Assuming the appropriate user interface, managers can ask the computer model these types of queries easily and get immediate response or answer.

### 2) Sensitivity Analysis:

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It is a special case of what-if-analysis. Typically, the value of only one variable is changed repeatedly, and the resulting changes on other variables are observed.

**For example,**

*let us cut advertising by \$100 repeatedly so we can see its relationship to sales.*

### **3) Goal seeking Analysis:**

It reverses the direction of the analysis done in what-if and sensitivity analysis. Instead of observing how changes in a variable affect other variables, goal seeking analysis sets a target value (goal) for a variable and then repeatedly changes other variables until the target value is achieved.

**For example,**

*How many nurses are needed to reduce the average waiting time of a patient in the emergency room to less than 10 minutes?*

*What annual R&D budget is needed for annual growth rate of 15% by 2008?*

### **4) Optimization Analysis:**

It is a more complex extension of goal seeking analysis. Instead of setting a specific target value for a variable, the goal is to find the optimum value for one or more target variables, given certain constraints.

*For e.g.,*

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*What is the best amount of advertising to have given our budget and choice of media?*

Examples of DSS:

### 1) AAIMS (An Analytical Information Management System):

- ✓ It's a decision support system used in the airline industry.
- ✓ Developed by American Airlines but is used by other airlines, aircraft manufacturers and airline financial analysts, consultants, and associations.
- ✓ Supports a variety of airline decisions by studying factors such as aircraft utilization, seating capacity, traffic statistics, market share, and revenue and profitability results.

### 2) BRANDAID (A Marketing DSS)

- ✓ Helps brand managers make pricing, sales effort, promotion, advertising and budgeting decisions for products lines, and brands of product.

### 3) GADS (Geo data Analysis & Display System)

- ✓ Developed by IBM.
- ✓ For e.g., Analyze and display the geographic distribution of crimes & thus help decide how to assign police to geographic areas of a city.

### 4) MAPP (Managerial Analysis for profit Planning)

- ✓ Developed by Citibank.
- ✓ Support financial planning, budgeting, costing, pricing of bank products

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