

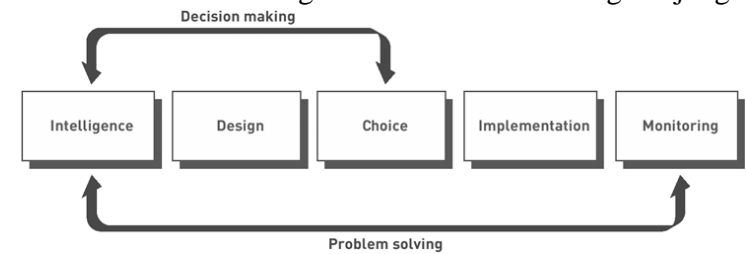
## Chapter 15: Decision Support System and Executive Information System

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## Stages of Decision Making

- Decision-making phase is the first part of problem-solving process:
  - ◆ **Intelligence** – The military sense of gathering information
  - ◆ **Design** – Identifying the alternatives, structuring how the decision will be made
  - ◆ **Choice** – Picking an alternative or making the judgment



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## Structured vs. Unstructured Decision Stages

- Each stage can be Structured (automated) or Unstructured
- Structured means that there is an algorithm, mathematical formula, or decision rule to accomplish the entire stage. The algorithm can be implemented manually or it can be computerized, but the steps are so detailed that no little or no human judgment would be needed.
- Any decision stage that is not structured is unstructured.

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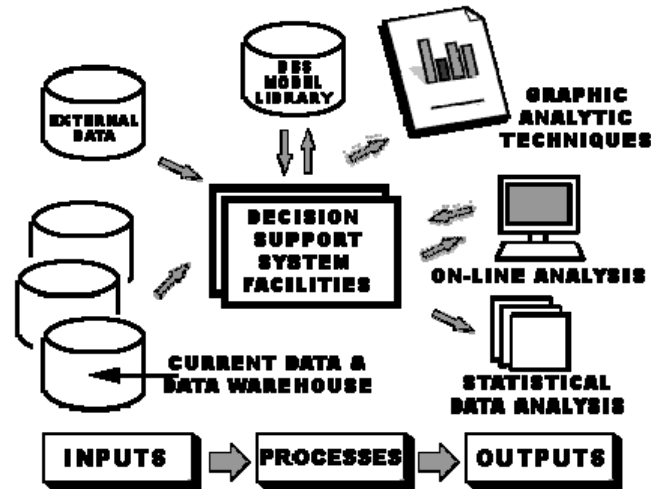
## Structured, Semi-structured, and Unstructured Decisions

- In a **Structured Decision** all three stages are structured
- In a **Unstructured Decision** all three stages are unstructured
- A **Semi-structured Decision** is one in which part, but not all, of the decision is structured.

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## Decision Support System (DSS)



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## What is a Decision Support System?

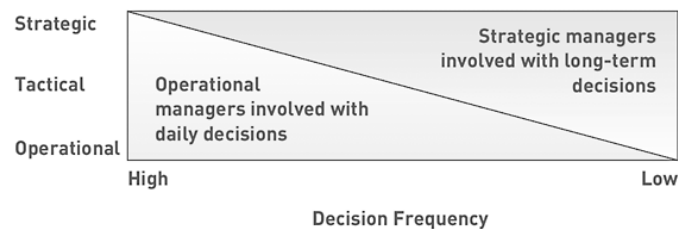
- A Decision Support Systems (DSS) is an interactive, highly “user-friendly” system that supports management decisions that are semi structured or that cannot be specified in advance.
- The most important considerations in the creation of DSS is the recognition of “information overload”.
- Decision Support Systems (DSS) have a diversity of users in the analysis of problems and the modeling of solutions.
- To be effective, DSS must be sufficiently easy-to-use and managers must know what and why they are doing something.

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## DSS & Decision Making Level

- Decision Support System, though skewed towards top level management, are used at all levels
- Managers at all levels face unstructured decisions
- Quantity and magnitude of unstructured decisions increases with management level



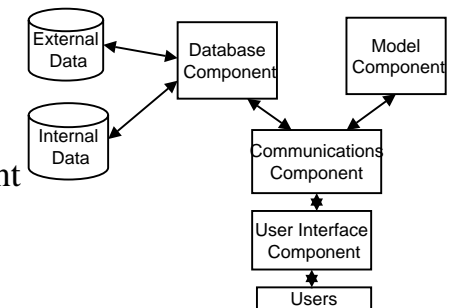
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## Components of DSS

- A Decision Support System is composed of the following:

- ◆ User Interface
- ◆ Data Management
- ◆ Model Management



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## Components of DSS – User Interface

- Users interact with a DSS through the user interface.
- It is important therefore that user interfaces are easy to learn and to use.
- The method of interfacing may vary with each DSS.

## Components of DSS – Data Management

- A typical DSS will access more than one database. These may contain both internal and external data.
- Data is extracted from these databases and updated into a DSS database.

## Components of DSS – Model Management

- The Model Management subsystem contains the model base.
- Models are software programs that support the user in a particular decision making situation.

## Selected DSS Applications

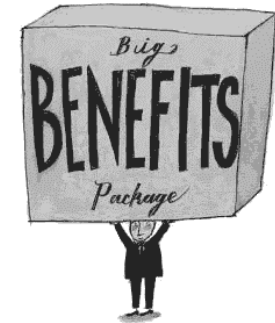
Company or Application	Description
Cinergy Corporation	The electric utility developed a DSS to reduce lead time and effort required to make decisions in purchasing coal.
RCA	The company developed a DSS called Industrial Relation Information System (IRIS) to help solve personnel problems and issues.
U.S. Army	It developed a DSS to help recruit, train, and educate enlisted forces. The DSS uses simulation that incorporates what-if features.
National Audubon Society	It developed a DSS called Energy Plan (EPLAN) to analyze the impact of U.S. energy policy on the environment.
Hewlett-Packard	The computer company developed a DSS called Quality Decision Management to help improve the quality of its products and services.
Virginia	The state of Virginia developed the Transportation Evacuation Decision Support System (TEDSS) to determine the best way to evacuate people in case of a nuclear disaster at its nuclear power plants.

## Business Applications

- Financial Investment
  - ◆ Some investment banks and brokerage firms use DSS in taking market positions with their own assets.
  - ◆ The decision-making support comes in the form of the software's ability to identify trends or disturbances in the market prices of securities and options.
- Ship Loading and Unloading
  - ◆ DSS can be used to load and unload ships in an optimal fashion. This is important as a ship could be picking up and dropping off cargo at many different ports.

## Benefits

- Fast Response to Unexpected Situations
- New Insights and Learning
- Cost Savings



## Benefits - Fast Response to Unexpected Situations

- Fast Response to Unexpected Situations
  - ◆ A DSS enables a thorough, quantitative analysis in a short time.
  - ◆ This results in the user being able to handle rapid changes in business situations without waiting for the IT department to perform programming changes as would be the case in an IRS.

## Benefits - New Insights and Learning

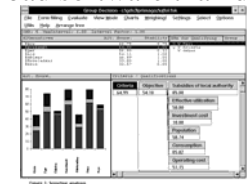
- New Insights and Learning
  - ◆ The user can be exposed to new insights throughout the composition of the model and an extensive sensitivity "what-is" analysis.
  - ◆ The new insights can help in training inexperienced managers and other employees as well.

## Benefits - Cost Savings

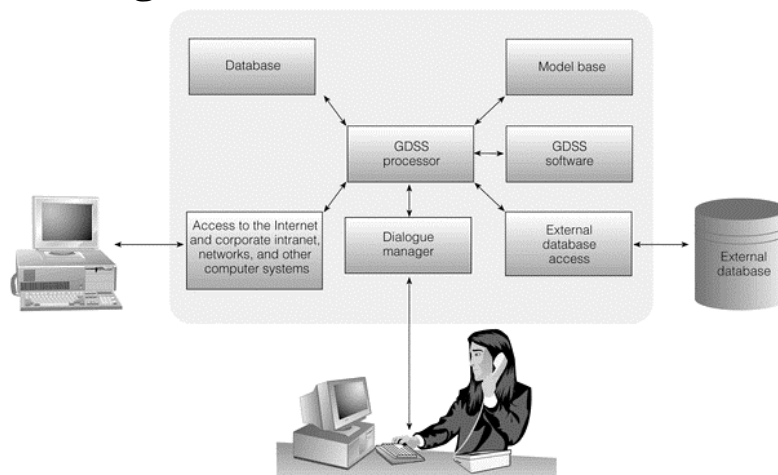
- Cost Savings
  - ◆ Routine applications of a DSS may result in consideration cost reduction, or in reducing the cost of wrong decisions.

## Group Decision Support System (GDSS)

- **Group Decision Support System (GDSS)** is a decision support system which provides support for problem formulation and solution and decision making by groups or teams of people
- GDSS is designed to support effective group communication and good decision making techniques, as well as creative thinking.
- GDSS software must be especially user friendly, since often groups have less patience with bad software than do individuals.



## Configuration of a GDSS



## Characteristics of a GDSS

- Special Design
  - ◆ Effective communication
  - ◆ Group decision making
- Ease of Use
- Flexibility
  - ◆ Accommodate different perspectives
- Anonymous Input
  - ◆ Individuals' names are not exposed
- Parallel Communication

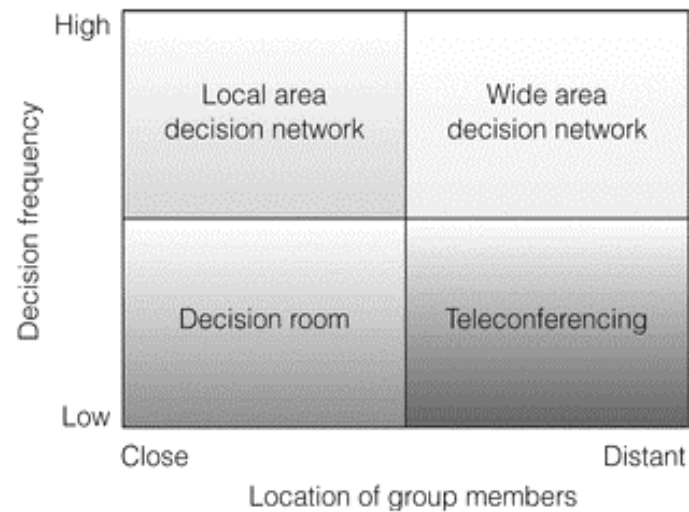
## Characteristics of a GDSS (cont')

- Decision-making Support
  - ◆ Delphi approach: Decision makers are scattered around the globe
  - ◆ Brainstorming: Say things as you think---think out loud
  - ◆ Group consensus approach: The group reaches a unanimous decision (everybody agrees)
  - ◆ Nominal group technique: Voting
- Reduction of Negative Group Behavior
  - ◆ A trained meeting facilitator to help with sidetracking
- Automated Record Keeping

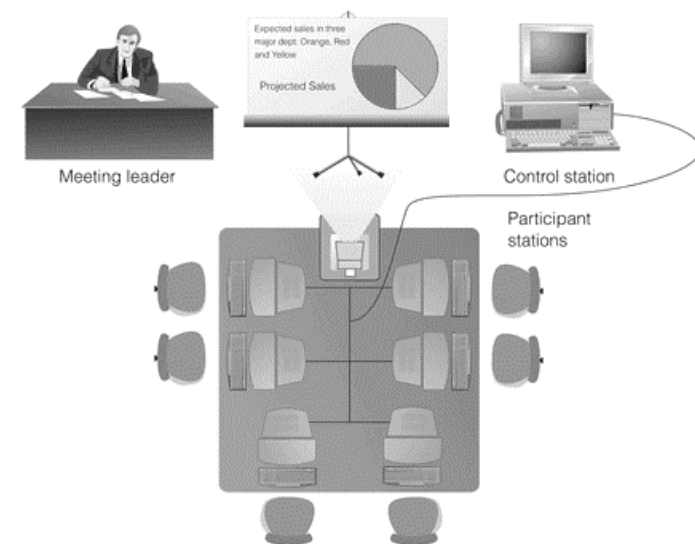
## Examples of GDSS Software

- Lotus Notes
  - ◆ Store, manipulate, distribute memos
- Microsoft Exchange
  - ◆ Keep individual schedules
  - ◆ Decide on meeting times
- NetDocuments Enterprise
  - ◆ Two people can review the same document together

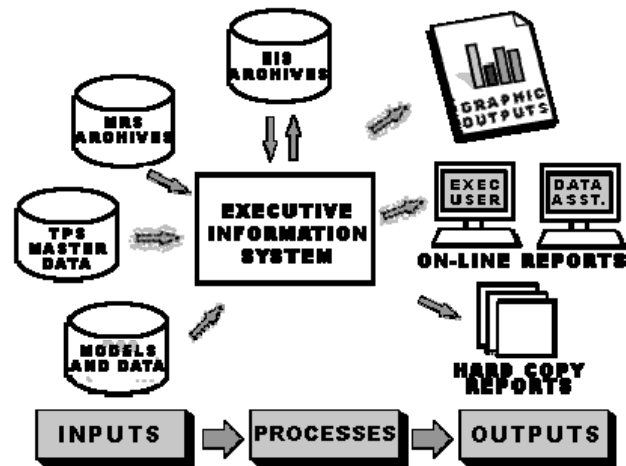
## GDSS Alternatives



## The GDSS Decision Room



## Executive Information Systems (EIS)



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## Executive Information Systems

- An Executive Information Systems (EIS) is a system that serves the information needs of top executives by providing rapid access to timely information with “drill-down” capabilities.
- The EIS can support multiple levels of investigation, depending on the level of drill down that is required.

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## Executive Information Systems (cont’)

- It is intended that the senior executive has the latest details about the company’s key performance indicators as well as economic and industrial indicators.
  - ◆ The information allows the executives to monitor the financial temperature of the organization.
  - ◆ The user of such a system can define the input to be placed into such a system and have “warning” indicators come out when there are significant deviations from an expected response.
- These are information that a top executive requires to monitor the health of a large organization.

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## Information Presentation in EIS

- The information presented through an EIS come from both internal and databases and external sources.
- Strategic decisions can be made based on up-to-date facts.
- The executive is able to define his or her own personalized range of deviations in expected performance levels.
- When a particular report is displayed, variables falling outside the defined range appear in specified colors.

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## Executive Problem Analysis

- Having identified a significant variance, the executive needs to view the data from a number of different perspectives.
- It is not enough to know that an unfavorable profit variance of 10% has occurred in one of the subsidiaries.
- Some divisions within that subsidiary may have increased profits while other divisions have deviations of more than 10%.
- An EIS can support multiple levels of investigation.
- By selecting the highlighted variance on the screen, it is possible to obtain more details of causes, “drilling-down” to get lower levels of details.

## Drill-down Capabilities

- An analytical operation which accesses and evaluates detail data which has been aggregated into interrelated data.

## Differences between DSS and EIS

- DSS is for middle managements whereas EIS is for top management
- DSS consumes operational data. EIS uses only high-level performance indicators from the organization as well as data from outside the organization.
- EIS is for long-term decision-making whereas DSS is for middle-term or short-term decision-making.
- EIS is more user-friendly and interactive, as executives generally have limited time and computing background.