Mansoura University
Faculty of Computers and Information
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DECISION SUPPORT SYSTEMS

Grade: 4TH YEAR (GENERAL)

Prepared by:

Ibrahim El-Hasnony

COURSE DETAILS

Course Syllabus
Chapter 1: Introduction to DSS
Chapter 2: Decision Making Concepts
Chapter 3: Decision Making Technologies and Environment
Chapter 4: Model Management
Chapter 5: Data Management System and Dialogue Management
Chapter 6: Designing and Developing Decision Support Systems
Chapter 7: Executive Support Systems
Chapter 8: Automated Decision Systems and Expert Systems
Chapter 9: Knowledge Management and Collaborative Systems
Chapter 10: DSS Intelligent Systems & Tools and Techniques
Chapter 11: Business Intelligence: Data Warehousing, Data Acquisition, Data Mining, Business Analytics, and Visualization

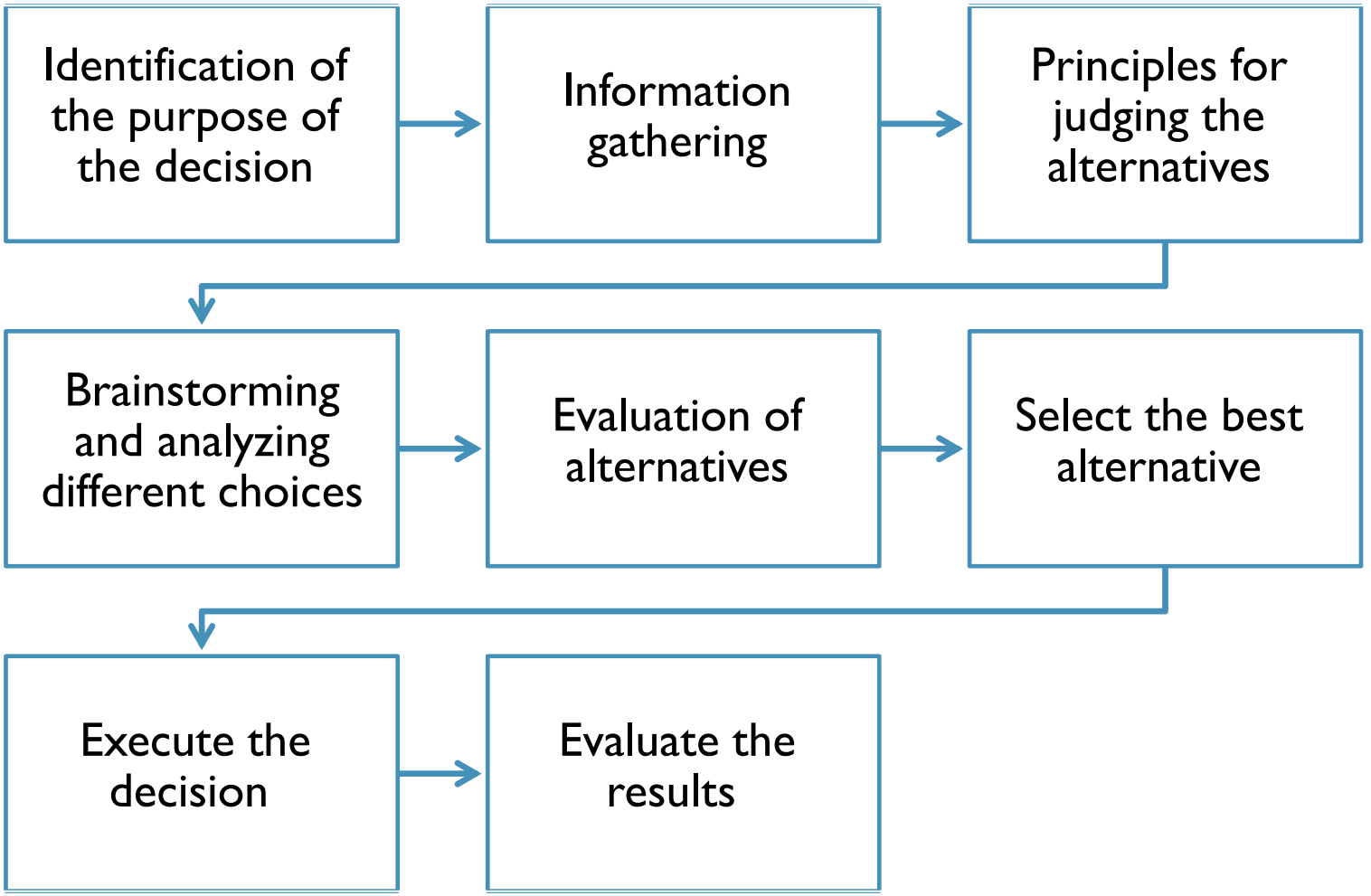
CHAPTER 2 CONTENTS

- Decision making process
- Decision support systems
- DSS characteristics
- DSS components
- DSS advantages and disadvantages
- DSS benefits

DECISION MAKING

Decision-making is a cognitive process that results in the selection of a course of action among several alternative scenarios

DECISION MAKING PROCESS



STEP 1: IDENTIFICATION OF THE PURPOSE OF THE DECISION

- What exactly is the problem?
- Why the problem should be solved?
- Who are the affected parties of the problem?
- Does the problem have a deadline or a specific timeline?

STEP 2: INFORMATION GATHERING

- In the process of solving the problem, you will have to gather as much as information related to the factors and stakeholders involved in the problem.
- For the process of information gathering, tools such as 'Check Sheets' can be effectively used.

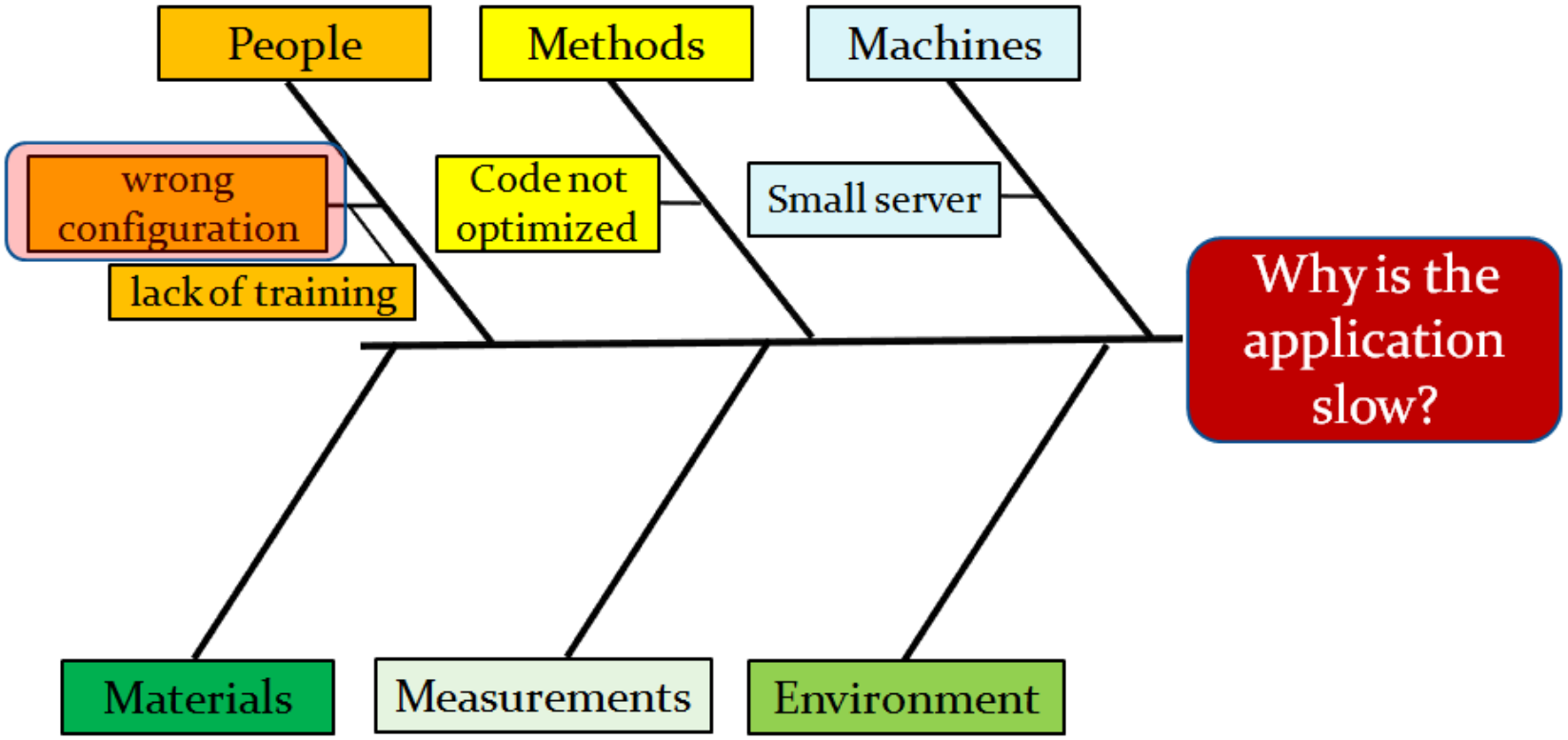
STEP 3: PRINCIPLES FOR JUDGING THE ALTERNATIVES

- The baseline criteria for judging the alternatives should be set up.
- When it comes to defining the criteria, organizational goals as well as the corporate culture should be taken into consideration.
- As an example, profit is one of the main concerns in every decision-making process.
- Companies usually do not make decisions that reduce profits unless it is an exceptional case

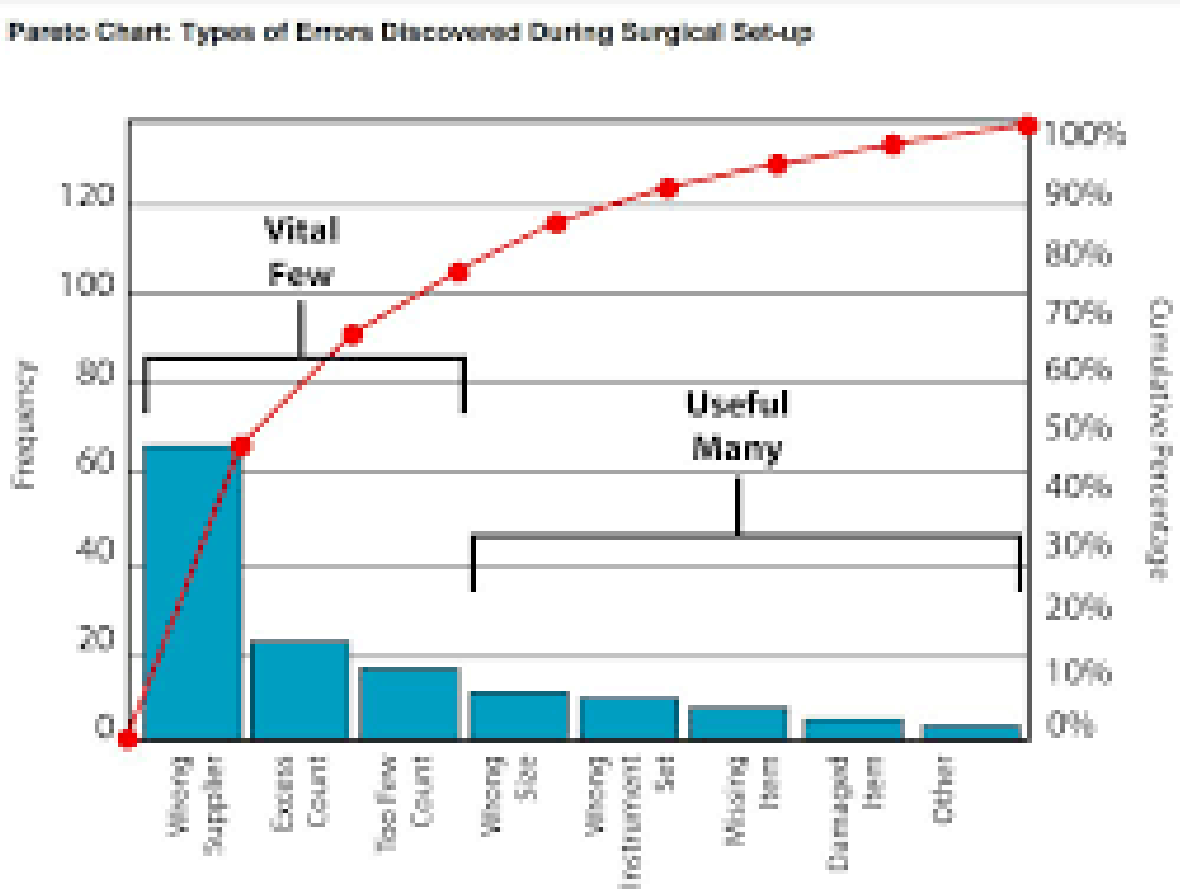
STEP 4: BRAINSTORM AND ANALYSE THE CHOICES

- You can make use of Cause-and-Effect diagrams and Pareto Chart tool.
- Cause-and-Effect diagram helps you to identify all possible causes of the problem
- Pareto chart helps you to prioritize and identify the causes with the highest effect.
- Then, you can move on generating all possible solutions (alternatives) for the problem in hand.

CAUSE-AND-EFFECT DIAGRAM



PARETO CHART



STEP 5: EVALUATION OF ALTERNATIVES

- Use your judgment principles and decision-making criteria to evaluate each alternative.
- In this step, experience and effectiveness of the judgment principles come into play.
- You need to compare each alternative for their positives and negatives.

STEP 6: SELECT THE BEST ALTERNATIVE

- The selection of the best alternative is an informed decision since you have already followed a methodology to derive and select the best alternative.

STEP 7: EXECUTE THE DECISION

- Convert your decision into a plan or a sequence of activities.
- Execute your plan by yourself or with the help of subordinates.

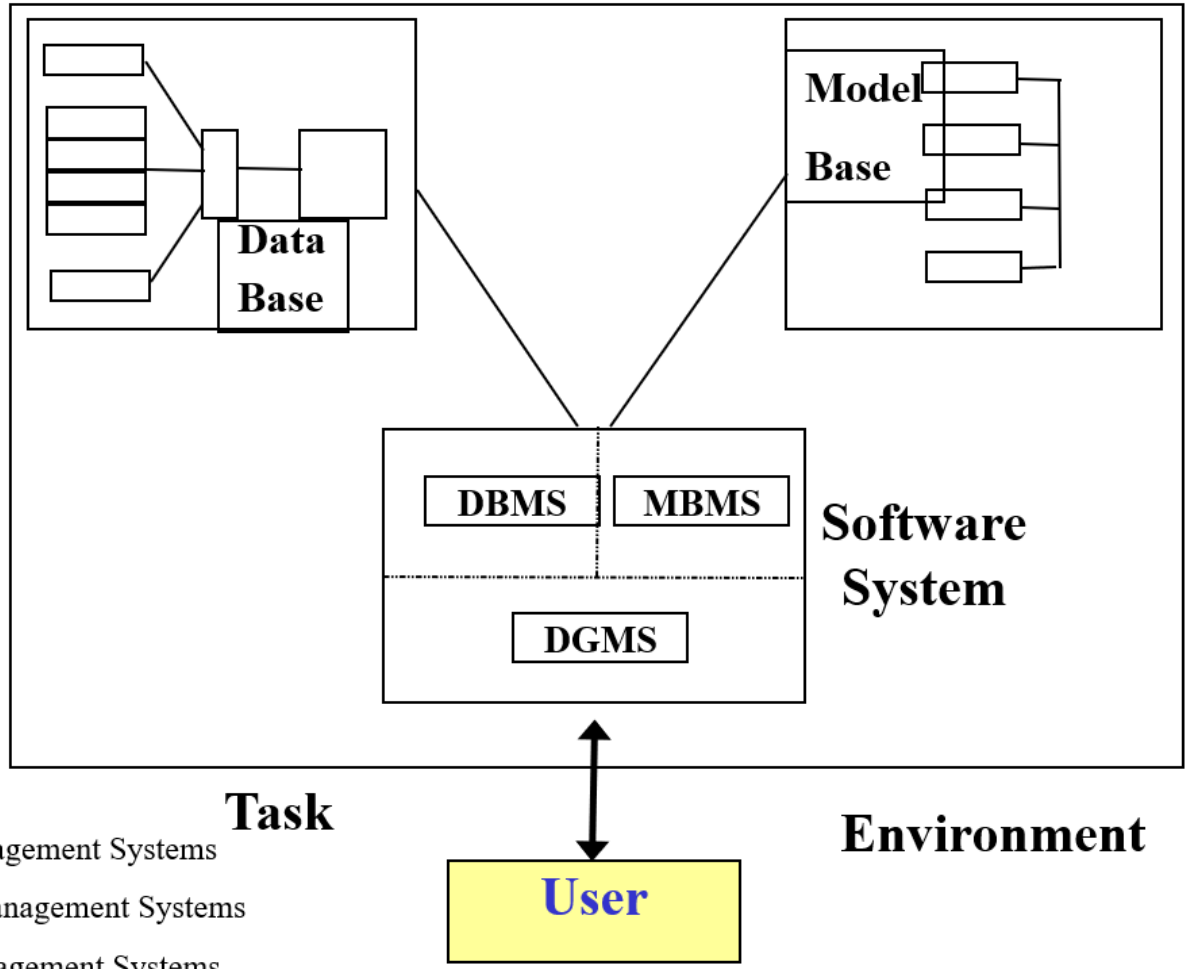
STEP 8: EVALUATE THE RESULTS

- Evaluate the outcome of your decision.
- See whether there is anything you should learn and then correct in future decision making.

DECISION SUPPORT SYSTEM (1)

- DSS is an information system application that helps in decision-making.
- DSS is used in planning and analyzing alternatives.
- DSS differs from most traditional information system in that each DSS is distinct from the other information system and is specifically made for managers.

DSS COMPONENTS



DBMS: DataBase Management Systems

MBMS: ModelBase Management Systems

DGMS: DialoGue Management Systems

DSS COMPONENTS

- **DSS Database**: It contains data from various sources, including internal data from the organization, the data generated by different applications, and the external data mined form the Internet, etc.
- **DSS Software System:** It consists of various mathematical and analytical models that are used to analyze complex data, thereby producing the required information.
- **DSS User Interface**: It is an interactive graphical interface which makes the interaction easier between the DSS and its users. It displays the results (output) of the analysis in various forms, such as text, table, charts or graphics.

DSS MODELS EXAMPLES

- **Statistical Models**: They contain a wide range of statistical functions, such as mean, median, mode, deviations etc. These models are used to establish, relationships between the occurrences of an event and various factors related to that event.
- **Sensitivity Analysis Models**: These are used to provide answers to **what-if situations** occurring frequently in an organization
- **Optimization Analysis Models**: They are used to find optimum value for a target variable under given circumstances
- **Forecasting Models**: They use various forecasting tools and techniques
- **Backward Analysis Sensitivity Models**: Also known as **goal seeking** analysis, the technique followed in these models is just opposite to the technique applied in sensitivity analysis models.

DSS CHARACTERISTICS (1)

1) Should aid the decision-maker in decision-making.
2) Should be able to address semi/un-structured decision-making situations.
3) Should support decision-makers particularly at tactical/strategic levels.
4) Should be able to create general-purpose models, simulation capabilities and other analytical tools available to decision-maker.
5) Should enable users to use DSS without assistance from MIS/technical professionals.
6) Should be readily adapted to meet information requirement for any decision environment.

DSS CHARACTERISTICS (2)

7) Should provide mechanism to enable rapid response to a decision-makers request for information.
8) Should have the capability to interface with corporate database.
9) Should be flexible to accommodate variety of management styles.
10) Should facilitate communication between/among various levels of decision-making.
11) Should have in-built flexibility and ability to evolve as user-sophistication grows.
12) Using of interactive methods are better advised.

DSS BENEFITS

1) Improves personal efficiency.
2) Speed up the process of decision making.
3) Increases organizational control.
4) Encourages exploration and discovery on the part of the decision maker.
5) Speeds up problem solving in an organization.
6) Facilitates interpersonal communication.
7) Promotes learning or training.
8) Generates new evidence in support of a decision.
9) Creates a competitive advantage over competition.
10) Reveals new approaches to thinking about the problem space.
11) Helps automate managerial processes.

DSS ADVANTAGES AND DISADVANTAGES

Advantages

- Time savings.
- Enhance effectiveness
- Improve interpersonal communication
- Competitive advantage
- Cost reduction.
- Increase decision maker satisfaction
- Promote learning
- Increase organizational control

Disadvantages

- Monetary cost
- Overemphasize decision making
- Assumption of relevance
- Transfer of power
- Unanticipated effects.
- Status reduction.
- Information overload.
- False belief in objectivity

Thanks

Any questions