

4.6 Decision-Making as a Component of Problem Solving

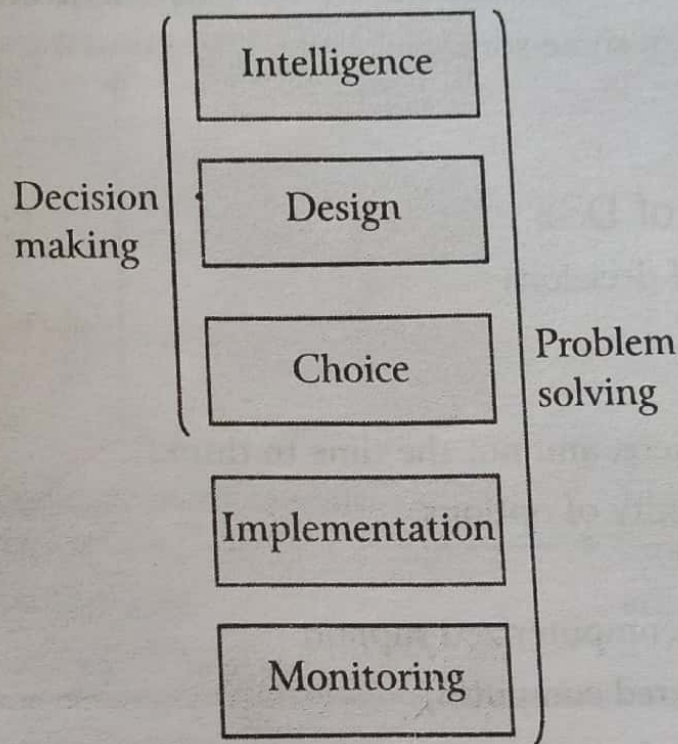


Fig. 11: Decision making as a component of problem solving

4.7 Solution Types

1. **Optimization model** : Finding the best solution
2. **Satisficing model**: Finding a good but not necessarily the best solution to a problem
3. **Heuristics**: Commonly accepted guidelines or procedures that usually find a good solution.

4.8 Problem Solving Factors

1. Multiple decision objectives.
2. Increased alternatives.
3. Increased competition.
4. The need for creativity.

5. Social and political actions.
6. International aspects.
7. Technology.
8. Time compression.

4.9 Characteristics of a DSS

1. Handles large amounts of data from different sources.
2. Provides report and presentation flexibility.
3. Offers both textual and graphical orientation.
4. Supports drill down analysis.
5. Performs complex, sophisticated analysis and comparisons using advanced software packages.
6. Supports optimization, satisficing, and heuristic approaches.
7. Performs different types of analyses.
 - (i) "What-if" analysis.
 - (a) Makes hypothetical changes to problem and observes impact on the results.
 - (ii) Simulation.
 - (a) Duplicates features of a real system.
 - (iii) Goal-seeking analysis.
 - (a) Determines problem data required for a given result.

4.10 Capabilities of a DSS

4.10.1 Supports

1. Problem solving phases
2. Different decision frequencies

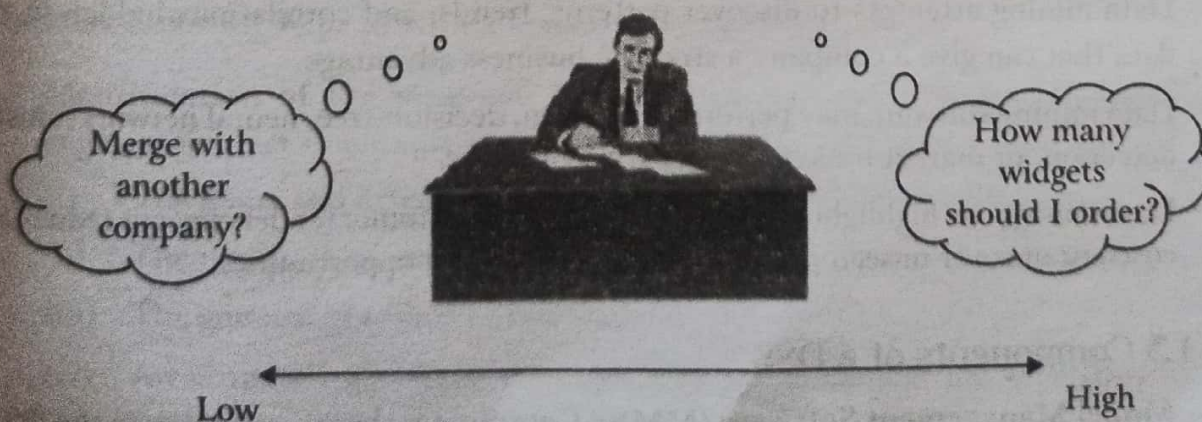


Fig. 12

4.10.2 Highly Structured Problems

Straightforward problems, requiring known facts and relationships.

4.10.3 Semi-structured or Unstructured Problems

Complex problems wherein relationships among data are not always clear, the data may be in a variety of formats, and are often difficult to manipulate or obtain.

4.11 Web-Based Decision Support Systems

Decision support system software provides business intelligence through web browser clients that access databases either through the Internet or a corporate intranet.

DSS Components: Decision support systems rely on *model bases* as well as databases as vital system resources. A DSS model base is a software component that consists of models used in computational and analytical routines that mathematically express relationships among variables.

Examples include:

- (i) Spreadsheet models
- (ii) Linear programming models
- (iii) Multiple regression forecasting models
- (iv) Capital budgeting present value models

4.12 Data Mining for Decision Support

The main purpose of data mining is knowledge discovery, which will lead to decision support.

4.12.1 Characteristics of Data Mining Include

1. Data mining software analyzes the vast stores of historical business data that have been prepared for analysis in corporate data warehouses.
2. Data mining attempts to discover patterns, trends, and correlations hidden in the data that can give a company a strategic business advantage.
3. Data mining software may perform regression, decision-tree, neural network, cluster detection, or market basket analysis for a business.
4. Data mining can highlight buying patterns, reveal customer tendencies, cut redundant costs, or uncover unseen profitable relationships and opportunities.

4.13 Components of a DSS

1. **Model Management Software (MMS):** Coordinates the use of models in the DSS.
2. **Model base :** Provides decision makers with access to a variety of models.
3. **Dialogue manager :** Allows decision makers to easily access and manipulate the DSS.

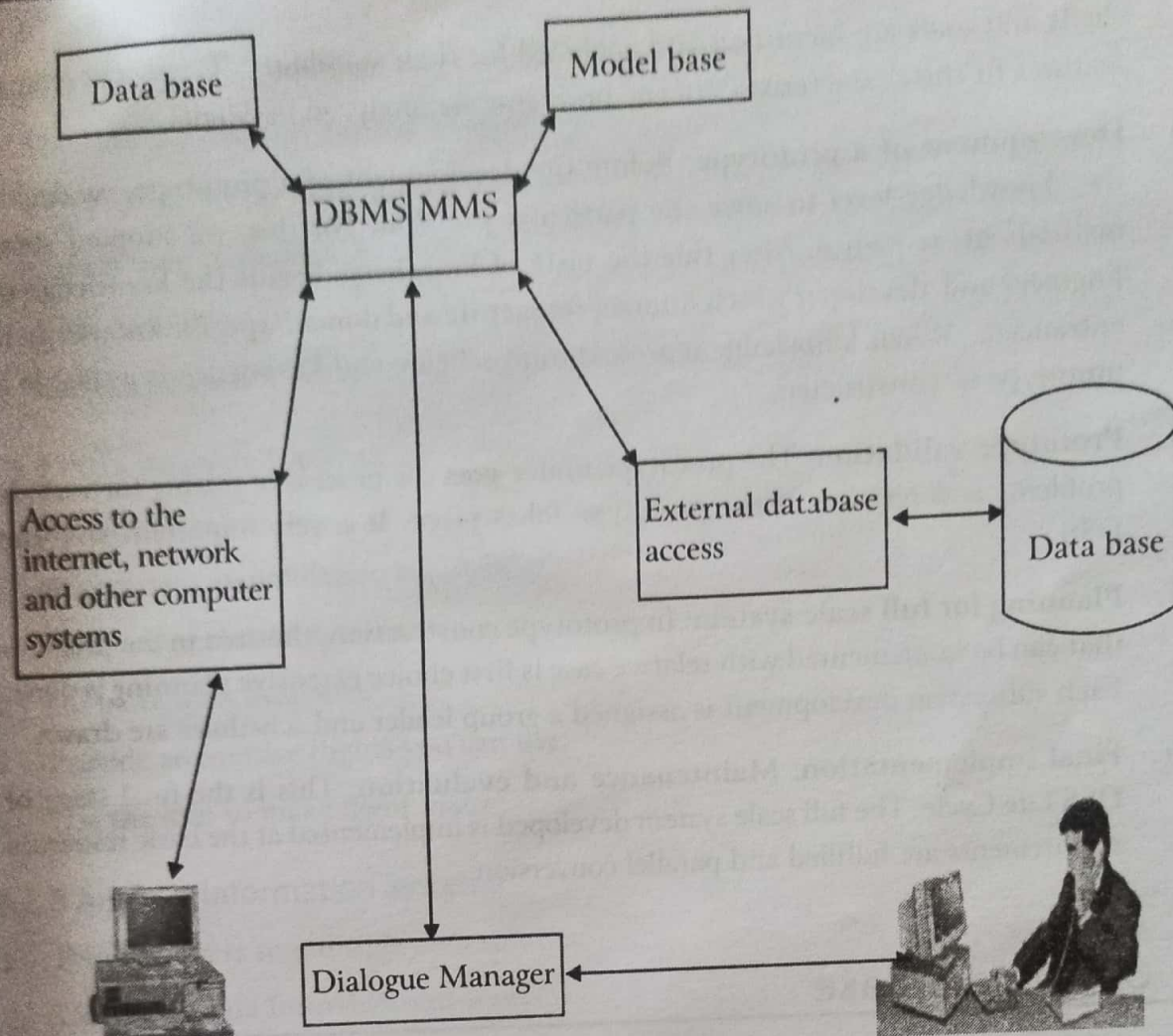


Fig. 13: An overview of componenting of DSS

5. Steps in Constructing Decision Support System and its Role in Business

There are following steps which are constructing the DSS.

1. **Identification of the problem:** In this stage the developer and the knowledge engineer interact to identify the problems. The following points are discussed:
 - (i) The scope and extent are analyzed.
 - (ii) The return of investment analysis is done.
 - (iii) The amount of resources needed is identified.
 - (iv) Areas in the problems that can give much trouble are identified and a conceptual solution of that problem is found.
 - (v) Over all specification is made.
2. **Decision about mode of development:** Once the problem is identified, the immediate step would be to decide about the vehicle for development. He can develop shell for development by any programming language. In this stage various

shells and tools are identified and analyzed for their suitability. These tools whose features fit the characteristics of the problems are analyzed in details.

3. **Development of a prototype:** Before the development of a prototype, we decide the knowledge level to solve the particular problem. For this, we adopted some methods in sequence. After this the taste of knowledge begins the knowledge of Engineer and developer which interact frequently and domain specific knowledge is entranced. When knowledge representation scheme and knowledge is available a prototype is constructed.
4. **Prototype validation:** The prototype under goes the process of testing for various problems and revision of the prototype takes place. It is very important step the DSS.
5. **Planning for full scale system:** In prototype construction, the area in the problem that can be implemented with relative ease is first choice extensive planning is done. Each subsystem development is assigned a group leader and schedules are drawn.
6. **Final implementation: Maintenance and evaluation:** This is the final stage of DSS Life Cycle. The full scale system developed is implemented at the basic resources requirements are fulfilled and parallel conversion.