UNIT 18 TACTICAL AND STRATEGIC INFORMATION MANAGEMENT : DSS AND EIS

Structure

18.1 INTRODUCTION

In the previous Unit 17, we have covered Data Warehousing and Data Mining concepts that is exploration and exploitation of data mining techniques to obtain useful information about the client, service provider and overall on the organization. This gives a path of directives, understanding of self and finding the important processes that strengthens or weakens the organization. Time management and suitable in-time decision is the key for betterment of the organization. The present unit explores decision-making process and the support system for management executives and decision makers.

18.2 OBJECTIVES

After reading this unit, you should be able to:

- define decision and decision making system;
- differentiate between DSS, MIS and EIS;
- explain group decision support system;
- identify software suitability for your organization;
- describe the DSS architecture; and
- generate decision support system for your organization.

18.3 DSS PHILOSOPHY

Let us begin with understanding of the concept. **A decision** basically is a resources allocation process that is irreversible, except that a fresh decision may reverse it or overrule the earlier one. We can also define it as a reasoned choice among alternatives. The **decision maker**, having authority over the resources being allocated, makes a decision. He makes the decision in order to further some

objective, which is what he hopes to achieve by allocating the resources. The decision might not succeed in achieving the objective. One might spend the funds and yet, for any number of reasons, achieve no acceleration at all. For example: To accelerate an R&D program is an objective, not a decision. To allocate the funds in an effort to accelerate the program is a decision.

Simple decision is one in which there is only one decision to be made, even having many alternatives.

A decision may be **goal** oriented for some degree of satisfaction for a given objective. Objective may be driven by a decision but goal is always target/result oriented. A decision may employ**) decision analysis;** a structured thought process to attain desired results. In doing this, we can distinguish three features of the situation: **alternatives, uncertainties and outcomes.** Decision analysis thus constructs **models,** logical or even mathematical, representing the relationships within and between the features of situation. The models then allow the decision maker to estimate the possible implications of each course of action that he might take, so that he can better understand the relationship between his actions and his objectives. Someone who buys a lottery ticket and wins the lottery obtains a good outcome. Yet, the decision to buy the lottery ticket may or may not have been a good decision

Decision maker may adopt **strategy,** which is a collection of actions. The outcome of these actions may be uncertain, but the possible outcome is attainment of that goal set by the decision maker. It is necessary to mention about the **risk** at this juncture that a decision maker often thinks while taking the decisions. Risk can be defined as the possibility of an undesirable result. The risk is linked with monitory befits or loss and thus, it can be governed by **risk tolerance,** an individual's attitude toward decision and the risk involved.

With the above background, we can now easily distinguish between **strategic and tactical decisions.** Strategic decision affects entire organization or major part of it vis-à-vis organizational objectives and the policies. It has long lasting effect on the organizational system and generally taken at the highest management level. On the other hand, tactical decision or management control decision affects a part of the organization for a restricted or short time. The tactical decision takes place within the context of existing strategic decisions. Thus, the contextual and effective management depends on good and timely information. The decision making process may use various techniques depending on the situation. We can define decision-making as an activity of deciding appropriate action in particular situations. With relevant and useful information the decision-making may reduce the uncertainty.

The quality information is a component that is dependant on the good datasets. The good data can be described as data having :

- accuracy, completeness and have authorization. This integrity in data is a base feature;
- in time availability of up-to-date records when actually needed;
- summarization to an appropriate level of aggregation;
- easy access to the relevant information; and
- relevance to the decisions being made.

The importance of these factors depends on the nature and impact of the decision. For example, in a manufacturing organization, the decision on the budgetary provisions for advertisement depends on the accurate and up-to-date data of sales of the product.

Simon provided a general model of any decision making process. The Simon model (*Figure 18.1*) describe the sequence of decision making as :

- **intelligence:** data in the general area is examined, leading to a specification of the problem to be solved;
- **design:** problem is formulated, solutions developed and tested for feasibility;
- **choice:** selection is made amongst alternatives; and
- **implementation:** the chosen alternative is implemented and substantiated to the stakeholders in the organization.

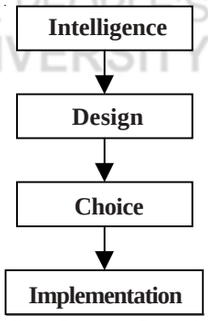

Fig. 18.1: Simon's Model

Having the basics of decision-making process, the decision support system (DSS) thus can be defined as the system that supports the decision-making. There are various definitions of DSS that links to information retrieval with the help of computers to use of information to support managers. Let us see that how some of these definitions describe DSS :

Table 18.1 : Various definitions of DSS

S.No.	Definition given by	Definition
1.	G.W. Peter Keen and Michael S. Morton, 1978	Decision support implies the use of computers to: a) assist managers in their decision processes in semi-structured tasks; b) support rather than replace, managerial judgment; c) improve the effectiveness of decision making rather than its efficiency.
2.	Ralph H. Sprague, 1979	Information system featuring an integrated system composed of decision models, database and decision maker to support decision-making.
3.	James Hick, 1993	An integrated set of computer tools that allow a decision maker to interact directly with computers to create information useful in making unanticipated semi-structured and unstructured decisions.
4.	Carroll W. Frenzel, 1996	Decision Support System are analytical models used to increase managerial or professional decision making by bringing important data to view.
5.	William E. Leigh and Michael E. Doherty, 1998	A set of computer based tools used by managers in connection with his or her problem solving and decision making duties.

These definitions points that :

1) decision support systems are information systems;
2) decision support systems are used by managers;
3) decision support systems are used in making decisions;
4) decision support systems are used to support, not to replace, people;
5) decision support systems are used when the decision is semi-structured or unstructured;
6) decision support systems incorporate a database of some sort; and
7) decision support systems incorporate models.

One word that attracts us is "Model". Let us see the following figure that describes a simple DSS model :

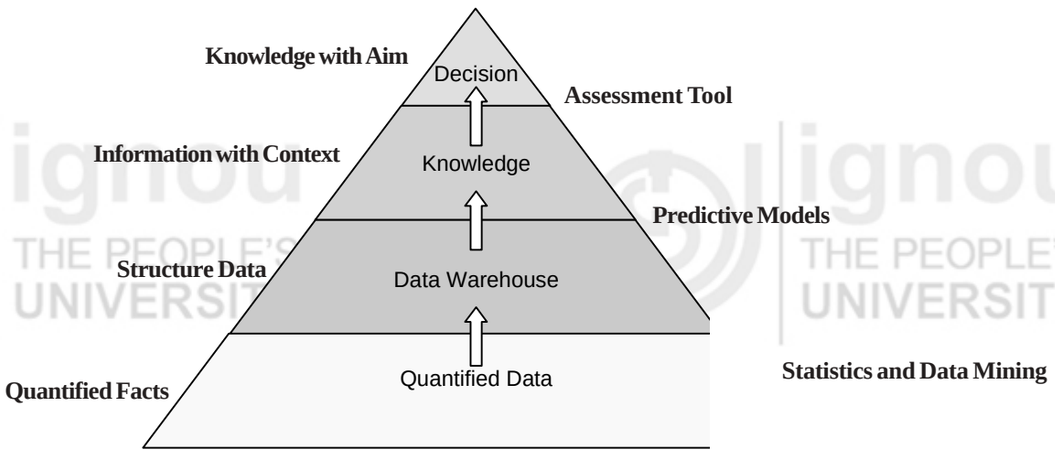

Fig. 18.2 : DSS Model

As can be seen, the decision knowledge emerges from the quantified data using statistical and data mining tools, predictive models and the assessment tools.

Activity A

1) Let us take an example of a travel agent selecting destinations for clients base on the clients' expressed interest in vacation activities and agents knowledge of what is available in various locations. Do you think that a computerized DSS will help in decision-making? If not, why? If yes, how? (*Based on Mallach, 2002*).

.....

.....

.....

.....

.....

.....

.....

.....

.....

18.4 INFORMATION SYSTEMS

The information system evolution has an interesting history. Many information systems researchers and technologists have had built and investigated Decision Support Systems (DSS) for more than 35 years. Decision Support Systems evolved early in the era of distributed computing. Initially it was very expensive to build large-scale information systems as the computers were in their infant stage. Powerful mainframe systems made it more practical and cost-effective to develop Management Information Systems (MIS) in large companies. MIS focused on providing managers with structured, periodic reports. Much of the information was from accounting and transaction systems.

Lets us examine various information system before actually differentiating between DSS and Management Information System (MIS). The different types of specialized information systems that support management decision making generally depend on the level of management, and the degree of structure in the decisions.

The earliest information system that became practical was **Model-oriented Management Decision Systems** (MDS) and **Strategic Planning Systems** (SPS). It was first that the marketing and production managers used MDS for to coordinate production planning.

Gordon Davis, a Professor at the University of Minnesota, who defined a **Management Information System** (MIS) in 1974 as "an integrated, man/machine system for providing information to support the operations, management, and decision-making functions in an organization".

Transaction Processing System (TPS) is a system that influences the decision-making on the basis of inventory. In want of updated inventory that transaction could be delayed or could take place with appropriate substitute.

Information Reporting System (IRS) is one where information is retrieved for pending decisions or overdue transactions. **Interactive Financial Planning System (IFPS)** became popular decision support tools that originated from conventional spreadsheet system of finance management. In this system, the model can be separated from the data.

Executive Information System (EIS) evolved from single user model-driven Decision Support systems and improved relational database products. The first EIS used pre-defined information screens and were maintained by analysts for senior executives. An EIS is a data-driven DSS that is intended to provide business intelligence to middle and senior-level managers.

The **Office Information (automation) System (OIS)** has to do with the effective and efficient flow of organizational information for carrying out day-to-day work. On the other hand, the **Personal Information System (PIS)** helps individual middle and senior executives to derive best possible solution for a given problem. It can also be linked with problem-solving process for supporting strategic decision-making. The information systems that used to improve communication and coordination among members of a group of executives who collaborate on a set of joint tasks, known as **Group Decision Support System (GDSS).** We shall be studying about GDSS in later sections.

An **Expert System (ES)** is specialist knowledge information base that help an expert to decide on crucial and item specific problems. **Strategic information system (SIS)** enables an organization to obtain a competitive advantage over its rivals or to prevent them from taking advantage over the information.

The commonality among all above system is provision of information to a decision maker. With advent of computers, the information management, its warehousing and retrieval in judicious way became easier, particularly with the availability of desktop systems. As on date, in any organization, the information is maintained on the computers and the same is used for the benefit of the organization. Each individual is thus, an important component in the information system.

18.5 DIFFERENCE BETWEEN DSS, MIS AND EIS

With the exposure to all the above information systems, let us find out the differences between DSS and MIS. *Table 18.2* enlists some basic differences between decision support system, management information systems and executive information system. As the name implies, the later two are the systems that provide information that may or may not be used for making a decision whereas the support information provided for deciding on the policy, planning or implementation is the basic component of DSS. Let us find out the characteristics of the three systems :

DSS:

- DSS generally provide support for unstructured, or semi-structured decisions (decisions that cannot be described in detail)
- DSS problems are often characterized by incomplete or uncertain knowledge, or the use of qualitative data
- DSS will often include modeling tools in them, where various alternative scenarios can be modeled and compared
- Investment decisions are an examples of those that might be supported by DSS

MIS:

- MIS is generally more sophisticated reporting systems built on existing transaction processing systems
- Often used to support structured decision making (decisions that can be described in detail before the decision is made)
- Typically will also support tactical level management, but sometimes are used at other levels
- Examples of structured decisions supported by MIS might include deciding on stock levels or the pricing of products

Table 18.2 : Difference between DSS, MIS and EIS

Dimension	DSS	MIS	EIS
Focus	Analysis, decision Support	Information processing	Status Access
Typical Users Served	Analysts, professions, managers (via intermediaries)	Middle, lower levels, sometime senior executives	Senior Executives Expediency
Impetus	Effectiveness	Efficiency	
Application	Diversified Areas where Managerial Decisions are made	Production control, sales forecasts, financial analysis, human resource management	Environmental scanning, performance evaluation, identifying problems and opportunities
Database(s)	Special	Corporate	Special
Decision Support Capabilities	Supports semi-structured and unstructured decision making; mainly ad-hoc, but sometimes repetitive decisions	Direct or indirect support, mainly structured routine problems, using standard operations, research and other models	Indirect support, mainly high level and unstructured decisions and policies
Type of Information	Information to support specific situations	Scheduled and demand reports; structured flow, exception reporting mainly internal operations	News items, external information on customers, competitors and the environment
Principal Use	Planning, Organizing, staffing and control	Control	Tracking and control
Adaptability to Individual User	Permits individual judgment, what-if capabilities, some choice of dialogue style	Usually none, standardized	Tailored to the decision making style of each individual executive, offers several options of outputs
Graphics	Integrated part of many DSS	Desirable	A must
User Friendliness	A must where no intermediaries are used	Desirable	A must
Treatment of Iinformation	Information provided by the EIS/or MIS is used as an input to the DSS	Information is provided to a diversified group of users who then manipulate it or summarize it as needed	Filters and compresses the information, tracks critical data and information
Supporting Detailed Information	Can be programmed into DSS	Inflexibility of reports, cannot get the supporting details quickly	Instant access to the supporting details of any summary
Model Base	The Core of the DSS	Standard Models are available but are not managed	Can be added, usually not included or limited in nature
Construction	By users, either alone or with specialists from IS or IC departments	By vendors or IS specialists	By Vendors or IS Specialists
Hardware	Mainframes, micros or distributed	Mainframes, Micros or distributed	Distributed system
Nature of Computing Packages	Large computational capabilities, modeling languages and simulation, applications and DSS generators	Application oriented, performance reports, strong reporting capabilities, standard statistical, financial, accounting and management science models	Interactive, easy to access multiple databases, on-line access, sophisticated DBMS capabilities and complex linkages

Adapted from *the Information Systems resource materials by Denis Manley, School of Computing at Dublin Institute of Technology.*

EIS:

- EIS support a range of decision making, but more often than not, this tends to be unstructured
- EIS support the executive level of management, often used to formulate high level strategic decisions impacting on the direction of the organization
- These systems will usually have the ability to extract summary data from internal systems, along with external data that provides intelligence on the environment of the organization
- Generally these systems work by providing a user friendly interface into other systems, both internal and external to the organization

Let us now explore differences among the three information systems based on the dimensions (*Table 18.2*).

In the following sections, we shall be studying various components of a DSS, building simple architecture for DSS and GDSS.

18.6 COMPONENTS OF DSS

The basic model of a DSS might be a spreadsheet containing the data. The user may make changes in some of the parameters of spreadsheet and observe the impacts on the outcomes. For example, one may create a spreadsheet to support various investment decisions or an individual may create a spreadsheet to model a home loan and see the impact on repayments of changing parameters like interest rates, principal size and the term of the loan. Another example could be from an education institution. A university may create a spreadsheet while entering into a contract with another offshore educational institution to provide its degree programs available in different locations. The spreadsheets then can be used to understand the set of costs, fixed and variable, and to compare its income in a range of circumstances, like student numbers, the impact of money exchange rates or delivery cost depending on the mode, etc. This allows for sensitivity analysis and risk management.

More sophisticated DSSs are often systems in their own right, although they may be *add-ons* to some existing transaction processing system. Let us examine basic components of a DSS model through *Figure 18.3*.

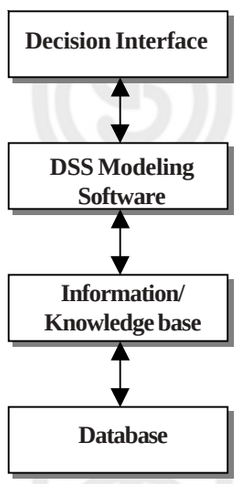

Fig.18.3 : Key components of a DSS

The *Figure 18.3* clearly defines that the data likely to be derived from a database underpins the information on which good decisions are made. Hence, the database is the base component of a DSS model. The information or knowledge base contains information about the intricate relationships that may exist between the data. This defines the rules that underpin the various knowledge systems or the relationship among the activities. For example, the relationships could be between costs, demand and profitability in a product costing.

The modeling software enables the user to experiment with various scenarios, i.e. to see the impact of varying parameters when they are changed on the outcomes, or to undertake other mathematical analysis, i.e. sensitivity analysis, linear programming, queuing models and to find out risks involved in each of the scenario.

Based on the database, knowledge base and the relations, the decision interface is created where the user component plays an important role. Here, the users are either senior management or middle management with lower levels of technical expertise.

Sometimes the underlying database might be a data warehouse, we have already studied in the previous unit. The real application of a data warehouse thus emerges in DSS though a data warehouse is not an operational business system, but is usually a large database that is updated periodically from a range of sources. The sources of data may be internal transaction processing systems, or may be from external sources and they are sometimes used to bring data together from a range of incompatible or isolated internal systems.

Activity B

Given are some examples of knowledge retrieval for decision-making process. Please give information system nomenclature to each of them :

1) An organization has to give annual money incentives to its employees serving at various levels. The management considers pay scales, last year's profits and losses, product sale and benefits extended to the employees along with self-appraisal to arrive at the decision.

   .....

   .....

   .....

2) The course materials in a distance education institute are to be distributed to all its registered students, but it is reported that the quantum required for distribution is not available in sufficient numbers. A senior officer makes an appropriate decision.

   .....

   .....

   .....

3) The marketing wing of a TV manufacturing company after considering the sales and forthcoming international Olympic games in the country decides on the advertising policy for company to be adopted for next six months.

   .....

   .....

   .....

   .....

4) Information on the blood group, allergy to penicillin and CT Scans, X-rays, blood pressures, blood sugar and blood urea along with temperature charts are obtained for a patient likely to be operated by a doctor.

   .....

   .....

   .....

   .....

18.7 GROUP DSS

Having basic understanding of decision-making process and DSS, let us find out what is Group Decision Support Systems (GDSS). GDSS are interactive computer-based systems that facilitate decision-makers working together as a group to arrive at a solution for unstructured problem. The group of executives analyzes problem situations and performs group decision-making tasks. The GDSS provides mechanisms to help the users to coordinate and keep track of on-going projects, allow them to work together thru computer-supported communication, collaboration, and coordination. Typical applications of GDSS include email, awareness and notification systems, videoconferencing, chat systems, multi-player games, and negotiation systems.

The group decision support system addresses the vary issue of human behaviour in a given environment along with computer science and management. It is found that a task assigned to a group is a typical information processing system that usually provides a judicious solution with alternatives. The GDSS has several implications that can be listed as follows :

- Enable all participants to work simultaneously thereby promoting broader input into the meeting process and reducing dominance of few people;
- Provide equal opportunity for participation;
- Enable larger group meetings that can effectively bring more information, knowledge, and skills for a given task;
- Provide process structure to help focus the group on key issues and discourages irrelevant digressions and nonproductive behaviors;
- Support the development of an organizational memory from meeting to meeting; and
- Individual satisfaction increases with group size.

The software developed for GDSS focuses principally on assisting brainstorming and mechanizing voting, two of the rare events in business meetings. We have reached the stage of mechanizing word-oriented problems in group meetings.

Group support systems are designed to support group decision-making through specialized software, hardware and decision support tools. This can be defined as a combination of computer, communications and decision technologies working in tandem to provide support for problem identification, formulation and solution generation during group meetings. Broadly, the fundamental goal of GDSS is to support the exchange of ideas, opinions, and preferences within the group. The primary goal of GSS is to reduce **process loss** attributed to disorganization within the group, social issues such as member dominance, inhibition, peer pressure and other recognized difficulties of group interaction and to improve overall decision quality. The taxonomy of GDSS is forced by three factors :

1) Group size,
2) Communication channel (face-to-face vs. computer-mediated) and
3) Task type.

GDSS are believed to improve the quality of group decisions by minimizing process losses and maximizing **process gains.** Process gains occur when certain aspects of the meeting improve the eventual outcome or result and process losses delay or reduce the final outcome. Thus, the overall meeting outcome is reliant upon the process gains versus the process losses.

Let us now study some of the terms used in GDSS.

Groupthink : Groupthink is a tendency of group members to fall in to similar thought patters and to disapprove the opinions that do not confirm to the patterns. This creates problems in group decision making process and sometimes become big hurdle in reaching to an appropriate decision. GDSS provides an opportunity to overcome the problems of groupthink where junior members of the group get equal chance to put forth their opinions that could not have been possible in face-to-face situations.

Media Richness is defined as the potential information carrying capacity of data transmission medium. The information processing depends on the richness of the communication medium. Figure 18.4 describes the level of communication richness across various media. In GDSS, the richness of a medium depends on availability of number of communication channels and the feedback that is received by the decision makers. In face-to-face situation, the communication richness is very high as the feedback and inputs are received through words used, facial expression, body language and tone. An important aspect is also selection of communication medium as this varies from task to task. For example, a low medium richness is more effective in money transactions via an ATM whereas to understand loaning system of bank highly rich medium may be required.

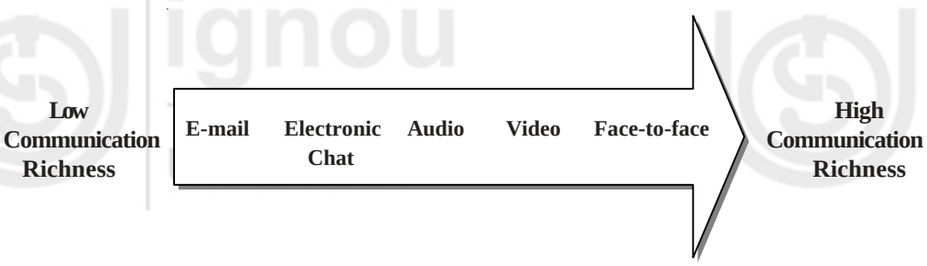

Fig.18.4 : Degree of Communication Medium Richness

Groupware : It is a term which relates to GDSS but is not identical. It is defined as a computer based system that support groups of people engaged in common goal and provide interface to a shared environment (Ellis, 1991). The field that studies how people use groupware is called **Computer-Supported Cooperative Work (CSCW)**. The relations among the DSS, GDSS and Groupware can be understood through *Figure 18.5*.

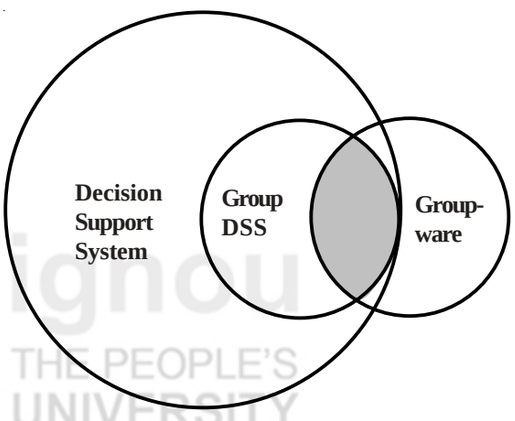

Fig.18.5 : Relationship Among DSS, GDSS and Groupware

As can be seen, GDSS is a part of DSS whereas groupware may or may not be essential component of DSS though it has some properties similar to GDSS.

War room, also known as electronic meeting room or electronic boardroom, is a facility created for GDSS by networking computers for each member participant. It is equipped with a large screen video display that can be seen by all the participants. There is a facilitator to control the display and have access to all members' computers. The software used have the capabilities to plan a session and group members can propose agenda items through it. It can organize and structure members' comments and can record them as organisational memory for longer and effective use.

Let us now look at the system of GDSS software procurement.

18.8 SOFTWARE TOOL SELECTION

Selecting a software package for organisational DSS is a major strategic decision as it has intense implications for the competitiveness for the organization for many years. As procurement of software involves money, involvement of senior managers along with technical managers in decision-making is important and crucial. The procurement processes need to have various stages to make a right decision on this issue. Some of the processes involve technical evaluation of software, identification of information needs for the company, meeting with vendors and assessing the reliability of senior executives at the vendor company as strategic partners. In this section, we shall be discussing the procedurals issues in procurement of DSS software.

Evaluation Steps

The evaluation of the software basically involves four steps, covering creation of **evaluation team, need identification, product evaluation and negotiations with vendors.** The evaluation team is key and thus it is vital to ensure availability of team members while making the project plan. Some points to be remembered in formulation of evaluation team are :

a) identification of suitable members
b) role specification for them
c) anticipation and management of time commitment
d) leadership selection
e) creating directions for the team.

The evaluation team should reasonably be small (5 to 7 members) with a project leader and the team should submit a regular report on findings to the senior management.

Needs Assessment

The next step is need assessment for enterprise-wide DSS. The evaluation team is supposed to create criteria and interact with the personnel who will be impacted by implementation of DSS. The role of evaluation team in communicating with the people is to crucial and is to be effective to determine the needs from those who want DSS, who will be expected to use DSS and who are concerned, opposed, bored or out of reach. The communication could be question based where interaction should not be over selling or under done. Questions can be related with the functions and tasks, controls and security needs, operational performance needs and on the design architecture strengths and problems.

Product Evaluation

The third step is evaluating a product. It is important to mention here that there is no software package available that can fit in any organisational DSS needs. The package is to be customized for the organization and one may need to explore other users and their experiences with the package. The product evaluation may involve the following three stages :

a) Preliminary evaluation : testing of actual products available in the market and their screening. The strengths and weaknesses of the vendor is also to be checked.

b) Functional screening and review of the product on the laid criteria : examination of cost, design, support and installation requirements.

c) Operational performance evaluation : screened packages have to be tested operationally either with the demonstration versions or pilot tested for its scalability, load bearing capacity, direct and indirect costs, after sale support, training, etc.

Negotiating with Vendors

The responsibility of final selection needs to have negotiations with the vendor who has submitted the project proposal with costs, infrastructure requirements. The negotiations are based on the installation plan and post-installation reviews. The role of evaluation team gets converted in to a project team as no vendor can guarantee on the performance of DSS when it is actually implemented. On the other hand, sustainability and reliable information extraction with constant support from the supplier with up gradations and appropriate changes in software are to be negotiated at the time of finalization of the software.

Activity C

Please name at least two information systems for each high, medium and low communication richness media.

S.No.	High Communication Rich Media	Medium Communication Rich Media	Low Communication Rich Media
1.			
2.			

18.9 BUILDING DSS/EIS IN AN ORGANIZATION

To build a DSS or EIS in an organization, it is important to understand the organisational environment in which it has to be functional. The environment here can be explained as the available hardware, operating system on the computers, approach to link or network computers, users, their work and workload, the links between the departments and information or data flow, hierarchies among the different levels of human resources, their interactivity level, etc. This total setup is covered under **information system architecture.**

The architecture of an information system refers to the way its pieces are laid out, types of tasks assigned to each piece, interaction among pieces and interaction of pieces with outside system. Martin (1991) defines information system architecture as "A written expression of the desired future for information use and management in an organization, that creates the context within which people can make consistent decisions".

Let us look at the flow diagram (*Figure 18.6*) of course development process adopted by Indira Gandhi National Open University for generating a course that you are reading as an example of information system architecture.

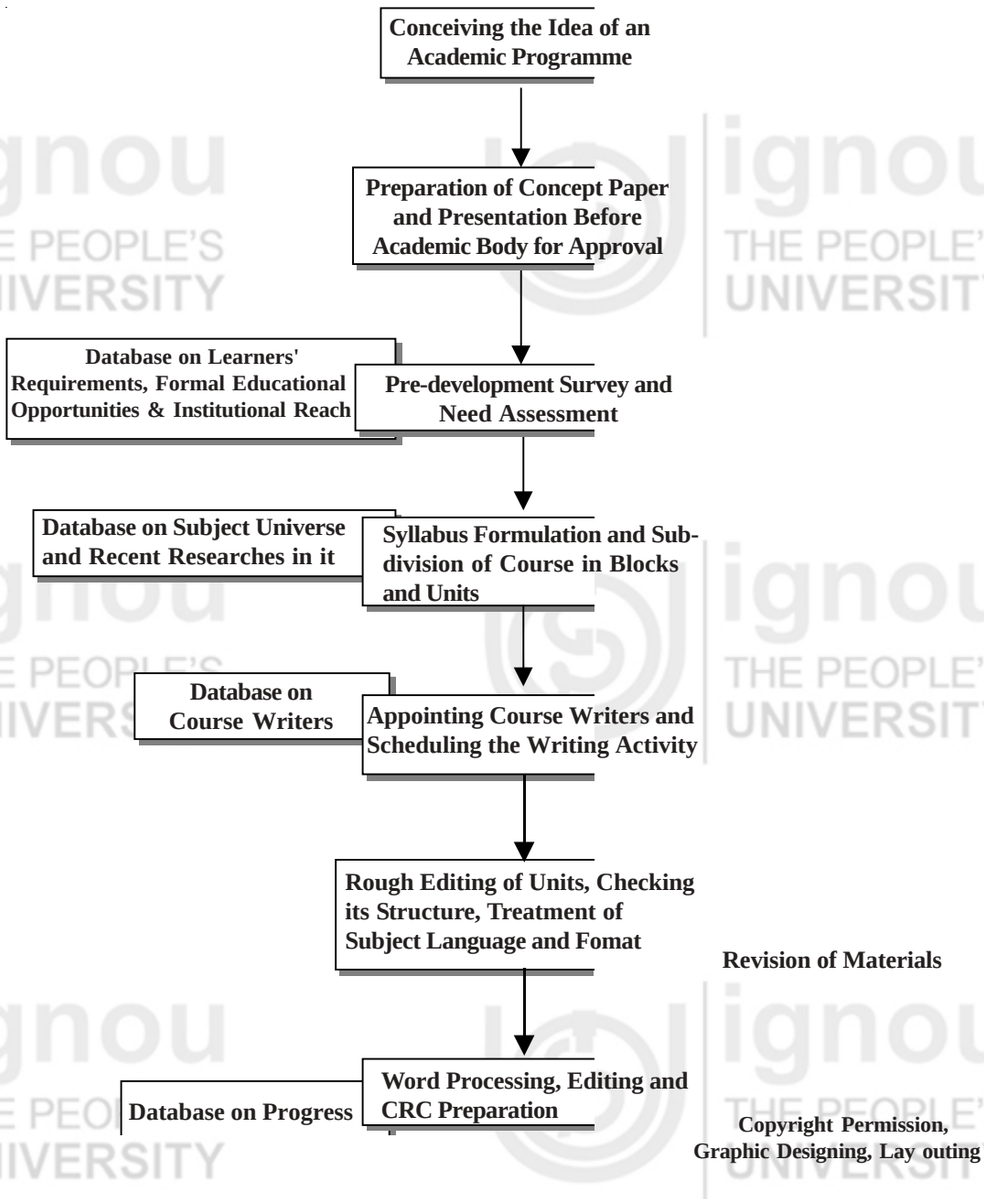

Fig.18.6 : Example of an Information System Architecture

We are not explaining the diagram, as it is self-explanatory, but please note the data gathering situations and try to identify the decision making points.

To build a DSS in organization, one has to consider the spectrum of DSS that organization is going to use. The following are to be well thought-out to approach systematically :

- Strategic, tactical and operational decisions of the organization,
- Unstructured, semi structured and structured decisions,
- All levels of management and knowledge workers in the organization,
- Major functions, product or line of business,
- Hierarchy in operations, and
- Geographical division of the organization.

Let us refer to *Figure 18.7* showing generic view of a DSS architecture.

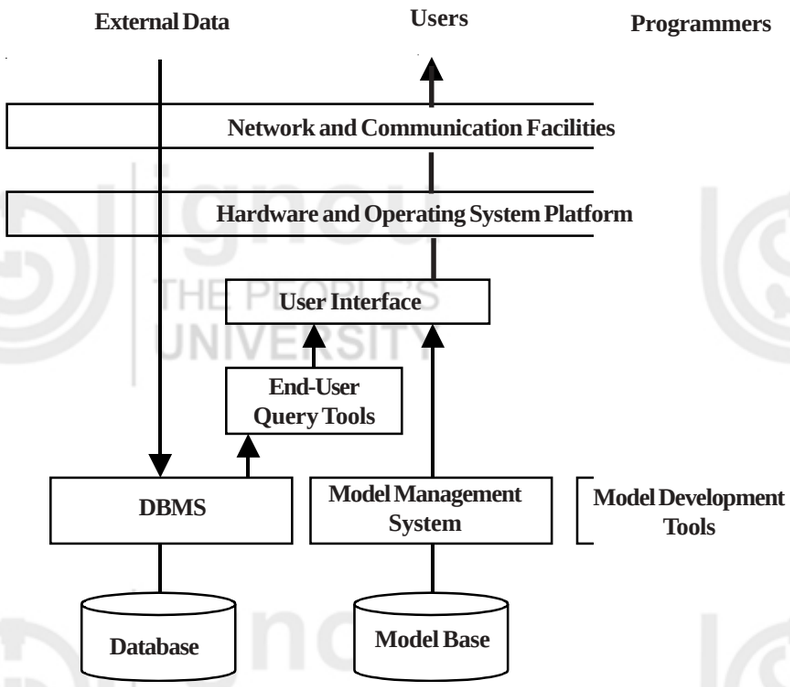

Fig.18.7 : Model DSS Architecture

Source : *Mallach*

Having an exposure to information system architecture, let us see that how a DSS is build in an organization. There are three approaches that are commonly used for development of an information system :

a) The traditional **System Development Life Cycle** (SDLC) approach considers identification of user requirement, analysis of existing system, designing overall system and its designing, development (with simultaneous implementation) and testing. Each of these steps culls a written document, reviewed and approved before starting next step. The basic advantage of this approach is that it covers all the areas and maintains a record of them. On the other hand it is too rigid for a system that is frequently changing or updating.

b) **Prototype Approach** considers user requirement and either applies prototype system design before system design or evolves prototype design after development and exercising a prototype system. In the former style, the implementation of the system design done on the basis of prototype design and development and testing follows whereas in the later approach, while evolving the prototype system or rapid application development all the changing factors are taken care of. The implementation of system is faster in later approach. Both prototype approaches are flexible and responsive to the development process. The drawback in the prototype approach is longer development schedule and possibility of using wrong tool or using the right tool in the wrong way.

c) **End-user Development** approach provides an opportunity for development of DSS by the decision makers themselves. Spreadsheet is a common low-level end-user development tool. The approach provides extensive control of the user on the system including target schedules and problem understanding-solving environment.

The DSS project development is teamwork where each team members has definite role to play. The members of the team are **the users,** responsible for solving the problem that the DSS is to help with**,** the intermediately, who help the users of DSS, **the DSS builder,** who are technical experts and have technical decision making power on the hardware, **the technical support person,** who are programmers integrating existing packages into overall system and do customized programming, and **the toolsmith,** who uses tools to be used in constructing the DSS.

Having had the defined approach and the team in place, who have already completed the tasks of need assessment and software selection, the following step may be useful in building the DSS (Mallach).

a) Obtaining and installing the DSS hardware;

b) Installing the DSS and making it run on intended hardware;

c) Providing user access to the system;

d) Creating and updating the database;

e) Training the user on the new system;

f) Documenting the system for its user and who will responsible for maintaining it in the future;

g) Making arrangements to support the user as the system is being used;

h) Transferring ongoing responsibility for the system from its developers to the operations or maintenance part of the MIS group; and

i) Evaluating the operations and use of the system.

Let us now examine some of the example of DSS that might include :

- scheduling systems, such as:
- staff roistering systems
- room timetabling
- production scheduling
- project scheduling and management
- product costing systems with predictive capabilities
- investment decisions
- strategic planning applications

18.10 SUMMARY

In this unit, we have read about the decision-making process and the support system for management executives and decision makers. The decision support system (DSS) was defined as the system that supports the decision-making and now we know that DSS is a information systems, used by managers in making decisions as support, not to replace, people and used when the decision is semi-structured or unstructured. We also understood that DSS incorporate a database of some sort and also models.

Through this unit, we defined various information systems and also differentiated between DSS, MIS and EIS. We also explored Group DSS and its implications. While building DSS of an organization, we explored the tips for procurement of software for DSS and system architecture.

This unit has broadly exposed the theories and practices of DSS and EIS. It is suggestive to read more materials to get deep information on the subject matters.

18.11 UNIT END EXERCISES

1) Define decision support system in your own words. Exemplify using your organizational context.
2) What are the characteristics of DSS? What are its components?
3) Differentiate between DSS, MIS & EIS with the help of suitable examples.
4) Why is DSS more of a facility than a system?
5) Explain the major functions of DSS and its applications.
6) What is group DSS ? What are the components of group DSS?

18.12 REFERENCES AND SUGGESTED FURTHER READINGS

Adelman, Leonard (1992) *Evaluating Decision Support and Expert Systems, New York :* John Wiley and Sons.

Mallach, Efrem G. (2000) *Decision Support and Data Warehouse System,* New Delhi :Tata Mcgraw Hill.

McGrath, Joesph Edward (1984) *Groups : Interaction and Performance,* New Jersey : Prentice Hall.

Murthy CSR (2002), *Management Information Systems: Text and Applications*, Third Edition, Himalaya Publishing House, Mumbai

Sadgopan S. (1997), *Management Information Systems,* Prentice-Hall if India Private Limited, New Delhi, India

Turban E, McLean E, Wetherbe J, 2004, *Information Technology for Management, 4th Ed*. John Wiley & Sons (Asia) Pte, Ltd., Singapore