Information Systems in Business

BBA 510113: Computer and Information Technology

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Information Systems in Business

Business information systems are sets of inter-related procedures using IT infrastructure in a business enterprise to generate and disseminate desired information.

Such systems are designed to support decision making by the people associated with the enterprise in the process of attainment of its objectives.

The business information system gets data and other resources of IT infrastructure as input from the environment and process them to satisfy the information needs of different entities associated with the business enterprise.

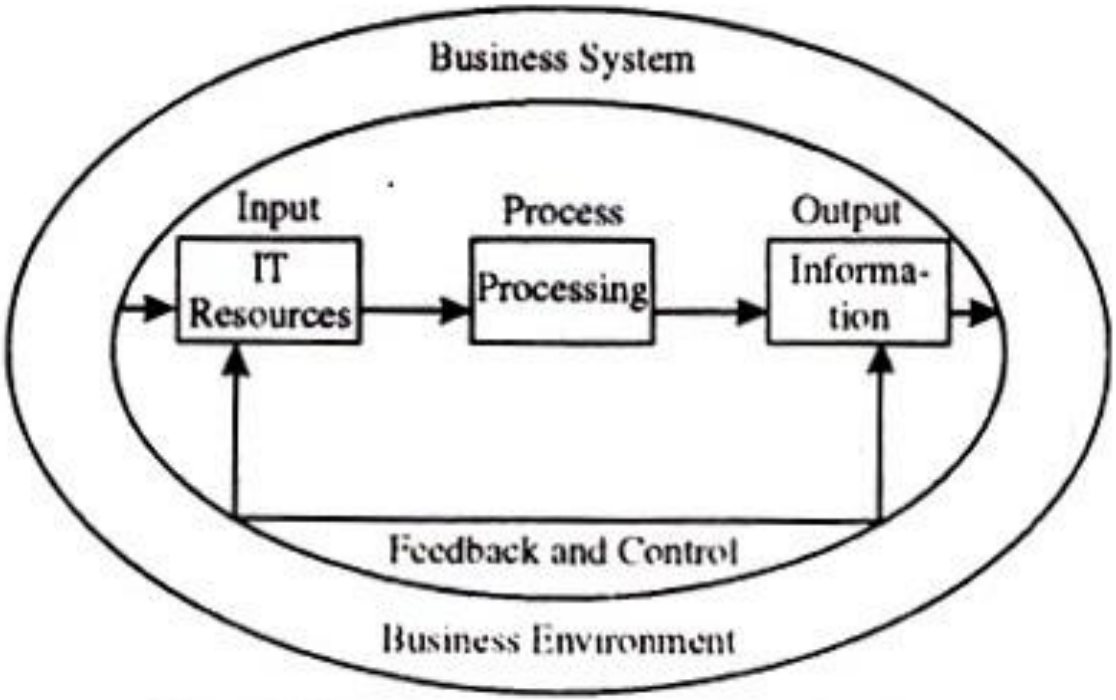
Information Systems in Business

There are systems of control over the use of IT resources and the feedback system offers useful clues for increasing the benefits of information systems to business. The business information systems are sub-systems of business system and by themselves serve the function of feedback and control in business system.

Information systems can be described by four of their key components which are:

- Decisions
- Transactions and processing
- Information and its flow
- Individuals or functions involved

Information Systems in Business



Management Information System

Management Information System or 'MIS' is a planned system of collecting, storing, and disseminating data in the form of information needed to carry out the functions of management.

To the managers, Management Information System is an implementation of the organizational systems and procedures. To a programmer it is nothing but file structures and file processing. However, it involves much more complexity.

Management Information System

The three components of MIS provide a more complete and focused definition, where System suggests integration and holistic view, Information stands for processed data, and Management is the ultimate user, the decision makers.
Management information system can thus be analyzed as follows −

Management

Management covers the planning, control, and administration of the operations of a concern. The top management handles planning; the middle management concentrates on controlling; and the lower management is concerned with actual administration.

Management Information System

Information

Information, in MIS, means the processed data that helps the management in planning, controlling and operations. Data means all the facts arising out of the operations of the concern. Data is processed i.e. recorded, summarized, compared and finally presented to the management in the form of MIS report.

System

Data is processed into information with the help of a system. A system is made up of inputs, processing, output and feedback or control.

Thus MIS means a system for processing data in order to give proper information to the management for performing its functions.

Objectives of MIS

Following are the basic objectives of an MIS −

Capturing Data − Capturing contextual data, or operational information that will contribute in decision making from various internal and external sources of organization.

Processing Data − The captured data is processed into information needed for planning, organizing, coordinating, directing and controlling functionalities at strategic, tactical and operational level. Processing data means −

- making calculations with the data
- sorting data

Objectives of MIS

- classifying data and
- summarizing data

Information Storage − Information or processed data need to be stored for future use.

Information Retrieval − The system should be able to retrieve this information from the storage as and when required by various users.

Information Propagation − Information or the finished product of the MIS should be circulated to its users periodically using the organizational network.

Characteristics of MIS

Following are the characteristics of an MIS −

- It should be based on a long-term planning.
- It should provide a holistic view of the dynamics and the structure of the organization.
- It should work as a complete and comprehensive system covering all interconnecting sub-systems within the organization.
- It should be planned in a top-down way, as the decision makers or the management should actively take part and provide clear direction at the development stage of the MIS.

Characteristics of MIS

- It should be based on need of strategic, operational and tactical information of managers of an organization.
- It should also take care of exceptional situations by reporting such situations.
- It should be able to make forecasts and estimates, and generate advanced information, thus providing a competitive advantage. Decision makers can take actions on the basis of such predictions.
- It should create linkage between all sub-systems within the organization, so that the decision makers can take the right decision based on an integrated view.

Characteristics of MIS

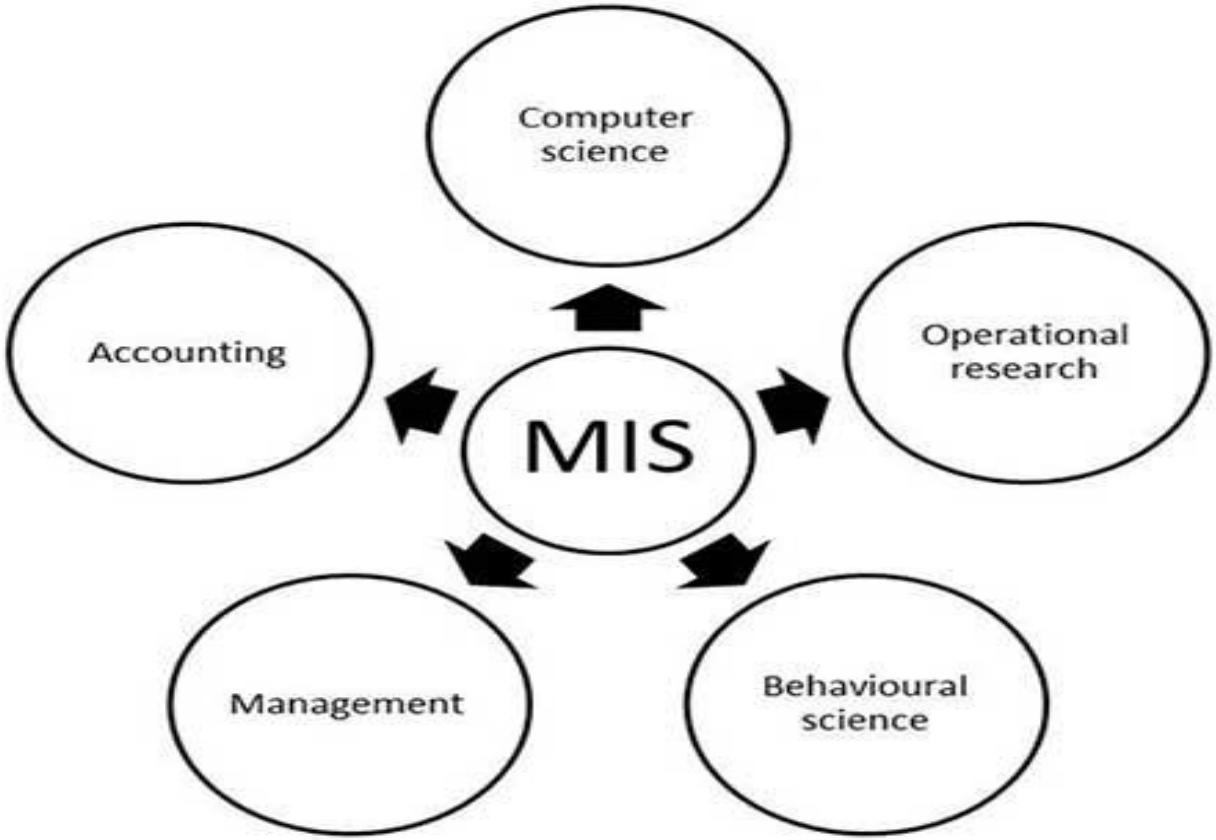
- It should allow easy flow of information through various sub-systems, thus avoiding redundancy and duplicity of data. It should simplify the operations with as much practicability as possible.
- Although the MIS is an integrated, complete system, it should be made in such a flexible way that it could be easily split into smaller sub-systems as and when required.
- A central database is the backbone of a well-built MIS.

Characteristics of Computerized MIS

Following are the characteristics of a well-designed computerized MIS −

- It should be able to process data accurately and with high speed, using various techniques like operations research, simulation, heuristics, etc.
- It should be able to collect, organize, manipulate, and update large amount of raw data of both related and unrelated nature, coming from various internal and external sources at different periods of time.
- It should provide real time information on ongoing events without any delay.
- It should support various output formats and follow latest rules and regulations in practice.
- It should provide organized and relevant information for all levels of management: strategic, operational, and tactical.
- It should aim at extreme flexibility in data storage and retrieval.

MIS Scope


Computer science
Accounting
Operational research
MIS
Management
Behavioural science

Designing MIS

In order to design an effective MIS, it's important to understand the stages MIS system design will go through as it becomes a part of daily business. Information systems usually follow a standardized cycle moving from concept to final product.

- **Planning:** The first step involves preliminary planning, which includes obtaining a full understanding of the gaps the business is looking to fill, evaluation of alternative solutions and the development of a preliminary budget and timeline to allocate resources if and when needed. The planning stage helps the business make its final decision and prepares the company for the upcoming project.

Designing MIS

- **Analysis:** This step analyzes the plan and begins to create a list of specifications and requirements the system will have to meet. Here functions are spelled out, communication protocols are established and a picture can be built of the end product. Often, work moves back and forth between the analysis and planning stages, when the potential system requirements hit a wall with regards to budget or schedule, so that the final picture can be agreed on by everyone.

- **Design:** This is the actual development stage. The team will come together and begin to build the code, databases and functions that will power the MIS as needed and required by the previous stages. This stage also includes extensive testing, first by the development team and then by the real users, to determine whether things are working as expected.

Designing MIS

- **Implementation:** This stage begins with formal testing and troubleshooting of the entire system before the new MIS goes live. Once the system has been accepted, integration into the existing day-to-day workload begins. In larger, more extensive systems, deployment may happen by module or by department; for smaller systems, implementation can go live all at once.

- **Maintenance:** The final stage involves monitoring the system to keep it current and functional. Users will report bugs or problems with the system, which the customer service support team will need to address. This stage should include extensive documentation for future users. It also often includes an evaluation of the workplace before and after, to ensure the system is meeting expectations; ongoing evaluations and new development are necessary to ensure the system does not become obsolete.

Benefits of MIS

- Understanding the need for decision or the opportunity,
- Preparing alternative course of actions,
- Evaluating all alternative course of actions,
- Deciding the right path for implementation.
- Pre-specified and preplanned reporting to managers.
- Interactive and ad-hoc support for decision making.
- Critical information for top management.
- It emphasizes on the management decision making, not only processing of data generated by business operations.
- It emphasizes on the systems framework that should be used for organizing information systems applications.

Inputs to an MIS

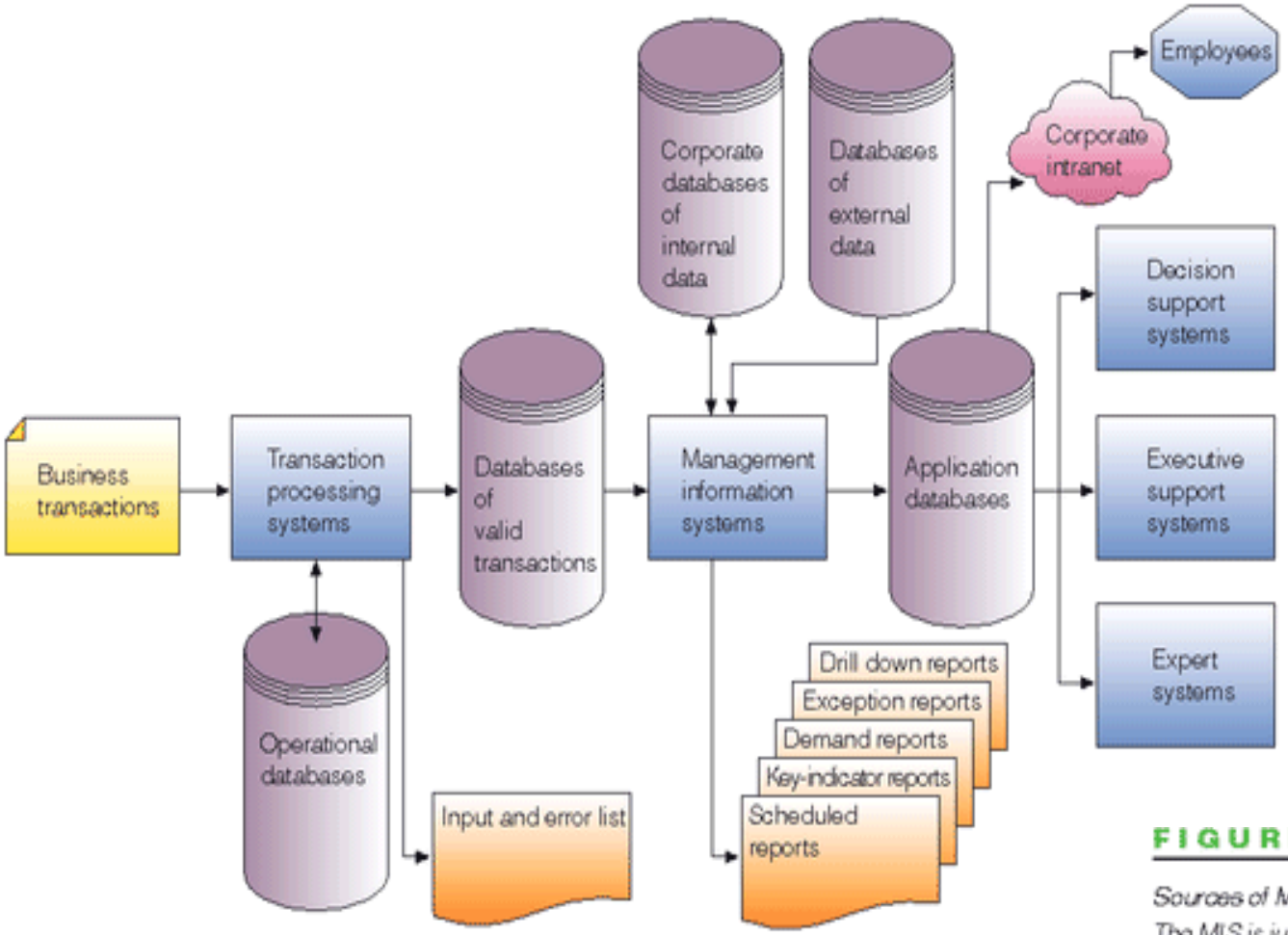


FIGURE 10.3

Sources of Managerial Information

The MIS is just one of many sources of managerial information. Decision support systems, executive support systems, and expert systems also assist in decision making.

Outputs of an MIS

(a) Scheduled Report

Daily Sales Detail Report
Prepared: 08/10/XX

Order #	Customer ID	Salesperson ID	Planned Ship Date	Quantity	Item #	Amount
P12453	C89321	CAR	08/12/01	144	P1234	$3,214
P12453	C89321	CAR	08/12/01	288	P3214	$5,660
P12454	C03214	GWA	08/13/01	12	P4902	$1,224
P12455	C52313	SAK	08/12/01	24	P4012	$2,448
P12456	C34123	JMW	08/13/01	144	P3214	$ 720
.....	.....	.....	.....	.....	.....	.....

(b) Key-Indicator Report

Daily Sales Key Indicator Report

	This Month	Last Month	Last Year
Total Orders Month to Date	$1,808	$1,694	$1,914
Forecasted Sales for the Month	$2,406	$2,224	$2,608

(c) Demand Report

Daily Sales by Salesperson Summary Report
Prepared: 08/10/XX

Salesperson ID	Amount
CAR	$42,345
GWA	$38,950
SAK	$22,100
JWN	$12,350
.....	.....
.....	.....

(d) Exception Report

Daily Sales Exception Report—Orders Over $10,000
Prepared: 08/10/XX

Order #	Customer ID	Salesperson ID	Planned Ship Date	Quantity	Item #	Amount
P12345	C89321	GWA	08/12/01	576	P1234	$12,856
P22153	C00453	CAR	08/12/01	288	P2314	$28,800
P23023	C32832	JMN	08/11/01	144	P2323	$14,400
.....	.....	.....	.....	.....	.....	.....
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FIGURE 10.4

Reports Generated by an MIS

The five types of reports are (a) scheduled, (b) key-indicator, (c) demand, (d) exception, and (e–h) drill down.

(Source: George W. Reynolds, *Information Systems for Managers*, 3rd ed. St. Paul, MN: West Publishing Co., 1995. Reprinted with permission from Course Technology.)

Outputs of an MIS

(e) First-Level Drill Down Report

Earnings by Quarter (Millions)			
	Actual	Forecast	Variance
2nd Qtr. 2002	$12.6	$11.8	6.8%
1st Qtr. 2002	$10.8	$10.7	0.9%
4th Qtr. 2001	$14.3	$14.5	-1.4%
3rd Qtr. 2001	$12.8	$13.3	-3.8%

(f) Second-Level Drill Down Report

Sales and Expenses (Millions)			
Qtr: 2nd Qtr. 2002	Actual	Forecast	Variance
Gross Sales	$110.9	$108.3	2.4%
Expenses	$ 98.3 $	$ 96.5	1.9%
Profit	12.6	$ 11.8	6.8%

(g) Third-Level Drill Down Report

Sales by Division (Millions)			
Qtr: 2nd Qtr. 2002	Actual	Forecast	Variance
Beauty Care	$ 34.5	$ 33.9	1.8%
Health Care	$ 30.0	$ 28.0	7.1%
Soap	$ 22.8	$ 23.0	-0.9%
Snacks	$ 12.1	$ 12.5	-3.2%
Electronics	$ 11.5	$ 10.9	5.5%
Total	$110.9	$108.3	2.4%

(h) Fourth-Level Drill Down Report

Sales by Product Category (Millions)			
Qtr: 2nd Qtr. 2002 Division: Health Care	Actual	Forecast	Variance
Toothpaste	$12.4	$10.5	18.1%
Mouthwash	$ 8.6	$ 8.8	-2.3%
Over-the-Counter Drugs	$ 5.8	$ 5.3	9.4%
Skin Care Products	$ 3.2	$ 3.4	-5.9%
Total	$30.0	$28.0	7.1%

FIGURE 10.4 *(cont.)*

Reports Generated by an MIS

The five types of reports are (a) scheduled, (b) key-indicator, (c) demand, (d) exception, and (e–h) drill down.

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Functional Aspects of an MIS

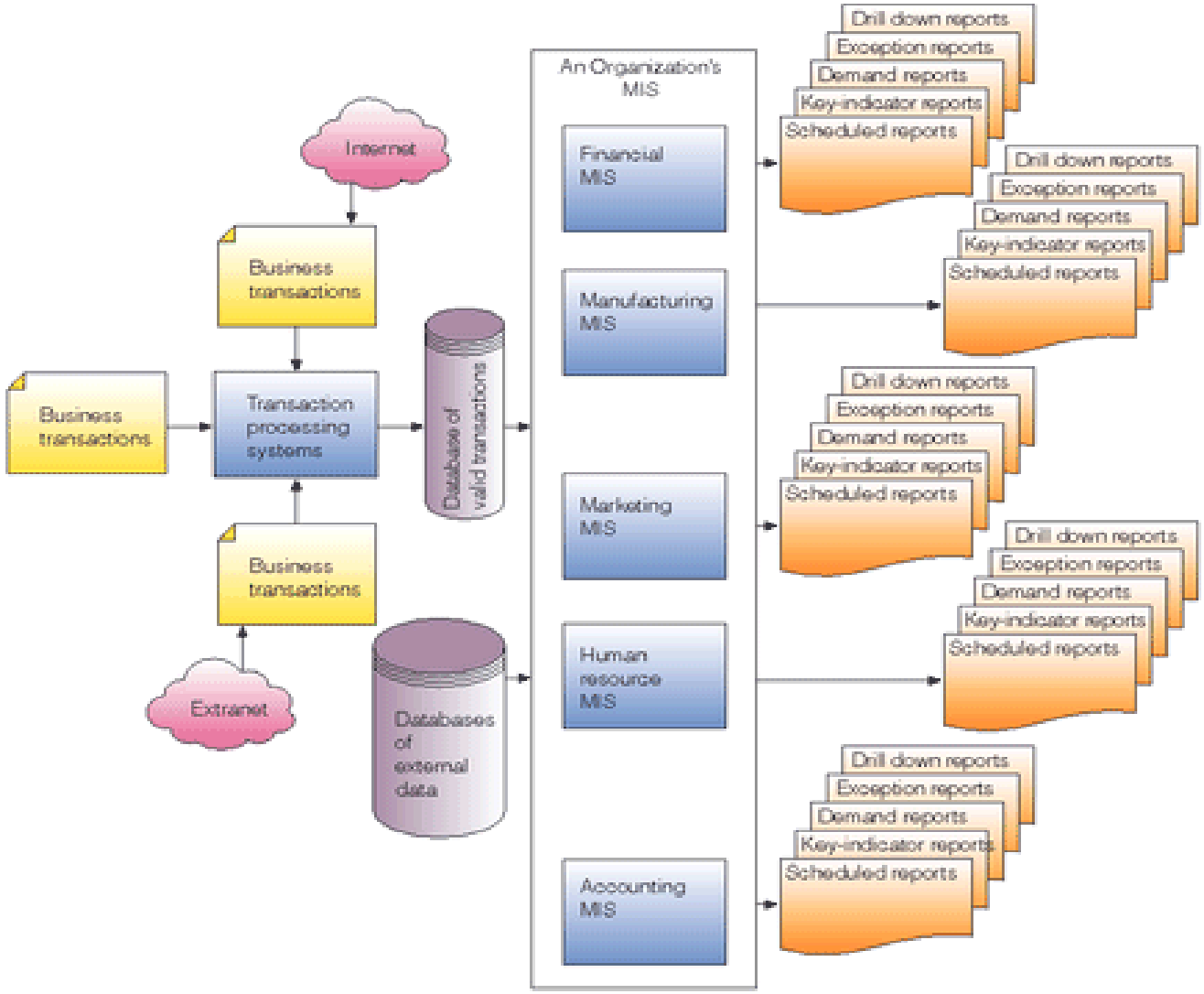

FIGURE 10.5

The MIS is an integrated collection of functional information systems, each supporting particular functional areas.

Decision Support Systems

Decision support systems (DSS) are interactive software-based systems intended to help managers in decision-making by accessing large volumes of information generated from various related information systems involved in organizational business processes, such as office automation system, transaction processing system, etc.

DSS uses the summary information, exceptions, patterns, and trends using the analytical models. A decision support system helps in decision-making but does not necessarily give a decision itself. The decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

Decision Support Systems

There are two types of decisions - programmed and non-programmed decisions.

Programmed decisions are basically automated processes, general routine work, where −

- These decisions have been taken several times.
- These decisions follow some guidelines or rules.

For example, selecting a reorder level for inventories, is a programmed decision.

Decision Support Systems

Non-programmed decisions occur in unusual and non-addressed situations, so −

- It would be a new decision.
- There will not be any rules to follow.
- These decisions are made based on the available information.

These decisions are based on the manger's discretion, instinct, perception and judgment.

For example, investing in a new technology is a non-programmed decision.

Attributes of a DSS

- Adaptability and flexibility
- High level of Interactivity
- Ease of use
- Efficiency and effectiveness
- Complete control by decision-makers
- Ease of development
- Extendibility
- Support for modeling and analysis
- Support for data access
- Standalone, integrated, and Web-based

Characteristics of a DSS

- Support for decision-makers in semi-structured and unstructured problems.
- Support for managers at various managerial levels, ranging from top executive to line managers.
- Support for individuals and groups. Less structured problems often requires the involvement of several individuals from different departments and organization level.
- Support for interdependent or sequential decisions.
- Support for intelligence, design, choice, and implementation.
- Support for variety of decision processes and styles.
- DSSs are adaptive over time.

Benefits of DSS

- Improves efficiency and speed of decision-making activities.
- Increases the control, competitiveness and capability of futuristic decision-making of the organization.
- Facilitates interpersonal communication.
- Encourages learning or training.
- Since it is mostly used in non-programmed decisions, it reveals new approaches and sets up new evidences for an unusual decision.
- Helps automate managerial processes.

Components of a DSS

Following are the components of the Decision Support System −

- **Database Management System (DBMS)** − To solve a problem the necessary data may come from internal or external database. In an organization, internal data are generated by a system such as TPS and MIS. External data come from a variety of sources such as newspapers, online data services, databases (financial, marketing, human resources).

Components of a DSS

- **Model Management System** – It stores and accesses models that managers use to make decisions. Such models are used for designing manufacturing facility, analyzing the financial health of an organization, forecasting demand of a product or service, etc.
- **Support Tools** – Support tools like online help; pulls down menus, user interfaces, graphical analysis, error correction mechanism, facilitates the user interactions with the system.

Types of DSS

Following are some typical DSSs −

- **Status Inquiry System** − It helps in taking operational, management level, or middle level management decisions, for example daily schedules of jobs to machines or machines to operators.
- **Data Analysis System** − It needs comparative analysis and makes use of formula or an algorithm, for example cash flow analysis, inventory analysis etc.
- **Information Analysis System** − In this system data is analyzed and the information report is generated. For example, sales analysis, accounts receivable systems, market analysis etc.

Types of DSS

- **Accounting System** – It keeps track of accounting and finance related information, for example, final account, accounts receivables, accounts payables, etc. that keep track of the major aspects of the business.
- **Model Based System** – Simulation models or optimization models used for decision-making are used infrequently and creates general guidelines for operation or management.

Group Decision Support System(GDSS)

A group decision support system (GDSS) is an interactive computer-based system that facilitates a number of decision-makers (working together in a group) in finding solutions to problems that are unstructured in nature. They are designed in such a way that they take input from multiple users interacting simultaneously with the systems to arrive at a decision as a group.

The tools and techniques provided by the group decision support system improve the quality and effectiveness of the group meetings.

Group Decision Support System(GDSS)

Groupware and web-based tools for electronic meetings and videoconferencing also support some of the group decision making processes, but their main function is to make communication possible between the decision-makers.

In a group decision support system (GDSS) electronic meeting, each participant is provided with a computer. The computers are connected to each other, to the facilitator's computer and to the file server. A projection screen is available at the front of the room. The facilitator and the participants can both project digital text and images onto this screen.

Group Decision Support System(GDSS)

A group decision support system (GDSS) meeting comprises different phases, such as idea generation, discussion, voting, vote counting and so on. The facilitator manages and controls the execution of these phases. The use of various software tools in the meeting is also controlled by the facilitator.

Characteristics of a GDSS

A GDSS has a number of unique characteristics to support a group of participants in their decision-making process:

- Special design to support creative thinking, effective communications and decision-making techniques
- Easy to use so participants from different backgrounds can all participate effectively
- Flexible so it can incorporate the different perspectives and decision-making styles of the different participants
- Automated record keeping for future review and analysis
- Parallel communication to allow multiple participants to contribute simultaneously

THANKS…