UNIT I

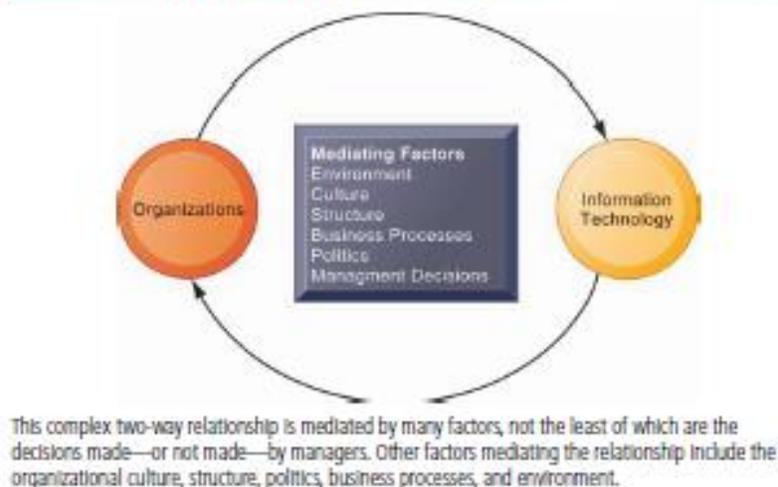--

ORGANIZATIONS AND INFORMATION SYSTEMS

Information systems and organizations influence one another. Information systems are built by managers to serve the interests of the business firm. At the same time, the organization must be aware of and open to the influences of information systems to benefit from new technologies. The interaction between information technology and organizations is complex and is influenced by many mediating factors, including the organization's structure, business processes, politics, culture, surrounding environment, and management decisions (see Figure3.1). You will need to understand how information systems can change social and work life in your firm. You will not be able to design new systems successfully or understand existing systems without understanding your own business organization.

FIGURE 3.1 THE TWO-WAY RELATIONSHIP BETWEEN ORGANIZATIONS AND INFORMATION TECHNOLOGY

This complex two-way relationship is mediated by many factors, not the least of which are the decisions made—or not made—by managers. Other factors mediating the relationship include the organizational culture, structure, politics, business processes, and environment.

As a manager, you will be the one to decide which systems will be built, what they will do, and how they will be implemented. You may not be able to anticipate all of the consequences of these decisions. Some of the changes that occur in business firms because of new information technology (IT) investments cannot be foreseen and have results that may or may not meet your expectations. Who would have imagined fifteen years ago, for instance, that e-mail and instant messaging would become a dominant form of business communication and that many managers would be inundated with more than 200 e-mail messages each day?

What is an organization?

An organization is a stable, formal social structure that takes resources from the environment and processes them to produce outputs. This technical definition focuses on three elements of an organization. Capital and labor are primary production factors provided by the environment. The organization (the firm) transforms these inputs into products and services in a production function. The products and services are consumed by environments in return for supply inputs (see Figure 3.2).
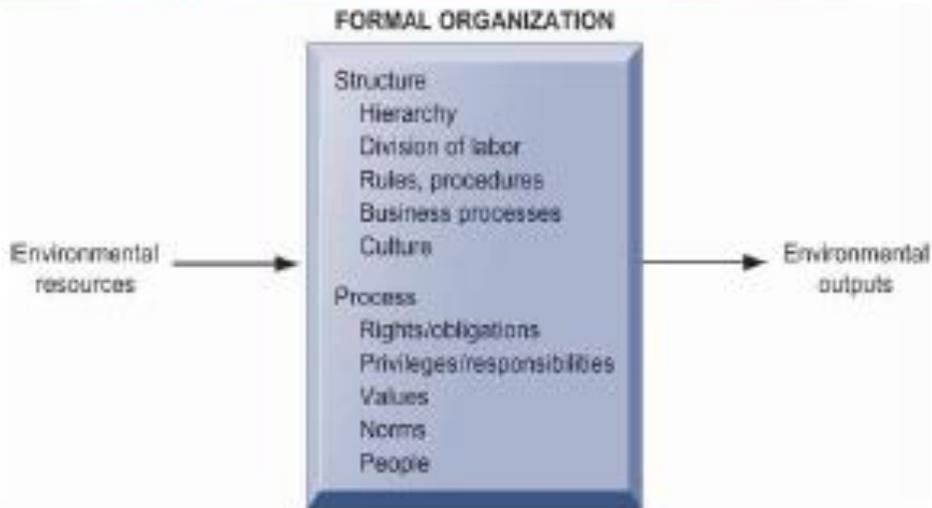
FIGURE 3.2   THE TECHNICAL MICROECONOMIC DEFINITION OF THE ORGANIZATION
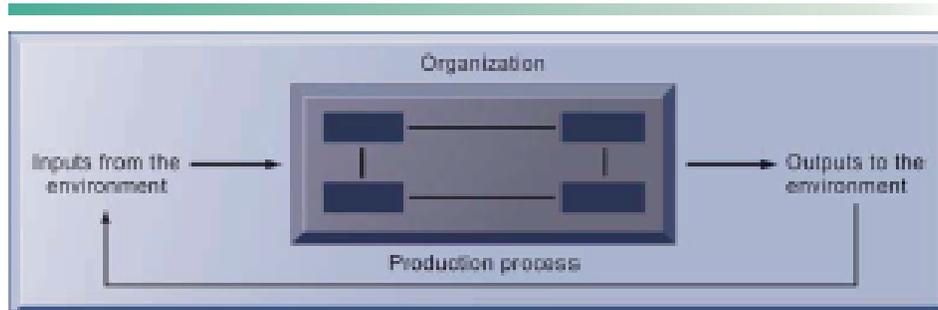
In the microeconomic definition of organizations, capital and labor (the primary production factors provided by the environment) are transformed by the firm through the production process into products and services (outputs to the environment). The products and services are consumed by the environment, which supplies additional capital and labor as inputs in the feedback loop.

An organization is more stable than an informal group (such as a group of friends that meets every Friday for lunch) in terms of longevity and routineness. Organizations are formal legal entities with internal rules and procedures that must abide by laws. Organizations are also social structures because they are a collection of social elements, much as a machine has a structure—a particular arrangement of valves, cams, shafts, and other parts. This definition of organizations is powerful and simple, but it is not very descriptive or even predictive of real-world organizations. A more realistic behavioral definition of an organization is a collection of rights, privileges, obligations, and responsibilities delicately balanced over a period of time through conflict and conflict resolution (see Figure 3.3). In this behavioral view of the firm, people who work in organizations develop customary ways of working; they gain attachments to existing relationships; and they make arrangements with subordinates and superiors about how work will be done, the amount of work that will be done, and under what conditions work will be done. Most of these arrangements and feelings are not discussed in any formal rulebook.

FIGURE 3.3   THE BEHAVIORAL VIEW OF ORGANIZATIONS

FORMAL ORGANIZATION

Structure
  Hierarchy
  Division of labor
  Rules, procedures
  Business processes
  Culture

Process
  Rights/obligations
  Privileges/responsibilities
  Values
  Norms
  People

Environmental resources →

→ Environmental outputs

The behavioral view of organizations emphasizes group relationships, values, and structures.

How do these definitions of organizations relate to information systems technology? A technical view of organizations encourages us to focus on how inputs are combined to create outputs when technology changes are introduced into the company. The firm is seen as infinitely malleable, with capital and labor substituting for each other quite easily. But the more realistic behavioral definition of an organization suggests that building new information systems, or rebuilding old ones, involves much more than a technical rearrangement of machines or workers—that some information systems change the organizational balance of rights, privileges, obligations, responsibilities, and feelings that have been established over a long period of time. Changing these elements can take a long time, be very disruptive, and requires more resources to support training and learning. For instance, the length of time required to implement a new information system effectively is much longer than usually anticipated simply because there is a lag between implementing a technical system and teaching employees and managers how to use the system. Technological change requires changes in who owns and controls information, who has the right to access and update that information, and who makes decisions about whom, when, and how. This more complex view forces us to look at the way work is designed and the procedures used to achieve outputs. The technical and behavioral definitions of organizations are not contradictory. Indeed, they complement each other: The technical definition tells us how thousands of firms in competitive markets combine capital, labor, and information technology, whereas the behavioral model takes us inside the individual firm to see how that technology affects the organization's inner workings.

Organizational Structure

All organizations have a structure or shape. Mintzberg's classification, described in Table 3.2, identifies five basic kinds of organizational structure (Mintzberg, 1979). The kind of information systems you find in a business firm—and the nature of problems with these systems—often reflects the type of organizational structure. For instance, in a professional bureaucracy such as a hospital, it is not unusual to find parallel patient record systems operated by the administration, another by doctors, and another by other professional staff such as nurses and social workers. In small entrepreneurial firms, you will often find poorly designed systems developed in a rush that often quickly outgrow their usefulness. In huge multidivisional firms operating in hundreds of locations, you will often find there is not a single integrating information system, but instead each locale or each division has its set of information systems.

TABLE 3.2 ORGANIZATIONAL STRUCTURES

ORGANIZATIONAL TYPE	DESCRIPTION	EXAMPLES
Entrepreneurial structure	Young, small firm in a fast-changing environment. It has a simple structure and is managed by an entrepreneur serving as its single chief executive officer.	Small start-up business
Machine bureaucracy	Large bureaucracy existing in a slowly changing environment, producing standard products. It is dominated by a centralized management team and centralized decision making.	Midsize manufacturing firm
Divisionalized bureaucracy	Combination of multiple machine bureaucracies, each producing a different product or service, all topped by one central headquarters.	Fortune 500 firms, such as General Motors
Professional bureaucracy	Knowledge-based organization where goods and services depend on the expertise and knowledge of professionals. Dominated by department heads with weak centralized authority.	Law firms, school systems, hospitals
Adhocracy	Task force organization that must respond to rapidly changing environments. Consists of large groups of specialists organized into short-lived multidisciplinary teams and has weak central management.	Consulting firms, such as the Rand Corporation

FUNCTIONS OF THE MANAGER

An individual who gets the thing done is a Manager. It is necessary to distinguish between the task and the functions. While manager may perform the task such as accounting, selling, manufacturing, purchasing, etc. These activities are called as tasks and not as functions. The activities that are performed through the managerial functions are planning, organization, staffing, directing coordinating and controlling.

Planning is a process of determining the goals and objectives and evolving strategies policies, programmers and procedures for the achievement of these goals. The essence of the process is decision making as there are a number of alternatives in each of these factors.

 Organization involves evolving the structure of the people working in the organization and their roles. It specifies an authority structure and assigns activities to the people backed by the delegation of authority. Building a meaningful effective structure of authority and the relationship is known as organizing.

 Staffing involves manning the positions in the organization structure. It requires defining the manpower needs per position or Centre of activity. It requires appropriate selection of the person or persons ensuring that they together will achieve the goals and objectives of the organization.

 Directing is a complex task of implementing the process of management. In the process, the manager is required to guide, clarify and solve the problems of the people and their activities. It is necessary to motivate the people to work for the goal with an interest and a confidence.

 Coordinating is the function which brings a harmony and smoothness in the various group activities and individual efforts directed towards the accomplishment of goals. It is a process of synchronizing individual actions and the efforts which may differ because of the differences in the personal goals and the common goals, the differences in the interpretation of methods and directions. It is, therefore, necessary to undertake centrally a process of coordinating and reconciling the differences in the approach, timing, efforts and interests towards a common goal. This task is to be carried out by the authority placed at a higher level in the organization structure.

 Controlling is a process of measurement of an output, comparing it with the goals, the objectives and the target, and taking corrective actions, if the output is falling short of the stated norms. Controlling ensures an achievement of the plan. The essence of the control lies in good planning. It helps to evaluate the performance, highlights abnormal deviations, and guides a manager to take specific corrective actions. This may call for a change of plan, a reallocation of resources, a modification of methods, procedures and even the organization structure. The control is central to the managerial function. The manager's main function,

therefore, is planning and control of the business functions and operations. While performing these functions, he resorts to the scientific approach to the management.

DEFINITION OF INFORMATION:

Information can be defined as meaningfully interpreted data. If we give you a number 1-212-290-4700, it does not make any sense on its own. It is just a raw data. However if we say Tel: +1-212-290-4700, it starts making sense. It becomes a telephone number. If I gather some more data and record it meaningfully like:

```
Address: 350 Fifth Avenue, 34th floor
New York, NY 10118-3299 USA
Tel: +1-212-290-4700
Fax: +1-212-736-1300
```

It becomes a very useful information - the address of New York office of Human Rights Watch, a non-profit, non-governmental human rights organization.

So, from a system analyst's point of view, information is a sequence of symbols that can be construed to a useful message.

An *Information System* is a system that gathers data and disseminates information with the sole purpose of providing information to its users.

The main object of an information system is to provide information to its users. Information systems vary according to the type of users who use the system.

A *Management Information System* is an information system that evaluates, analyzes, and processes an organization's data to produce meaningful and useful information based on which the management can take right decisions to ensure future growth of the organization.

According to Wikipedia:

"Information can be recorded as signs, or transmitted as signals. Information is any kind of event that affects the state of a dynamic system that can interpret the information.

Conceptually, information is the message (utterance or expression) being conveyed. Therefore, in a general sense, information is "Knowledge

communicated or received, concerning a particular fact or circumstance". Information cannot be predicted and resolves uncertainty."

Information Vs. Data

Data can be described as unprocessed facts and figures. Plain collected data as raw facts cannot help in decision-making. However, data is the raw material that is organized, structured, and interpreted to create useful information systems.

Data is defined as 'groups of non-random symbols in the form of text, images, voice representing quantities, action and objects'.

Information is interpreted data; created from organized, structured, and processed data in a particular context.

*According to **Davis and Olson**:*

"Information is a data that has been processed into a form that is meaningful to recipient and is of real or perceived value in the current or the prospective action or decision of recipient."

Information, Knowledge and Business Intelligence

Professor Ray R. Larson of the School of Information at the University of California, Berkeley, provides an *Information Hierarchy*, which is:

- Data - The raw material of information.

- Information - Data organized and presented by someone.

- Knowledge - Information read, heard, or seen, and understood.

- Wisdom - Distilled and integrated knowledge and understanding.

Scott Andrews' explains *Information Continuum* as follows:

- Data - A Fact or a piece of information, or a series thereof.

- Information - Knowledge discerned from data.

- Business Intelligence - Information Management pertaining to an organization's policy or decision-making, particularly when tied to strategic or operational objectives.

Information/Data Collection Techniques
The most popular data collection techniques include:

- Surveys: A questionnaires is prepared to collect the data from the field.

- Secondary data sources or archival data: Data is collected through old records, magazines, company website etc.

- Objective measures or tests: An experimental test is conducted on the subject and the data is collected.

- Interviews: Data is collected by the system analyst by following a rigid procedure and collecting the answers to a set of pre-conceived questions through personal interviews

Classification of Information

Information can be classified in a number of ways and in this chapter, you will learn two of the most important ways to classify information.
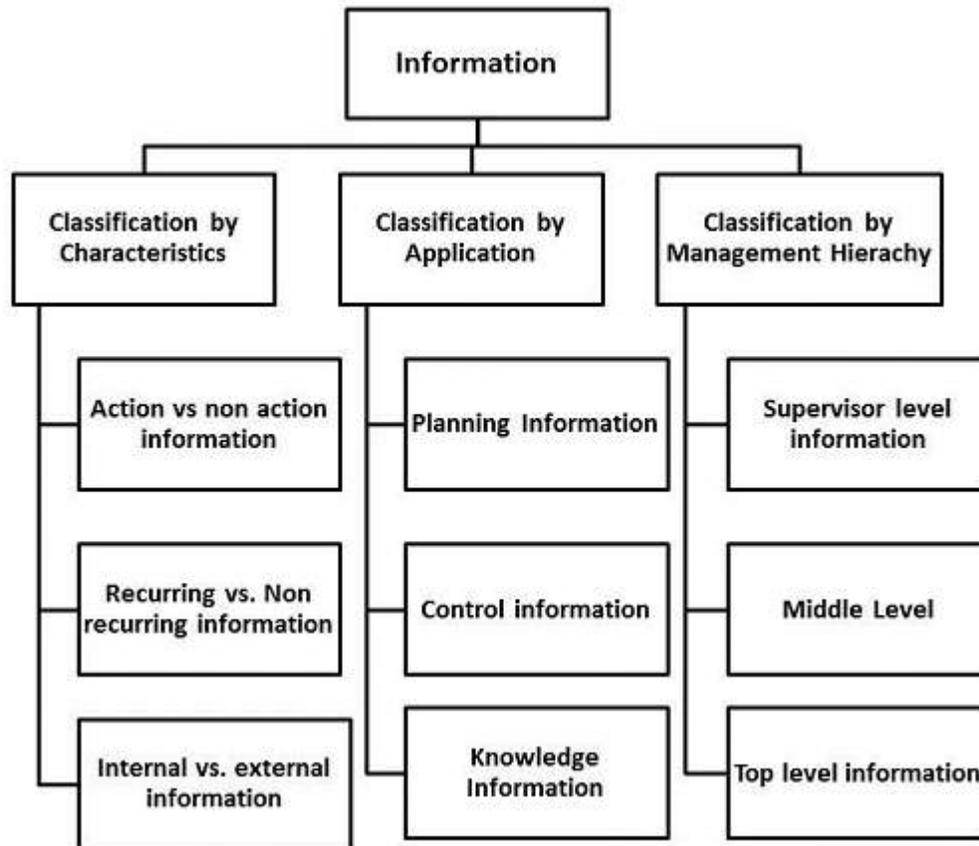
Classification by Characteristic

Based on Anthony's classification of Management, information used in business for decision-making is generally categorized into three types:

- **Strategic Information:** Strategic information is concerned with long term policy decisions that defines the objectives of a business and checks how well these objectives are met. For example, acquiring a new plant, a new product, diversification of business etc., comes under strategic information.

- **Tactical Information:** Tactical information is concerned with the information needed for exercising control over business resources, like budgeting, quality control, service level, inventory level, productivity level etc.

- **Operational Information:** Operational information is concerned with plant/business level information and is used to ensure proper conduction of specific operational tasks as planned/intended. Various operator specific, machine specific and shift specific jobs for quality control checks comes under this category.

Classification by Application

In terms of applications, information can be categorized as:

- **Planning Information:** These are the information needed for establishing standard norms and specifications in an organization. This information is used in strategic, tactical, and operation planning of any activity. Examples of such information are time standards, design standards.

- **Control Information:** This information is needed for establishing control over all business activities through feedback mechanism. This information is used for controlling attainment, nature and utilization of important processes in a system. When such information reflects a deviation from the established standards, the system should induce a decision or an action leading to control.

- **Knowledge Information:** Knowledge is defined as "information about information". Knowledge information is acquired through experience and learning, and collected from archival data and research studies.

- **Organizational Information:** Organizational information deals with an organization's environment, culture in the light of its objectives. Karl Weick's Organizational Information Theory emphasizes that an organization reduces its equivocality or uncertainty by collecting, managing and using these information prudently. This information is used by everybody in the organization; examples of such information are employee and payroll information.

- **Functional/Operational Information:** This is operation specific information. For example, daily schedules in a manufacturing plant that refers to the detailed assignment of jobs to machines or machines to operators. In a service oriented business, it would be the duty roster of various personnel. This information is mostly internal to the organization.

- **Database Information:** Database information construes large quantities of information that has multiple usage and application. Such information is stored, retrieved and managed to create databases. For example, material specification or supplier information is stored for multiple users.

Information is a vital resource for the success of any organization. Future of an organization lies in using and disseminating information wisely. Good quality information placed in right context in right time tells us about opportunities and problems well in advance.

Good quality information: Quality is a value that would vary according to the users and uses of the information.

According to Wang and Strong, following are the dimensions or elements of Information Quality:

- **Intrinsic:** Accuracy, Objectivity, Believability, Reputation

- **Contextual:** Relevancy, Value-Added, Timeliness, Completeness, Amount of information

- **Representational:** Interpretability, Format, Coherence, Compatibility

- **Accessibility:** Accessibility, Access security

Various authors propose various lists of metrics for assessing the quality of information. Let us generate a list of the most essential characteristic features for information quality:

- **Reliability -** It should be verifiable and dependable.

- **Timely -** It must be current and it must reach the users well in time, so that important decisions can be made in time.

- **Relevant -** It should be current and valid information and it should reduce uncertainties.

- **Accurate -** It should be free of errors and mistakes, true, and not deceptive.

- **Sufficient -** It should be adequate in quantity, so that decisions can be made on its basis.

- **Unambiguous -** It should be expressed in clear terms. In other words, in should be comprehensive.

- **Complete -** It should meet all the needs in the current context.

- **Unbiased -** It should be impartial, free from any bias. In other words, it should have integrity.

- **Explicit -** It should not need any further explanation.

- **Comparable -** It should be of uniform collection, analysis, content, and format.

- **Reproducible -** It could be used by documented methods on the same data set to achieve a consistent result.

Information processing beyond doubt is the dominant industry of the present century. Following factors states few common factors that reflect on the needs and objectives of the information processing:

- Increasing impact of information processing for organizational decision making.

- Dependency of services sector including banking, financial organization, health care, entertainment, tourism and travel, education and numerous others on information.

- Changing employment scene world over, shifting base from manual agricultural to machine-based manufacturing and other industry related jobs.

- Information revolution and the overall development scenario.

- Growth of IT industry and its strategic importance.

- Strong growth of information services fuelled by increasing competition and reduced product life cycle.

- Need for sustainable development and quality life.

- Improvement in communication and transportation brought in by use of information processing.

- Use of information processing in reduction of energy consumption, reduction in pollution and a better ecological balance in future.

- Use of information processing in land record managements, legal delivery system, educational institutions, natural resource planning, customer relation management and so on.

In a nutshell:

- Information is needed to survive in the modern competitive world.

- Information is needed to create strong information systems and keep these systems up to date.

Implications of Information in Business

Information processing has transformed our society in numerous ways. From a business perspective, there has been a huge shift towards increasingly automated business processes and communication. Access to information and capability of information processing has helped in achieving greater efficiency in accounting and other business processes.

A complete business information system, accomplishes the following functionalities:

- Collection and storage of data.

- Transform these data into business information useful for decision making.

- Provide controls to safeguard data.

- Automate and streamline reporting.

The following list summarizes the five main uses of information by businesses and other organizations:

- **Planning** - At the planning stage, information is the most important ingredient in decision making. Information at planning stage includes that of business resources, assets, liabilities, plants and machineries, properties, suppliers, customers, competitors, market and market dynamics, fiscal policy changes of the Government, emerging technologies, etc.

- **Recording** - Business processing these days involves recording information about each transaction or event. This information collected, stored and updated regularly at the operational level.

- **Controlling** - A business need to set up an information filter, so that only filtered data is presented to the middle and top management. This ensures efficiency at the operational level and effectiveness at the tactical and strategic level.

- **Measuring** - A business measures its performance metrics by collecting and analyzing sales data, cost of manufacturing, and profit earned.

- **Decision-making** - MIS is primarily concerned with managerial decision-making, theory of organizational behavior, and underlying human behavior in organizational context. Decision-making information includes the socio-economic impact of competition, globalization, democratization, and the effects of all these factors on an organizational structure.

In short, this multi-dimensional information evolves from the following logical foundations:

- Operations research and management science

- Theory of organizational behavior

- Computer science:

    o Data and file structure

    o Data theory design and implementation

- o Computer networking

- o Expert systems and artificial intelligence

- Information theory

Following factors arising as an outcome of information processing help speed up of business events and achieves greater efficiency:

- Directly and immediate linkage to the system

- Faster communication of an order

- Electronic transfer of funds for faster payment

- Electronically solicited pricing (helps in determining the best price)

MIS Need for Information Systems

Managers make decisions. Decision-making generally takes a four-fold path:

- 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.

Transaction Process System (TPS)

A transaction process system (TPS) is an information processing system for business transactions involving the collection, modification and retrieval of all transaction data. Characteristics of a TPS include performance, reliability and consistency. TPS is also known as transaction processing or real-time processing.

A transaction process system and transaction processing are often contrasted with a batch process system and batch processing, where many requests are executed all at one time. The former requires the interaction of a user, whereas batch processing does not require a user to be present. Also, in batch processing the results of each transaction are not immediately available. Additionally, there is a delay while the many requests are being organized, stored and eventually executed. In transaction processing there is no delay and the results of each transaction are immediately

available. During the delay time for batch processing, errors can occur. Although errors can occur in transaction processing, they are infrequent and tolerated, but do not warrant shutting down the entire system.

To achieve performance, reliability and consistency, data must be readily accessible in a data warehouse, backup procedures must be in place and the recovery process must be in place to deal with system failure, human failure, computer viruses, software applications or natural disasters.

Examples of transaction processing systems include payroll, order processing, reservations, employee records, accounts payable and accounts receivable. These systems collect and store data about transactions, which are activities that change stored data. For example, using a credit card, reserving a flight and ordering products from a catalog are transactions
An order processing system is a common type of TPS that organizations use to conduct business. When a company receives an order for a product, a TPS checks inventory to determine whether the product is in stock. If it is, the TPS alerts employees to retrieve the product from the warehouse, create and print an invoice and then ship the product.

A TPS can process transactions in two ways: batch and real time. With batch transaction processing, the system gathers transactions over a period of time and processes them all at once. For example, a payroll TPS gathers employees' hours for two weeks and then processes all the hours in one batch to calculate paycheck amounts. In contrast, with real-time processing, the system processes a transaction immediately. For example, when a traveler reserves a seat on a flight, a TPS uses real-time processing to reserve the seat immediately so that no one else can select it.

Management Information System

MIS is an information system that provides information in the form of standardized reports and displays for the managers. MIS is a broad class of information systems designed to provide information needed for effective decision making.

Data and information created from an accounting information system and the reports generated thereon are used to provide accurate, timely and relevant information needed for effective decision making by managers.

Management information systems provide information to support management decision making, with the following goals:

- Pre-specified and preplanned reporting to managers.

- Interactive and ad-hoc support for decision making.

- Critical information for top management.

MIS is of vital importance to any organization, because:

- 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.

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.

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.

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.

Definition

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.

Objectives of MIS

The goals of an MIS are to implement the organizational structure and dynamics of the enterprise for the purpose of managing the organization in a better way and capturing the potential of the information system for competitive advantage.

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

    - 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.

- 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.

- 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.

Nature and Scope of MIS

- The following diagram shows the nature and scope of MIS:
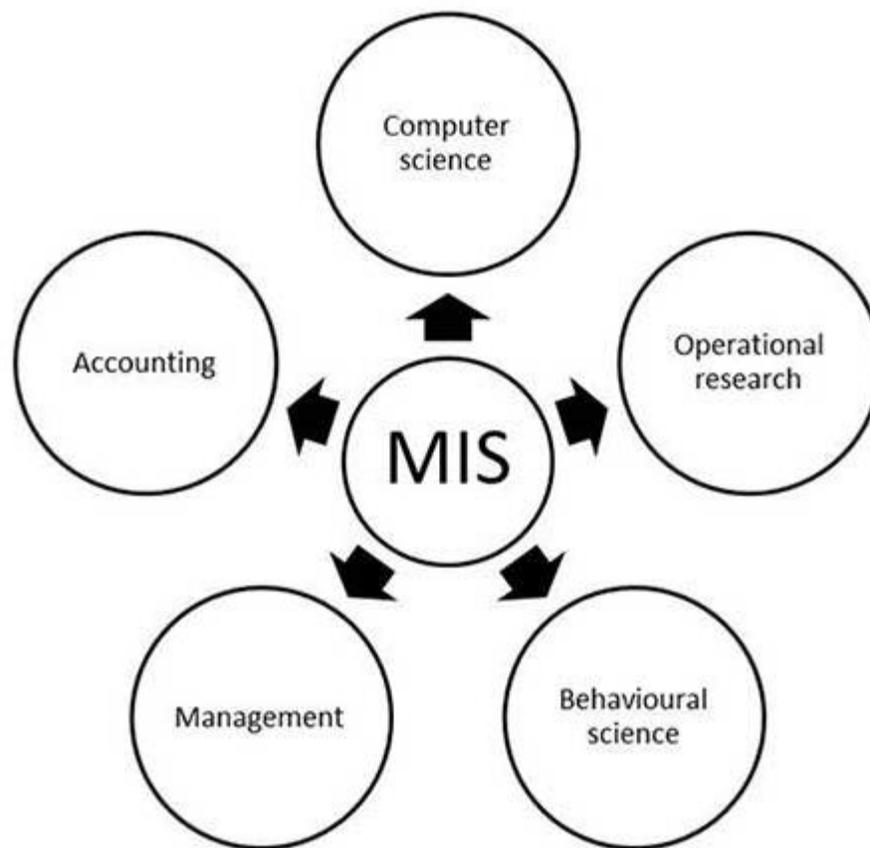
Decision Support System

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.

Programmed and Non-programmed Decisions

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.

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. Decision support systems generally involve non-programmed decisions. Therefore, there will be no exact report, content, or format for these systems. Reports are generated on the fly.

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).

- **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.

Classification of DSS

There are several ways to classify DSS. Hoi Apple and Whinstone classifies DSS as follows:

- **Text Oriented DSS:** It contains textually represented information that could have a bearing on decision. It allows documents to be electronically created, revised and viewed as needed.

- **Database Oriented DSS:** Database plays a major role here; it contains organized and highly structured data.

- **Spreadsheet Oriented DSS:** It contains information in spread sheets that allows create, view, modify procedural knowledge and also instructs the system to execute self-contained instructions. The most popular tool is Excel and Lotus 1-2-3.

- **Solver Oriented DSS:** It is based on a solver, which is an algorithm or procedure written for performing certain calculations and particular program type.

- **Rules Oriented DSS:** It follows certain procedures adopted as rules.

- **Rules Oriented DSS:** Procedures are adopted in rules oriented DSS. Export system is the example.

- **Compound DSS:** It is built by using two or more of the five structures explained above.

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.

- **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 helps a team of decision-makers solve problems and make choices. GDSS are targeted to supporting groups in analyzing problem situations and in performing group decision-making tasks (cf., DeSanctis and Gallupe, 1987; Huber, 1984). The name is very descriptive. A GDSS is a hybrid system that uses an elaborate communications infrastructure and heuristic and quantitative models to support decision-making.

The Decision Support System has been designed in such a way that it can be used conveniently by the individual decision maker but the decision makers need to work in groups. So this Decision Support System does not suit such a process which has given way for the development of the group Decision Support System, which provides with the following advantages over the Decision Support System

1. Better comprehensive consideration of the problems and the various relating issues.
2. Better group understanding of the problem.
3. Less likelihood of quibbling with the help of the 20/20 hindsight.
4. Better group commitment to the decision.
5. Better communication to/with the implementers.

Group Decision Support System according to De Sanctis and Gallupe is "an interactive computer based system, which helps in solving the various un-structured problems with the help of the decision makers working in the groups.

Features of the Group Decision Support System

1. Very much similar to the Decision Support System.
2. Is a group decision facilitator.
3. Extension or expansion of the Decision Support System.
4. Helps in concentrating on the merits of the input without considering about the fact that who gave it.
5. Enables every group member to address the issues.
6. Automated record keeping plays a critical support for the future review and the analysis.

Group Decision Support System success depends on the following factors

1. Improved pre planning.
2. Increased participation.
3. Open, collaborative meeting atmosphere.
4. Criticism free idea generation.
5. Idea organization and then evaluation.
6. Setting priorities.
7. Making decisions depending on the priorities.
8. Documentation.
9. Record keeping of the meetings.
10. Access to the external information.
11. Preservation of the 'organization memory'.