

Unit 1

Organizations and Information Systems

Organizations and information systems have a mutual influence on each other. The information needs of an organization affect the design of information systems and an organization must be open itself to the influences of information systems in order to more fully benefit from new technologies. The organization's environment, culture, structure, standard operating procedures, politics and management decisions are mediating factors that influence the interaction between information technology and organizations.

Fig 1

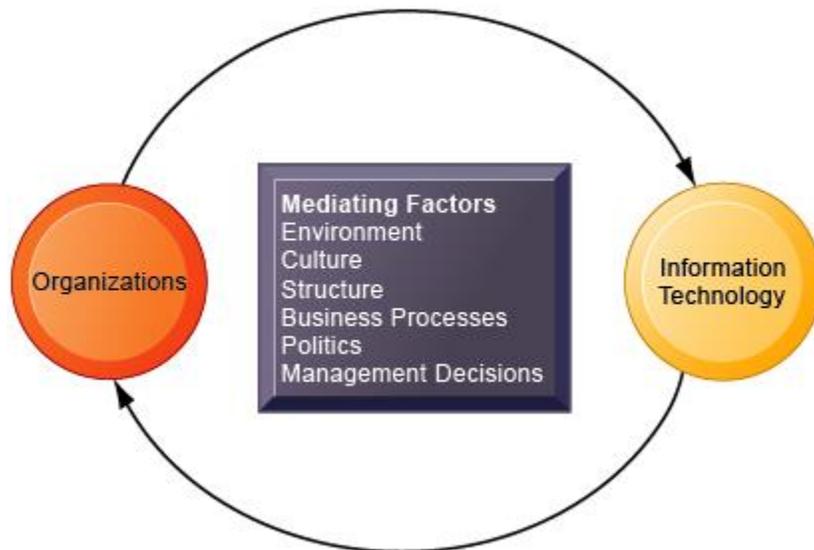


FIGURE 1 THE TWO-WAY RELATIONSHIP BETWEEN ORGANIZATIONS AND INFORMATION TECHNOLOGY

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.

From a technical view, an organization is a formal, legal, social structure that processes resources, or inputs, to produce outputs. The firm is seen as infinitely malleable, with capital and labor substituting for each other quite easily.

Figure-2

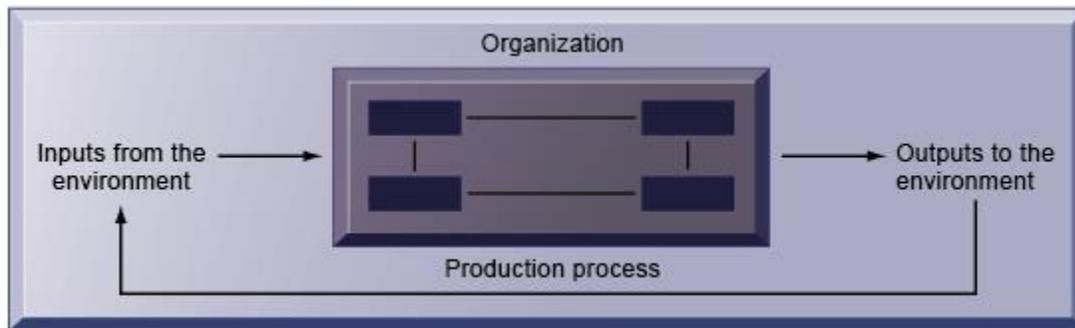


FIGURE 2 THE TECHNICAL MICROECONOMIC DEFINITION OF THE ORGANIZATION

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.

A behavioral definition of an organization is that it is a collection of rights, privileges, obligations, and responsibilities that is balanced over time through conflict and conflict resolution. This definition suggests that building new information systems or rebuilding old ones involves much more than a technical rearrangement of machines or workers. 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.

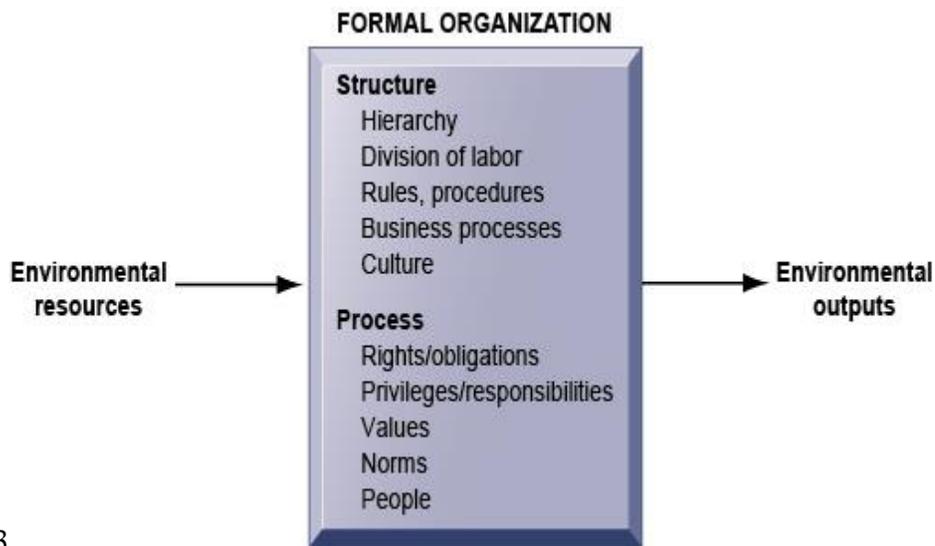


Figure 3

FIGURE 3 THE BEHAVIORAL VIEW OF ORGANIZATIONS
 The behavioral view of organizations emphasizes group relationships, values, and structures.

The technical and behavioral views of organizations complement one another. The technical definition describes how thousands of firms in competitive markets combine capital and labor with information technology, whereas the behavioral model describes how technology affects the organization's inner workings.

All modern organizations can be seen as bureaucracies which share some essential characteristics: clear division of labor, hierarchy, explicit rules and procedures, impartial judgments, technical qualifications for positions, and maximum organizational efficiency. Additionally, all organizations develop routines and business procedures, politics, and cultures.

Business processes are collections of routines, or standard operating procedures (SOPs), which enable a firm's efficiency.

Figure 4

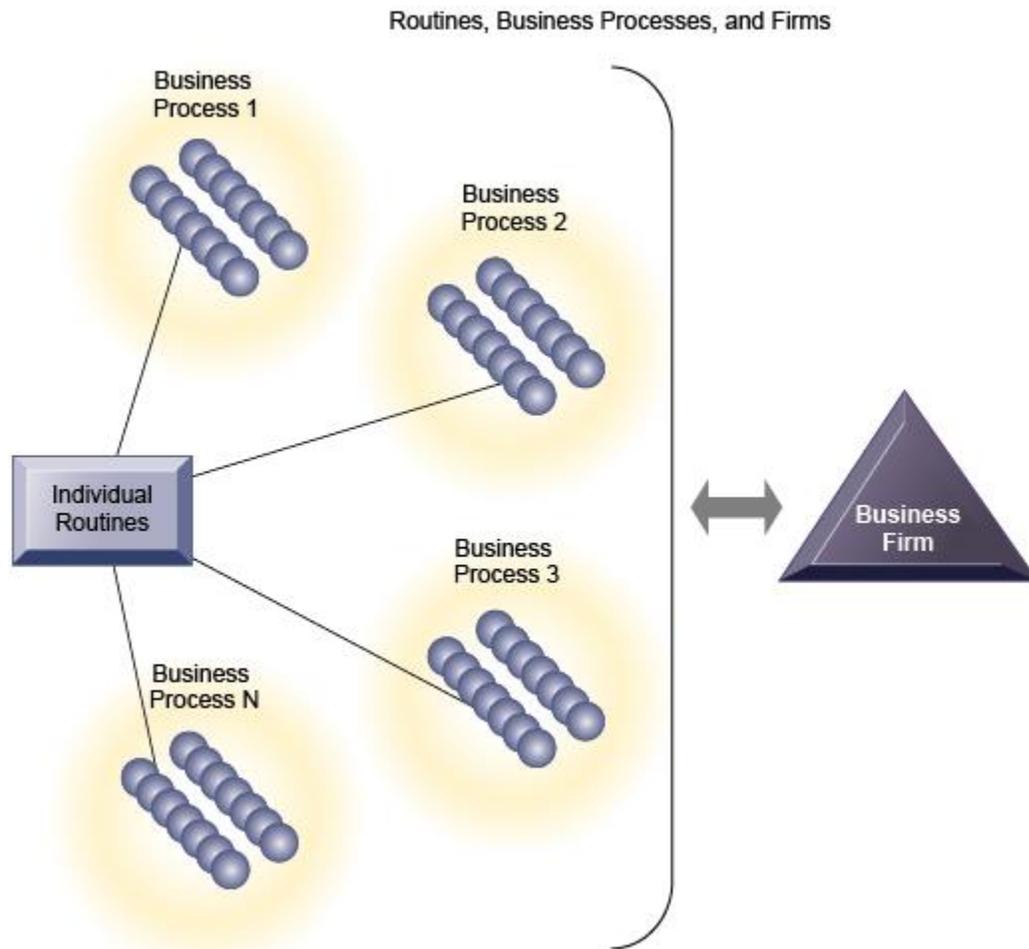


FIGURE 4 ROUTINES, BUSINESS PROCESSES, AND FIRMS
All organizations are composed of individual routines and behaviors, a collection of which make up a business process. A collection of business processes make up the business firm. New information system applications require that individual routines and business processes change to achieve high levels of organizational performance.

Organizational politics reflects the political struggles due to divergent concerns and perspectives of individuals and groups within the organization. Political resistance is one of the great difficulties of bringing about organizational change.

Organizational culture is the set of fundamental assumptions about what products the organization should produce, how it should produce them, where, and for whom. Organizational culture is a powerful unifying force that restrains political conflict. However, technological change that threatens commonly held cultural assumptions usually meets great resistance.

No two organizations are identical. Organizations have different structures, goals, constituencies,

leadership styles, tasks, and surrounding environments. Differences in these characteristics will affect the type of information systems used by the organization.

Organizations have different social and physical environments, which exert a powerful influence on the organization's structure. Information systems help organizations respond to their surrounding environments, from which they draw resources and to which they supply goods and services. Information systems are key tools for environmental scanning, helping managers identify external changes that might require an organizational response.

Figure 5

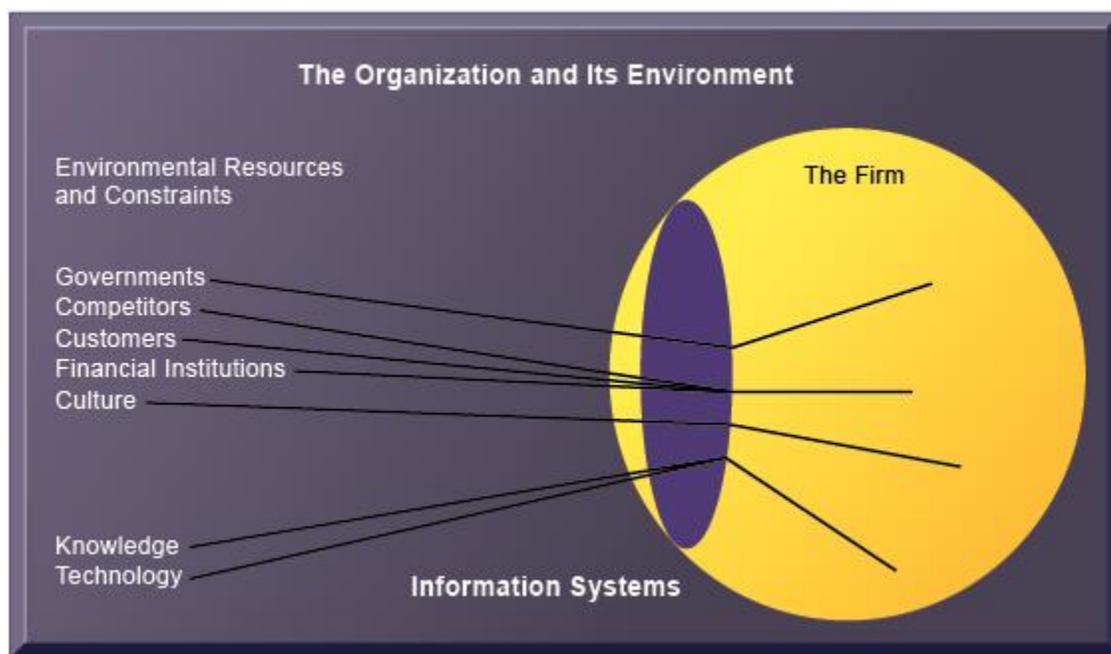


FIGURE 5 ENVIRONMENTS AND ORGANIZATIONS HAVE RECIPROCAL RELATIONSHIPS

Environments shape what organizations can do, but organizations can influence their environments and decide to change environments altogether. Information technology plays a critical role in helping organizations perceive environmental change and in helping organizations act on their environment.

The Mintzberg classification of organizations includes five categories:

1. **Entrepreneurial structure:** Young, small firm, such as a small startup business, in a fast-changing environment. It has a simple business structure and is managed by an entrepreneur serving as its single chief executive officer.
2. **Machine bureaucracy:** Large bureaucracy, such as a midsize manufacturing firm, existing in a slowly changing environment, producing standard products. It is dominated by a centralized management team and centralized decision making.

3. **Divisionalized bureaucracy:** Combination of multiple machine bureaucracies, such as a Fortune 500 firm, each producing a different product or service, all topped by one central headquarters.
4. **Professional bureaucracy:** Knowledge-based organization (such as law firms, school systems, hospitals) where goods and services depend on the expertise and knowledge of professionals. Dominated by department heads with weak centralized authority.
5. **Adhocracy:** Task force organization (such as a consulting firm) that must respond to rapidly changing environments. Consists of large groups of specialists organized into short-lived multidisciplinary teams and has weak central management.

Organizations also differ in their ultimate goals, the types of power used to achieve them, the groups and constituencies they serve, the nature of leadership within the organization, the tasks performed, and the technology used.

Organization Structure:

Any operating organization should have its own structure in order to operate efficiently. For an organization, the organizational structure is a hierarchy of people and its functions.

The organizational structure of an organization tells you the character of an organization and the values it believes in. Therefore, when you do business with an organization or getting into a new job in an organization, it is always a great idea to get to know and understand their organizational structure.

Depending on the organizational values and the nature of the business, organizations tend to adopt one of the following structures for management purposes.

Although the organization follows a particular structure, there can be departments and teams following some other organizational structure in exceptional cases.

Sometimes, some organizations may follow a combination of the following organizational structures as well.

Organizational Structure Types

Following are the types of organizational structures that can be observed in the modern business organizations.

Bureaucratic Structures

Bureaucratic structures maintain strict hierarchies when it comes to people management. There are three types of bureaucratic structures:

1 - Pre-bureaucratic structures

This type of organizations lacks the standards. Usually this type of structure can be observed in small scale, start-up companies. Usually the structure is centralized and there is only one key decision maker.

The communication is done in one-on-one conversations. This type of structures is quite helpful for small organizations due to the fact that the founder has the full control over all the decisions and operations.

2 - Bureaucratic structures

These structures have a certain degree of standardization. When the organizations grow complex and large, bureaucratic structures are required for management. These structures are quite suitable for tall organizations.

3 - Post-bureaucratic Structures

The organizations that follow post-bureaucratic structures still inherit the strict hierarchies, but open to more modern ideas and methodologies. They follow techniques such as total quality management (TQM), culture management, etc.

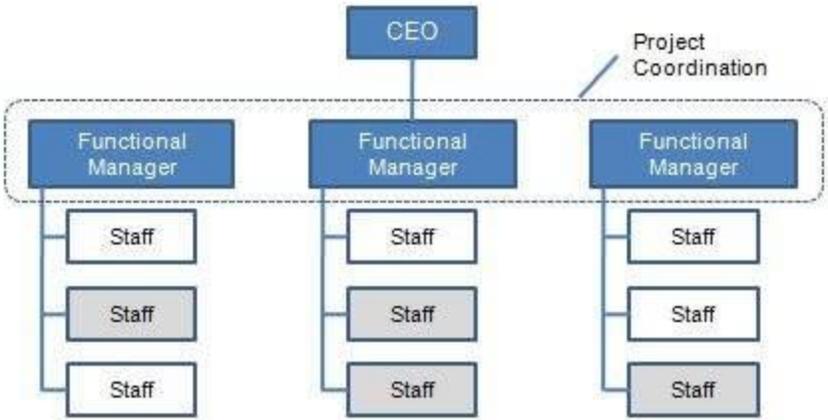
Functional Structure

The organization is divided into segments based on the functions when managing. This allows the organization to enhance the efficiencies of these functional groups. As an example, take a software company.

Software engineers will only staff the entire software development department. This way, management of this functional group becomes easy and effective.

Functional structures appear to be successful in large organization that produces high volumes of products at low costs. The low cost can be achieved by such companies due to the efficiencies within functional groups.

In addition to such advantages, there can be disadvantage from an organizational perspective if the communication between the functional groups is not effective. In this case, organization may find it difficult to achieve some organizational objectives at the end.



Divisional Structure

These types of organizations divide the functional areas of the organization to divisions. Each division is equipped with its own resources in order to function independently. There can be many bases to define divisions.

Divisions can be defined based on the geographical basis, products/services basis, or any other measurement.

As an example, take a company such as General Electrics. It can have microwave division, turbine division, etc., and these divisions have their own marketing teams, finance teams, etc. In that sense, each division can be considered as a micro-company with the main organization.



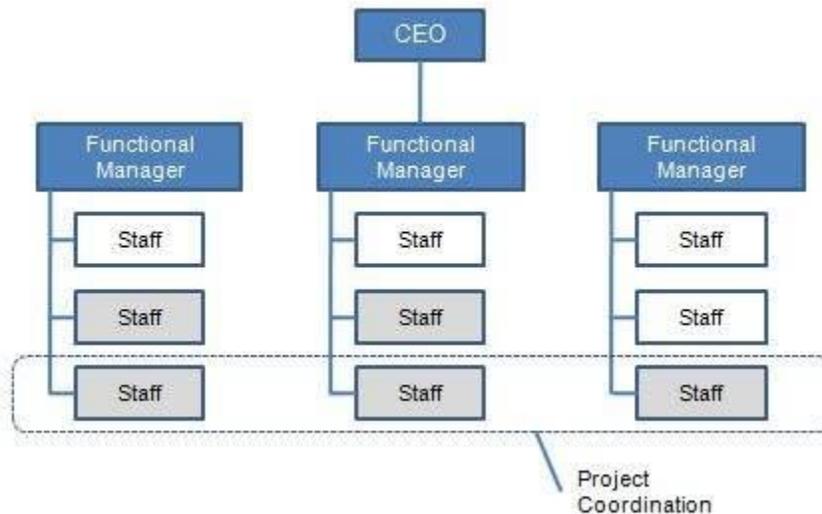
Matrix Structure

When it comes to matrix structure, the organization places the employees based on the function and the product.

The matrix structure gives the best of the both worlds of functional and divisional structures.

In this type of an organization, the company uses teams to complete tasks. The teams are formed based on the functions they belong to (ex: software engineers) and product they are involved in (ex: Project A).

This way, there are many teams in this organization such as software engineers of project A, software engineers of project B, QA engineers of project A, etc.



Conclusion

Every organization needs a structure in order to operate systematically. The organizational structures can be used by any organization if the structure fits into the nature and the maturity of the organization.

In most cases, organizations evolve through structures when they progress through and enhance their processes and manpower. One company may start as a pre-bureaucratic company and may evolve up to a matrix organization.

Data information and its attributes

Management Information Systems is a system comprising of software and hardware used for processing information automatically. Generally, In a organizations MIS System enables individuals access and make changes to information. In almost all the organizations, the MIS mainly performs tasks in the backend, and the users are rarely associated or fully aware of the operations that are performed by the MIS. From a business point of view MIS and the information generated from it enables the organisation in making decisions and are considered important components

What is a management system?

A Management System is a framework established on a structured integration of best practice into operating systems - frequently built around the Plan, Do, Check, Act cycle.

The business works with a shared vision as a unit, allowing them to transfer information, share data, creating benchmark, working as team and with an object of excellent quality and environmental principles. So the management system allows the organization to reach these targets by means of processes optimization, managing focus and discipline of management thinking.

Five Attributes for Management Information System

Fixed and standard formats reports

Reports consisting Hard copies and soft copies

Usage of internal data saved in the system

Allowing the end users to develop or modify custom reports

Users requires to send request

What is Information system and Why to use Management Information System?

Processing business orders by using computer system or application can be considered a management information system because it is allowing or helping the system users in processes of orders automatically.

Many examples of management information systems like websites that enable and performs transactions for organizations or helping users as a support for requests. A simple example of a management information system can be the companies' website for a product can be a MIS as it communicates or builds a platform for transferring information to the end user after the user updates input in the system

Management Information Systems consists of its own support system delivering function and also maintain systems, updating and implement the new technologies in a company. These positions are specialised and allowing a group to focus on various sectors within the computer system.

The level of people and their information needs:

When developing an information management strategy within an organisation, it is useful to consider information needs on three levels:

- corporate
- team, division, business unit, etc
- individual

The needs of each of these three levels must be met if a coordinated and effective solution is to be maintained in the long-term.

Failure to address any one of the levels will lead to areas of the business or individuals finding their own solution, which may not fit well within the strategic goals of the organisation.

These are not new ideas, but they will be explored in the context of intranets and other corporate information systems.

Corporate

At the top is the corporate information that is useful for the whole organisation. This 'global' information is generally fairly well addressed by the corporate intranet (even if the intranet itself needs improvement).

Examples of corporate information include policies and procedures, HR information, online forms, phone directory, etc.

Interestingly, there may be a limited amount of truly global information, and it may not deliver the greatest (measurable) business benefits.

Team, division, business unit

The middle level is perhaps the most interesting, as it covers all the information shared within teams, divisions, business units, etc. This information may be critical to the day-to-day activities of the group, but of little interest to the rest of the organisation.

Examples include project documentation, business unit specific content, meeting minutes, etc.

This level is generally poorly-served within organisations, although collaboration tools are increasingly being used to address team information needs. It is also being recognised that it is this 'local' information that may be the most valuable, in terms of driving the day-to-day activity of the organisation.

Individual

At the lowest level is the personal information needs of staff throughout the organisation. Examples include correspondence (both internal and external), reports and spreadsheets.

In most organisations, staff must struggle with using e-mail to meet their information management needs. While staff generally recognise the inadequacy of e-mail, they have few other approaches or technologies at their disposal.

Note that some organisations (such as consulting firms) are heavily dependent on personal information management amongst their staff.

Managing the levels

When managing the information within each of the three levels, consider the following:

- An information management solution must be provided for staff at each of the three levels.
- If corporate solutions aren't provided, then staff will find their own solutions. This is the source of poor-quality intranet sub-sites, and other undesirable approaches.
- A clear policy must be developed, outlining when each of the three levels applies, and how information should be managed within each level.
- Processes must be put in place to 'bubble up' or 'promote' information from lower levels up to higher levels. For example, some team-generated information will be critical for the whole organisation.
- As much as possible, a seamless information management environment should be delivered that covers all three levels.

Types of Decisions and Information

Organizational decisions differ in a number of ways. The following basis are used to classify the decisions:

Purpose of Decision-making

On the basis of the purpose of decision-making activities, the organizational decisions are divided into 3 categories:

Strategic Planning Decisions: Strategic planning decisions are those decisions in which the decision-maker develops objectives and allocates resources to achieve these objectives. Such decisions are taken by strategic planning level (top level) managers.

Management Control Decisions: Management control decisions are taken by management control level (middle level) managers and deal with the use of resources in the organization.

Operational Control Decisions: Operational control decisions deal with the day-to-day problems that affect the operation of the organization. These decisions are taken by the managers at operational level (bottom level) of the organization.

Levels of Programmability

Simon on the basis of level of the programmability of a decision, proposed two types of decisions:

Programmed, also known as structured decisions

Non-programmed, also known as unstructured decisions.

Programmed/Structured Decisions

Programmed or structured are those decisions, which are well defined and some specified procedure or some decision rule might be applied to reach a decision. Such decisions are routine and repetitive and require little time for developing alternatives in the design phase. Programmed

or structured decisions have traditionally been made through habit, by operating procedures or with other accepted tools.

Non-programmed /Unstructured Decision

Decisions, which are not well defined and have not pre-specified procedures decision rule are known as unstructured or non-programmed decisions.

Knowledge of Outcomes

Another approach of classifying decisions is the level of knowledge of outcomes. An outcome defines what will happen, if a decision is made or course of action taken. When there is more than one alternative, the knowledge of outcome becomes important. On the basis of the level of knowledge of outcomes, decision-making can be classified into three categories.

1. **Decision under certainty:** Decision-making under certainty takes place when the outcome of each alternative is fully known. There is only one outcome for each alternative.
2. **Decision under risk:** Decision-making under risk occurs when there is a possibility of multiple outcomes of each alternative and a probability of occurrence can be attached to each outcome.
3. **Decision under uncertainty:** Decision-making under uncertainty takes place when there are a number of outcomes for each alternative & the probabilities of their occurrences are not known.

Management Information Systems

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.

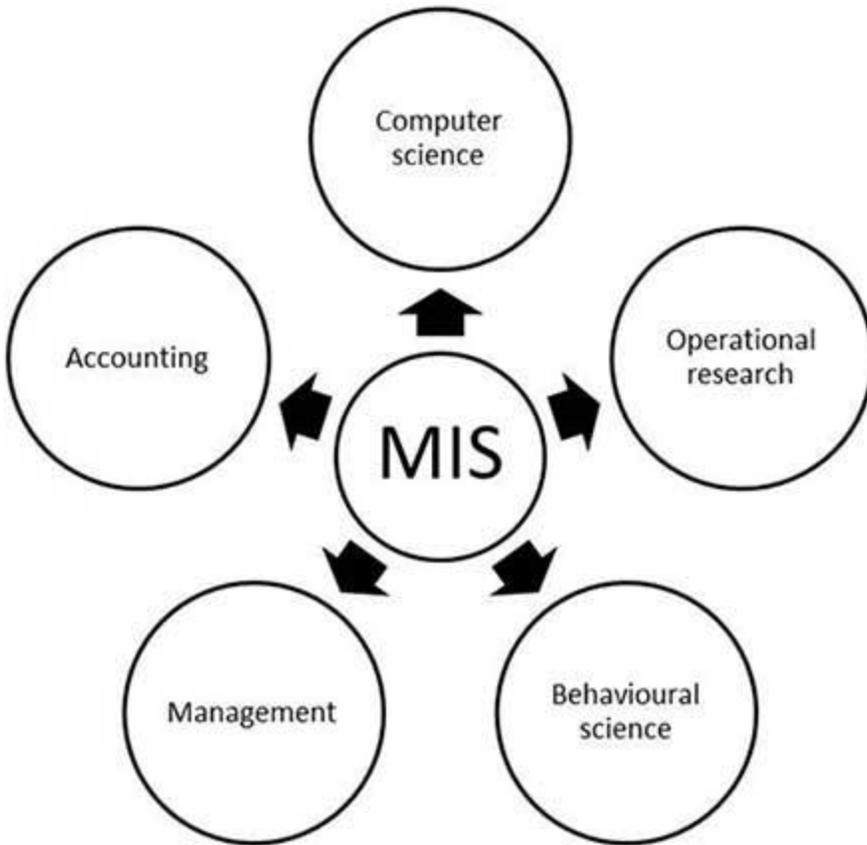
Characteristics of Computerized MIS

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 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.

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 manager'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. Expert 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.