



**Subject Code:
MCAILE5053**

Management Information System

Syllabus as per

**Mumbai University
Semester 5[CBCS]**

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Syllabus

1. Management Information Systems

Perspectives on Information Systems, Nature and scope of MIS, Characteristics of MIS, Need and Role of MIS, Impact of MIS, functions and future of MIS, MIS: A support to the management, MIS: organization effectiveness, MIS for a digital firm, Case Study

2. Strategic Design and Development of MIS

Strategic Management of the Business, Strategic design of MIS, Business Strategy Implementation, Development of Long Range Plans of MIS, Ascertaining the class of Information, Determining the Information Requirement, Development and Implementation of MIS, MIS: Development Process Model, case study.

3. Decision Making

Decision making concepts, Decision Analysis by analytical modelling, Behavioural concepts in decision making, Organizational decision making, MIS and Decision Making, Case Study

4. Information, knowledge, Business Intelligence

Information Concepts, Information :A Quality Product, Classification of the information, Methods of data and information collection, Value of information, General model of a human as a information processor, Summary of information concepts and their implications, Knowledge and knowledge management systems, Business Intelligence, MIS , and the Information and Knowledge, Case Study

5. E-Commerce: Applications and Issues

Introduction to E-Commerce, Scope of E-commerce, E-Commerce Applications and Issues, case study

6. Securing Information Systems

System Vulnerability and Abuse, Business value of security and control, Technology and Tools for protecting Information, Resources, case study



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Unit 1

Management Information Systems

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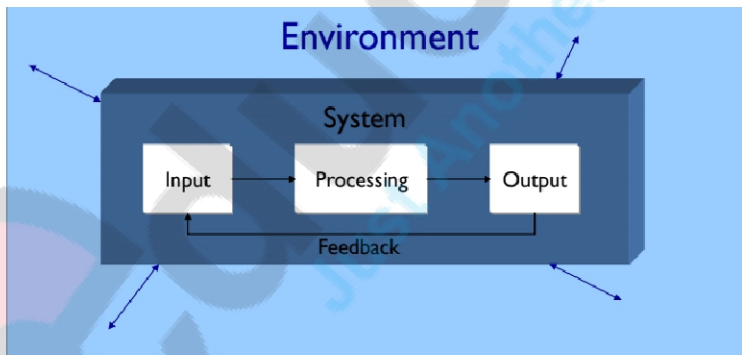
Perspectives on Information Systems

Imperative to understand information systems from both:

- Technical perspective
- Business perspective

Technical Perspective:

An information system is a set of interrelated components that collect or retrieve, process, store, and distribute information to support decision making and control in an organization. Information systems can also be used to analyse problems, visualize complex subjects, and create new products.



Technical Perspective:

Information technology infrastructure

- Computer software
- Data management software
- Networking and telecommunications technology
- Data management software

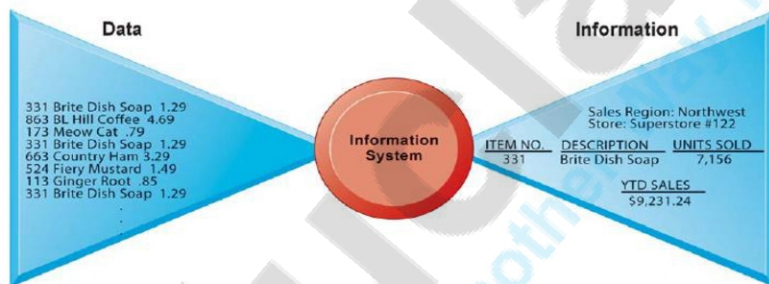
Computer hardware: The physical equipment and computing devices used for input, storage, processing, output, and telecommunications



Computer software: The detailed, preprogramed instructions that control and coordinate the computer hardware components

Data management software: The software governing the organization of data on physical storage media

Networking and telecommunications technology: Hardware and software used to link the various pieces of hardware and transfer data from one physical location to another; a computer network links two or more computers together to share data, such as files, images, sounds, video, or share resources, such as a printer.



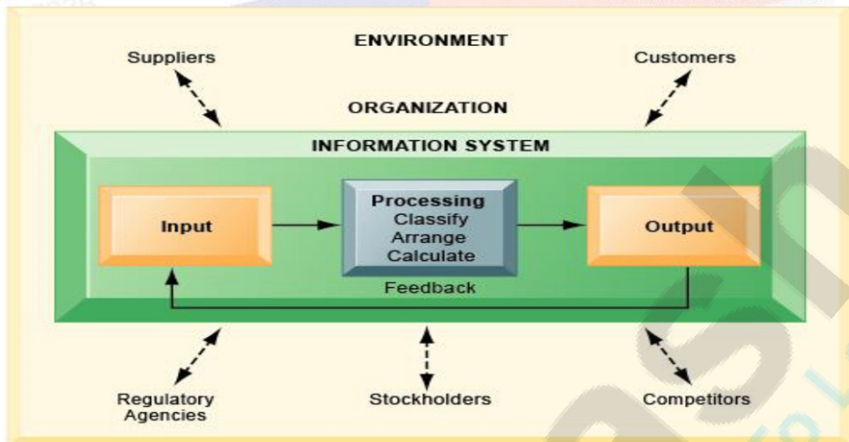
Business Perspective:

Input, processing, and output are the three activities in an information system that produce the information an organization needs.

Input captures or collects raw data from within the organization or from its external environment. Processing converts this raw input into a meaningful form.

Output transfers the processed information to the people who will use it or to the activities for which it will be used.

Information systems also require feedback, which is output that is returned to appropriate members of the organization to help them evaluate or correct the input stage.



An information system contains information about an organization and its surrounding environment. Three basic activities—input, processing, and output—produce the information organizations need. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input. Environmental actors, such as customers, suppliers, competitors, stockholders, and regulatory agencies, interact with the organization and its information systems.

It is important to distinguish information systems, which are designed to produce information and solve organizational problems, from the computer technology and software that is typically used to create and manage information systems.

Computer literacy focuses primarily on knowledge of information technology. Information systems literacy, the understanding of information systems, includes a behavioural and technical approach to understanding the broader organization, management, and information technology dimension of systems and their power to provide solutions. The field of management information systems (MIS) tries to achieve this broader information systems literacy.

MIS: Definition

The Management Information System (MIS) is a concept of the last decade or two. It has been under_ known as the Information System stood and described in a number of ways. It is also popularly, the Information and Decision System. the Computer-based Information System. The MIS has more than one definition, some of which are given below.



1. The MIS is defined as a system which provides information support for decision-making in the organisation.
2. The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision-making function in the organization.
3. The MIS is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.
4. The MIS is defined as a Computer-based Information System.

Though there are a number of definitions, all of them converge on one single point, i.e., the MIS is a system to support the decision-making function in the organization. The difference lies in defining the elements of the MIS. However, in today's world, the MIS is a computerized business processing system generating information for the people in the organization to meet the information needs for decision-making to achieve the corporate objectives of the organisation. In any organisation, small or big, a major portion of the time goes in data collection, processing, documenting and communicating it to the people. Hence, a major portion of the overheads goes into this kind of unproductive work in the organisation. Every individual in an organisation is continuously looking for some information which is needed to perform his/her task. Hence, the information is people-oriented and it varies with the nature of the people in the organisation.

The difficulty in handing this multiple requirement of the people is due to a couple of reasons. The information is a processed product to fulfil an imprecise need of the people. It takes time to search the data and may require a difficult processing path. It has a time value and unless processed on time and communicated, it has no value. The scope and the quantum of information is individual-dependent and it is difficult to conceive the information as a well-defined product for the entire organisation. Since the people are instrumental in any business transaction, a human error is possible in conducting the same. Since a human error is difficult to control, the difficulty arises in ensuring a hundred percent quality assurance of information in terms of completeness, accuracy, validity, timeliness and meeting the decision-making needs. In order to get a better grip on the activity of information processing, it is necessary to have a formal system which should take care of the following points:

1. Handling of a voluminous data.
2. Confirmation of the validity of data and transaction.



3. Complex processing of data and multidimensional analysis.
4. Quick search and retrieval.
5. Mass storage.
6. Communication of the information system to the user on time.
7. Fulfilling the changing needs of the information. The management information system uses computers and communication technology to deal with these points of supreme importance.

Role of the Management Information System

The role of the MIS in an organization can be compared to the role of the heart in the body. The information is the blood and MIS is the heart. In the body, the heart plays the role of supplying pure blood to all the elements of the body including the brain. The heart works faster and supplies more blood when needed. It regulates and controls the incoming impure blood, processes it and sends it to the destination in the quantity needed. It fulfils the needs of blood supply to the human body in the normal course and also in crisis. The MIS plays exactly the same role in the organization. The system ensures that an appropriate data is collected from the various sources, processed, and sent further to all the needy destinations. The system is expected to fulfil the information needs of an individual, a group of individuals, the management functionaries: the managers and the top management. The MIS satisfies the diverse needs through a variety of systems such as Query Systems, Analysis Systems, Modelling Systems, and Decision Support Systems. The MIS helps in Strategic Planning, Management Control, Operational Control, and Transaction Processing. The MIS helps the clerical personnel in the transaction processing and answers their queries on the data pertaining to the transaction, the status of a particular record and reference on a variety of documents. The MIS helps the junior management personnel by providing the operational data for planning, scheduling, and control, and helps them further in decision-making at the operations level to correct an out of control situation. The MIS helps the middle management in short-term planning, target setting and controlling the business functions. It is supported by the use of the management tools of Planning and control. The MIS helps the top management in goal setting, strategic planning and evolving the business plans and their implementation.

The MIS plays the role of information generation, communication, problem identification and helps in the process of decision-making. The



MIS, therefore, plays a vital role in the management, administration, and operations of an organization.

Impact of the Management Information System

Since the MIS plays a very important role in the organization, it creates an impact on the organization's functions. Performance and productivity. The impact of MIS on the functions is in its management. With a good MIS support, the management of marketing, finance. Production and personnel become more efficient. The tracking and monitoring of the functional targets become easy. The functional managers are informed about the progress, achievements, and shortfalls in the activity and the targets. The manager is kept alert by providing certain information indicating and probable trends in the various aspects of the business. This helps in forecasting and long-term perspective planning. The manager's attention is brought to a situation which is exceptional in nature. Inducing him to take an action or a decision in the matter. A disciplined information reporting system creates a structured database and a knowledge base for all the people in the organization. The information is available in such a form that it can be used straight away or by blending and analysis, saving the manager's valuable time. The MIS creates another impact in the organization which relates to the understanding of the business itself. The MIS begins with the definition of a data entity and its attributes. It uses a dictionary of data, entity, and attributes, respectively, designed for information generation in the organization. Since all the information systems use the dictionary, there is the common understanding of terms and terminology in the organization bringing clarity in the communication and a similar understanding of an event in the organization. The MIS calls for a systemization of the business operations for an effective system design. This leads to streamlining of the operations which complicate the system design.

It improves the administration of the business by bringing a discipline in its operations as everybody is required to follow and use systems and procedures. This process brings a high degree of professionalism in the business operations. Since the goals and objectives of the MIS are the products of business goals and objectives, it helps indirectly to pull the entire organization in one direction towards the corporate goals and objectives by providing the relevant information to the people in the organization.



A well designed system with a focus on the manager makes an impact on the managerial efficiency. The fund of information motivates an enlightened manager to use a variety of tools of the management. It helps him to resort to such exercises as experimentation and modelling. The use of computers enables him to use the tools and techniques which are impossible to use manually. The ready-made packages make this task simpler. The impact is on the managerial ability to perform. It improves the decision-making ability considerably. Since the MIS work on the basic systems such as transaction processing and databases, the drudgery of the clerical work is transferred to the computerized system, relieving the human mind for better work.

It will be observed that a lot of manpower is engaged in this activity in the organization. If you study the individual's time utilization and its application, you will find that seventy percent of the time is spent on recording, searching, processing and communicating. This is a very large overhead in the organization. The MIS has a direct impact on this overhead. It creates an information-based work culture in the organization

MIS and the User

Person in the organization is a user of the MIS. The people in the organization operate at all levels in the hierarchy. A typical user is a clerk, an assistant, an officer, an executive or a manager. Each of them has a specific task and a role to play in the management of the business. The MIS caters to the needs of all persons.

The main task of a clerk is to search the data, make a statement and submit it to the higher level. A clerk can use the MIS for a quick search and reporting the same to a higher level. An assistant has the task of collecting and organizing the data and conducting a rudimentary analysis of it. The MIS offers the user tools to perform these tasks. An officer has a role of integrating the data from different systems and disciplines to analyse it and make a critical comment if anything adverse is found. The MIS offers the methods and facilities to integrate the data and report the same in a proper format. An executive plays the role of a decision maker. He is in a position of responsibility and accountability; a position of a planner and a decision-maker. He is responsible for achieving the targets and goals of the organization. The MIS provides facilities to analyse the data and offers the decision support systems to perform the task of execution. The MIS provides an action-oriented information. The manager has a position of responsibility and accountability for the business results. His management role expands beyond his management function. He is a strategist and a



long-term planner. He is a person with a foresight, an analytical ability and is expected to use these abilities in the functions of top management. The MIS provides information in a structured or unstructured format for him to react. The MIS caters to his constant changing needs of information. The user of the MIS is expected to be a rational person and the design of the MIS is based on this assumption. However, in reality, the impact created on individuals by MIS is difficult to explain. The nature of the impact in a few cases is negative. However, this negative impact can be handled with proper training and counselling. It is observed that at a lower level, there is a sense of insecurity. As the MIS takes away the drudgery of search, collection, writing and reporting the data, the working vacuum, so created, is not easily filled, thus creating a sense of insecurity. To some extent the importance of the person is also lost, giving rise to a fear of non-recognition in the organization

At the level of an officer and an executive, the MIS does the job of data manipulation and integration. It analyses the data in a predetermined manner.

This means that the knowledge of business is transferred from an individual to the MIS and is made available to all in the organization. This change arising out of the MIS creates a sense of being neglected for knowledge, information, and advice. The psychological impact is larger if the person is not able to cope up with this change by expanding or enriching the job and the position held by him.



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Management as a Control System

Planning, organizing, staffing, coordinating, directing and controlling are the various steps in a management process. All the steps prior to a control are necessary but are not necessary results unless it is followed by a strong control mechanism. The management experts these steps as 'Management Control System.' They postulate the hypothesis that unless a control is exercised on the process, the goals will not be achieved. They advocate a system of effective control to ensure the achievement of the business objective. A definition of control is the process through which managers assure that actual activities conform to the planned activities,



leading to the achievement of the stated common goals. The control process measures a progress towards those goals and enables the manager to detect the deviations from the original I plan in time to take corrective actions before it is too late. Robert J Mockler defines and points out the essential elements of the control process. The basic steps of the control process are given in Fig. 1.3 The management is a systematic effort to set the performance standards in line with the performance objectives, to design the information feedback systems, to compare the actual performance with these predetermined standards, to identify the deviations from the standards, to measure its significance and to take corrective actions in case of significant deviations. This systematic effort is undertaken through the management control system.

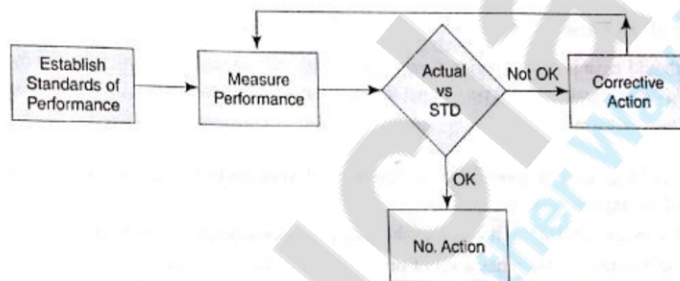


Fig. 1.3 Process Flow of Control System

The control system is essential to meet the environmental changes discussed earlier, to meet the complexity of today's business, to correct the mistakes made by the people, and to effectively monitor the delegation process. A reliable and effective control system has the following features.

Early Warning Mechanism

This is a mechanism of predicting the possibility of achieving the goals and the standards before it is too late and allowing the manager to take corrective actions.

Performance Standard

The performance standard must be measurable and acceptable to all the organization. The system should have meaningful standards relating to the work areas, responsibility, managerial functions and so on. For example, the top management would have standards relating to the business performance, such as production, sales, inventory, quality, etc. The operational management would have standards relating to the shift



production, rejections, downtime, utilization of resources, sale in a typical market segment and so on. The chain of standards, when achieved, will ensure an achievement of the goals of the organization.

Strategic Controls

In every business there are strategic areas of control known as the critical success factors. The system should recognize them and have controls instituted on them.

Feedback

The control system would be effective if it continuously monitors the performance and sends the information to the control center for action. It should not only highlight the progress but also the deviations. The feedback should be accurate in terms of results and should be communicated on time for corrective action.

Realistic

The system should be realistic so that the cost of control is far less than the benefits. The standards are realistic and are believed as achievable. Sufficient incentive and rewards are to be provided to motivate the people.

Management by Exception

Pareto's principle of 80:20 is applicable to the management of the enterprise. Several terms have been coined on this principle such as management by objectives, management by results, and management of strategic areas. At the root of the management, methodology is the management by exception. When the management operates under a time constraint, each manager has to allocate specific time for the several demands made on his time. It is, therefore, necessary for him to attend to the situation where his attention is necessary. Such attention would lead to an action, a decision or a wait-and-see approach. If all the situations are considered in a routine manner, it consumes time and tends to be neglected over a period of time. An efficient manager tries for selective attention to manage within the available time resource. The principle evolved, therefore, is of the management by exception. The exception is decided on the impact a situation would make on the performance, the process and the standards set in the management control system.

MIS: A Support to the Management

The management process is executed through a variety of decisions taken at each step of planning. Organizing. Staffing, directing. Coordinating and control. As discussed earlier. the MIS aids decision-making. If the



management is able to spell out the decisions required to be taken, the MIS can be designed suitably.

Steps in management	Decision
Planning	A selection from various alternatives—strategies, resources, methods, etc.
Organisation	A selection of a combination out of several combinations of the goals, people, resources, method, and authority.
Staffing	Providing a proper manpower complement.
Directing	Choosing a method from the various methods of directing the efforts in the organisation.
Coordinating	Choice of the tools and the techniques for coordinating the efforts for optimum results.
Controlling	A selection of the exceptional conditions and providing the decision guidance to deal with them.

The objective of the MIS is to provide information for a decision support in the process of management. It should help in such a way that the business goals are achieved in the most efficient manner. Since the decision-making is not restricted to a particular level, the MIS is expected to support all the levels of the management in conducting the business operations. Unless the MIS becomes a management aid, it is not useful to the organisation.

Management Effectiveness and MIS

'Negandhi Estafen' provides a good model (Fig. 1.5) for the analysis of management effectiveness, which generates an enterprise effectiveness in achieving the goals and objectives. The models put a lot of emphasis on the management philosophy and the environmental factors on which the effectiveness is dependent. The environment factors provide the opportunities to survive and grow with certain constraints, while the management philosophy sets the guidelines for deciding the management practices of run the enterprise.

While the environment factors are difficult to control. It is left for the management; philosophy towards the various payers in the business. viz., the employees., the COMUMCFN, the suppliers, the government, the community and the shareholders. Basicity, it is a change in For example, how to look at the employees? If the attitude is to treat them as business partners, you will empower them and create a sense of before Fig to the organisation. Such an attitude will have an impact. On the management practices, where the employee will play a decisive critical role. It will affect the organisation structure by reducing its size and the reporting levels. Ti the attitude towards the consumer is changed to fulfil the expectations giving rise to a satisfaction then the management practices in product



	Business organisation	Hospital	State transport organisation
GOALS	Be a leader in the household consumer goods industry, with modern amenities.	Be a hospital providing total service to the patients.	Connect all villages of population 5000 and above by S.T. service.
OBJECTIVES	Provide complete range in Food Processing & Entertainment products.	Establish 300-bed hospital.	Manage state transport expense at the rate of Rs 5 per kilometre travel.
TARGETS	20 per cent growth per annum in turnover.	Achieve Rs 800 per bed per day earnings.	Achieve 90 per cent average seat occupancy every day.

MIS for a Digital Firm

Twenty first century organizations is E-Enterprises, that run their major Operations on Internet/WEB and WAN, spread over large area. The term 'E-Business enterprise' was coined to convey the use of the Internet and IT in key resource management processes and to transact the business with customers, suppliers, and business partners. ERP, SCAM, CRM, PLM and home-grown legacy systems are the main applications in the business. The application of Internet and information technology is in key core areas of business. These technologies are used for computing, collaboration, communication, storage information in all kinds of format. These applications, however, did not integrate the entire cycle of business starting from Customer to finishing at Customer: Customer Ordering to Delivery to Customer Service'.

With the advancement of the Internet, Web communication, network, and Information technology, business process management crossed the boundaries of the organization and embraced every aspect of the business making all its operations 'Digital'. That is capturing the data or event, validating, processing, decision making, storing, and delivering. The extent of use of these technologies is so much across the boundaries of the organization that E-Business enterprise has become completely digitalized all its operations, and hence is now called as a "Digital Firm".

Digital describes electronic technology that generates, captures, validates and stores, and processes data in terms of two states: positive and non-positive. Positive is expressed or represented by the number 1 and non-positive by the number 0. Digital firms use extensively computing, convergence, and content management technologies on internet platform for all E-business processes, transactional and relational. Digital firms rely heavily on Internet and Information technology to conduct the E-business operations. The complete change over to digital platform makes



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organization and its activities more flexible, profitable, competitive, and efficient than traditional people, paper and process driven organization. Going digital has a clear strategic advantage to the firm and its stakeholders. Supply chain management systems, customer relationship management systems, enterprise management systems (ERPs), and knowledge management systems, content management systems are the main systems which drive the function of a digital firm. In a digital firm, relationships with customers, suppliers, and employees are digital, meaning all transactions, communications, pictures, images, drawings, data, and information are exchanged through a digital medium. Customer orders, delivery, billing and payment, purchases and so on are through web and internet using enterprise software. Information like product details is communicated through the web to the customer. Using an organization's Web portal customer can build the order to the self-requirement accessing this information and post it to the organization's order book, and keep its track until it is delivered.

One of the characteristics of a digital firm is it functions in critical areas in real time. In real time mode, decision makers' responses have to be faster and correct. In a digital firm, there is an automation of data or event capturing, assessing, analysing, inferring and decision making. Fairly large amount of decision making responsibility is embedded in information-driven decision making systems. This calls upon MIS to provide just in time information on the specific emerged situation and display, simultaneously, the support information to make appropriate decisions. Conventional design of MIS designed to throw information on 'Where, What, When' in standard report format is totally ineffective and useless.



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