Management Information System

Subject code 18KP2COELC02

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UNIT – I

INTRODUCTION

1.1 Information System:

An Information system is a formal, socio-technical, organizational system designed to collect, process, store, and distribute information. In a socio-technical perspective, information systems are composed by four components: task, people, structure, and technology. Information system play a crucial role in the management of any contemporary enterprise such as small, medium and large organisation; a profit making or social service set-up; a public or a private sector undertaking, a manufacturing or a service organisation; a local or a global corporation and an upcoming or an established business house. Information system applies information technology to a firm's product, services, or business processes to help it gain a strategic advantage over its competitors.

1.2 Definition

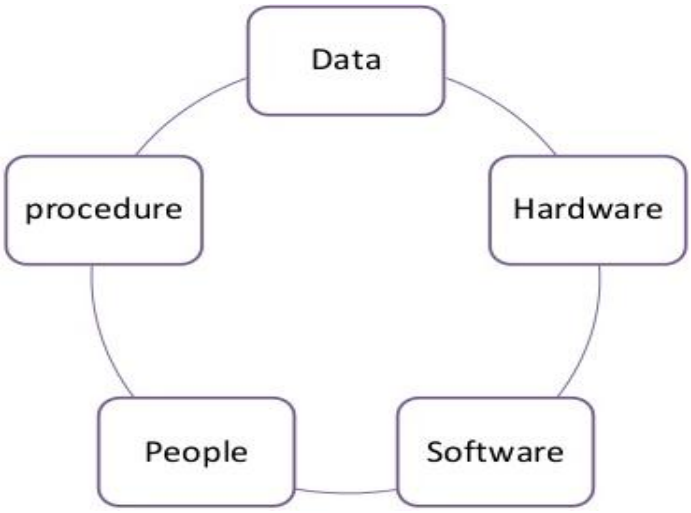
Information systems (IS) is the study of complementary networks of hardware and software that people and organizations use to collect, filter, process, create, and distribute data."

"Information systems are combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful data, typically in organizational settings."

"Information systems are interrelated components working together to collect, process, store, and disseminate information to support decision making, coordination, control, analysis, and visualization in an organization."

1.3 Components of Information System

Information System is made up of five components: hardware, software, data, people, and process. The first three, fitting under the technology category and the last two, people and process, work together to bring value to an organization.



(a) **Hardware:** Technology can be thought of as the application of scientific knowledge for practical purposes. Information systems hardware is the part of an information system – the physical components of the technology. Computers, keyboards, disk drives, iPads, and flash drives are all examples of information systems hardware.

(b) **Software:** Software is a set of instructions that tells the hardware what to do. Software is not tangible – it cannot be touched. When programmers create software programs, what they are really doing is simply typing out lists of instructions that tell the hardware what to do.

(c) **Data:** The third component is data. You can think of data as a collection of facts. But aggregated, indexed, and organized together into a database, data can become a powerful tool for businesses. Organizations collect all kinds of data and use it to make decisions.

(d) **Networking Communication:** An information system can exist without the ability to communicate – the first personal computers were stand-alone machines that did not access the Internet. Technically, the networking communication component is made up of hardware and software.

(e) **People:** From the front-line help-desk workers, to systems analysts, to programmers, all the way up to the chief information officer (CIO), the people involved with information systems are an essential element that must not be overlooked.

(f) **Procedure:** A procedure is a series of steps undertaken to achieve a desired outcome or goal. Information systems are becoming more and more integrated with organizational processes, bringing more productivity and better control to

those processes. Using technology to manage and improve processes, both within a company and externally with suppliers and customers, is the ultimate goal.

1.4 Types/Models of Information system in Business

The application of information systems that are implemented in today's business world can be classified in several ways. Information system are categorised to spotlight the major roles each plays in the operations and management of business.

i) Operations support system

Information systems have always been needed to process data generated by and used in, business operations such operations support system produce a variety of information products for internal and external use ; however they do not emphasize the specific information products that can best be used by mangers. Further processing by management information systems is usually required. The role of firm's operations support systems is to process business transactions, control industrial process, support enterprise communications and collaborations and update corporate database efficiently.

(a) **Transaction processing system:** Transaction processing systems process transactions in two basic ways. In batch processing, transactions data are accumulated over a period of time and processed periodically. In real-time processing, data are processed immediately after a transaction occurs.

(b) **Process control systems** monitor and control physical process.

(c) **Enterprise collaboration systems** enhance team and workgroup communications and productivity and include applications that are sometimes called office automated system.

ii) Management support system

When information system applications focus on providing information and support for effective decision making by mangers, they are called management support systems. Providing information and support for decision making by all types of managers and business professionals is a complex task.

(a) **Management Information System** provides information in the form of reports and displays to managers and many business professionals.

(b) **Decision support systems** give direct computer support to managers during the decision-making process.

(c) **Executive Information system** provides critical information from a wide variety of internal and external sources in easy-to-use displays to executives and managers.

iii)Other types/Models of Information system

Several other types of information system support either operations or management applications.

(a) **Expert systems:** Knowledge-based systems that provide expert advice and act as expert consultants to users.

(b) **Knowledge management system**support he creation, organisation, and dissemination of business knowledge within the enterprise.

(c) **Strategic Information system** supports operations or management process that provide a firm with strategic products, services, and capabilities for competitive advantage.

(d) **Functional business system** support a variety of operational and managerial applications of the basic business functions of a company.

1.5 Evolution of Information Systems

With the introduction of computers in 1950's, the way the information that flows into through the organisation was process has dramatically changed the introduction of corporate database eliminated the duplication of data and queries are used to locate information. From the late 1950s through the 1960s, computers were seen as a way to more efficiently do calculations. These first business computers were room-sized monsters, with several refrigerator-sized machines linked together. The primary work of these devices was to organize and store large volumes of information that were tedious to manage by hand. Only large businesses, universities, and government agencies could afford them, and they took a crew of specialized personnel and specialized facilities to maintain. These devices served dozens to hundreds of users at a

time through a process called time-sharing. Typical functions included scientific calculations and accounting, under the broader umbrella of "data processing."

In the late 1960s, the Manufacturing Resources Planning (MRP) systems were introduced. This software, running on a mainframe computer, gave companies the ability to manage the manufacturing process, making it more efficient. From tracking inventory to creating bills of materials to scheduling production, the MRP systems (and later the MRP II systems) gave more businesses a reason to want to integrate computing into their processes. IBM became the dominant mainframe company. Nicknamed "Big Blue," the company became synonymous with business computing. Continued improvement in software and the availability of cheaper hardware eventually brought mainframe computers (and their little sibling, the minicomputer) into most large businesses.

The Eras of Business Computing			
Era	**Hardware**	**Operating System**	**Applications**
Mainframe (1970s)	Terminals connected to mainframe computer.	Time-sharing (TSO) on MVS	Custom-written MRP software
PC (mid-1980s)	IBM PC or compatible. Sometimes connected to mainframe computer via expansion card.	MS-DOS	WordPerfect, Lotus 1-2-3
Client-Server (late 80s to early 90s)	IBM PC "clone" on a Novell Network.	Windows for Workgroups	Microsoft Word, Microsoft Excel
World Wide Web (mid-90s to early 2000s)	IBM PC "clone" connected to company intranet.	Windows XP	Microsoft Office, Internet Explorer
Web 2.0 (mid-2000s to present)	Laptop connected to company Wi-Fi.	Windows 7	Microsoft Office, Firefox
Post-PC (today and beyond)	Apple iPad	iOS	Mobile-friendly websites, mobile apps

1.The PC Revolution

In 1975, the first microcomputer was announced on the cover of *Popular Mechanics*: the Altair 8800. Its immediate popularity sparked the imagination of entrepreneurs everywhere, and there were quickly dozens of companies making these

"personal computers." Though at first just a niche product for computer hobbyists, improvements in usability and the availability of practical software led to growing sales. The most prominent of these early personal computer makers was a little company known as Apple Computer, headed by Steve Jobs and Steve Wozniak, with the hugely successful "Apple II." Not wanting to be left out of the revolution, in 1981 IBM (teaming with a little company called Microsoft for their operating-system software) hurriedly released their own version of the personal computer, simply called the "PC." Businesses, who had used IBM mainframes for years to run their businesses, finally had the permission they needed to bring personal computers into their companies, and the IBM PC took off. The IBM PC was named *Time* magazine's "Man of the Year" for 1982.

Because of the IBM PC's open architecture, it was easy for other companies to copy, or "clone" it. During the 1980s, many new computer companies sprang up, offering less expensive versions of the PC. This drove prices down and spurred innovation. Microsoft developed its Windows operating system and made the PC even easier to use. Common uses for the PC during this period included word processing, spreadsheets, and databases. These early PCs were not connected to any sort of network; for the most part they stood alone as islands of innovation within the larger organization.

2.Client-Server

In the mid-1980s, businesses began to see the need to connect their computers together as a way to collaborate and share resources. This networking architecture was referred to as "client-server" because users would log in to the local area network (LAN) from their PC (the "client") by connecting to a powerful computer called a "server," which would then grant them rights to different resources on the network (such as shared file areas and a printer). Software companies began developing applications that allowed multiple users to access the same data at the same time. This evolved into software applications for communicating, with the first real popular use of electronic mail appearing at this time.

This networking and data sharing all stayed within the confines of each business, for the most part. While there was sharing of electronic data between companies, this was a very specialized function. Computers were now seen as tools to collaborate internally, within an organization. In fact, these networks of computers were becoming

so powerful that they were replacing many of the functions previously performed by the larger mainframe computers at a fraction of the cost. It was during this era that the first Enterprise Resource Planning (ERP) systems were developed and run on the client-server architecture. An ERP system is a software application with a centralized database that can be used to run a company's entire business. With separate modules for accounting, finance, inventory, human resources, and many, many more, ERP systems, with Germany's SAP leading the way, represented the state of the art in information systems integration.

3.The World Wide Web and E-Commerce

First invented in 1969, the Internet was confined to use by universities, government agencies, and researchers for many years. Its rather arcane commands and user applications made it unsuitable for mainstream use in business. One exception to this was the ability to expand electronic mail outside the confines of a single organization. While the first e-mail messages on the Internet were sent in the early 1970s, companies who wanted to expand their LAN-based e-mail started hooking up to the Internet in the 1980s. Companies began connecting their internal networks to the Internet in order to allow communication between their employees and employees at other companies. It was with these early Internet connections that the computer truly began to evolve from a computational device to a communications device.

In 1989, Tim Berners-Lee developed a simpler way for researchers to share information over the network at CERN laboratories, a concept he called the World Wide Web.[4] This invention became the launching point of the growth of the Internet as a way for businesses to share information about themselves. As web browsers and Internet connections became the norm, companies rushed to grab domain names and create websites.

Registered trademark of Amazon Technologies, Inc.

In 1991, the National Science Foundation, which governed how the Internet was used, lifted restrictions on its commercial use. The year 1994 saw the establishment of both eBay and Amazon.com, two true pioneers in the use of the new digital marketplace. A mad rush of investment in Internet-based businesses led to the dot-com boom through the late 1990s, and then the dot-com bust in 2000. While much can be learned

from the speculation and crazy economic theories espoused during that bubble, one important outcome for businesses was that thousands of miles of Internet connections were laid around the world during that time.

As it became more expected for companies to be connected to the Internet, the digital world also became a more dangerous place. Computer viruses and worms, once slowly propagated through the sharing of computer disks, could now grow with tremendous speed via the Internet. Software written for a disconnected world found it very difficult to defend against these sorts of threats. A whole new industry of computer and Internet security arose.

4.Web 2.0

As the world recovered from the dot-com bust, the use of technology in business continued to evolve at a frantic pace. Websites became interactive; instead of just visiting a site to find out about a business and purchase its products, customers wanted to be able to customize their experience and interact with the business. This new type of interactive website, where you did not have to know how to create a web page or do any programming in order to put information online, became known as web 2.0. Web 2.0 is exemplified by blogging, social networking, and interactive comments being available on many websites. This new web-2.0 world, in which online interaction became expected, had a big impact on many businesses and even whole industries. Some industries, such as bookstores, found themselves relegated to a niche status. Others, such as video rental chains and travel agencies, simply began going out of business as they were replaced by online technologies. This process of technology replacing a middleman in a transaction is called disintermediation.

5.The Post-PC World

After thirty years as the primary computing device used in most businesses, sales of the PC are beginning to decline as sales of tablets and smartphones are taking off. Just as the mainframe before it, the PC will continue to play a key role in business, but will no longer be the primary way that people interact and do business. The limited storage and processing power of these devices is being offset by a move to “cloud” computing, which allows for storage, sharing, and backup of information on a massive scale. This will require new rounds of thinking and innovation on the part of businesses as technology continues to advance.

1.6 Information System Architecture

Information **system architecture** is a formal definition of the business processes and rules, **systems** structure, technical framework, and product technologies for a business or organizational **information system**. It encompasses the hardware and software used to deliver the solution to the final consumer service. It is a description of the design and contents of computerised system. It is an art and science of organising and labelling websites, intranets, online communities and software to support findability and useability. It may include information such as detailed inventory of current hardware, software and networking capabilities, a description of long-range plans and priorities for future purchases, and a plan for upgrading and/or replacing dated equipment and software.

It consists of four layers namely business process architecture, system architecture, technical architecture and product delivery architecture.

(a) **Business Process architecture:** It is a blueprint of the enterprise that provides a common understanding of the organisation and is used to align strategic objectives and tactical demands. It bridges enterprise business model and enterprise strategy on the one side and the business functionality of the enterprise on the other side.

(b) **System Architecture:** It is a conceptual model that defines the structure, behaviour and more views of the system. It comprises system components the externally visible properties of those components, the relationship. It provides a plan from which products can be procured, and system developed that will work together to implement the overall system.

(c) **Technical architecture:** It defines and specifies the interfaces, parameters, and protocols used by product architecture and system architecture layers.

(d) **Product delivery architecture**: Functional elements of the product are arranged into physical chunk and by which the chunks interact.

1.7 Business Information System

The gathering and dissemination of information is usually the company's most difficult problem. Information is voluminous, scattered and often difficult to obtain. Manger's workday is fraught and searchers the information to handle the various crisis that arise in addition to the normal flow of work. Overtime the typical company has

developed the major information system to provide planning, operating and control information to decision-makers throughout the organisation. The system isconnected, interact for the effective functioning of an organisation.

(a) **Financial Information:** All the companies have some kind of financial information system. This basis of the system is the flow of money throughout the organisation and if they are designed correctly the profitability and responsibility accounting system follow the organisation structure. These systems involve large amounts of data concerned primarily with historical and internal information although in some cases of financial planning.

(b) **The production/operations:** The production/operation system is concerned with information about the physical flow of goods or the production of goods and services. It covers such activities as production planning and control, inventory control land management, purchasing, distribution and transportation.

(c) **Marketing Information:** The basic areas of the marketing function that lend themselves to improvement through information systems include (1)forecasting/sales planning;(2) market research;(3)advertising;(4)operating and control information required to manage the marketing function. The system will give information to the marketing managers to help them make better decision about pricing, advertising, product promotion policy, sales force effect and marketing control.

(d) **Personnel Information:** The personal information system deals with the flow of information about people working in the organisation as well as future personnel needs. This system is concerned with personnel functions namely recruiting, placement, training, compensation, maintenance and health, safety and security.

(e) **Purchasing:** In this rapidly growing area of application, some purchasing uses are: automatic preparation of quote requests, updating order records, handling routine, follow-up, processing requirements. More advanced applications include order writing, vendor rating, computation of EOQ and preparation of accounts payable checks.

(f) **PERT:** Programme Evaluation Review Techniques has become a widely used information device for controlling the time cost and work in a project.

(g) **Research and Development:** This is a vital area for industrial companies but of less importance for financial and service organisation. This system may include some method for exchanging information on the results of research findings.

(h) **Simulation:** Simulation is not an information system; it may be classified as such because it is computer based and it depends upon access to the company's data bank. It is a method for simulating decisions and hence is vital tool for planning

UNIT – II

MANAGEMENT INFORMATION SYSTEM (MIS)

2.1 Meaning

Management Information System is very essential for the success of all types of organisation. Top level managers use Information while performing their functions namely planning, co-ordinating, controlling, directing and controlling. Every business organisation should be in a position to provide right information, in right quantity and in right time to right people. So, organisations might have management information system in order to provide data to users at all levels.

Management refers to a set of functions and process designed to initiate and co-ordinate group efforts in an organised manner in pursuant of certain goals. Information means data used for making decisions. A system I a group of interrelated components working together by accepting inputs and producing outputs in an organised transformation process for the accomplishment of an objective.

2.2 Definition

MIS is a "system of people, equipment, procedures, documents and communication that collects, validates, operates or transforms, stores, retrieves and present data for use in planning, budgeting, accounting, controlling and other management process" -Schwartz.

"Proper management information system is structured to provide the information when and where needed. It represents the internal communications network of the business providing the necessary intelligence to plan, execute and control." Frederic B. Cornish

2.3 Characteristics of MIS

(a) **Based on management needs:** The development of an information system should be based on the appraisal of management needs and overall business objectives of the management.

(b) **Management driven:** It is essential that management actively participates in the developmental efforts of the system. It must devote sufficient time during its designing, reviewing and implementing stages. The management should be responsible for setting system specification and must play a key role in system development.

(c) **Integrated function:** All the functional and operational information sub-system should be tied together as one entity. An integrated information system has the capability of generating more meaningful information to the management.

(d) **Eliminates duplication in data:** Data is captured by the system analysts only once from its original source in all probability. They attempt to utilise minimum data processing procedures and sub-systems to process data in order to minimise the number of output documents and reports produced by the sub system. This process eliminates duplication in data collection, simplifies operations and procedures.

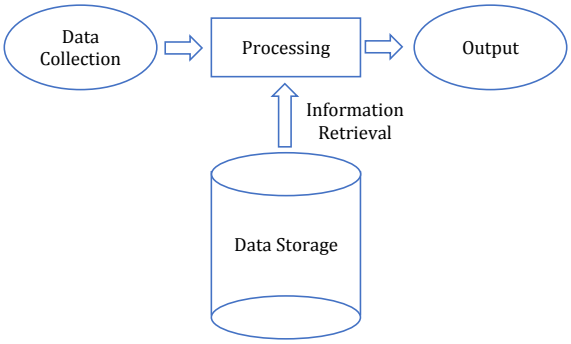
(e) **Total Reliance on planning:** It takes a minimum of 3 to 4 years to get MIS established firmly in an organisation. It implies that the designer of the system should keep the future objectives and requirements of the firm in his mind. He must bear in mind the possibility of system obsolescence before system gets into operation.

(f) **Sub-system concept:** Even though the information system is viewed as a single entity, it must be broken down into digestible sub-system which can be implemented one at a time also. This feature enables one to actually phase its plan.

(g) **Effective use of computers:** The use of computers increases the effectiveness of the system. Its use equips the system to handle a wide variety of applications by providing their information requirements quickly.

2.4 Functions of MIS

A system is defined as a group of interrelated elements forming a unified whole. The components are working together toward a common objective by accepting inputs and producing outputs in an organised transformation process.Information systems are made up of five different functions: **input**, **storage**, **processing**, **output** and feedback loop.



(1) **Inputs: C**ollect raw data from which the organisation from its external environment.

(2) **Processing:** Converting raw inputs into a meaningful form (Information).

(3) **Output:** Transfers the processed information to the people who will use it to the activities for which it will be used.

(4) The raw data as well as information and other reports prepared by the officials are stored in a system and retrieved whenever required.

(5) **Feedback and Control:** Feedback deals with output that is returned to appropriate members of the organisation to help them evaluate or correct the input state. Control deals with monitoring and evaluating feedback to determining whether a system is moving toward the achievement of its objective.

2.5 Levels of management

The four levels of information system that exist in a typical business moderate to large size are i) operational ii) lower management iii) middle management and iv)top management

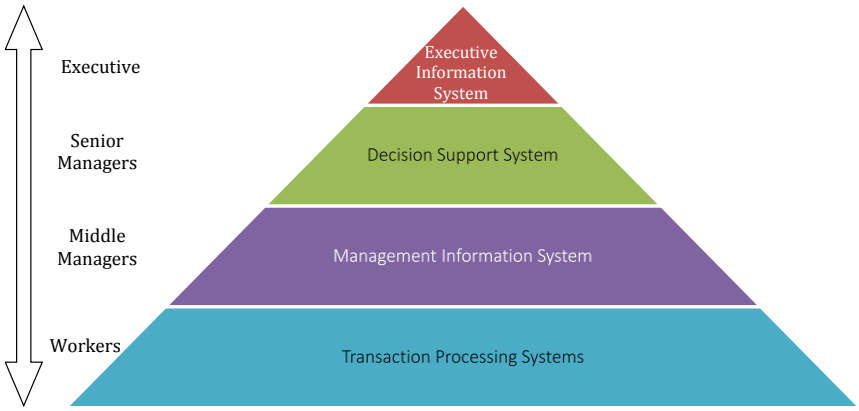
(a) **Operational level** or functional level, routine production or clerical operations are performed. Operational systems provide little feedback directly to the employees. A supervisor evaluates the employees' performance. Records of transactions occurring at the operational level are collected, organised and processed become the basis for higher level management actions.

(b) **Lower-level** management performs supervisory functions that are short term relative to the higher levels of management.

(c) **Middle management** functions are known to be tactical in nature. This level is responsible for allocating and controlling resources necessary to

accomplish the objectives that support the strategic goals of the business. Planning is performed.

(d) **Top level** management functions are strategic. These include establishment of the goals of the business, long range planning, new market and product development, mergers and acquisitions and major policy decision.



2.6 Hierarchy Level of Management

MIS at different structural levels of organisation

Management Information system supports operational, tactical and strategic management in each of the representative functional areas.

Levels of Organisation		Production	Finance	Personnel	Marketing
Top Level	Strategic	New plant location	Alternative financing	Welfare policy	Competitor survey
Middle Level	Tactical	Production bottleneck	Variance analysis	Performance appraisal	Advertising
Bottom Level	Operational	Daily scheduling	Payroll	Leave records	Sales analysis

2.6.1 Operational Decision

(a) **Daily schedules** refer to the detailed assignment of jobs to machine or machines to operations in a production environment. The schedules must be detailed, unambiguous reports produced in large numbers relatively low cost. Most of the information contained in such reports is internal to the individual organisation.

(b) The **payroll** contains data pertaining to a large number of employees in a timely manner, month after month, cost based efficiency and speed would be major consideration in the design of such system.

(c) **Leave records** constitute a major statutory record that must be maintained for every employee, throughout the many years the employee serves the organisation. Speed and accuracy are the major performance measures of such system.

(d) **Detailed sales analysis** is a must for any sales and marketing function. It might involve a very detailed data collection processing pertaining to every salesman, every product over a long-time span – an entire year or quarter – with details of the region, market segment.

2.6.2 Tactical Decision

(a) **Production bottleneck analysis** calls for senior management involvement, by people with years of experience. Results arising from such analysis are likely to have medium range impact. Comparative analysis – shift wise, plant wise, machine-wise, operator wise, etc.

(b) **Variance analysis**for the finance function calls for system that point out deficiencies, cost overruns, budget excess etc., by carefully matching target information with the summary information generated by operational data.

(c) **Performance appraisal** which would take into account, among others, the individual employee's leave records. Since decisions based on such systems are likely to have medium to long term impact, accuracy should not be underestimated, while keeping the priority of analysis.

(d) Planning for advertisement would use much of the information generated by detailed sales analysis. **Advertising information system** helps to decide on the levels of advertisement, mix of advertisement, and budget for advertisement.

2.6.3 Strategic Decisions

(a) A strategic decision by the production functions of the management deciding about the **location of a new plant.** Such decision requires much of the internal information generated by the tactical system designed to analyse the production bottleneck which is internal to the organisation**.** Strategic information system should have mechanism for scanning and assimilating environmental information which are likely to influence strategic decision in a systematic way.

(b) For a finance discipline, **alternative financing** is a strategic decision. It uses summary status information about the internal finances of the company including budget, variance analysis, and business environment. Information support for such strategic decision would call for substantial external information supplemented with internal financial health indicators.

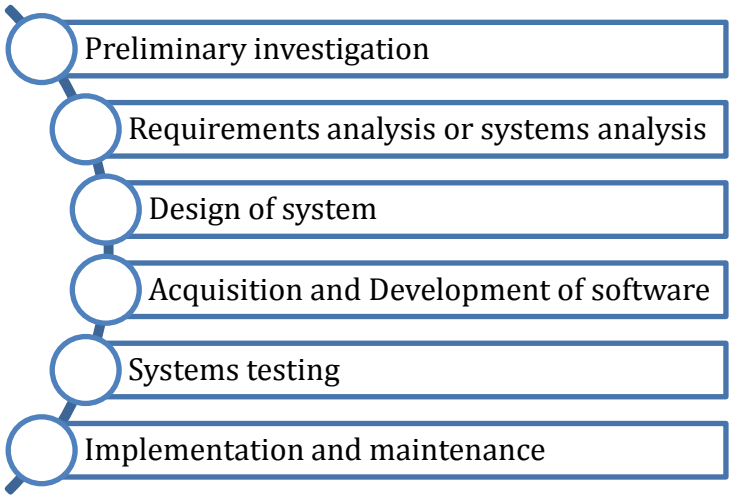
(c) Decision concerning the **welfare policy** of an organisation is a strategic decision that must be made by personnel management. The decision must be made by personnel management. The decision will be influenced by internal information about the size and quality of staff, the compensation package etc., but the strategic decision will be governed by the vision for the future of organisation as seen by the top management as well as the labour market conditions of the environment.

(d) **Competitor survey** helps to take decision relating to advertising, sales planning. This brings to the focus the importance of external information for strategic decision.

2.7 System Development Life Cycle

The system development life method can be thought of as a set of activities that analysts, designers and users carry out to develop and implement an information system. Different parts of a project can be in various phases at the same time, with some components undergoing analysis while others are at advanced design stages.

The systems development life cycle method consists of the following activities.



(a) **Preliminary investigation:** A preliminary investigation is undertaken when users come across a problem or opportunity and submit a formal request for

a new system to the MIS department. This activity consists of three parts request clarification, feasibility study and request approval. Before any system investigations can be considered, the system request must be examined to determine precisely what the originator wants. Thereafter, the analyse tries to determine whether the system requested is feasible or not. Aspects of technical, economic and operational feasibility of the system are covered in the feasibility study. The third part of the investigation relates to approval of the request. Not all requested systems are desirable or feasible. Based on the observations of the analyst, the management decides which system should be taken up for development.

(b) **Requirements analysis or systems analysis:** If, after studying the results of preliminary investigation, management decides to continue the development process, the needs of the users are studied. Analysts work closely with employees and managers of the organisation for determining information requirements of the users. Several fact-finding techniques and tools such as questionnaires, interviews, observing, the decision-maker's behaviour and their office environment etc., are used for understating the requirements. As details are gathered, the analysts study the present system to identify its problems and shortcomings and identify the features, which the new system should include to satisfy the new or changed user application environment. This step is also referred to systems analysis.

(c) **Design of system:** During system design, the user requirements that arose from analysing the user applications environment are incorporated into a new systems design. The design of an information system produces the details that state how a system will meet the requirements identified above. The analyst designs various reports/outputs, data entry procedures, inputs, files and database. He also selects file structures and data storage devices. These detailed design specifications are then passed on to the programming staff so that software development can begin.

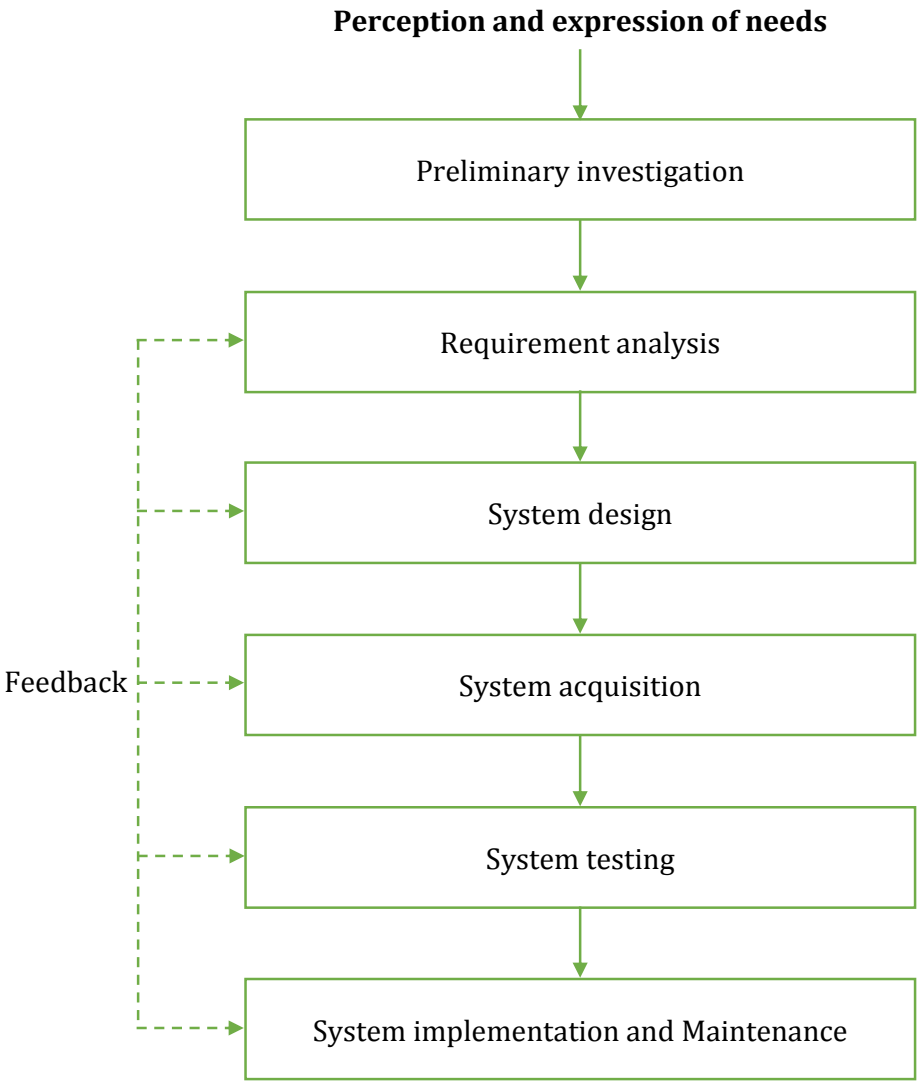
(d) **Acquisition and Development of software:** After the system design details are resolved, such resources need as specific type of hardware, software and services are determined. Subsequently, choices are made regarding which products to buy or to lease from which vendors. Software developers may

install (or modify and then install), purchased software or they may write new, customer-designed programs. The choice depends on many factors such as time, cost and availability of programmers. The analyst works closely with the programmers if the software is to be developed in-house. During this phase, the analyst also works with users to develop worthwhile documentation for software, including various procedure manuals.

(e) **Systems testing:** Before the information system can be used, it must be tested. Systems testing is done experimentally to ensure that the software does not fail *i.e.,* it will run according to its specifications and in the way users expect. Special test data are input for processing, and results examined. If it is found satisfactory, it is eventually tested with actual data from the current system.

(f) Implementation and maintenance: After the system is found to be fit, it is implemented with the actual data. Hardware is installed and users are then trained on the development efforts are reviewed to ensure that the new system satisfies user requirements. After implementation, the system is maintained; it is modified to adapt to changing users and business needs so that the system can be useful to the organisation as long as possible.

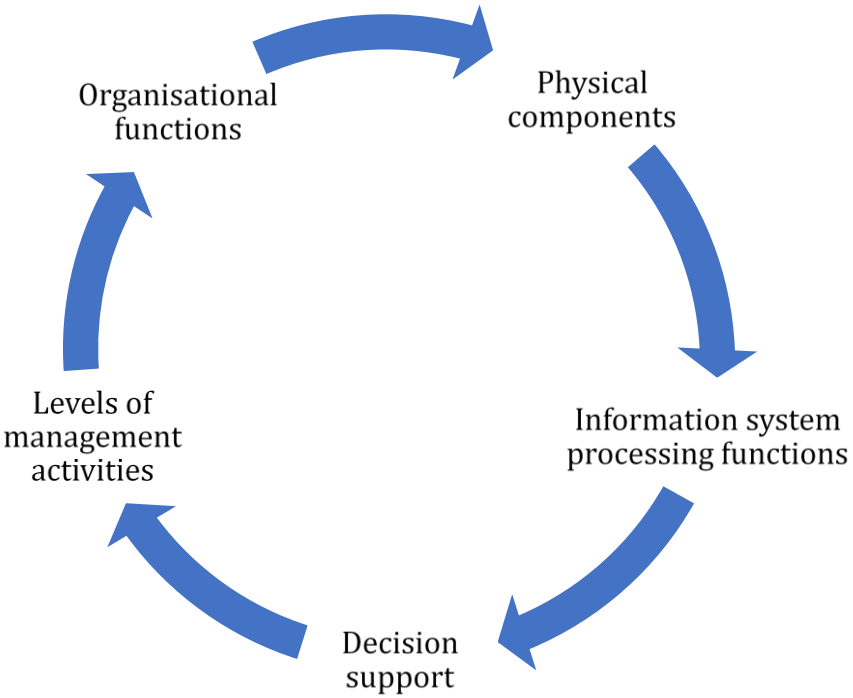
The system development life cycle should be viewed as continuous interface process that recycles through each stage for many applications. Thus, even when a system is fully specified, designed, purchased and running, it is continually being enhanced or maintained. Enhancement and maintenance may require returning to one of the earlier stages of system development life cycle.



Activities of the System Development Life Cycle

2.8 Structure of MIS

MIS structure may be described by following a variety of different approaches such as:



(1) MIS Structure Based on Physical Components

Structure of MIS may be understood by looking at the physical components of the information system in an organisation. The physical components of an organisational information system may be hardware, software, database, manual procedures and operating persons. A brief description of these components has been outlined in the following paragraphs:

(a) **Hardware:** Hardware refers to the physical data processing equipment and peripheral devices. For example, Central Processing Unit (CPU), monitor, keyboard, printer, drives, tapes, communication devices, etc.

(b) **Software:** Software is a broad term given to the instructions or programs that direct the operation of the hardware. Software could be two types, *i.e.,* system software and application software.

(c) **Database:** The database consists of all data utilised by application software. Data is stored in files.

(d) **Procedures:** Formal operating procedures, which are required to operate a system, such as manuals, are also regarded as physical elements.

(e) **Operating Personnel:** Personnel like Computer Operators, Computer Programmers, System Analysts, System Managers, etc., are the operating people of the information systems.

(f) **Input and Output:** Various physical inputs and outputs from the information system, existing in the forms life printout, reports, etc.

(2) Information System Processing Functions

Information system structure can also be understood in terms of its processing functions. The functions of an MIS explain what the system does. The main processing functions of information systems are described below.

(a) **To Process Transactions:** Information systems process transaction, where transaction may be defined as an activity taking place in an organisation. For example, making a purchase or a sale or manufacturing a product. It may be within the organisation or may be external in nature.

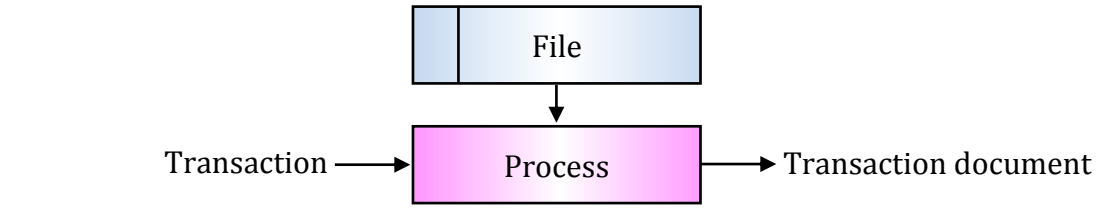
(b) **To Maintain Master Files:** Information systems create and maintain master files in an organisation. A master file stores relatively permanent or historical data about organisational entities. For example, data processing to prepare an employee's salary requires data items for the employee's basis pay, allowances, deductions, etc.

(c) **To Produce Reports:** Reports are significant products of an information systems. Many reports are produced on a regular basis, which are called scheduled reports. An information system also produces reports on ad-hoc request. These are known as special or ad hoc reports.

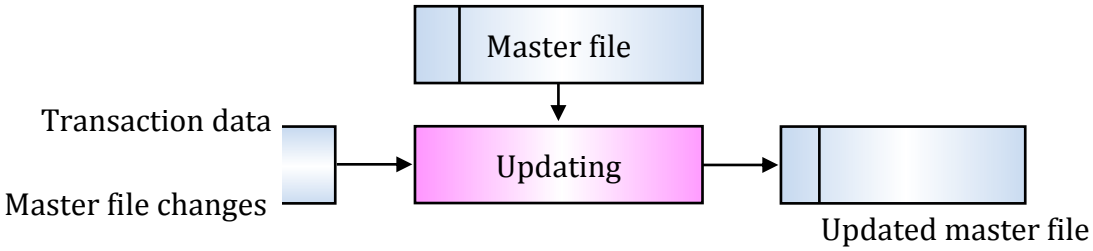
(d) **To Process Enquiries:** An information system is used to process enquiries. For processing such queries, the information system uses its database. These may be regular enquiries with a pre-defined format or ad hoc enquiries.

(e) **To Process Interactive Support Applications:** The information system contains applications designed to support systems for planning, analysis, and decision-making. Various types of models are used for processing such applications. The mode of operation, as the name suggests, is interactive, in which the user response to questions and request for data

and receives results so as to make changes in the inputs until an optimum solution is found.

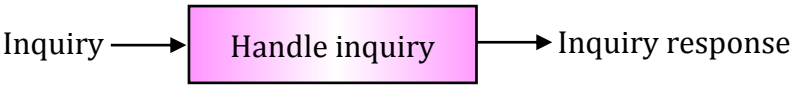


(i) Process Transaction

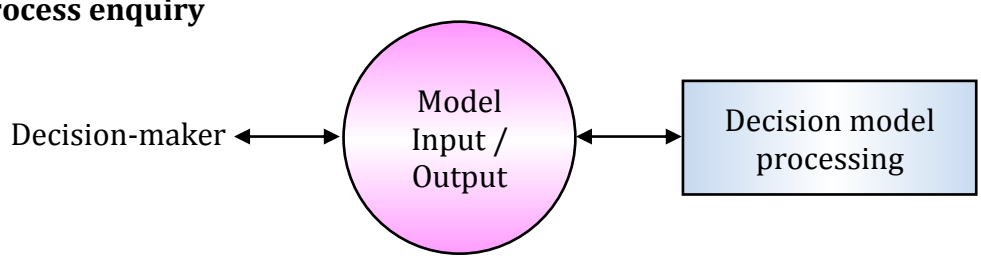


(ii) Maintain master file

(iii) Process reports



(iv) Process enquiry



(v) Process interactive supper applications

Information System Processing Functions

(3) Decision Support

Structure of MIS can also be described on the basis of its support in decision-making in an organisation. Decisions vary with respect to the structure that can be provided for making them. A highly structure decision can be pre-planned, whereas a highly unstructured decision cannot. A structured decision, because of its well-defined nature can be said to be programmable. However, it should not be taken to necessarily mean that the decision is automated, although many programmable decisions are

automated. An unstructured decision is said to be non-programmable. The structured programmable decision tends to be routine and frequently repeated; the unstructured decision tends to occur with less frequency and tends to be irregular.

(4) Levels of Management Activities

Management information systems support various management activities in an organisation. This implies that the structure of an information system can be categorised in terms of levels of management activities. Anthony, on the basis of activities, has classified the management hierarchy into three levels. These are:

(a) Strategic Planning Level,

(b) Management Control Level, and

(c) Operational Control Level

Strategic planning deals with long-range considerations. The decisions include the choice of business directions, market strategy, product mix, etc. Management control level includes acquisition and organisation of resources, structuring of work, and acquisition and training of personnel. Operational control is related to short-term decision for current operations.

(5) Organisational Functions

The structure of management information system can also be described in terms of the organisational functions. Thought there is not standard classification of functions; a typical set of functions in a manufacturing organisation includes productions, sales and marketing, finance and accounting, material, personnel and information system.

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