UNIT 3 MANAGEMENT INFORMATION SYSTEM (MIS)

Structure

3.0 OBJECTIVES

After reading this Unit, you will be able to:

- understand the meaning of Management Information System;

- get more ideas on the scope, objective purposes and characteristic features of Management Information System;

- know the advantages and benefits of Management Information System;

- get yourself acquainted with the problems and pitfalls encountered in developing an effective Management Information System; and

- realise the importance of Management Information System for library managers.

3.1 INTRODUCTION

The term Management Information System (MIS) is of relatively recent origin and is widely adopted following the accelerated use of computers in the early 1960's. The Management Information System to business what is the nervous system is to the human body. It is described as "informational blood stream" of an organisation. It encompasses a wide range of subject matters like management theory, communication theory, human processing of data and information technology. Often the concept of Management Information System is splintered and confused by' touting new ideas like decision support system, management reporting system, office information system, transaction processing systems, office automation, information resource management and database management system as replacements for Management Information System. However, a brood interpretation of the concept of Management Information System includes all the above.

Management Information System has something significantly to do with two important management functions (or elements of management) studied in Unit 1, namely, planning and controlling. The basis for Management Information System is that computers, in addition to data processing, can serve as fine tools to improve the planning and control of operations by providing better information for decision making. As library and information professionals, we provide information support for research, education, planning, business, decision making and so on and so forth. By and large, libraries are providing information from public domain published information and to a limited extend public domain semi-published information. The critical requirements in a decision making situation in business is the classified and unpublished information as well as the crucial dynamic internally generated information. Each business enterprise will design and maintain its own Management Information System for the purpose and library and information professionals with their techniques and tools can play vital role in this endeavour. However, the purpose of this 'unit is to seek answer to the

questions like don't we, as library managers, need Management Information System for libraries and information centres for decision making and efficient functioning? The answer is definitely yes and let us look into various aspects of Management Information System for library and information centres.

Library managers must have information concerning each aspect of their operations, functions and services. As a processor of information, a manager should collect, store, process, retrieve and utilise information required for decision making. Keeping abreast with all his requirements of information (both internal and external) in this ever expanding and complex library and information situation is beyond the capacity of individual library managers. As such a system has to be planned, designed and evolved to take care of this crucial information requirement of information people.

3.2 DEFINITION AND MEANING OF MANAGEMENT INFORMATION SYSTEM

There are numerous definitions of Management Information System. Yet the fundamental concept remains essentially the same. Management Information System can be defined as a collection of data processing equipment, procedures, software and people that integrates the sub-systems of the organisation and provides information for decision making on planning and control operations. In other words, Management Information System is an integrated user-machine system that monitors and retrieves data from the environment, captures data from transactions and operations within the firm, filters, organises and selects data and presents them as information to managers, and also provides the means for managers to generate information as desired. In simple terms Management Information System is any organised approach for obtaining relevant and timely information on which to base management decisions.

Historically, accounting systems provide information for planning and control in business. Managers have always had sources of information. But Management Information System, with computerised processing of data provides a comprehensive system of information. Management Information System is a powerful method for aiding managers in operations analysis for solving problems and making decisions.

Self Check Exercise

1)   Define Management Information System.

Note: i)   Write your answer in the space given below.

           ii)   Check your answer with the answers given at the end of this Unit.

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3.3 SCOPE, OBJECTIVES AND PURPOSES OF MANAGEMENT INFORMATION SYSTEM

The scope and purposes of Management Information System can be better understood if we examine each word in the term. Firstly, management comprises the activities of managers and Management Information System is necessary to facilitate the decisions, managers have to take. Further, management has become system oriented and more sophisticated in management techniques. Secondly, information (as distinguished from data) is the essential raw material for making decisions. The job of Management Information System is to turn data into information. Information is planned for and made available to managers as needed, Thirdly, organisation is a system with a high degree of synergism. A system of information ties planning and control by managers to operational systems of Implementation.

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In general, the Management Information System is the means for connecting the managers with operating systems by exchange of information. The specific purpose of a Management Information System is to provide information for decision making on planning, organising and controlling the major activities of the organisation and initiating action with the intention of achieving synergistic benefits.

The main objectives of Management Information System are facilitating the decision making, planning and control processes, objective performance appraisal of different units and' individuals, the economic and efficient production of reports and serving as means for giving direction and action to manager's communication. It is important to note that Management Information System is meant for supplying and not generating information for managers. It is expected to provide processed information to the decision makers. The output of Management Information System is usually in the form of information reports. Such processed information is also disseminated to members of the organisation, the public and external stake holders like customers, distributors, competitors, suppliers, labour unions, stock- and bond-holders, financial institutions, trade associations, governments, special interest groups at large and regulating agencies.

Self Check Exercise

2)   What are the main objectives of Management Information System ?

Note: i)   Write your answer in the space given below.

ii)   Check your answer with the answers given at the end of this Unit.

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3.4   CHARACTERISTICS OF MANAGEMENT INFORMATION SYSTEM

It is important to note here that Management Information System captures data and information from the environment as well as the transactions and operations of the system. Data have to be obtained both from the internal environment like internal operations (marketing, production, finance and other functional areas) as well as from the external environment like competitors, unions, labour force, government policies, legal considerations, suppliers, customers, society, market etc. The internal information is generated from the operations of the organisation at various management levels in the various functional areas. The information gets processed within an organisation as it travels from the clerical level to the top levels of management. That is, the internal information always pertains to the various operational units of the organisation and gets summarised and processed as it gets from lower level to the top level. Only summarised internal information is consumed at the top level and other internal information is consumed by lower and middle level managers. The external information which is from the environment affects the performance of the organisation from outside.

Two basic approaches possible to Management Information System in any organisation are:

i)   Organisational functional sub-systems like marketing, production, materials, personnel and finance.

ii)   Processing activity sub-system at four different levels:

a)   Transaction processing (Clerical staff)

b)   Operational control   (Junior level managers)

c)   Management control   (Middle level managers)

d)   Strategic planning   (Top level managers)

The major processing functions in Management Information System are:

i)   Processing of business transaction

ii)   Updating of master files

iii)   Generation of information reports

iv)   Processing of interactive enquiries

v)   Providing interaction analytical support

Information systems could be of two different types, i.e., structured and unstructured. Formalisation and publicisation of information lead to structuredness in information processing activity. Information systems could also be characterised as formal and informal. Formal systems follow the hierarchical structure of the organisation, whereas systems where unauthorised people pass on public or private information from one level to another level are called informal systems. MIS can also be classified according to function and time frame (i.e., for historical, control and planning purposes). As discussed in the "Communicating" function of managers in Unit 1, much information flowing in an organisation is informal. Any formalised information system operates within the context of the informal information channel or interpersonal networking called "grapevine".

Seven important characteristics or attributes of quality information from an effective Management Information System are timeliness, accuracy, precision, completeness, conciseness, relevance and appropriateness of form.

It may also be noted that an organisation can have information sub systems like accounting information system, office management system, marketing system, human resource information system, etc. The physical components of MIS are hardware, software, database, personnel and procedures. A database (i) which avoids data redundancy and inconsistency, (ii) which is programme and data independent, (iii) which provides flexible access to shared data, (iv) which ensures centralised control of data and v) which provides data privacy, security and confidentiality against fraud, theft, system errors, maliciousness, accidents, disasters, computer crime and abuse, etc. The essential functions carried out in the transaction processing are data capture, validation, classification, sorting, retrieval, calculation and summarisation.

In order to achieve its set objectives Management Information System has to have many desirable characteristics apart from the attributes of quality information mentioned above. First of all, an MIS has to be management oriented as well as management directed. It must posses attributes like accessibility, comprehensiveness, accuracy, appropriateness, timeliness, clarity, flexibility, verifiability, freedom from bias and qualifiability. It has to be highly selective and capture only relevant data and information. It must integrate all functions, departments and levels of management in the organisation so as to ensure both synergistic effects as well as the impact of one function on the other. It must systematically synthesise the information requirements of each manager based on his position, responsibilities and scope for decision making. Management Information System must differentiate the kind of information required for planning, decision making and controlling purposes. MIS is designed for job positions rather than for individuals keeping in mind the job responsibilities and for needs of different levels of management in different functional areas. It must be highly responsive to changes caused by organisational and experimental changes. It Must have some flexibility, ease to use, adaptability and an in-built contingency nature. Further, Management Information must consider the full effect of a decision in advance by supplying the required data. The information provided should have degrees of details just needed for the level of management, minimum need for further analysis and interpretation, uniform presentation and identified significant past relationship and forecasted future relationship. Management Information System should be integrated by way of a database with single point data entry and updation and no data redundancy.

Self Check Exercise

2)   Explain the characteristics of an effective Management Information System.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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3.5 BENEFITS OF MANAGEMENT INFORMATION SYSTEM

An efficient Management Information System has many advantages. Some of them are given below:

1) Management Information System quickly provides all sorts of information required for decision making at different levels of management.

2) In the process of capturing data forms, one may find gaps, incomplete and incorrect data. The same are likely to be rectified or completed or filled in the process.

3) Management Information System makes decision making easy, accurate and less risky.

4) Information flow from either direction is ensured and encouraged in the rank and file of managers.

5) Continuous monitoring and updating of information become imperative.

6) Greatly helps long range planning with accurate forecasting trend analyses and preplanning information in budget preparation. Even operations planning and tactical planning are provided with information inputs by MIS. Plan modelling (consisting of premising, identification and comparison of alternative courses of action) is greatly aided by MTS.

7) MIS plays a crucial role in controlling managerial operations, monitoring performance and decentralised decision making through performance report, break-even analysis, financial ratios, etc. It calculates variations between budgeted and actual results, triggers revised forecasts and acts as an early warning systems for monitoring activities. In other words, MIS provides for control of information which was not previously available and for information sharing across departments.

8) MIS helps planning additional new facilities.

By and large, MIS helps libraries in determining efficiency, effectiveness, competitiveness and performance, and facilitates collection of data, training and development of staff.

3.6 PROBLEMS AND PITFALLS IN DEVELOPING MIS

An effective MIS requires continuous, consistent, long-range planning with involvement and commitment from the management as an institutionalised planning process involving everybody concerned. There is a need for an information steering committee and it may take more than one iteration to establish the process firmly. It has to undergo an application development cycle consisting of analysis, synthesis and implementation phases. Systems feasibility (consisting of technical, economic and operational feasibilities) is a most important starting point of MIS development. In other words, the development process should take into account the rationale, definition and characteristics, economics, design, specification; schedule, implementation plan, implementation status and review.

Some of the usual pitfalls and problems in developing and running effective Information System are mentioned below along with -some ways of increasing effectiveness:

1) **Emphasis on Clerical System:** Just taking over an existing clerical system and modifying it without upgrading or changing it does not help. The clerical system has to be upgraded to a management system. On the other hand, computers have been put to work on those things that are best understood and easily structured and which require little management involvement.

2) **Communication gap between Computer Technologist and Manager/ User:** Ensuring maximum cooperation and coordination between computer personnel and managers is necessary. A greater degree of interaction and involvement between the systems function and the management function is required.

3) **Lack of a Master Plan:** A systematic long range plan/planned approach is necessary for establishing an effective Management Information System. Increased focus on the area of problems definition is required in the systems analysis. The dramatic changes in business strategy together with changes in the top management personnel and organisation structure call for a through plan.

4) **Subordition of MIS Function to EDP Accounting System:** Management Information System's function should be made an independent function so that it reports directly to top management.

5) **Lack of Managerial Participation:** This involvement and support of top management as well as participation of all managers in the design of their own management information system are necessary. If top management tends to depend upon its informally designed private information systems, development of structured, formalised and a public management information systems becomes difficult. Many top managers wrongly feel that good strategic decisions are made more by intuition than by a quantitative analysis of the available data.

6) **Overlooking Human Acceptance:** Users of Management Information System should be involved right at the early stages of design. Their cooperation by demonstrating how Management Information System will positively affect their job is a must.

7) **Lack of Resources and Trained Personnel:** Lack of trained personnel consisting of system analysts, system designers, programmers and chief information officers who are business trained and/or have a basic business prospective is a handicap.

8) **Voluminous and Unstructured Nature of Data:** Sometimes the volume of data itself can be a hurdle unless careful sifting is done. On the other hand, it may also be difficult to locate and retrieve relevant data. Often, the data required by top management is unstructured, non-programmed, future oriented. inexact and external and hence difficult to capture.

9) **Limited Use of Management Science and or Techniques:** Some of the ways of increasing the effective of Management Information System include motivating managers to participate and get involved in Management Information System, establishing consistent performance and work criteria for Management Information System, maintaining simplicity and ease of use, training systems analysts and careful consideration of basic computer feasibility criteria like volume and repetitive nature of transactions, degree of mathematical processing, quick turnaround time, accuracy and validity of data, common source documents and well understood processing logic.

10) **Enormous Time, Effort and Resources Required:** MIS budget includes data processing costs, hardware costs, personnel costs, supplies, services, etc.

Self Check Exercise

4) Enumerate the important problems in developing a Management Information System.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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3.7 MANAGEMENT INFORMATION SYSTEM FOR LIBRARY AND INFORMATION MANAGERS

Management Information System is a vast area and what has been presented is only an elementary exposure to the concepts of Management Information System. The procedures of design, development, operation and evaluation of Management Information System are not discussed here. Those interested in more information about Management Information System may refer to the books cited at the end.

It is interesting to note that a fully computerised and comprehensive Management Information System is yet to be seen in libraries and information centres. However, the underlying principles are followed in manual, mechanical or semi-automated way to gather, process and use information mostly from within the organisation required by library managers. Information from the external environment is rarely collected and processed. In most cases use of periodic reports and statistics can be seen. But they cannot match the characteristics of Management Information System discussed earlier. It is really an interesting area to know how the information requirements of decision makers and managers of information are scuttling. As examples, you may think of the following simple situations in a typical library and how equipped Management Information System of libraries are to face such decision making situations.

1)   Monitoring and feedback on need for procuring additional copies of certain books based on heavy demand

2)   Change of policy regarding entitlement of number of books to be borrowed by customers as well as the number of days (period) for which books can be kept

3)   Taking a decision regarding a sudden cut or a windfall of budget for journals

Though library statistics and annual reports cannot be considered as substitutes for MIS, they serve the major purposes of providing a base for performance assessment of libraries, decision making and public` relations. They are aimed primarily at users, library authorities and taxpayers at large rather than library managers and staff. They also serve the purpose of knowing the activities of the year, comparing libraries and comparing performance over the years.

Comprehensive, accurate, well planned and up-to-date library statistics help gauging the progress of a library, formulating policy and procedure, measuring the efficiency of various sub systems, planning a new service or improving an existing service, measuring the output and performance of library staff and planning reward and salary structure. As statistics have all the potential for abuse, misuse and overuse, due care and precaution should be taken on using library statistics.

As mentioned above, properly compiled annual reports of libraries help in determining the progress, providing publicity, evaluating the library, and taking remedial measures where needed, apart from serving as a way of seeking public funds, providing feedback to top management, comparing performance with standard as well as other libraries and finally serving as historical records.

A typical MIS for library and information centres with reference to Users, Use, Use time, Collection, Services and Personnel is given below, indicating how such an MIS may be useful in decision making for library managers. This is merely illustrative and not exhaustive.

Users

Regular members who have borrowing privileges and use the library well. Visitors who are not regular but use intensively the library. Casual visitors.

Analysis of data relating to their position, duties and responsibilities in their respective organisations, purpose of use and how used, frequency of use, etc.

Information obtained from data analysis may provide useful indicators for extending support to intensive users, offer them special facilities and thus fix priorities for attention to different categories of users.

Use

What materials are heavily used, by whom, materials used within the library, and such other things. These data may be obtained from statistics kept in the circulation division and Reading and reference rooms.

Use Time

When is the library heavily used - During a day, during a specific period, etc.

Information on this will enable staff deployment during rush hours and satisfy customers with speedy service.

Collection

Collection analysis in terms of subject distribution, types of material within a collection and such others will throw light on the quality of collection, if properly assessed.

This information will be vital for collection, planning and building and thus improve usefulness and the image of the library.

Services

Services like circulation, reference service, literature search, Current Awareness Service, and Selective Dissemination of Information, etc.

These services may be assessed for cost effectiveness, cost benefits, and such others to give indicators for fixing priorities, allotment of financial resources, deploying personnel, improvements in quality, etc.

Personnel

Assessment of performances, promotion to deserving persons, control deployment, upskilling capabilities, harmonious development, etc. will lead to a better organisational image and performance. This information if systematically collected, organised and stored and available for retrieval through multiple access points will be of invaluable support to decision making.

An MIS can be developed, collecting all data mentioned above, which can be accessed by authorised person, providing facilities of access through LAN (Local Area Network) and also integrated appropriately so that data collected in one operation can be used for other purposes, if necessary.

The characteristics of MIS, benefits, problems and pitfalls, etc., are all relevant to such an MIS for library and information centre Management.

3.8   SUMMARY

Management information System is considered to be the nervous system of business enterprises. Not only does Management Information System cover many subjects but it also covers other areas like decision support system and database management system which are often confused

with Management Information System. Management Information System ensures better information for decision makers. Management Information Systems is any organised approach for obtaining relevant and timely information on which to base managerial decisions. Each word in the term Management Information System is to provide information for decision making on planning, organising and, controlling major activities of the organisation and initiating action with the intention of achieving synergistic benefits. Management Information System captures data from both the internal and external environments as well as the transactions and operations of the organisation. Information supplied by Management Information system should be timely, accurate, concise, relevant, and complete. Some of the important characteristics of Management Information System are selectivity, capability to integrate all functions for synergistic benefits, systematic synthesis of information, flexibility, adaptability and conformity. By providing all sorts of information from the data captured, corrected, processed on a continuous basis, Management Information System helps in long-range planning, ensures two way communication and makes decision making easy, accurate and less risky. Some of the usual problems and pitfalls in developing good Management Information System include emphasis on clerical system, communication gap between manager and computer technician, lack of master plan, resources, trained personnel and managerial participation, subordination of Management Information System's function to EDP or accounting function, lack of involvement of users in the design phase, difficulty in locating data and enormous time, effort and resources, required to capture and process voluminous data. Computerised and comprehensive Management Information Systems are not normally found in libraries. Yet the underlying principles are adopted in a more traditional way. Most often it is the periodic reports and statistics that are serving the basic information for decision making in libraries and information centres.

3.9   ANSWERS TO SELF CHECK EXERCISES

1)   Management information System is a collection of data processing equipment, procedures, software and people that integrates the sub-systems of the organisation and provides information for decision making on planning and control operations. In other words, Management Information System is an integrated user-machine system that monitors and retrieves data from the environment, captures data from transactions and operations within the firm, filters, organises and selects data and presents them as information to managers, and also provides the means for managers to generate information as desired.

2)   The main objectives of Management Information System are facilitating the decision making, planning and control processes, objective performance appraisal of different units and individuals, the economic and efficient production of reports and serving as a means for giving direction and action to manager's communication. Management Information System is meant for supplying and not generating information for managers. It is expected to provide processed information to the decision makers. Such processed information is also disseminated to members of the organization, the public and external stake holders like customers, distributors, competitors, suppliers, labour unions, stock and bond-holders, financial institutions, trade associations, governments, special interest groups at large and regulating agencies.

3)   First of all, an MIS has to be management oriented as well as management directed. It must possess attributes like accessibility, comprehensiveness, accuracy; appropriateness, timeliness, clarity, flexibility, verifiability, freedom from bias and qualifiability. It has to be highly selective and capture only relevant data and informations. It must integrate all functions departments and levels of management in the organisation so as to ensure both synergistic enacts as well as impact of one function on the other. It must systematically synthesise the information requirements of each manager based on his position, responsibilities and scope for decision making. Management Information System must differentiate the kind of information required for planning, decision making and controlling purposes. MIS is designed for job positions rather than for individuals keeping in mind the job responsibilities and the needs of different levels of management in different functional areas. It must be highly responsive to changes caused by organizational and experimental changes. It must have some flexibility, ease

to use, adaptability and in-built contingency nature. Further, Management Information System must consider the full effect of a decision in advance by supplying required data. The information provided should have degrees of details just needed for the level of management, minimum need, for further analysis and interpretation, uniform presentation and identified significant past relationship and forecasted future relationship. Management Information System should be integrated by way of a database with a single point data entry and Updation and no data redundancy.

Seven important- characteristics or attributes of quality information from an effective Management Information System are timeliness, accuracy, precision, completeness, conciseness, relevance and appropriateness of form.

4) Some of the problems in developing and running effective Management Information System are mentioned below along with some ways of overcoming them.

   i) **Emphasis on Clerical System:** Just by taking over an existing clerical system and modifying it without upgrading or changing it does not help. The clerical system has to be upgraded to a management system. On the other hand, computers have been put to work on those things that are best understood, easily structured and which require little management involvement.

   ii) **Communication gap between Computer Technologist and Manager/User:** Ensuring maximum cooperation and coordination between computer personnel and managers is necessary. A greater degree of interaction and involvement between the systems function and the management function is required.

   iii) **Lack of a Master Plan:** A systematic long range plan/planned approach is necessary for establishing an effective Management Information System. Increased focus on the area of problems definition is required in the systems analysis. The dramatic changes in business strategy together with changes in the top management personnel and organisation structure call for a thorough plan.

   iv) **Subordition of MIS Function to EDP or Accounting System:** Management Information System's function should be made an independent function so that it reports directly to top management.

   v) **Lack of Managerial Participation:** Involvement and support of top management as well as participation of all managers in the design of their own management are necessary. If top management tend to depend upon their informally designed private information systems, development of structured, formalised and public management information systems becomes difficult. Many top managers wrongly feel that good strategic decisions are made more by intuition than by a quantitative analysis of the available data.

   vi) **Overlooking Human Acceptance:** Users of Management Information System should be involved right at the early stages of design. Their cooperation by demonstrating how Management Information System will positively affect their job is a must.

   vii) **Lack of Resources and Trained Personnel:** Lack of trained personnel consisting of system analysts, system designers, programmers and chief information officers who are business trained and/or have a basic business prospective is a frequent handicap.

   viii) Voluminous and Unstructured Nature of Data: Sometimes the volume of data itself can be a hurdle unless careful sifting is done. On the other hand, it may also be difficult to locate and retrieve relevant data. Often, the data required by top management is unstructured, non-programmed, future oriented, inexact and external and hence difficult to capture.

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x) **Enormous Time, Effort and Resources Required:** MIS budget includes data processing costs, hardware costs, personnel costs, supplies, services, etc.

3.10 KEY WORDS

Data	:	A collection of values of various types (numbers, characters and so on) that are used by information systems to produce information.
Data Base	:	An integrated collection of persistent data that serves a number of applications in an enterprise.
Database Management	:	The integration of the various information sub-systems in order to reduce the duplication of information.
Decision Making	:	The process of generating and evaluating alternatives and making choices among them.
Decision Support System	:	An information system that allows users to interact directly with a computer so that they can get answers quickly.
Information	:	An increment in knowledge. In Management Information System, information is obtained by processing data into a form meaningful to the users.
Management Reporting System	:	A type of Management Information System whose main objective is to provide lower and middle management with reports and inquiry capabilities.
Synergism	:	The cooperative action of two or more persons coming together to accomplish more than they could do separately.
Systems Approach	:	The viewing of any organisation or entity as an arrangement of inter-related parts that interact in ways that can be specialised and to some extent predicted.

3.11 REFERENCES AND FURTHER READING

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