EDUCATION MANAGEMENT INFORMATION SYSTEM (EMIS): A SINE QUA NON FOR THE DIGITALIZATION OF HIGHER EDUCATIONAL SYSTEM IN NIGERIA

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Abstract

Digitalization means adaptation of a system, process, etc. to be operated with the use of computers and the internet. It is a process of converting information from analog to digital format. A cursory look at most universities and colleges in Nigeria shows that majority of them do not offer Education Management Information System (EMIS) as a course. This paper x-rayed the detailed course content of Education Management Information System (EMIS), as a pre-requisite for the digitalization of higher education in Nigeria. Information and Communication Technology (ICT) is an indispensable part of the contemporary world. In fact, culture and society have to be adjusted to meet the challenges of the information age, so higher education cannot be left out. The introduction of ICT in education as a course cannot take the place of EMIS. Conclusion was drawn. It was recommended that in this era of introducing the Core Curriculum and Minimum Academic Standard (CCMAS), National Universities Commission, Universities and Colleges should make Education Management Information System (EMIS) a core course at 300 level in all colleges and universities if digitalization is envisaged.

Introduction

Management at all levels in all sectors take important decisions. For example, decisions are made on future plans and present activities; for such decisions to be effective, adequate, timely and reliable information is needed by management, and this can be provided by Management Information System (MIS). According to Lucey (2005), Management Information System is a system that converts data from internal and external sources into information and communicate such information in an appropriate form to management at all levels, in all functions, to enable them make timely and effective decision for planning, directing and controlling the activities for which they are responsible. Management Information System provide adequate and reliable information that enables management to take effective decisions concerning their organization. On the other hand, digitalization means adaptation of a system, process, etc. to be operated with the use of computers and the internet. It is a process of converting information from analog to digital format. This typically involves converting information in physical form (paper documents, photographs, films, etc) into digital files that can be stored and processed by computers. It means using digital process to transform your operations; it can help to improve efficiency and productivity.

According to Laudon and Laudon (2010) Information System can be defined technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organization. In addition to supporting decision making coordination, and control, information systems may also help managers and workers analyze problems, visualize complex subjects, and create new products or services. Information systems contain information about significant people, places and things within the organization or in the environment surrounding it. Management Information System on the other hand, tries to achieve a broader information system literacy. It deals with behavioural issues as well as technical issues surrounding the development, use and impact of information system used by managers and employees in an organization.

Kroenke (1989) sees Management Information System in Education as a system that is using formalized procedures to provide management at all levels, in all functions, with appropriate information based on data from both internal and external sources, to enable them make timely and effective decisions for planning, directing and controlling the activities for which they are responsible. Lucey (1997) defined Management Information System as an integrated computer based user machine system that provided information for supporting operation, and decision-making functions. Buch and Grundnitski (1989) emphasized that the success of management information system in any organization depends largely on the level of awareness of the system to the users. They further explained that users of the information system should be educated or informed of what the system requires, and provides and that the awareness programme must be carried out properly.

Tertiary or higher education, also referred to as third stage, third level, and post-secondary education, is the educational level following the completion of a school providing a secondary education. The World Bank, for example, defines higher education as including universities as well as institutions that teach specific capacities of higher learning such as colleges, technical training institutes, community colleges, nursing schools, seminaries, research laboratories, centers of excellence, and distance learning centers. Higher education is taken to include undergraduate and postgraduate education, while vocational education and training beyond secondary education is known as *further education* in the United Kingdom, or *continuing education* in the United States. The Management of higher institution encompasses its functions which include teaching, research and community service. In educational Institutions, important decisions on the various problems facing these institutions can be taken effectively with the use of Management Information System. Such problems include hiring, training and development of staff, ghost teachers/students, inaccurate demographic figures on students and staff resulting in inaccurate budget estimates, etc. Most of these problems exist due to poor management of Information. These institutions still use manual method in the collection, processing, storing and retrieval of information; thus, the complex nature of managing our educational institutions calls for the use of Management Information System in these institutions – hence Education Management Information System (EMIS). Based on the foregoing, Education Management Information System (EMIS) could be defined as a system that collate, manipulate and converts data from internal and external sources into information and communicate such information in an appropriate form to educational administrators at all levels, to enable them make timely and effective decision for planning, directing, organizing and controlling the activities of their various institutions for which they are responsible. It is therefore not sufficient and necessary to replace the above course with introduction to computer or ICT in education course. Let us examine the detailed course content of Education Management Information System (EMIS), and compare it with other ICT related courses in education.

Information and Data

Information like any other resource needs to be managed. There is a lot of emphasis on the management of human and material resources in the organization. Information requires proper management because of its role in decision-making. The terms data and information are used interchangeably as meaning the same thing. But data and information have different meanings. E.g. Data are the input raw materials from which information is produced; they are facts, events, transactions which have been recorded, but when data is processed in such a way that it is useful to the user, it becomes information. Processed data is not information, it becomes

information only when it is useful to the recipient. The processing of data into information and communicating the information to the user, i.e management is the main function of MIS.

Management at all levels need relevant information to help them to plan, control and to make decisions. Information is relevant when it increases knowledge, reduces uncertainty and is usable for the intended purpose. Although relevant information is required by management at all levels, they do not all need the same type of information; their information needs is dependent on the level of management, the task, confidentiality, urgency, etc. for this reason, information can be classified as follows:

Classification of Information

Information can be classified as follows:

1. *By source:* this could be internal or external
2. *By nature:* this could be qualitative, quantitative, formal, informal.
3. *By level:* this could be strategic, tactical and operational.
4. *By Time:* this could be historical, present, future.
5. *By Frequency:* this means, continuous i.e hourly, daily, monthly, annually.
6. *By use:* this can be for planning, control, decision.
7. *By form:* this can be written, visual, aural (sense of hearing).
8. *By Occurrence:* this can be planned interval, occasioned, on demand, etc.
9. *By type:* this means detailed, summary, aggregate, abstract.

Characteristics of good Information

A good information is that which creates value when used. It has the following characteristics: *(a) Relevance*

(b) Accuracy
(c) Completeness
(d) Confidence in the Source
(e) Timely
(f) Communicated to the right user (person)
(g) Contains the right level of detail
(h) Communicated through the appropriate channel
(i) Understandable by user

Relevance: Information must be relevant for its purpose, i.e it must be relevant to the problem.
Accuracy: For information to be relied upon, it must be accurate. Accurate information helps in taking effective decisions.
Completeness: For decision to be carried out effectively, all the information required must be available. In other words, the information must be complete in the key areas of the problem.
Confidence in the source: The users of the information must have confidence in the source of the information. Their confidence can be enhanced if the source has been reliable in the past or if there is close liaison between the information producers and users of the information.
Timely: Information must be communicated in time for use; delays in communicating information makes the information worthless.
Communicated to the right person: When information is communicated to the right person, i.e the person that needs the information, it will have value, but if the information is communicated to the wrong person, it is meaningless.

Contains the right level of detail: Information should contain the right level of detail; i.e it should contain the amount of detail that is consistent with effective decision-making.

Communicated through the appropriate channel: Information must be transmitted through the appropriate channel of communication; e.g it can be written communication, oral communication, face-to-face, electronic communication.

Understandable by user: If information is not understood, it cannot be used. A lot of factors can affect understandability of information, which include:

(i) *Preference of the user:* Information can come in the form of pictures, graphs, statistical, numeric presentation. These varied means of communicating information means that the same message may receive different interpretations.

(ii) *Remembered knowledge:* The extent of remembered knowledge affects understanding.

(iii) *Environmental factors:* Environmental factors such as group pressure, time and trust in the information system affects understanding.

(iv) *Language:* Information is conveyed by means of signals or messages. This may be in the form of a code or in a natural language such as English or French. The ability to understand the language the information is conveyed affects understanding of the information.

Functions of Information to Management

Information is knowledge and understanding that is usable by the recipient. It must tell the recipient something not already known. Information assist management in many ways. These include: (1) Reduction of uncertainty: Relevant information helps to reduce the unknown.

(2) As an aid to monitoring and control: By providing knowledge about performance of workers and the extent of deviation from standard, the management are in a better position to monitor and control situations in the organization.

(3) Serves as a means of communication.

(4) As a memory supplement: By having information about past performances, transactions, results of past actions and decisions available for reference, personnel memories are supplemented.

(5) As and aid to problem solving: By enhancing understanding and reducing uncertainty, problems are simplified and becomes more manageable.

(6) Serves as an aid to planning and decision making.

Communication Systems

The process by which people exchange information or express their thought and feelings, i.e it is a way of sending information. It could be through the media, radio, TV, newspapers, internet, telephone, etc. Communication involves three elements, the source, i.e where the message originates, the message, i.e the information; the destination, i.e the recipient or the users. This means that the three elements are the source, the message and the destination.

Terminologies used in Communication Process

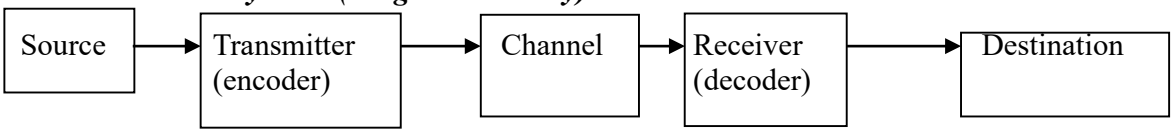
(1) *Encoding:* This is the way a message is written or spoken to be able to communicate with another person.

(2) *Channel:* This is the means by which the information is carried in order to reach the users, it could be through an internal mail, postal services, telephone, television, radio, internet, etc.

(3) *Noise/Distortion:* This is anything that causes the message at the receiver's end to be different from the original message that was being sent. E.g. it could be illegible hand writing, poor accents, poor quality picture on the tv, etc.

(4) *Decoding:* This is the process of achieving understanding from the message. It is an individual process because people read, see and hear what they want to read, see or hear. This means that different people are likely to derive different meanings from the same message. To ensure that messages are properly received and understood, the following methods can be adopted: (a) repeat important words; (b) confirm letters by telephone calls; and (c) make multiple copies of the message.

Communication Systems (Diagrammatically)



Factors to be considered in choosing the method of communication

In choosing the appropriate method of communication, the following should be considered:

(1) *Urgency:* Consider how urgent the message is; how important is the information to the recipient? What would be the effect of delay?

(2) *Security:* Are the contents of the message confidential; would unauthorized access to the message cause problems?

(3) *Nature/complexity of the message:* Does the message contain detailed and complex information that could be misunderstood if transmitted orally?

(4) *Number of recipients:* Is the message intended for one person, group of people or everybody?

(5) *Record:* Is a written record of the message necessary; is a record of proof/legal purposes or subsequent purposes needed?

(6) *Distance:* Is the message for internal use, or does it need to be transmitted further?

(7) *Feedback:* Will an instant response be required from the message?

(8) *Cost:* What will be the cost of the method of communication chosen; does the urgency warrant the cost?

Barriers to good communication

A good communication is when the sender transmits relevant, timely and up-to-date message that the recipient understands and is able to use (for management) for planning, organizing, controlling, decision-making, etc. Sometimes messages are not properly transmitted due to the following barriers that may occur:

(1) Differing background of the sender and the recipient.

(2) Difference in age, gender, education, status, race, class etc. these may cause differences in interpretation and hence understanding.

(3) Language of message: poor use of language, unexplained terminologies and jargon, etc.

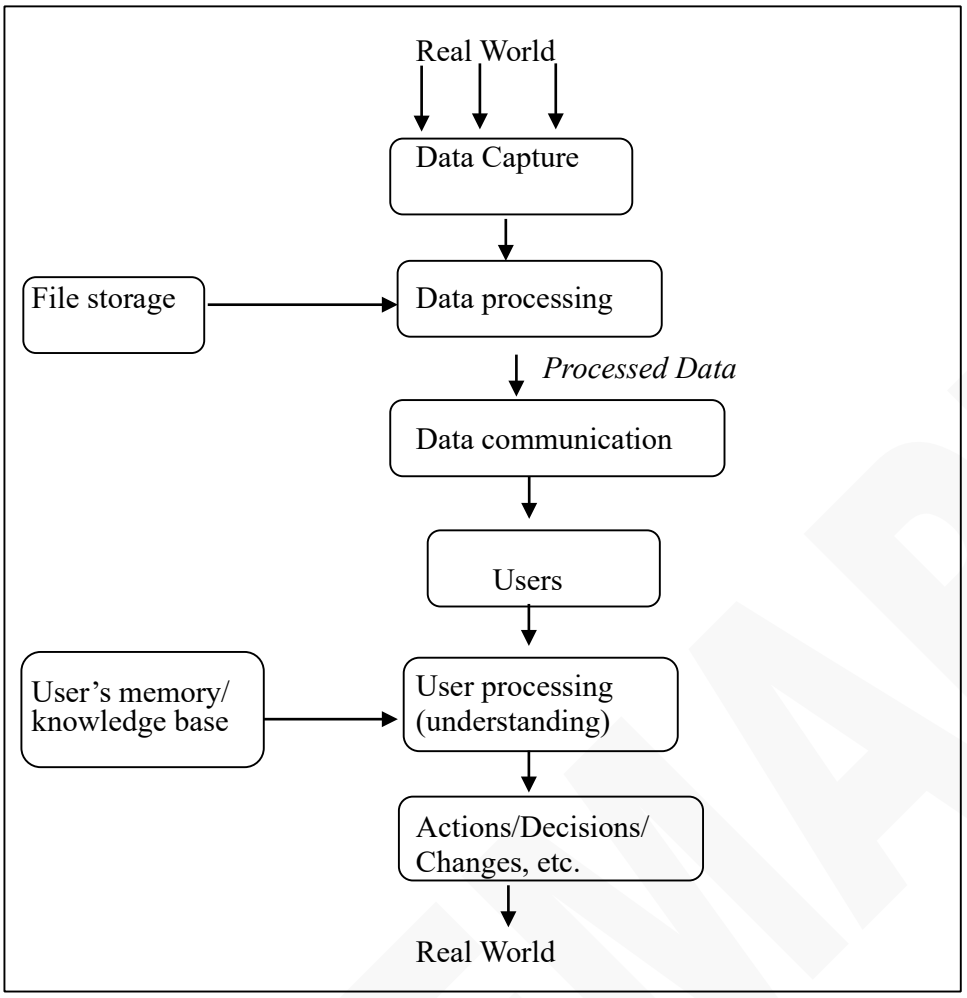
(4) Volume of message: The volume may be inadequate for the intended purpose, or it could be excessive causing information overload.

(5) Distortion: For political, personal or status reasons, information may be withheld or misrepresented.

(6) Bureaucracy: If a message is to pass through a lot of checks and authorization it is likely to be distorted, forgotten or delayed.

(7) Inappropriate presentation: The method of presentation should take account of the purpose of the message and the recipient.

MIS, Data, Information and Communication Systems in Outline



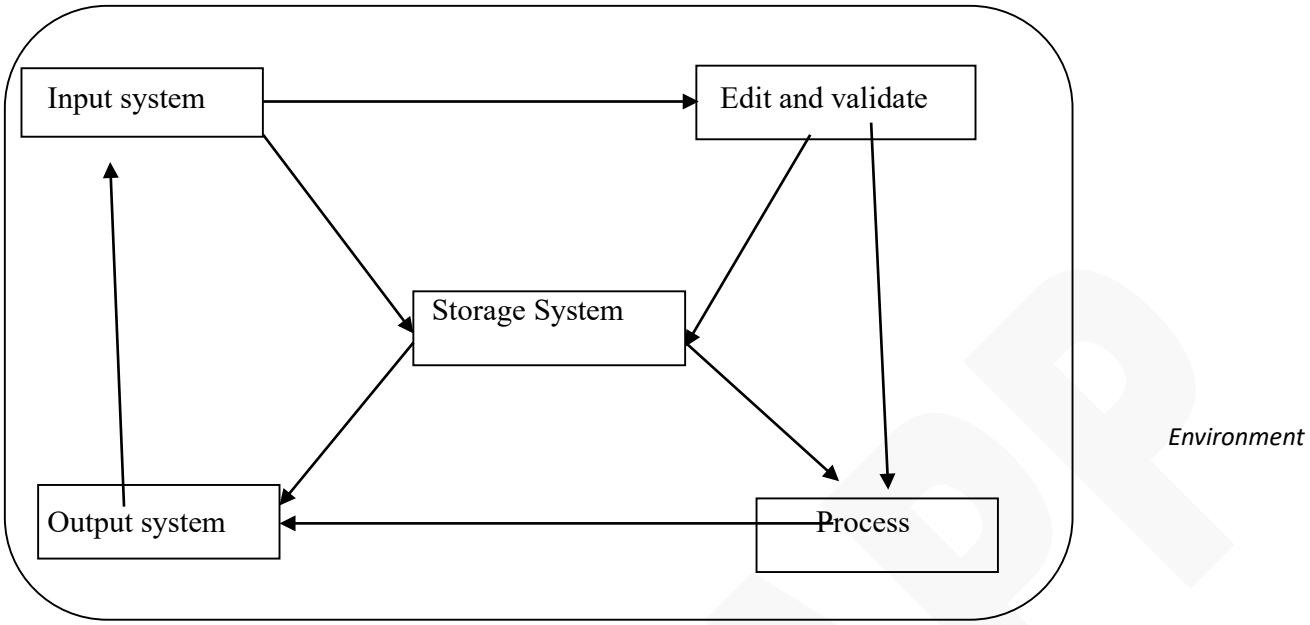
MIS AS A SYSTEM

A system according to Cole (1993) is a collection of interrelated and interdependent parts which form a whole. It is made up of input, process and output which are surrounded by an environment. The environment of a system consists of many elements which lie outside the system and which at the same time have impact on the goals and the operations of the system. Feedback about the performance of a system is another important component. Feedback is used by a system to monitor and control its operation so as to make sure that it meets the goals and objectives. Systems may be closed or open. The closed system are those that are self-supporting and so do not interact with their environment.

The educational management information system is a set of interrelated elements that collects, manipulates, stores and disseminates educational data and information. The computer based information systems such as MIS require hardware, software, database, telecommunication and specialists to accomplish their goals. Management information system is particularly designed to assist management in their decisionmaking processes. The system theory can be applied to the educational management information system. The MIS is made up of a number of interrelated parts and like any other system is made up of inputs, processes and output.

The input into MIS is made up of computers, electricity, generators, personnel (including system programmers, system analysts, computer technologists, entry clerks); it also includes funds. The process include the appropriate ways of collecting data to feed into the system as well as the processing, storage and retrieval of information. Output include: timely, appropriate and up-to-date information supplied to the education management by the system. The accuracy and the timeliness of the information provided by MIS will determine if there will be modification in the inputs.

Model of MIS as a System



Source: Adapted from Robinson (1994).

MIS and Decision Making

Decision-making is the selection of a plan of action for the purpose of achieving a desired result. It is the elimination of all the alternatives, but one. Decision-making is therefore a step in planning and a plan cannot be said to exist unless a decision has been made. In any organization, a wide range of decision problems are encountered, which requires management to choose consciously from two or more courses of actions. Decisions can be programmed or non-programmed. In a programmed decision, a standard routine procedure for handling problems is devised when ever the problem arise. E.g in education system, payroll decision occur regularly and so the same decisions take place during each pay period. In a non-programmed decisions, there is no set of rules for handling the problems because the problems are not repetitive and so are not handled in a routine manner. Effective decisions are therefore desperately needed in all aspects of the educational system, based on the availability of adequate and accurate information. The management information system is capable of providing adequate and accurate information through data-capturing, processing, storage and retrieval.

Types of Data used in generating Information

Data used in generating information can be categorized into the following:

(a) Numeric
(b) Alpha-numeric
(c) Logical

This classification is important because it helps in the determination of the nature of analysis to be performed by MIS.

(a) The numeric data are data that are numbers; e.g personnel record such as age, years of service, salary; or students record such as age, year of admission, no. of subjects taken, total credit units, bursary records, i.e accounts.
(b) Alpha-numeric data include data on address, sex, nationality, state and local government area, etc.
(c) Logical data – this is obtained from the comparison of two sets of data, it takes the form of true or false, yes or no, pass or fail, etc.

Thus, decision-making require facts as well as figures and this is necessary in MIS processing of data for use by management in education.

Information Systems in Organizations

Organizations tend to adopt information systems that will help to achieve the goals of the organization. Information systems are therefore designed to improve productivity in organizations. The following types of system can be found in organizations:

(1) ***Transaction Process System (TPS):*** The TPS is a system that processes large volumes of transactions that occur daily within an organization.

(2) ***Management Information System (MIS):*** MIS uses information from the TPS to generate information for decision-making by management. The MIS produces different types of reports such as: (i) scheduled report: these are reports that contain pre-specified information, they are generated on a regular basis. (ii) Demand reports: there are reports generated on the request of the user. (iii) Exception reports: This contains items that do not meet a pre-determined set of conditions.

(3) ***Decision Support System (DSS):*** These are information system that are designed to meet the needs of individuals. The DSS differs from the MIS in terms of support given to users, decision emphasis and support, the system development speed and output.

(4) ***Expert System:*** The expert system is designed to help management in taking decision on specific situation.

Information system can be described by using several types of models. A model is an approximation of reality. Models can be any of these types:

(a) Narrative model: this is written or a spoken description.
(b) Physical model – a tangible representation of the actual system.
(c) Schematic model – this is an illustration of the system components.
(d) Mathematical model – users formulate to explain the way processes are performed.

Information Resource Management

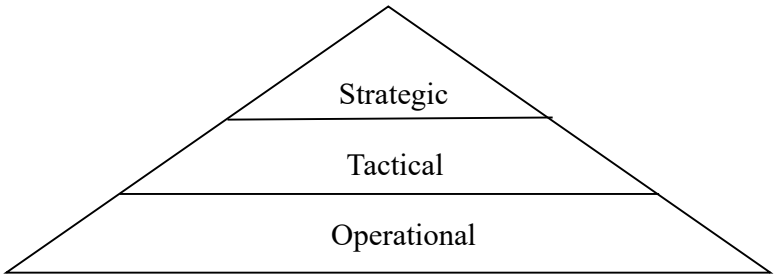
Information like other resources needs proper management. Information is a very important resource in any organization and so, its proper management is crucial to the realization of organizational goals. A good management of information starts with development of an information system that will meet the needs of the organization. It also requires proper maintenance and control of the system. The management information system (MIS) is a good information system that can help any organization to manage its information resource properly. To be able to function properly, the management information system should have the following: *(i) An MIS unit or Department*

(ii) MIS personnel, made up of system analysts/technologists, and data entry clerks.
(iii) Physical facilities such as: adequate power supply, adequate working space, telephones, printers, and scanning machine, official vehicles, etc.
(iv) Efficient Local Area Network (LAN).

MIS should be able to provide adequate, reliable and up-to-date information on staff, students and facilities in educational system. It should also be able to provide adequate information for budget preparations. Networks are communication systems which link together computers, storage devices, telephone systems and other electronic devices. Within organizations such as a university, networks are known as local area network (LAN). LANs operate within the organization. It facilitates interconnections between computers and other devices for the purpose of distributing information, among users. With this, users communicate easily with each other. This means that users of information within the organization especially the management must have computers and at the same time be computer literate.

MIS and the Three Management Levels

The three management levels are: Strategic, Tactical and Operational management.



MIS at the Operational level: Operational management in any organization is concerned with the day-to-day management of the organization. It is concerned with the day-to-day activities of the organization. MIS at this level needs effective and efficient information processing to enable management get quick or timely information for decision-making. MIS at the operational level are thus file processing systems. In most cases, information to be fed into the system is made up of data from the day-to-day activities of the organization and their outputs are usually reports.

MIS at the Tactical Level: At the tactical or middle level management, management are faced with decisionmaking which can affect the organization's effectiveness. Reliable, timely and up-to-date information is needed to take effective decisions. The tactical level management is concerned with decisions bordering on finance, human resource, admissions, hostel accommodation, etc. A typical example of how MIS can help the human resource management is as follows: MIS can help to provide information in the selection, recruitment and training of staff. It can also provide information on wages and salaries, promotion, education and development of staff, etc. For MIS to provide meaningful information on the above, its typical input would be (a) Application forms; (b) interview summaries; (c) staff reports; (d) wages and salary comparative data; (e) pension fund performance; (f) government legislation on health and safety, employment, etc. Based on the above inputs, MIS will then produce reports such as: (a) wages and salaries analysis; (b) labour turn-over statistics; (c) job description; (d) pension analysis and projections; (e) job evaluation reports; (f) manpower planning reports and projections.

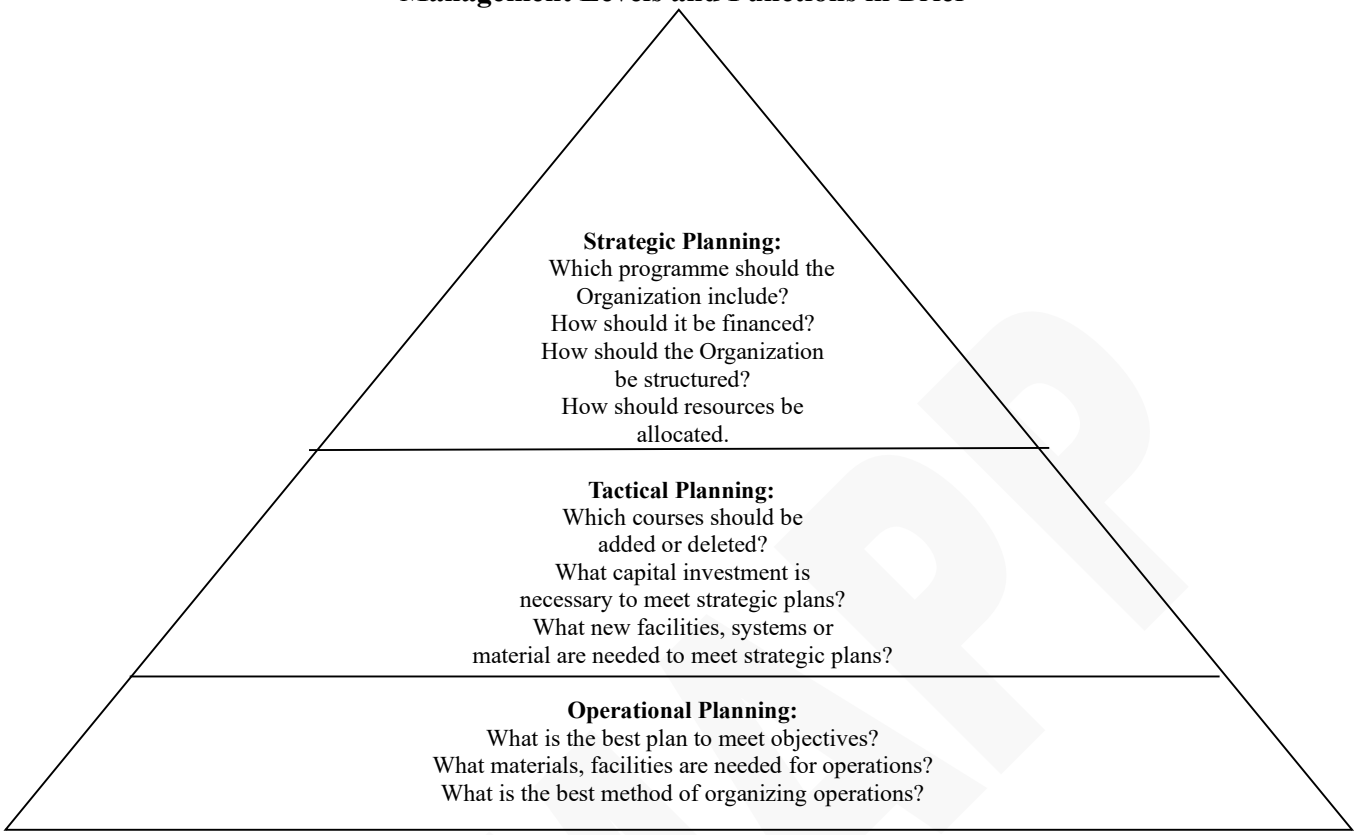
Although most of the information used by management at this level comes from informal sources, (i.e they get information from informal sources, they assess and analyze the information for use in decision-making). MIS helps management in taking efficient and relevant decisions by collecting, processing, analyzing, storing and retrieving information at the appropriate time.

MIS at the Strategic Management Level: Strategic planning is usually planning by the top management about the overall direction of the organization over medium or long term. It concerns issues which affect the entire organization at the highest level. It is a "top-down" process. Strategic information are:

(1) *Usually external – i.e strategic problems concern the external environment, e.g educational trends, technological changes, political factors, etc.*
(2) *Concerned with the future – strategic planning is concerned with the medium to long term future and so involves forecasts and assessments.*
(3) *Qualitative as well as quantitative: Strategic planning require quantitative information for decision making; it also requires qualitative judgments, insights and observations.*
(4) *Informal – strategic planning requires informal information.*
(5) *Boundary free – At the strategic level, information must be broad ranging and reflect a holistic view of the organization.*
(6) *Multi-dimensional – strategic planning takes an all-embracing view of problems and so considers all aspects that are relevant.*

Strategic planning is essentially about understanding the environment and predicting key changes, trends, the organization in the future.

Management Levels and Functions in Brief



Management Information System (MIS) Design

To design a functional MIS, the information needs of users i.e (those who will make use of the system) must be taken into consideration. It is also important to note the purpose of having the system in the organization. It is important to note that the design of MIS for any organization depends on the nature of the organization. To design an MIS for an organization, the following factors must be taken into consideration.

1. *The primary function of the organization*
2. *The structure and levels of organization*
3. *The degree of centralization*
4. *Environmental influences*
5. *What decisions needs to be taken*
6. *The scale of operation*
7. *The Management style*
8. *Use of computers and extent of computer knowledge*
9. *The extent planning is formalized.*

Primary Function of the Organization: What type of organization is it, is it a manufacturing company, hospital, university, etc.

Structure and Levels of Organization: Is the organization made up of many sections/departments, what degree of autonomy have the sections/departments.

The degree of centralization: Is the organization controlled at the centre? What decisions and or actions are the sections allowed to take? What is the committee structure?

Environmental Influence: To what extent is external information important; in what ways does the organization need to communicate with its environment; i.e with parents, the community, government, NUC in the case or universities, etc.

What decisions need to be taken: What levels of management take decisions? What is the time scale of decision-making; what is the extent of programmed an non-programmed decision-making.

The Scale of Operation: How many employees does the organization have, how many branches/faculties, departments/sections, etc.
Management Style: What is the management style? Is it authoritarian or participative style?
Use of Computers and extent of Computer knowledge: What is the availability of computers? What is the extent of computer knowledge among those who will make use of the MIS, what is the availability of internet services in the organization.
The extent planning is formalized: What is the extent of participation in planning? What time scales are involved, i.e is it long, medium or short term planning? How are plans implemented?

Management Involvement in MIS

The rational for MIS in any organization is to improve decision-making. This cannot be achieved unless management is involved in the selection of issues and problems which the system addresses. Since managers know the problems of the organization, they should be fully involved in the design of a system which will help to generate solution. Managers at all levels must agree on what needs to be incorporated in the MIS design. Thus, the information needs of managers at all levels must be identified. This will enable the MIS designers to design an MIS that will meet the needs of the management, other end-users, i.e (Management and all others who are expected to use the MIS). The involvement of end-users in MIS design will help in the development of a very effective MIS.

Stages in the Design of MIS

The stages in the design of Management Information System are as follows:
1. Project inception
2. System definition and Analysis
3. System design
4. System Production
5. System Acceptance and Maintenance
6. Feed back

Project inception: At this stage, a problem is identified, i.e a management problem which the system is intended to support is identified. It could be lack of reliable information, important information is always missing due to use of the manual filing system, or it could be that important information for decision-making do not always come at the right time, etc.

System definition and Analysis: After identifying and analyzing the problems. The designer of the system gives a rough idea of what the system should be, based on the management problems identified.

System design: This stage considers how best to produce the required results. Here the overall tasks are subdivided into linked modules (module is a part of computer software that does a particular job).

System Production: Here the system is developed into a working system that meets the requirements of management.

System Acceptance and Maintenance: Here, the users, i.e management and all those that will make use of the MIS will testify that the system so designed, is doing what it is expected to do.

Feedback: With the use of MIS in the organization, the successes, failures and experiences encountered form the basis of improvement of the system.

Database Management System (DBMS) as a Component of EMIS

A database manager, which in other words is called Database Management System (DBMS) is a computer program for storing information in an easily retrievable form. It is used mainly to store text, numbers and pictures to enhance decision making. A database is a single organized collection of structured data, stored with minimum duplication in a retrievable means (such as magnetic disk), so as to provide a consistent and controlled pool of data. It is a logically organized collection of related data designed and built for a specific purpose, a technology for pulling together facts that allows the slicing and dicing and mixing and matching of data in all kinds of way (Amaechi, 2007).

According to French (2000), database is a comprehensive, consistent, controlled and coordinated collection of structured data items. In other words, it is a collection of huge amount of data under different fields made up of records. A single database file can contain as much as one billion records and above. According to Wikipedia, a database is an organized collection of data. The data are typically organized to model relevant aspects of reality in a way that supports processes requiring this information. Date (2004) defines a database as a kind of electronic filing cabinet, that is, a repository or container for a collection of computerized data files, while Adesanya, Onilude and Sodipe (2004) explained a database as a modern system of storing and retrieving information with the aid of electronic devices. They stressed that databases have the sole aim of making available through one source, a comprehensive and exhaustive assemblage of information on any given subject area. The advantages of a database system over the traditional, paper-based methods of managing information as identified by Date (2004) are: compactness, speed, less drudgery, data sharing, currency and protection. A database cannot be constructed in a single operation, it is usually built up section by section, during which process, the user is able to specify the file structure of the required data base, the data-type and the possible width of each field. Database Management System (DBMS) is a complex software that is used to construct and maintain database. It is a software program which has access to all of an organization's master files (i.e organization's database) and which can be used to interrogate files and generate required report; it provides facilities for different types of file processing and security of data in the base. According to Wikipedia, a database management system (DBMS) is a collection of programs that enables you to store, modify, and extract information from a database. There are many different types of DBMSs, ranging from small systems that run on personal computers to huge systems that run on mainframes. The following are examples of database applications:

- computerized library systems
- automated teller machines
- flight reservation systems
- computerized parts inventory systems
- University & College portals

Database Management Systems (DBMS) are specially designed software applications that interact with the user, other applications, and the database itself to capture and analyze data. A general-purpose DBMS is a software system designed to allow the definition, creation, querying, update, and administration of databases. Well-known DBMSs include MySQL, MariaDB, PostgreSQL, SQLite, Microsoft SQL Server, Microsoft Access, Oracle, SAP HANA, dBASE, FoxPro, IBM DB2, LibreOffice Base, FileMaker Pro and Inter-Systems Caché. The database management system has terminologies, which must be understood by its users, such as: character, field, record, file. These are hierarchical in nature; character is also referred to as bit, an assembly of related characters makes a field, an assembly of related fields makes a record, an assembly of related records makes a file (database). Records stored in a database file may be produced as printed summaries (reports) of the information selected.

When setting up your own database, it is important to plan its use in advance, this is particularly important if you are setting one up which will be used by other people. There are three pertinent questions you need to answer before creating a database file, which are: what fields do I need, what names do I give to the fields, and what data-type will each field contain. Among the things which you should also consider are:

- What information you will need to store
- What information you want to get out
- Who the data is intended for and how other users will use it

- Whether you want to restrict access to parts of the data to some users only
- Who is allowed to add or change data

Although you can change the specification as you develop it, you will save yourself a lot of work if as much as possible is planned in advance. In a database file, data are held in tables, with each row in a table being known as a record. Each record is divided up into columns known as fields, with each field containing certain data about that record. So for example, a table of data for students list in a school would have one record per student of the school and each record would be split into fields such as surname, firstname, lastname, address, age, sex, telephone number, state of origin, registration number, department, course, etc. it should be noted that a single table or database file can contain more than one billion records and each record can have as much as 128 fields or more, each of the character fields can contain as much as 255 characters or more.

Conclusion

Education management, administration and financial analysis are all components of higher education management system. To prepare the next generation for the task of digitalization of higher education, to handle digital students' records, personnel records, inventory, payroll, portals, databases, etc.; there is the grave need to re-introduce the Education Management Information System (EMIS) course at both undergraduate and postgraduate levels in Colleges and Universities. This will in no small measure curtail the huge amount of money and other resources spent by government on re-training educators and administrators on computer-related skills for managing higher educational institutions in Nigeria.

Way Forward

Based on the foregoing discussions, the following suggestions are put forward:

1. The National Universities Commission (NUC) in collaboration with National Council for Colleges of Education (NCCE) should include Educational Management Information System (EMIS) as a core course for all education student in colleges and universities.
2. Universities and Colleges are encouraged to embrace the Educational Management Information System (EMIS) course as a home-grown program, especially now that NUC is asking universities to develop 30% of the Core Curriculum and Minimum Academic Standard (CCMAS) for implementation.
3. The Faculties of Education in Colleges and Universities should make the Education Management Information System (EMIS) course compulsory for categories of students (undergraduate and postgraduate).
4. Experts in Information Science or ICT should be engaged to teach this course for a thorough understanding and application; not forgetting some of our Educational Administrators with bias in ICT.

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