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A Review of the Roles of Management Information System at Enhancing Organization's Decision Making

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ABSTRACT

As the number of employees, customers, and transactions continue to grow in an organisation it becomes more multifaceted and the required information for effective management and decision making becomes more complex and difficult to achieve. However, with the advent of the Management Information System (MIS), useful information from all relevant sources that would enable management at various levels of the organisation to make timely and effective decisions using formalised procedures is provided. Decision making is regarded as being among the most crucial functions of senior managers and it occurs at every level of management in the presence of easily accessible and reliable information. This study aims to provide a theoretical review of the roles of MIS in management decision making in an organisation. The study expounds on the basic elements that make up MIS and its functions in an organisation. Moreover, the paper explores the concept of decision making, its levels, and classifications. From the study it shows that MIS plays a significant role in providing a wide range of information from which decision makers are able to make their preferred choices, thereby enhancing an organisation's decision making.

Keywords: *Decision Making, Information, Management, MIS, Organisation.*

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1. INTRODUCTION

Information is a quintessential commodity for the operation and development of a modern business organisation. It is distinguished from data in that information has been processed in order to serve some purposes within the business environment. In order to understand the nature of management information, it is imperative to understand the purposes for which it is provided. Information is used in the planning, controlling, and monitoring of business activities and in making decisions. The first two, planning and control, in of themselves involve decisions, so the primary purpose of information is to aid decision making (Curtis, 1999).

The roles of information in decision making cannot be over-emphasised, and effective decisions demand

accurate, timely, and relevant information. As the number of employees, customers, and logistics continue to grow in an organisation, the more it becomes multifaceted and the information needed for effective management, planning, decision making, and control invariably become more complex. Decision making is the task of every top management employee in an organisation and they need relevant, and timely information to assist in making these decisions (Olumoye, 2013).

Information basically assists management in two ways, which are stated as follows:

- **Alleviation of Uncertainty**: Uncertainty exists where there is less than perfect knowledge. Rarely, if ever, is there perfect knowledge, but relevant information helps to reduce the unknown. This is particularly relevant in planning and decision making.
- **It Supports Monitoring and Control:** With the provision of sufficient information about performance and the degree of nonconformities from planned levels of performance, management is able to control the operation better (Lucey, 2005).

However, according to Olumoye (2013), there are difficulties in producing relevant and timely information within organisations, but with the advent of MIS, which is an application of information system, most organisations collect data which are raw facts. This data can, in turn, be processed into useful and meaningful information, which can be used to make decisions on issues that affect the current and future operations of the organisation.

During the mid–1950s, computers were first commercially used to carry out business data processing. These were limited to processing transactions, the most common application areas were payroll, high-volume billing (such as in the electricity industry), and simple ledger accounting activities. The results of this processing was stored, and soon it became obvious that this wealth of stored transaction data could provide management with useful information. This information needs to be extracted and processed to be digestible and exist in a suitable format useful to management (Curtis, 1998).

Historically, the managerial uses of MIS were focused on making internal operations faster, more accurate, and more efficient. Planning, directing, and controlling are the essential ingredients for management. In essence, the transformation of data into information and communicating the resulting information to the user is the key function of MIS. It should therefore be noted that MIS exists in organisations in order to help them achieve their objectives, plan and control their processes and operations, to help deal with uncertainty, and to adapt to change or initiate change (Oladejo, 2013).

Moreover, the increase in the power of computing technology witnessed over the last two decades together with its decreasing cost has meant that computers are used more and more by business organisations to carry out routine data processing. Over this period there has also been a change in management thinking in order to accept the importance of the fast and effective provision of targeted information for management planning and control. The combined effects of these factors have led to an increased growth in MIS, thereby providing relevant information, which aids the making of decision (Curtis, 1999).

2. REVIEW OF RELATED WORKS

Several studies have discovered and reported diverse findings regarding MIS usage in decision making. MIS is useful in the area of decision making as, by itself, it can monitor disturbances in a system, determine a course of action, and take said action to get the system in control. This was buttressed by Markgraf (2018), who states that MIS assists in making valid decision through the provision of accurate and the latest information and performance of analytic functions. It was further stated that a suitable MIS helps to structure the basic data available in the organisation's operational records into reports which can be used as a guide for decision making.

Samer and Rawan (2018) opine that MIS is positively correlated and significantly impacts on decision-making process efficiency in an organisation. According to Yassine (2017), modern MIS contributes to accomplishing planned results better than before, thereby producing timely, effortlessly, flexible, and more accurate decisions. This connotes that the development of MIS supports or increases the effectiveness of decision making in an organisation. Oladejo (2013) concurs that the roles played by an effective MIS in an organisation are quite enormous and cannot be over emphasised.

Moreover, the survival of any business unit or manufacturing firm in this technological era depends purely on the manufacturer's ability to include the use of MIS in their day-to-day activities. This was buttressed by Harsh (2011), who states that the importance of MIS to improve decision making has long been understood by

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farm management economists. Financial and production records have long been used by these economists as an instrument to measure and evaluate the success of farm businesses. However, when computer technology became more widely available in the late 1950s and early 1960s, there was an increase in enthusiasm for information systems to enhance management decision processes. Nowduri (2011) reinforces the fact that a good MIS leads to good decision making in businesses in the same way poor management leads to poor decision making.

Al-Zhrani (2010) opines that MIS has improved effectiveness of the decision making of a range of different tasks. MIS increases productivity, effectiveness, sharing of information with others, and the speedup of management operations. In addition, the efficiency and effectiveness of decision making is corrected with the improved use of MIS. Moreover, it was revealed that the adequate use of MIS enhances accurate and timely information required for effective decisions on issues related to staff promotion, staff training and development, appointment of staff to duty posts, and the allocation of resources, among other things.

Furthermore, MIS delivers summarised and brief information that helps managers quickly with knowledge in business conditions (Abbadi, 2010). Then the manager can use MIS to "drill down" and isolate the data that relates to the cause of the problem. These days, MIS is becoming so widely used by managers, analysts, and other knowledge workers that they are sometimes humorously called "everyone's information systems". More popular alternative names are Enterprise Information System (EIS) and Management Support Systems (MSS).

Adebayo (2007) argues the need for MIS in decision making as it provides information that is needed for better decision making on issues affecting the organisation regarding human and material resources. Obi (2003) highlights the relevance of MIS in non-programmed decisions as it provides support by supplying information for the search, analysis, evaluation, and the choice and implementation process of decision making.

However, in spite of the immense benefits that result from using MIS in decision making, some critics (e.g. (Nowduri, 2011; Olumoye, 2013)) have reportedly been slowly but surely asserting that MIS poses surmountable and detrimental effects to organisations. Hence, MIS should be used sparingly or avoided if possible. According to Nowduri (2011), despite the positive

benefits associated with the roles of MIS in the decision-making process, there are few challenges that limits its efficacies, such as:

- The dynamic nature of MIS makes it difficult for some organisations to keep up with the principles, strategies, propositions, or even ideas.
- Different situations call for different decisions to be made. This poses challenges to MIS theorists since some MIS tends not to be adaptable.
- The running of MIS programs tends to be relatively costly for some organisations especially small ones who are not well endowed financially.
- Most organisations do not have a well-defined decision-making system. Even with the right MIS tools, very little can be achieved in terms of improving decision making.

By and large, for the successful implementation of MIS in an organisation, the following suggestions are made:

- There should be an increase in monitoring of MIS so as to avoid falling victim to unobserved MIS, which has appalling implications.
- Managers and business owners should find a way of tailoring information in a way that fits various decision-making processes in variant businesses.
- A well-defined decision-making system should be fledged in businesses so as to provide a variable working environment for MIS.
- Business managers must ensure that they employ, or alternatively outsource, professional personnel who are able to ardently run both MIS and the decision-making process (Nowduri, 2011).

3. CONCEPTS OF MANAGEMENT INFORMATION SYSTEM (MIS) AND DECISION MAKING

1. Management information System

The concept of MIS evolved over a period of time encompassing various facets of the organisational function. However, MIS is a necessity for all organisations. The initial concept of MIS was to process data within the organisation and present it in the form of reports at regular intervals. The system was capable of handling the data from the collection to processing stages, thereby allowing various individuals to choose the processed data and use it for their requirements. This concept was further modified when a distinction was made between data and information, that information is a product of an analysis of data. Later the concept of MIS

was further transformed, it was established that the system should present information in such a form and format so as to create an impact on its users to inspire a decision or an investigation.

MIS can be described in an infinite number of ways. There is no universally accepted definition for MIS and those that exist reflect the emphasis and prejudices of the particular writer (Lucey, 2005). The term MIS has almost been synonymous with computer-based data processing. Many books with MIS as the title turn out to be exclusively concerned with topics such as system analysis, file design, and other forms of the technical facets of computer-based systems.

Nofiu *et al.* (2012) refer to MIS as an organised method of providing each manager with all the necessary data which they need to make the right decision on time and in the form needed, as well as being in a manner that will aid understanding and stimulate action. The continued existence, development, and growth of an organisation is largely dependent on the existence of a good management information system, because it is upon the accurate and timely information of MIS that management decisions will be made. Reddy *et al.* (2009) describe MIS as the study of providing information to people who make choices about the disposition of valuable resources in a timely, accurate, and complete manner, and at a minimum of cognitive and economic cost for acquisition, processing, storage, and retrieval.

The primary objective of MIS is to provide the management of an organisation with useful information from all relevant sources so as to enable them to make timely and effective decisions using formalised procedures. When MIS was first developed, its focus was on providing top management with the strategic information needed (Abbadi, 2010). Thus, the first goal of MIS was to provide top executives with immediate and easy access to information about a firm's critical success factors (CSFs); that is, key factors that are critical to accomplishing an organisation's strategic objectives.

Moreover, a highly efficient MIS ensures a reduction in industrial accidents and a reduction in losses of assets such as raw materials, financial assets, and finished goods. MIS also guarantees improved resource utilisation and general performance. MIS primarily serves the functions of planning, controlling, and decision making at a management level. Besides, MIS is generally thought of as an integrated system providing information to support operations, management, and decision-making functions

in an organisation (Al-Zhrani, 2010; Ajayi and Omirin, 2007).

MIS is basically made up of four elements namely management, information, system, and communication.

- **Management**: Fayol's classic definition of management is derived from his own experience and is stated as thus: "To manage is to forecast and plan, to organise, to command, to coordinate, and to control" (Lucey, 2005). A more modern and detailed definition of management is provided by Drucker, which lay emphasis on the need to guide, lead, and motivate people rather than merely commanding them. Drucker's definition of management goes as thus: Management is a practice, not a science; it is not knowledge, but performance. Management is the primary source in the organisation that coordinates all the activities within the system and relates them to the environment. It is management that makes the decisions about work, people, strategies, and systems (Lucey, 2005).

- **Information**: Information is the result of processed data. It is the basis for management decisions and actions, without which it would be impossible for management to fulfill their fundamental managerial assignment.

- **Systems**: A system can be described as a collection of interrelated components connected together in an organised manner with the common purpose of achieving an objective.

- **Communication**: It is the process by which information is transmitted in an organisation. It is the basis of management information and involves three basic elements which are the source, message, and destination.

The basic functions performed by MIS in an organisation are as follows:
(i) Data Processing: MIS collects raw data and processes it into valuable information through the use of a computerised system, making it readily available for the organisation.

(ii) Planning: Planning is an act of deciding in advance what is to be done and how it is going to be done. Also, it involves all the activities leading to the formulation of goals and establishing the strategies to help achieve them.

(iii) Controlling: This is the process of ensuring that operations proceed according to plan. MIS helps to compare the actual result with the planned result in order to bring activities in line with plans or amend the plans.

(iv) Decision Making: MIS monitors the activities of a system, determine the cause of an action, and takes action to get the system in control.

(v) Communication: MIS helps to communicate the result of data processing activities, which is information, to the user.

2. Decision Making
Decision making is an integral part of management that happens in every function and at all levels (Lucey, 2005). Basically, the type of decisions that are taken vary, but all decision makers just have to go through a similar process. All of them must decide by some means to choose the outcome, which is considered necessary for them. Shaker (2011) opines that decision making is the point at which plans, policies, and objectives are translated into concrete actions. Moreover, decision making is at the core of planning; for instance, the choosing of objectives, policies, procedures, programs, rules, strategies, and tactics require the entire process of decision making. The purpose of decision making, as well as that of planning, are to direct human behaviour and effort towards future objectives. Good planning enhances sound decision making by providing the opportunity to select from alternative courses of action.

Shaker (2011) expresses decision making as a conscious process, and a particular course of action from among a set of possible alternatives. To decide means to come to a conclusion or resolution. Decision making refers to the conscious and human process that involves both individual and social phenomenon based upon factual and value premises, which concludes with a choice of one behavioural activity from among one or more alternatives with the intention of moving towards some desired state of affairs.

The process of making decision consists of different activities. According to Simon (1977), an authority in management decision, the four stages in decision making are highlighted as intelligence, design, choice and implementation (Curtis, 1999). These are discussed accordingly.
- **Intelligence**: The first stage of decision making consists of identifying and understanding the problems occurring in the organisation; why the

problem exists, where, and with what effects? Traditional MIS systems that deliver a wide variety of detailed information help to identify problems, especially the systems report exceptions (Laudon and Laudon, 2001).
- **Design**: This is the second stage of decision making where an individual conceives of possible alternative solutions to a problem. It also involves the recognition of the range of acceptable decisions and the implications of each. At this stage, information needs to be supplied to aid the decision maker in predicting and evaluating these implications (Curtis, 1999).
- **Choice**: This stage of decision making involves selecting among the various alternative solutions investigated in the previous stage.
- **Implementation**: This is final stage of decision making where the chosen decision is carried out. It is imperative to know that decision making is an iterative process that involves a general flow from intelligence, to design, to choice, and to implementation. At any time, there could be a return to an earlier stage. Moreover, decision making is based on information. Information helps to define and structure the problem, explore and select among the alternative solutions, and then implement the selected choice.

Levels of Decision Making
Decision making in an organisation can be categorised into three levels with distinctly different characteristics. These are the strategic, tactical, and operational levels.
- **Strategic Level**: Decision making is carried out by the most senior management employee in an organisation and deals with broad issues that concern the organisation's development over a long term. According to Lucey (2005), at the strategic level, decision making is much more dependent on human factors and judgment. Such decision making is based on guided trial and error and, because of uncertainty and ambiguities, all possibilities cannot be explored. This type of decision making is known as heuristic and is based on rules of thumb rather than explicit decision rules. In order to make strategic decisions, the senior management employee needs information. This information may be informal and qualitative.
- **Tactical Level**: This is a managerial activity that deals with middle stratum of management. The information required for decisions at the tactical

level will be mainly generated internally within the organisation, though some external information may be necessary. Decisions made at this level are for the medium term, between now and the next few months or a year.

- **Operational Level**: This refers to the decisions made in the normal day-to-day operations within a business organisation. Decisions made at this level are designed for ensuring the effective and efficient use of existing resources to realise budget objectives. These decisions may involve how personnel are treated within the organisation, the control of inventory and production levels, pricing decisions, and other forms of accounting and cash controls. The Information required for operational decision making is generated almost exclusively within the organisation and is highly detailed, certain, and relevant for immediate use.

Classification of Decisions

Within each of these levels of decision making, researchers classify decisions as unstructured, semi-structured and structured.

(i) Unstructured Decisions: In this case, decision makers must provide judgment, evaluation, and insights into the problem definition. Each of these decisions is novel, important, non-routine, and there is no well understood or agreed upon procedure for making them (Laudon and Laudon, 2001). In essence, unstructured decisions involve situations where it is not possible or desirable to spell out, in advance, most of the decision procedures to follow.

(ii) Semi-structured Decisions: These are decisions that lie between being structured in some stages and unstructured in others. Semi-structured decisions occur in a situation where the relevant parameters are mostly known and where the influencing relationships are suspected or are approximately known. In such cases, the MIS can give assistance to the decision maker through the provision of information. For semi structured decisions (e.g. production, scheduling, cash management, overall budget, new product planning), semi-structured techniques can be used (Shaker, 2011).

(iii) Structured Decisions: These types of decisions are governed by clear rules. The decision procedure can be expressed as a set of steps to be followed, can be incorporated in a decision table, or revealed by a procedural logic flowchart. The information that is needed before a structured decision can be made is clearly

specifiable, unambiguous, and once it is obtained, the process of arriving at the decision action is straightforward (Curtis, 1999).

4. ROLES OF MANAGEMENT INFORMATION SYSTEM IN DECISION MAKING

Basically, MIS lays a solid foundation for the establishment of concrete decisions through its automated tools which provide accurate, timely, cost effective, and relevant information as well as adequate management policies and regulations. According to Kumar (2006), MIS provides a fitting platform for good decision making. This was buttressed by Nowduri (2011) that, without the established systems of getting information in MIS, it would be extremely difficult for organisation to make their decisions. This is because organisations would be forced to make baseless decision due to a lack of accurate information.

Awan and Khan (2016) expound that MIS helps to enhance organisational performance in the areas of innovation, growth, and profitability. Additional, MIS fulfils diverse needs through various means such as the analysis system, query system, modeling system, and decision support system. MIS also assists top-level management in setting their goals, strategic planning, emerging business plans and their implementation, to generate and communicate information, and to identify problems in the process of making decision.

According to James (2017), the role of MIS in MIS-based enterprises is critical to the survival and growth in this modern and complex, competitive world. Moreover, small-scale enterprises and start-ups have the challenge of 'David competing with Goliath' in their respective markets. This makes the MIS based planning, controlling, strategic decision making, human resource management, and other vital sectors crucial for such organisations. These are of course the basic necessities of MIS in business.

It is very crucial for an organisation to have a good MIS since decision making is based on the available information. In support of this, Rhodes (2010) states that MIS give managers quick access to information. This includes the interaction with other decision support systems, information inquiries, cross-referencing of external information, and potential data mining techniques. Going by general observation, a good MIS ensures good decision making as it provides useful,

accurate, and relevant information in the same way that bad MIS produces bad decisions.

Moreover, Nowduri (2011) states that most MIS programs are endowed with the capacity to give real time updates of the occurrences in a company or system. By 'real-time', scholars simply refer to immediate updates of occurrences in a system. These immediate updates help managers to take the necessary actions as soon as it is deemed appropriate, especially during the discovery and management of crises. This was buttressed by Allen, Heurtebise and Turbull (2010), who state that the programmability of most MIS saves a lot of valuable time and resources for owners. In other words, through programmability, business managers can program the systems to automatically discover certain deficiencies and even solve them.

Consequently, the manager or system operator can use the time and resources they would have used in monitoring or fixing of problems for other key uses. By routinely programming a MIS, the business is bound to make positive progress since time and resources can be easily channeled into their rightful business paths. This was accentuated by Pedarpur *et al*. (2013), who states that MIS helps managers at all levels to make more accurate and precise decisions and also reduce the barriers to internal and external decisions. Obviously, the review and study of proper method of use increases the efficiency and effectiveness of organisation functions and provides better coordination between short-term, middle-term, and long-term goals of the organisation. This was equally supported by Ajayi and Omorin (2007).

MIS improves the effectiveness of decision making within a range of different tasks. The efficiency and effectiveness of decision making is corrected with the improved use of MIS. These days, MIS is more complex than it used to be in the 1960's and 1970's when it was first born, it is now used not only for transaction processing but also for the provision of information for managerial decision making.

MIS and its organisational subsystems contribute to decision-making processes in many basic ways. Nowadays, some of organisations use MIS to assist managers in decision making; for example, to assist managers and decision makers in extracting synthesised information from a massive database such as the Current Public Transport Record (CPTR) of Durban, South Africa, the Durban Unicity Council decided to make use of a Public Transport Management Information System

(PTMIS) developed by Steward Scott. This system is used by transport planners and managers (Asefeh et. al., 2011).

In addition, MIS plays two important roles in management decisions; firstly, it helps managers to work on the provided information and make decisions. Secondly, in terms of decision making, decision patterns remain constant and only input data changes as a repeater will be supportive of all kinds of management decisions (Asefeh et. al., 2011). Also, MIS is a tool that acts as an organisation's information resources which provides needed information for manager and prepare them for their decision making.

MIS in an organisation provides decision-making process information. The system is a formal commitment by executives to make the computer available to all managers. MIS sets the stage for accomplishments in other areas, which are the Decision Support System (DSS), the virtual office, and knowledge-based systems. The main idea behind MIS is to keep a continuous supply of information flowing to management. This was further highlighted that MIS is very important for every organisation because it does not only collect and manage information but it also presents it in various formats useful for management to make important business decisions (Asefeh et. al., 2011; Awan and Khan, 2016; Nowduri, 2011).

Furthermore, MIS helps clerical personnel in transaction processing and it answers their queries regarding the data pertaining to the transaction, the status of a particular record, and references on a variety of documents. MIS also assists the junior management staff in providing the operational information required for planning, scheduling, and control; it also helps them further in decision making at an operational level to control each situation. MIS helps the middle echelon of management to plan and control. MIS aids top-level management to set goals, develop strategic planning, and evolve the business plans and their implementation. Unendingly, MIS acts as an information generator, communication facilitator, problem identification system, and it helps in the process of making decisions.

Conclusively, MIS plays a crucial role in providing a wide range of streamlined actions from which decision makers are able to make their preferred choices. This ensures that whatever choice is made by decision makers, the outcome more often than not becomes positive. This is one of the reasons why many decision makers tend to

prefer using MIS tools when making tough business choices.

5. CONCLUSION AND RECOMMENDATIONS

The study revealed that MIS forms an integral part of modern organisations and businesses as it provides needed and relevant information to management at different levels in order to make timely and useful decisions. Also, MIS is designed to support management activities, and the effective use of it in decision making empowers personnel and helps the organisation to succeed. Moreover, MIS makes it possible for organisations to dig up the right information for the right personnel at the right time by enhancing interactions between the organisation's personnel, the data collected by the data processing system, and the procedures involved in encouraging their personnel to use MIS when making decisions.

Some of the benefits of implementing MIS includes increased motivation and improved productivity, effectiveness, and information sharing among staff as well as facilitating the speed up of management operations. MIS also improves the effectiveness of decision making within a range of different tasks and allows information to flow along functional areas and departments within the organisation instantaneously. Thus, MIS helps in reducing the need for face-to-face communication among employees, thereby improving productivity.

Based on the underlying issues that arose in the study, the following recommendations are made:

- MIS department should be passably financed and maintained to ensure the free flow of information and adequate use of MIS in decision making.
- Also, training and retraining programs should be organised for all the managers at all levels to ensure the proper and adequate use of MIS in generating and disseminating information for better decision making in the organisation.
- A centralised database management system should be introduced and implemented in the organisation. The system will help to provide information to the users at any required time within the organisation.

Organisations should also develop suitable computer software and procure appropriate hardware to meet the ever-growing needs and expansion of their business.

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