

Management Information System in Nigerian Secondary Schools: Challenges and Way Forward

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ABSTRACT

Information is regarded as a fundamental resource to organization and as such its management is apparently one of the most strategic operational instruments for organizational efficacy. Management information system plays indispensable roles in the smooth running of secondary schools. This paper examined management information system in Nigerian secondary schools. The concept of management information system was examined from different perspectives. Also, the features, components and development of management information system in Nigeria were examined. The national policy on ICT integration in Nigeria school system, the roles of MIS, challenges and strategies for effective integration of information system in Nigerian school system were elucidated consecutively. The study concluded that school system requires an efficient management information system to take the secondary school a step further boosts students' academic success. It was recommended among other that secondary school administrators must maximally integrate educational management information system towards making appropriate decision, seminars, conferences and workshops on educational management information system should be periodically organized for relevant stakeholders in secondary education and intensive efforts should be made by stakeholders (e.g. government, NGO, philanthropists) in secondary education towards genuine integration of ICT policies in the school.

ARTICLE HISTORY

Received 2022-04-22

Accepted 2022-07-12

KEYWORDS

Management Information System
Secondary School
Nigeria

INTRODUCTION

The global interest for advancement in education of developing countries has been challenged by management information system. The distinctive nature of MIS has made it momentous in the contribution to the knowledge acquisition, utilization and skills development. Thus, there is an urgent need for educational institution like secondary schools to genuinely embrace management information system (MIS) driven to avoid being eliminated from the global village of internet and intranet. At present, effective information system is vital for the educational administrators due to ever increasing complexities in the management of their institutions (Ampofo, 2020, Bauer & Kenton, 2015; Boorne, 2012; Veenhof & Cindy, 2016).

Effective management of information in secondary schools aid the school administrators in resolving administrative challenges emanated from paucity of accurate, dependable and timely information for decision-making. Information gathering technique could be utilized to improve administrative decisions in the school system in areas like: planning lecture and examination timetables electronically to avoid clashes,

providing the needed information relating to students, staff and the school activities, managing resources, recruitment and promotion of staff, appointment of school principals and other school officers in taking decisions on students' enrolments, hostels, offices, staff quarters allocations among others (Turban, Aronson & Liang, 2014). Management information system is central focus for educational policies and the needs for its integration into educational curriculum cannot be undermined. However, students, teachers and administrators in Nigerian secondary schools are yet to be adequately exposed to the realities of numerous challenges of the 21st Century that is technologically driven in outlook (Nkata, 2020). The Federal Republic of Nigeria through the school access programme in 2010 made concerted efforts towards the provision of basic tools regarding the application and utilization of internet facilities to some secondary schools in the country, however, the efficacy has not been maximally actualized. After over 60 years of Nigeria independent, the country still lags behind technologically as a larger percentage of her secondary schools leavers still require adequate training and retraining programmes on the utilization and application of management information system (Jacob, Jegede & Musa, 2020; Okonjo, 2010).

Management information system is undoubtedly a veritable tool for effectiveness of secondary school administration and hence, its proper management is a panacea for institutions success. The major challenge facing the contemporary educational administrators centred on how to maximally exploit the potential of computer technology for effective administrative decision making to achieve the goal of secondary education. There is need for timely and relevant dissemination of information because it is one of the major issues of planning when adequate information required for essential planning are not available at the appropriate time. If the foregoing, is missing, thus it will lead to poor planning, poor priority of needs, defective scheduling of activities, and inappropriate decision making (Aminu, 2016). The implication is that efficacy of secondary school system will be hanging and be more of mirage than reality. Poor management of information management technique has been observed as a logjam to the successful management of schools in Nigeria (Heise, 2011; Okeke & Ikediugwu, 2021). One of the salient issues about the usage of MIS in Nigerian secondary schools is hinged on the fact that whether management information system facilitates adequately available and within the reach of school administrators in Nigerian secondary schools or not.

Therefore, failure to address this question by the political ruling class and the bureaucratic authorities in Nigerian secondary schools is likely to affect the attainment of secondary education goals. It is on this ground that this study critically examined management information system in Nigerian secondary schools with reference to challenges and way forward.

RESULTS AND DISCUSSION

Concept of Management Information System

There is no consensus of opinions among scholars and researchers with respect to providing universally accepted definitions for the concept of management information system. Thus, MIS as a concept has been subjected to plethora of definitions (Okeke & Ikediugwu, 2021). Ovwasa (2019) observed that information system is a prescribed method of gathering timely information via electronic subsystem in an organization in order to ease and improve effective decision making. Alabi (2016) advanced that managing information in an organization is described as a step by step procedure that augments the collection and presentation of information using integrated data based device for flow of information to upshot the actions and reactions of resources. According to Jahangir (2017), he posited information system is a method of collecting and processing data to offer the basis for effective decision making. Jones (2019) opined that information system is a procedure that managers plan and design to deliver precise information mandatory in the effective presentation of their roles. Sarwani (2016) asserted that management information handling for collecting information from its cradles of origin and providing the administered information to the various users for managing the business.

Boorne (2012) advanced that MIS is a structured programme, which interact with complex of machines and persons designed to generate an arranged flow of information from organizational sources for effective decision-making that will entrench growth and development of the organization. Zwass (2009) submitted that MIS is the entire portfolio of computer-based systems and their complimentary manual operations. Management information system aid the production and use of information for effective planning, monitoring and evaluation of school system. Management information system as advanced by Lucey (2019) is a courteous procedures that track the management at all levels the proper information based on data from both internal and external foundations for timely and effective decisions, directing and controlling the happenings for which they are accountable for. In a nutshell, management information system connotes techniques of easing managerial challenges in an organization using electronic data based devices towards ensuring effective decision making, policy implementation and performance appraisal or feedback.

As a data base, the aim of MIS in the school settings is to ensure accurate, appropriate and timely management of information to make pertinent educational decisions. Therefore, MIS as a global concept that encompasses the use of contemporary technology to gather and analyse data for decision making, formulation of policies, planning and monitoring for effective administration of educational system at all levels. Management information system is a centre for information that is domicile in the ministry of education and often accountable for information provision and data to plan, implement policies, make decision and access educational system (Lucey, 2009; Wako, 2013; Salako, 2012). Management information system as advanced by Stephen and Cuning (2019) connotes the process of collecting data from educational institutions, stakeholders, replicas, schemes, events, policies and a set of law. Lack of reliable data management component could hinder timely required information to guide the administrators in decision-making in most schools.

Features of Management Information System

Management information is described as a specialized information system that conforms to numerous features or characteristics. These features are regarded as universal in nature and remain more or less the same even when the knowledge around such information management changes (Wako, 2013). Specifically, the following are the common features of MIS:

1. *Management Oriented:* The management oriented features of MIS suggests that top-down method needs to be charted for designing it. The top-down methods denotes that the initiation system of improvement decides management desires as well as the set goal.
2. *Future Oriented:* The design and development features of MIS is future based and the system is not constrained to provide only the previous information.
3. *Integration:* MIS connotes combination of multiple sub-components to offer the relevant information to enable a useful decision. An integrated system, which balances information on several operation area, create a necessary physical characteristics of management information system.
4. *Common data flow:* MIS supports various basic views of system analysis such as avoiding duplication, joining parallel function and streamlining operations. The enlargement of common data flow is cost effeteness and logical idea.
5. *Central database:* MIS covers data in tabular base which is accountable for set-up like insertion, updating of records and deletion. In the same vein, MIS covers information that related to personnel, vendors, inventory, and data storing base.
6. *Strategic planning:* MIS requires high degree of preparation, which goes in creative an effective organization in order to ensure its relevancy to the present and future occurrence due to the dynamic nature of the society. It is designed to easily modify to accommodate growth or new types of processing activities.

7. Comprehensive: MIS is comprehensive in nature in that it transacts the process of information system designed primarily for administrators at all levels. It also embraces other systems such as formal informal system, manual and computer systems, project information system, intelligence information system, decision support system and other computer models distinctive information system.

Component of Mis

Generally, MIS is made up of three key mechanisms, namely hardware, software and people (Al-Oteawu, 2012). The mechanisms or components are explained below:

1. **Hardware:** hardware is made up of the computers, printers, networking devices and other physical components of the computer. The hardware provides the computing power for processing data, networking and printing proficiencies. The hardware speeds up the processing of data into information.

Portable Devices and Laptops: both laptop and portable devices have computing power as desktop computers but have the advantageous of being portable. With the arrival of the internet and virtual private networks, organizational employees have the chance to travel with their laptops to secluded locations and still have the opportunity to access the server.

Networking Devices: these are used to connect computing resources to communicate with each other. The networking devices include switches and networking hubs and Wi-Fi routers among others. Specifically, both hubs and switches are commonly used to give network connectivity via cable and are usually used to link desktop computers. In the same vein, Wi-Fi routers are commonly used to run wireless networking capabilities.

Printers: Printers are used to print hardcopies of information or reports. They differ depending on the use. Some printers have networking capabilities and can be connected on a network and used by one or more users. This decreases the prices of buying individual printers for each computer.

Storage Devices: Storage devices are known for storing data in office and these include: audio, documents, video, database backups, software installation packages. However, the most common storage procedures are external discs. Storage devices with schmoothing competences also exist that can be used to share files via network.



Source: Ampofo (2020) and Nkata 2020

2. **Software:** This is a program that runs on the hardware, which is fragmented down into two main classes (applications software and system software). Specifically, system software denotes the operating system like Mac OS, Windows, and Ubuntu. Also, applications software infers specialized software for realizing business responsibilities such as point of sale system, banking system, payroll program, and banking system (Bodo, 2016).
3. **People:** These are the operators who make use of MIS to record the day to day organization transactions. They are normally described as qualified specialists such as accountants and educationists. The ICT unit of the organization usually has the supporting staff who ensure that the organization is running correctly.

Development of Management Information System in Nigeria

The emergence of MIS in Nigeria is traceable to 1980 and could be explained in four main phases.

The Initial Stage: the first phase started with the transformation of the Nigerian Civil Service which became indispensable due to the need for making prudent use of appropriate and concise data for decision making. This was the phase that developed into the law which established the planning research and statistic department in government ministries, departments and agencies. The fundamental principle was to build up structures to harmonize, forecast, research, store, analyze and distribute educational data. The initial brought about the emergence of the Nigeria Education Data Bank and the first Educational Management Information System funded by the United Nations Educational, Scientific and Cultural organization (Federal Ministry of Education, 2000; UNESCO, 2015). The foremost aim was to reinforce the educational statistics to generate more related, timely and consistent data into educational system.

The International Donor and Development Partners Stage: this stage is characterized by concerned global supporter and development agencies which conducted a national scale through data collection and storage in an uncompleted data base. Nevertheless, at the conclusion of the research conducted by the UNESCO, getting donor agency to finance and support the process of data collection and analysis became a major challenge. It was then that the World Bank agreed to conduct more comprehensive research on management information system in school system.

Contemporary Stage: the modern stage in the evolution of management information system was developed in recent time to correct inaccuracies and challenges that characterized the previous stages using a series of interrelated activities among through inviting relevant stakeholders, organizing seminars, workshops, conferences, holding of meetings, reviewing and analyzing of policies, needs assessment, investigation, sensitization and strengthening of individual and institutional capacity building. All these efforts resulted in developing the Nigerian Educational Management Information System Policy (NEMIS). Policy through the combined efforts of both federal and state education ministries and their parastatals, international development partners as well as civil society organization (Shoobridge, 2016; Tietjen, 2005). The development of MIS in recent time received boost in 2014 through the decision of the Ministry of Education at the federal level in partnership with the board of universal basic education towards enhancing improvement in the states though there was continuity in sustainability at the center (FME, 2015),

Devolution Stage: this approach to management information system development was driven by the institutional growth which demand for compulsory census in the schools. The idea was formerly piloted in six state in Nigeria with the plan of extension to additional nineteen states in the year 2006. The development began in Kano State in 2006 when management information system was employed it in the training of management staff with the sole aim of creating information on the basis of number of students in educational institutions, rate of retention, amenities, training and retaining of teachers for effective service delivery as well as gather additional data from census. This ensured that MIS gives comprehensive report on abnormalities in the educational industry. For instance, a reduction in students' attendance, increase the number of students in schools or sexual characteristic matters. It is worthy of note that using the reports

generated via MIS. Furthermore, MIS systems are becoming cleverer. Thus, most of the developments below are not new but they have tendency to shape MIS in the nearest future:

Automation and cross-functional integration: This can be used work such as monotonous tasks and to cross-populate data with other machines. This enables employees to free up time to focus on higher-value jobs. For instance, automation can identify and alert you when stocks are low or automatically reorder stocks when needed without human interpolation.

Big data analytics: Universally, more than 2.5 quintillions bytes are generated on daily basis. This accounts for a ton of data, this made a lot of it harvested by business owners. From customers' point of view, buying habits to social media interactions, attracts rolling of data everywhere. MIS do not only have system that can be used to cope with the influx of data, but it has the wherewithal to analyze it. Thus, MIS can be employed to make operations more efficient, improve service, and ensures personalized marketing strategies.

Artificial intelligence (AI): There is no denying the fact that AI is seriously making waves across all sector of the economy. It is perhaps the biggest disruptor of business in recent in recent years. From self-driving cars to chatbots, artificial intelligence has become part of people's lives and it has continued to become more ingrained. Also, AI has capacity to ensure learning patterns and recognize anomalies when treating big data. IT is used to detect deception and determine the risk profile of the people that are looking for credit loans.

Cyber security: Crime has become a global threat to business outfits. Most of the attacks are financially induced while some are based on stealing vital information so as to gain a competitive edge. The cyber-attack is a fatal bow to people that engaged in businesses. According to research conducted by Fundera, it shows that 60% of small-scale businesses that experienced cyber-attack went bankruptcy within six months. As a result of the foregoing, many companies have invested heavily in protecting their data from being stealing. Due to the sophistication of criminals, cyber security software has gone ahead in terms of development. This is hinged on the fact that outdated technology cannot be used to track crime and stop access to classified and unclassified information of the business owners. Thus, a robust MIS has the wherewithal to enhance productivity of the employee in organization and improve customer's service.

Nigeria's Policy on Integration of Mis in Nigerian Secondary School System

According to section 2 sub-section 21 of the National Policy of Education, it described junior secondary education in Nigeria as the type of education that a child obtains immediately after the acquisition of primary education. Section 2 of the policy lists the specific aims and objectives of junior secondary education: (1) to offer the child with diverse basic knowledge and skills for entrepreneurship and educational innovation; (2) to grow patriotic young people equipped so as to contribute to social development and the performance of their civic responsibilities; (3) to inculcate morals and raise decently upright people capable of having independent thinking, and who appreciate the dignity of labour; and (4) to inspire national awareness and melodious co-existence notwithstanding of dissimilarities in religion, ethnic, socio-economic background and others.

Furthermore, section 3 sub-section 33 of the policy also described post basic education as the type of education that children obtain after successful accomplishment of basic education. Precisely, section 3 sub-section 36 of the policy states the following as the objectives of post-basic education in Nigeria as follows: (1) to offer holders of Basic Education Certificate with opportunity for education of a higher level, regardless of social status, gender, ethnic background or religious; (2) to offer diversified syllabus to cater for the changes in disposition, future roles and opportunities; (3) to provide trained manpower in the applied sciences, technology and commerce; (4) to provide entrepreneurial, technical and vocational job-specific skills for self-reliance; (5) to develop and promote Nigerian languages, art and culture in the context of world's cultural heritage; (6) to inspire students with a desire for self-improvement; (7) to foster patriotism, national unity and security education; (8) to raise morally upright and well-adjusted individuals who can think independently

and rationally, respect the views and feelings of others and appreciate the dignity of labour (Federal Republic of Nigeria, 2014).

To achieve the above goals of secondary education, section 8 of the policy empowered government at all levels to ensure provision of appropriate Information and Communication Technology (ICT) facilities to support the educational management at secondary school level. Also, it is mandatory for government to provide necessary facilities for the promotion of ICT in secondary and other levels of education in Nigeria. If provided, the use of ICT in secondary schools in Nigeria is expected to ease the operation of educational policy as well as the attainment of policy goals and promotion of usefulness in secondary school (Federal Republic of Nigeria, 2014).

Roles of Management Information System in Nigerian Secondary Schools

The broad functions of management information system as advanced by Balram, (2020) are given below:

1. *Improved decision making:* Effective use of MIS helps educational managers by providing comprehensive background information on variety of educational issues. This will help them to improve decision making quality of educational system. Therefore, the fast and accurate information provided by MIS is leveraged by the managers to take quicker and better decision making quality and adding to bottom line of the educational industry.
2. *Improved efficiency:* MIS assists administrators to conduct their tasks with greater ease and better effectiveness. This shows a better productivity in the school system. Therefore, MIS enhances productivity by ensuring that routine tasks are effectively implemented in the educational industry.
3. *It ensure connectivity:* management information system provides secondary school administrators with other members of the school as well as the relevant stakeholders in the educational industry.
4. *It provides details of students' academic records:* educators need to deploy technology to gain in-depth knowledge about students' behaviour in areas like outcome based education and make the best out of them using the available resources at disposal to provide maximum aid to students. Learning management system helps to reduce workload by streamlining the classroom activities delivery and digitalizing students' online assessment in a protracted environment with bloom taxonomy and course outcome.
5. *Aids in student information management:* Students behaviour can largely be tracked through the educational management information system. Storage of crucial students' information such as financial records, examination records, hostel records and health details. Also, students' progress such mode of registration assists the school system to optimize online admission procedure. In the same vein, transparency and operational efficiency can be tracked for clear insights and help to manage the performance indices
6. *Reduction of teachers' workload:* management information system reduces the workload of teachers by ensuring speedy access to any students' information which can be drilled down, filtered and prepared accordingly within a few connects. Precious time and energy that would have wasted are being judiciously utilized and management in the administration of school system via management information system.

Challenges of Management Information System in Nigerian Secondary Schools

According to Jacob, Jegede and Musa (2020) and Nkata (2020), the following challenges face effective implementation of management information system in Nigerian secondary schools include:

Lackadaisical Attitude of Teachers: One of the challenges of MIS in Nigerian secondary schools is lackadaisical nature or attitude of the teachers. On MIS, some teachers are often found to display attitude that is inimical to the adoption of technology to manage the information that they need to be properly kept.

Attitude is described as a predilection to respond favourably or unfavourably to an event, object or person. To positively initiate and implement the integration of educational technology in schools depends largely on teachers' overwhelming support based on their positive attitudes. Additionally, among the factors that stimulate successful incorporation of MIS into teaching is teachers' beliefs and character towards the use of technology. If teachers' attitudes are perceived to be highly negative toward the use of technology to manage data or information then they have no knowledge wherewithal to easily provide useful insight about the integration of MIS into teaching and learning processes.

ICT Incompetence: Computer competence is termed as one's ability to handle a wide range of computer applications. However, evidence suggests that majority of Nigerian teachers does not have basic knowledge and skills that would allow them to make use of computer for effective data management in the school system.

Lack of Computer Self-Efficacy: Research conducted on teacher's perceived self-efficacy and reported to have effect on their use of MIS. Self-efficacy is described as a belief in one's own capacities to perform an action to achieve a task. In another words, self-efficacy is deemed as the confidence that individual has in his/her ability to perform certain things.

Poor Teaching Experience: Research carried out on poor teaching experience reported that teachers' experience in teaching did not necessarily stimulate their use of technology in teaching (Niederhauser & Stoddart, 2011). Baek, Jong and Kim (2008) are of the view that experienced teachers have tendency to be less ready to integrate MIS into their teaching.

Education Level: Studies on educational qualification of teachers revealed that individual teachers who possessed less than upper-secondary education are considerably less likely to use computers for a range of reasons. In addition, items that measure individual's use of technology and attitudes tend to increase with the literacy ability of individuals (Jones, 2014). Borghans and Weel (2016) discovered that people with more education have higher technology skills, but concluded that more educated people tend to make use of computers often, making it impossible to distinguish whether education or employment has the biggest impact on technology skill levels.

Lack of Professional Development: Teachers' professional development is often described as a factor for successful integration of technology in school. However, studies have indicated that whether beginner or experienced, teachers' training on technology influence teachers' positive attitudes toward teachers' adoption of technology that will assist them in teaching effectively in classroom (Chisango, Marongwe, Mtsi & Matyedi, 2020).

Inadequate Accessibility of Facilities: Another challenge that confronts the use of MIS in school is hinged on inadequate accessibility of facilities. Studies indicates that majority of schools are having inadequate ICT facilities, which hampered teachers' use of the technology. For instance, teachers that are competent and desirous of using computers in school may not be able to use it if there is no computer and internet facilities provided for them (Owenga, 2012).

Way Forward on Effective Use of Management Information System in Nigerian Secondary Schools

Studies conducted in various countries confirmed the significant impact of MIS in the running of school system. In fact, it was discovered that both managers and teachers ascribed their efficiency and effectiveness to wide range exposure to technology. This lessened their workload and made management process more seamless (Ampofo, 2020; Jacob, Jegede & Musa, 2020; Nkata, 2020). Thus, to address the challenges that are associated with the use of MIS in Nigerian secondary schools, the following measures are needed:

1. The identified school objectives should guide the secondary school administrators in utilizing the management information system outputs for effective decision-making process.

2. The success of the management information collection technique depends to a large extent on the availability of accurate, relevant and timely information for decision-making. It is recommended that the information collection personnel should use the identified information collection techniques in providing the relevant data for decision activities in the secondary schools.
3. More information processing facilities should be made available in the secondary schools since the task facing schools are complex, staff handling students' records should be made to be computer literate to enhance the utilization and processing of students' records, the library staff, other staff among others.
4. The information analysis personnel should use the data processing and analysis methods identified to process the captured data and transform them into information. This information should be used for administrative decision-making in the secondary schools.
5. State government should ensure the level of management information system in all public secondary schools is high with adequate funds.
6. Secondary school administrators must maximally integrate educational management information system towards making appropriate decision while seminars, conferences and workshops on educational management information system should be periodically organized for relevant stakeholders in secondary education.
7. Concerted efforts should be made by the government and stakeholders in secondary education towards genuine integration of ICT policies in the school system. Lastly, there is need for attitudinal change by secondary school teachers and administration on adequate effective utilization of ICT facilities.

CONCLUSION

Management information system is a system designed to provide the vital and reliable information needed in secondary schools for effective decision making. Management information system plays vital roles in decision-making in the tertiary institutions such as, providing the vital information, real-time updates of information, ensuring multitasks, providing record-keeping and allowing quick access to information. Any type, kind and size of an educational institution requires a user friendly and efficient management information system to take the institution a step further in right direction and boost students' success. No matter what the core needs, every forward thinking secondary school administrators must maximally integrate, effectively utilize and fully track their resources towards making appropriate decision using MIS.

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