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MANAGEMENT INFORMATION SYSTEM AND OPERATIONAL PERFORMACE OF TERTIARY INSTITUTIONS IN NIGERIA
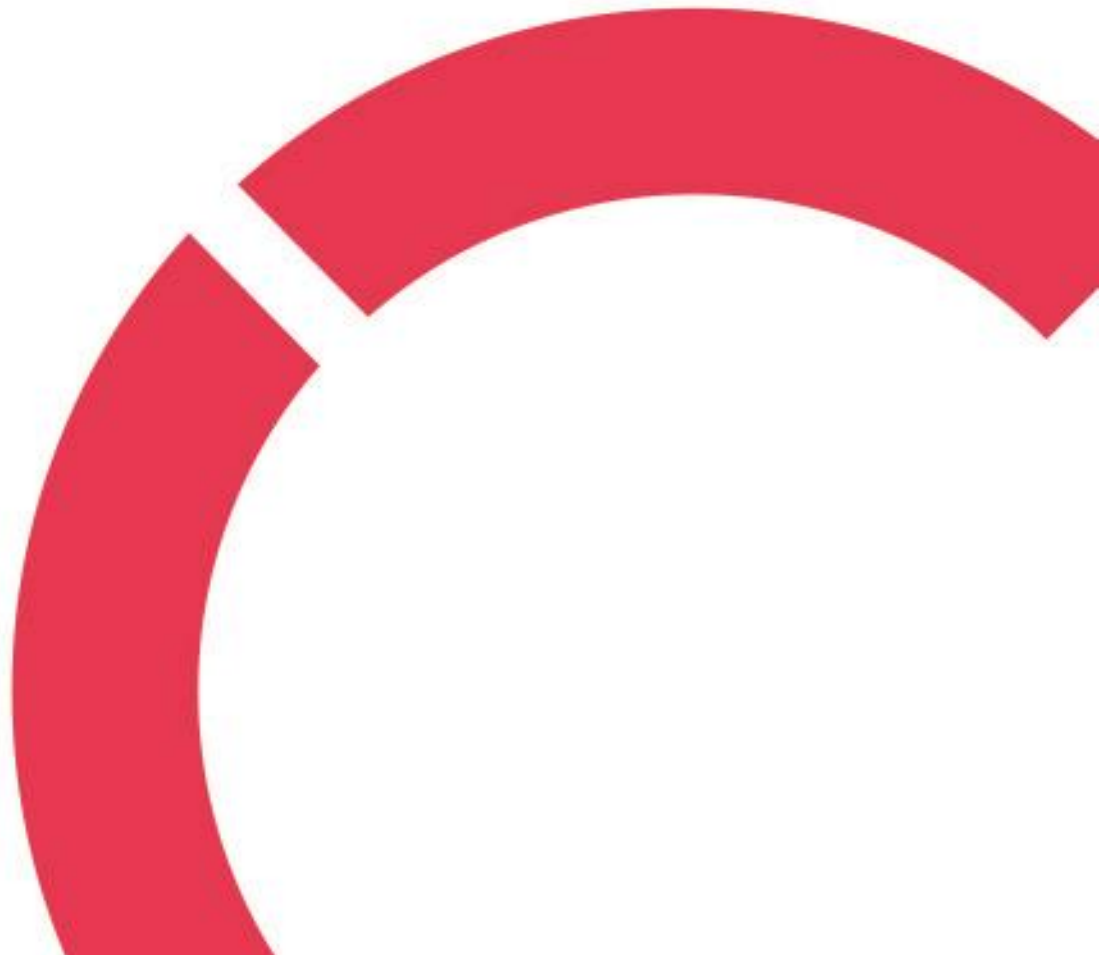
A Study of Lead City University, Nigeria.

ABSTRACT

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The aim of this study was to evaluate the role of management information system on the operational efficiency of Universities in Nigeria with reference to one of the leading private universities in Nigeria, Lead City University, Ibadan, Nigeria. The use of management information systems can give a university the needed edge over others. However, not much has been done to empirically investigate the influence of management information system on operational efficiency among private universities in Nigeria. This study intended to fill that gap. This research work was based on quantitative research methodology.

The data was analyzed using descriptive statistics. The results showed that the implementing of a management information system in the institution is very robust with all the components adequately present and capable of meeting its present needs. This has obviously impacted on its operational efficiency as the respondents have a highly positive perception of the impact of the use of management information system.

The study therefore recommended that institution could serve as a model for other Nigerian universities aspiring to become a relevant player in the global tertiary education landscape.

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1 INTRODUCTION

Management information systems (MIS) are being increasingly adopted by Nigerian tertiary institutions. It is expected that this will contribute to the operation efficiency of the institutions through effective record management, improved response time and organizational agility. However, there are still widespread reports of students' academic records misplacement, delay in making important decisions, poorly designed call roster (timetable) and unstable program scheduling among others. All these are having adverse effects on the operation of tertiary institutions. It has been reported that the contribution of MIS to organizational efficiency depends on certain attributes of the system such as system quality, information quality and services quality. These qualities are often missing in the MIS created by Nigerian tertiary institutions with the results being the lack of impact of the MIS on the overall efficiency of the institutions.

This study, therefore, aims to investigate whether the adoption of MIS has contributed to the effectiveness of tertiary institutions in Nigeria. The objectives of the study will be to investigate how various qualities of information systems such as information quality, service quality and system quality of the MIS contribute to the operational performance of the institutions by enhancing record management activities, improved response time and organizational agility.

The thesis is divided into five chapters. The first chapter deals with the background of study. The second chapter focuses on the commissioner. It traces the establishment, development and the philosophy guiding the operations of the commissioner as well as the operational environment dictating its approach to the education of its students.

The theoretical aspect of the study is set in the third chapter. It analyses the key concepts in the study and the findings of previous studies. Chapter four will present the research methodology. The fifth chapter will focus on the analysis and discussion of results, and the sixth chapter will outline the conclusions, recommendations, and suggestions for further studies.

The thesis will adopt a quantitative research methodology. This means that a questionnaire will be used for the purpose of empirical data collection. The random sampling technique was adopted to select the study sample and descript statistics such as frequencies, percentages and mean scores was used to analyse the data collected in order to address the research questions.

The commissioner is Lead City University, a private university in Ibadan, in South-West, Nigeria. It was licensed to begin operation by the National University Commission (NUC) in the year 2005. The university is a conventional University with courses offered in a wide range of subjects such as Law, Education, Engineering, Nursing, and the Arts among others. Lead City University is one of the private universities in Nigeria trying to take advantage of irregular services offered by government-owned tertiary institutions in Nigeria. The university is however in competition with several others, so it must ensure that it offers value for money in term of effective services in order to attract students.

2 THE COMMISSIONER

The Commissioner for this thesis is Lead City University, Nigeria. It is a private university in Ibadan, in South-West, Nigeria. It was licensed to begin operation by the National University Commission (NUC) in the year 2005. According to information on the University Website (Lead City University, 2022), the university's mission is to equip students with the type of quality education that can make them to become self-reliant. The university aims to use education to tackle inequality by equipping youths and adults with lifelong skills that can help them become productive members of the society. In line with this, Lead City University caters for both the young adolescents and the adult working class. Programmes are offered by specialised faculties, comprising leading academics, practitioners, and experts (Lead City University, 2022).

The Southwest of Nigeria, the region where the university is located has over 36 universities and Ibadan which hosts its campus has five other universities including the first University in Nigeria: The University of Ibadan. All this goes to show that the University operates in a very competitive environment. In order to thrive in this environment, the university has leveraged on technology innovation in its operations. The university is constantly expanding, adding faculties and programmes such as engineering, medicine, pharmacy, and software development to attract more students. (Lead City University, 2022.)

To ensure that the University remains at the forefront of the latest development in the field of Information Technology and Management education, it has integrated modern technology into its teaching and learning; state-of-the-art Computer Facilities, Internet Linkage, Electronic Library, Audio-visual Aids, and Student-friendly course materials. The university was among the few in Nigeria who kept operating during the Covid 19 lockdown declared in the year 2020. This was made possible due to the availability of the necessary infrastructure and data needed to plan a successful online teaching and learning. In addition to this, students' registration, fee payment and continuous assessment are now carried out using online application (Lead City University, 2022).

The use of Management Information System (MIS) by the university can be regarded as a business strategy as it is designed to ensure that it can meet the demands of students and other stakeholders as effectively and efficiently as possible. The use of MIS can be seen in various aspects of the university's operations such as application for admission, course registration, fee payment and processing of examination results and certificate. The application of the MIS in this process has been projected to

eliminate errors, speed up services and minimize the expenses on personnel. It is also expected to make the service experience pleasant for existing and prospective students as well as former students who still need further services such as transcript processing. (Eze, Awa, Okoye, Emecheta, & Anazodo, 2013.)

The MIS is also used to manage staff information. All employees' records are expected to be kept by the Human resources department and other relevant department. The use of MIS has also been found useful in the seamless management of employment records between various units of the university who must deal with the same employees. All issues relating to recruitment, promotion, rewards, and sanctions are dealt with effectively with the absence of errors or duplication of efforts. Perhaps the most import role of MIS use in Lead City University is the data it provides for management to make informed decisions about the operations of the university (Bright & Asare, 2019.)

The university's management expect the rich data provided by the MIS to aid in make key decisions such as allocating courses to lecturers, lecture rooms, and timing among others. The MIS is also expected to help in making projections regarding the new students, which programmes are attracting students and which ones are not. This enrolment data is also found useful in determining the personnel and equipment needs of a department. In essence, the MIS is expected to help the university achieve effective allocation of resources and present wastage. (Eze et. al., 2013.)

Effective allocation of resources is essential for private universities where the main source of income comes from fees paid by students. Therefore, ensuring that all academic needs of the students are taken care of is a way of ensuring their satisfaction and boosting the reputation of the institution. This reputation is what often attract students to Nigerian universities as students and their parents often rely on the recommendations of others who have attended the university before. (Ugwude, Agu, & Ekweogu, 2021.)

In the same vein, the use of the MIS helps in dealing with employee matters. For instance, it is not advisable to keep many personnel in a department that requires minimal human resource while neglecting the need of others where the demand is greater. Thus, by implementing the Management Information System, the University hopes to be able to provide quality services that meet the expectation of the stakeholders while also ensuring that organisational resources are well allocated to ensure the continuous survival and progress of the university. (Odusanya, 2019b.)

3 MANAGEMENT INFORMATION SYSTEMS

Management information systems, as the name implies, are information systems designed to provide the management of an organization with the necessary information for effective decision-making. The management information system, therefore, encompasses the aggregate of the information available to various units in the organization (Berisha-Shaqiri,2014, 2).

Theoretically, management information systems (MIS) refer to an integrated collection of digital databases built with relevant software and supported by appropriate computer hardware for the purpose of gathering, processing, organizing, analyzing, and disseminating information vital to the effective management of various types of organizations and institutions including universities (Rahman, Park, & Suh, 2019). The main function of an MIS is to provide timely, accurate, and easily accessible information for decision-makers. The implementation of MIS in private universities is therefore expected to aid effectiveness in the areas of leadership, decision making, academic planning, human resource management, communication, as well as for monitoring and evaluation purposes. Achieving efficiency in these areas is expected to ultimately lead to operational efficiency which is a situation whereby the university can achieve its objective at a minimal cost, both in terms of financial and human resources.

Bright and Asare, (2019, 4) observed that there is no unanimous definition of management information systems (MIS). The authors choose to define management information systems as computerised systems set up to collect, store, organize, process, and disseminate data and information for the use of organisations. This is a functional definition that properly outlines what the MIS is expected to do in the organisation. However, other authors have focused on what the MIS is expected to add to the organisation instead of its 'mechanical' functions of collecting, processing, and disseminating information. In this respect, Odusanya (2019a, 55) conceptualised Management Information System (MIS) as a computer-based system used by decision-makers in the educational sector for various purposes such as planning, organizing, decision making, monitoring, control, and evaluation to ensure that their operations proceed efficiently.

Berisha-Shaqiri, (2014, 1) also defined MIS from the perspective of the purpose for which it is set up by organisations by defining MIS as flow-processing procedures based on computer data and integrated with other procedures in order to provide information in a timely and effective manner to support decision-making and other management functions. A typical tertiary institution's Management Information System is made up of various Transaction Processing Systems (TPS) designed to serve

various purposes related to the activities of the institution (Berisha-Shaqiri, 2014). For instance, Odusanya (2019b, 30) identified various information systems that constitute MIS in tertiary institutions such as course registration portals, online learning platforms, admission processing portals, examination result checkers and others that include management functions such as procurement management, human resources management, course allocation, payroll, and employee benefit management among others. All these separate interfaces are brought together in one system to provide management with a bird eye view of what is going on in the institutions.

From the various definitions and descriptions of management information systems, it is possible to deduce the main roles that they play or are expected to play in an organisation. It is obvious from the definitions that an MIS is used to collect relevant data from various sources, process the data, organise it and keep it safe with the aim of meeting present and future information needs of the organisation and its members. The data collected by the MIS can be retrospective, current or in anticipation of future events relating to the organisation and anyone associated with it. The retrospective data may refer to records of past activities that are needed in order to make sense of the present or to make some decision. An example is a student who apply for academic transcript. Such students may need to provide details about their academic journey in the institutions. The information collected in the present may be on students' attendance at lectures, examination, and other ongoing school activities while the data collected in anticipation of future events may application for leave or day off etc. (Ampofo, 2020.)

What is most important is that the information is captured accurately by the system, and it is promptly made available to relevant stakeholders whenever they need it. This means that any authorised person who need to retrieve information from the system can get the information they need in the format they want and without any significant effort to get what they need (Ajah, I& Chigozie-Okwum, 2019). This will ultimately enable the system to serve its main purpose of supporting the decision-making process. (Bright, & Asare, 2019). Indeed, the focus of establishing MIS in Nigerian universities is to improve efficiency.

3.1 Subsystems of Management Information Systems

A management information system is a complex combination of various information systems which reflects the activities and objection of the institution that develop it. It therefore brings together various components doing different tasks which are directed towards the achievement of the overall objectives of the institutions. Some of the subsystems of Management Information System identified in literature

include transaction processing systems (TPS), Management reporting systems (MRS, Decision Support system (DSS), and Office Information System (OIS) (Alsalim, 2022). This is represented in figure 1 and explained in the following section

3.1.1 Transaction processing systems

Transaction processing systems (TPS) are information systems used in carrying out the routine activities in an institution. The transaction processing systems allow people to conduct business with an organisation in a computer-mediated environment. For tertiary institutions, it allows existing and prospective students to interact with the university in a computer-mediated environment. The transaction processing system in tertiary institutions is used for various activities such as admission processing course registration, hostel booking, fee payment and submission of various applications which were previously carried out manually. A typical TPS operate on a few basic steps for each transaction. These steps include entering or capturing of data, validating the data, processing, storing or preservation, generating output, and querying the databases. Transaction processing are used to automate routine and repetitive tasks, shifting from human mediated to computer-mediated services with the hope of boosting the speed and ease of service delivery. (Trianita, Dharma, Mulatsih, & Fitri, 2020).

However, not all TPS are designed to facilitate self-service. Some a designed to be used by an employee instead of using manual or electronic files which cannot be interfaced with other modules. In this mode, there is a trained staff who keeps records of transactions and enter them into the TPS. The operator can record the transactions in either the batch or online mode. Using the batch mode records updates means that all records are collected through a form and the update will occur at a designated time, normally at the close of each day. The online mode on the other hand allows for transactions to be recorded as they occur. This is more suitable to self-service TPS which users can access remotely without physically being present (Wang & Kogan, 2018).

3.1.2 Management reporting systems

Management reporting systems are also referred to as information reporting system (IRS). Their main purpose is to generate reports of business activities in an organisation. They usually get their data from

transaction processing systems. Management reporting systems (MRS) provide a summary and high-light of major activities in an organization. A key feature of the MRS is that it is more focused on showing information and data in a way that shows precedents and current realties, but it does not try to make projections for the future. This is because the MRS often has limited analytical ability and it is not expected to play the role of a Decision support system. In addition, what the MRS report is strictly on activities that happens within an organisation without considered the external factors (Ugwude, Agu, & Ekweogu, 2021).

According to Nita (2015), management reporting systems works by setting objectives and collecting data to gauge to what extent the objective are being met. Management reporting systems do not track the overall performance organisation, but specific parameters as defined by the management. The system is used to generate management reports showing the performance of each unit, department, or individual members of the organisation to determine how set goals are being met and where to adjust. In order to generate the most helpful management report, it is important for organisations to evaluate the performance of different units and components of the organisation. The key items to be included in a management reporting system include employees' individual targets, progress towards the set target, overall organisational efficiency and productivity and others considered relevant to the organisation (Nita, 2015).

3.1.3 Decision Support system

Decision support systems (DSS) are improvement Management Reporting System as they have more analytical power. A typical decision support system provides management with several simplified models for their data analysis and translation. The modelling allows institutions to use available data to build various scenarios and understand the likely outcome of each decision based on various combinations. It also facilitates effective information retrieval of easy-to-use modelling, retrieving, and reporting capabilities so that people can generate the information they feel will be useful for them when making decisions. For instance, a DSS might allow a manager to sit at an interactive terminal and browse through data, analyse it, and create specially tailored reports (Nita, 2015).

Decision support systems does not hold static or rigid data like the TPS. Rather, it works on the data and makes it to be more dynamic and presents it in various dimensions using specialized tools to enhance decision making. From the analysis of the DSS, it is obvious that it also feeds on data collected by the transaction processing systems. With its ability to performance complex permutation on data, it

provides a significant level of support that enables the management to deal with various issues. Some of the main features of DSS are that it focuses more on specific decision rather than are used as an information collection tool and it can also present the result of a data anaylsis in a way that can be easily understood (Meeßen, Thielsch, & Hertel, 2020.)

3.1.4 Office Information System

As the name implies, an office information system is used to manage the flow of information in and out of the organisation. Like other information systems, office information systems are made up of hardware, software, and networks all of which work together to ensure the seamless flow of information among the employees of the organisation. Office information systems are also called office automation which is a situation where the organisation has applied computers to various tasks in the organisation. In such an environment, staff carry out their daily activities using computers and other electronic devices, instead of manually. An office information system allows tertiary institutions to keep electronic records, communication through digital networks and carry out activities that would have been done manually before, with the aid of computer systems (Febiri, 2019).

As a result, an institution using an office information system must provide internet enabled computer systems, cameras, scanners, printers, and computer accessories such as flash drives and internet connection. Office information systems can be based on simple computer software such as Ms Word, Excel, Access, PowerPoint, and graphic design software. Others include, e-mail, Web browsers, cloud storage application, and so on (Ugwude, Agu, & Ekweogu, 2021).
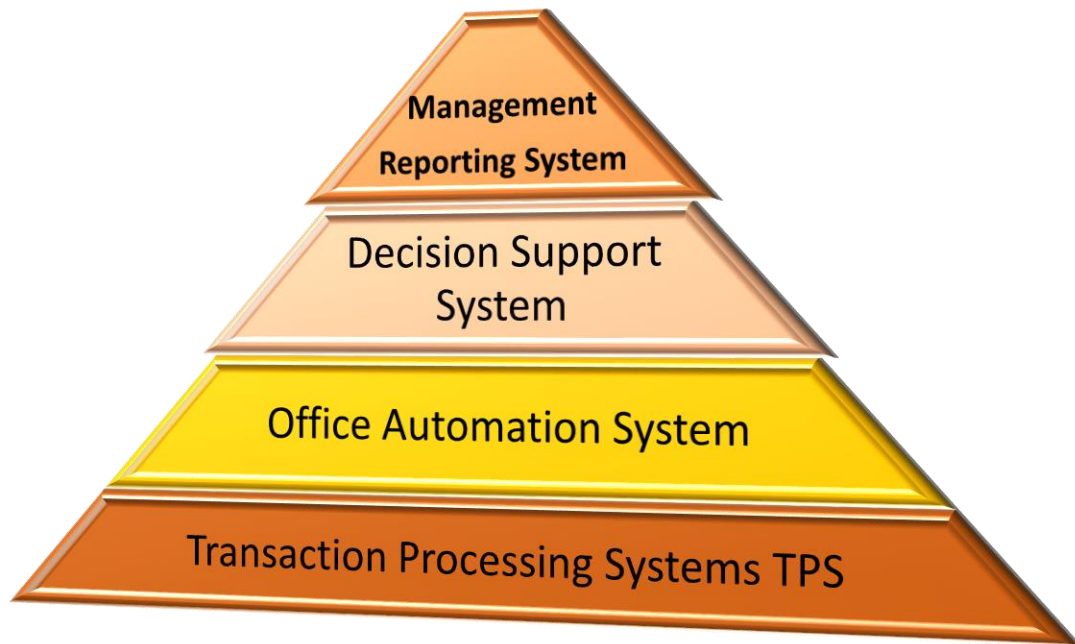
FIGURE 1. Subsystems of Management Information Systems (Adapted from Liu, Ahmad, Ahmed, & Omar, 2011)

3.2 Management Information Systems in Nigerian Universities

Before the introduction of MIS into Nigerian educational systems, administrators, lecturers, students, and other members of the university community were inconvenienced by the outcome of poor information management (Mabera, 2020, 32). As reported by Ugwude, Agu, and Ekweogu, (2021, 14) some of the challenges experienced by Nigerian universities that could be traced to poor information management include allocating the same classroom for different lectures at the time, delay in processing and dissemination examination results, inability of students and their parents/guardian to obtain information about their academic status, haphazard management of issues relating to staff and contractors etc.

Poor information management also affected the interaction of the universities with regulatory bodies such as the Nation University Commission (NUC) and other agencies such as the Joint Admission and Matriculation Board (JAMB), the National Youth Service Commission (NYSC) and other stakeholders. These bodies and agencies usually request for various data either for evaluation or for other purposes such as mobilization for the mandatory National Youth Service or to allocate admission quotas.

Many universities and their students have often suffered embarrassment due to their inability to submit timely and accurate information to these bodies (Odusanya, 2019). The poor management of records and its effect on poor planning and ineffective decision making in universities also has implications for national development which is why this issue is of concern to developmental agencies such as the World Bank (Mabera, 2020).

Ugwude, Agu, and Ekweogu, (2021, 13) traced the origin of MIS in Nigerian universities to the partnership between the World Bank and the National Universities Commission (NUC). The World Bank recognise universities education as a key element in boosting development, especially in developing countries so it realised the importance of having well run tertiary institutions with financial and technical support from the World Bank, the National University Commission developed the National University Management Information System (NUMIS). The importance of data and information led to the support for the development of Management Information Systems (MIS) to ensure that university administrators and management staff have the accurate, timely and complete information necessary for decision making to ensure the effective administration of their institutions.

The objective of this pioneer MIS includes the standardization of data collection procedure in the universities, ensuring the accuracy and timeliness of information, effective organization of information for planning and decision-making which is expected to enhance operational efficiency in the universities. The NUMIS was developed with three different modules: students' records, staff records, and financial records (Nwankwo, Ugwude, & Ugwude, 2020). The NUMIS was designed as an integrated system using the Dbase as its operating system. It operates on five key phases namely, data entry, data update, query, reports, and file maintenance. These phases are interconnected with various modules such as staff and student entities, finance, reference tables, student and staff lists, and student and staff information (Eze et al. 2013).

The NUMIS was expected to eliminate or reduce the perennial information management challenges facing Nigerian universities, such as incomplete and inaccurate planning data, underutilization of resources due to faulty planning and other challenges such as missing students' academic records, manipulation of sensitive records and delay in information retrieval from manual records repositories. It was also expected to provide educational planners with the needed data to guide policy formulation, allocate resources and stimulate development in the educational sector (Omohwovo, et al., 2021). Although the NUMIS did not achieve its aim due to various technical issues, it serves the purpose of teaching Nigerian institutions about how not to approach the development of Management information

systems. The shortcomings noted in the development and implementation of the NUMIS were duly identified by scholars (Nwankwo, Ugwude, & Ugwude, 2020).

According to Sutton, Pincock, Baumgart, Sadowski, Fedorak, and Kroeker, (2020, 15-17), the main features of information systems that determine their effectiveness include information quality, service quality, and system quality. Service quality in terms of MIS considers the kind of technical support available for the use of the system, the training provided for the users and how well the users understand the system. Information quality focuses on the usefulness of the information contained in the system, the accuracy, completeness, and reliability. System quality is the ability of the system to meet the information needs of the users, on time and accurately It also covers how easy to use the MIS is. (Li, Tung, & Chang, 2015, 16). Most of the MIS in Nigerian Universities often fail the tests of service quality, information quality and system quality because administrators are yet to grasp the full essence of Management Information Systems (Odusanya, 2019a).

Management Information System in the context of universities, is basically an information system designed to collect, process, organise, preserve, and disseminate data and information that can contribute to effective university management (Odusanya, 2019a). By their nature, information systems are made up of various integral components such as computer software, computer hardware, people, and processes (Figure 2). According to Meeßen (2019), a system is a combination of certain elements and components that must interact together in order to attain a specific objective. Thus, information systems can be described as a combination of related units that work together to achieve efficient collection, processing, manipulation, organisation, and dissemination of information. Any information system that fails to include all the components is bound to fail. It is therefore important for universities to understand the full scope of management information systems if they are to reap the benefits accruable from the implementation of an effective management information system. (Omohwovo, et al., 2021; Ugwude, 2015.)

According to Alsalim (2022), the first component of the MIS should by the human component. This includes the technical staff that will manage the system as well as the end users who will make use of the system. The importance of human component to the success of MIS was highlighted in the development of the national university MIS (NUMIS) in Nigeria (Ugwude, Agu, & Ekweogu, 2021). According to Ugwude (2015), the focus system was developed by foreign experts who did not fully comprehend the Nigerian university system or the level of technical expertise available to Nigerian universities. The result was a system that was not compatible with the needs of the Nigerian university sys-

tem and for which there is no staff skilled enough to manage effectively. The system is probably so-phisticated and would have worked perfectly in a European university, but it failed because there was no local input and not local experts to manage it after the handover by the developers. Understanding the human component is essential in deciding on the system component of the MIS.

The system component of the MIS is made up of computers and related devices such as software, hardware, and networking. Software resources refer to the entire computer-based program and associated instruction manuals that help manipulate the hardware. Software are computer programs designed to achieve specific purposes. There is various software that can be used in the development of a MIS. However, since each MIS is tailored to meet the specifications of its developer, it is advisable that the institution fully comprehends the objectives to be achieved by the information system and communication such objectives clearly to the system developers. (Ugwu, 2015.)

While the software aspect of the MIS is intangible and understood only by those with the required technical skills, the hardware part includes tangible items such as computers and other related devices such as printers, scanners, storage devices, internet servers and others (Febiri, 2019). The effectiveness of the MIS depends on the quality and quantity of available hardware. Therefore, it is important to properly evaluate the hardware to be used for a proposed MIS. Reports from Nigerian universities often show a lack of adequate or quality hardware which often makes it difficult to deposit or retrieve data from the MIS (Omohwovo et al., 2021). The thread that combines all other components of MIS such as people, software and hardware is the process that guides the operations of the MIS (Febiri, 2019).

Process as a component of the MIS is the systematic, organised and outlined ways which the operations of the MIS must follow in order to achieve the set objectives. They are the organisation-approved best practices that must be followed by all users and other components for the MIS to work efficiently. The process may differ based on the peculiarities of each institution (Alamoudi & Kumar, 2017). It may also differ across departments and units in the universities as the information needs of each department and units differ from the other. The information needs of the admission unit, for example, differ from those of the human resources management. The admission unit wants information about new applicants, basic admission requirements, and available spaces. As a result, the system developers have to the appropriate process in such a way that the MIS system assists the department in retrieving the information it requires. This is a simplification as the process also includes other aspects such as information use ethics, data entry procedure, authorized users of the system and others. (Ugwu, 2015.)

While software, hardware, people, and process are the most discussed components of information system, other authors such as Febiri (2019) and Bourgeois (2014) added networking as a component. This is important because the components of MIS were conceptualised when interconnectivity of information systems have not become widespread. The earlier information systems were based on stand-alone computers that operate as individual islands without having to interact with other computers or devices over any network (Bourgeois, 2014). However, the modern information system is predominantly online based as organisations and institutions focus communication remotely with various stakeholders spread across wide geographical locations. As a result, whilenetworking is technically related to hardware and software, it has become an important part of today's information system that it should be considered on its own merit. The importance of networking in modern management information system can be better understood from the perspectives that the systems is made of various subsystems that must share data and information among themselves. (Omohwovo et al., 2021.)
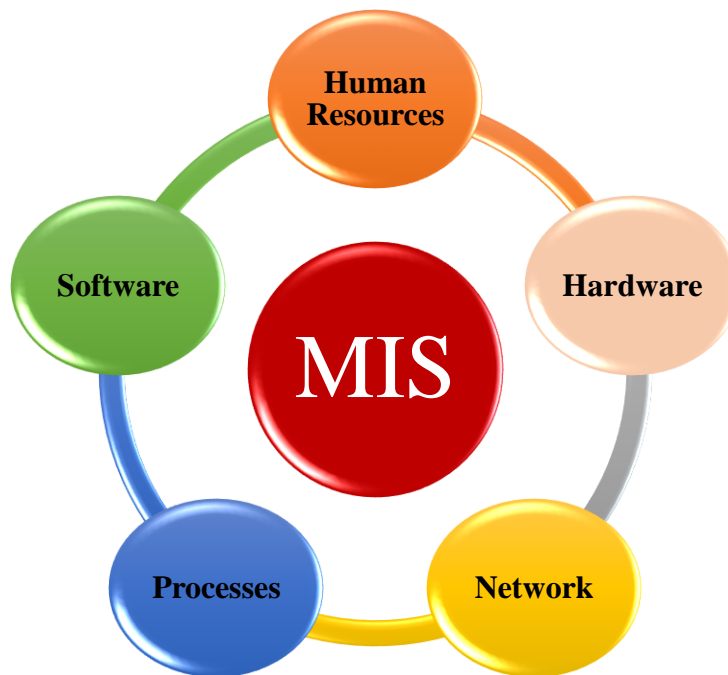
FIGURE 2: Components of Management Information System (Adapted from Ugwu, 2015)

3.3 Advantages of MIS to Nigerian Universities

The use of management information systems offers many advantages and solves many problems for tertiary institutions in developing countries. With the level of information generated as a result of the interaction between universities and their students, the manual ways of managing records and sharing information has proven to be inadequate. According to Ampofo (2020), countries in the developing world used to depend on unreliable post systems to communicate with students. They also had to create cumbersome file cabinets and file systems to manually manage students' and staff's records. The result was a frequent delay in information retrieval, missing students' records and other problems that often cause frustration for students and members of staff. The adoption of MIS therefore became non-negotiable especially with the proliferation of competing universities which mean that, students who are not satisfied with one university simply choose another one.

In the same vein, Abu Amuna, Al Shobaki, and Abu-Naser, (2017, 2) also submitted that MIS provide organisational management with the necessary information to guide them in the managerial process of making rational decisions and assist them in the overall performance of their functions of planning, control, and decision-making. This is expected to enhance operational efficiency. Bright and Asare, (2019, 2) also observed that educational institutions are implementing MIS with the expectation that it will improve the effectiveness and efficiency of their core operation which revolves around teaching and learning. Available literature shows that there are certain characteristics or features of management information systems that determine whether they can contribute to the operational efficiency of universities.

The use of Management Information System has made it easier and more economical for universities to maintain both active and redundant records relating to their students. Most importantly, MIS brings these records together and make the available to decision makers who can easily access and deploy them in making the most appropriate decisions concerning the operations of the university (Bright & Asare, 2019).

The computerized MIS has brought about energy and time conservation for staff and clientele, ease in the preparation and issuance of student's transcripts. Also, the computerized MIS provides institution with all the information they need for decisions making, when they need it, and the form that aids their understanding and stimulates appropriate action. (Odusanya, 2019a.)

3.4 Challenges of MIS Use in Nigerian Universities

Despite the advantages offered by MIS in services delivery in tertiary institutions, various challenges have been identified by researchers in African Universities when it comes to the use of MIS in tertiary institutions. According to Abutu, Abduldayan, Addullahi, and Abduldayan (2019), many MIS in Nigerian tertiary institutions have failed to contribute to the efficiency of their developers because of lack of qualified staff. A successful operation of MIS requires skilled staff who understands the philosophy and operational procedure of the university. However, database management and administrators are among the most sought-after skilled professionals in Nigeria. The result is that university are regularly losing their best hands to the private sector and foreign countries where the pay is better. This often disrupts the effective operation of the MIS (Abutu et al., 2019).

Ampofo, (2020), reporting on the experience of students and staff in a Ghanaian University observed that the MIS is not functioning as expected with users always finding it difficult to access the database and when they do, the user interface is often distorted making it difficult to read the information of the system. This challenge speaks to the information quality aspect of the system which is one of the success factors in the use of information systems. Information quality means the extent to which information retrieved from an information system is effective in enlightening the users or help them make the right decision. According to Hakimpoor and Khairabadi (2018), the information emanating from an information system is usually judged by accuracy, relevance, and completeness the information. It means that users of MIS expect to find the information that is accurate, relevant to their need and completely satisfies their information needs.

There are contrasting reports on the experience of users with information from MIS in Nigerian Universities. Ajoye (2014) reported that the information provided by the MIS in some Nigerian universities is accurate and satisfactory to the users. However, Momoh and Maishanu, (2015) found that poor structural design and lack of effective management has ensured that many MIS in Nigerian universities do not have up-to-date, accurate and easily retrieved information. Many of the MIS are poorly designed and they often fail to capture all the necessary data that users of the system may need down the line. In addition, poor infrastructural support often means that the system is often inaccessible to the users which makes it impossible to upload or retrieve information from the system.

4 OPERATIONAL EFFICIENCY IN UNIVERSITIES

Operational efficiency is a concept that emanated from the business and manufacturing world. It basically means the ability of an organisation to achieve maximum productivity with each unit of resource input. According to Munoz (2016) efficiency can be defined as the ability of an entity to achieve a set goal with the use of as little resources as possible or simply ensuring the highest possible output is achieved with the use of a given amount of input. Operational efficiency can therefore be taken to refer to an operation in which little input is deployed to achieved maximum output. Operational efficiency is a concept that may be perceived differently depending on the organisation or the industry in which it operates (Lausa, 2016).

Operational efficiency in telecommunication companies according to Hendrawan, & Nugroho (2018) is seen as the result of effective human resource management, supply chain and quality control management, which results in customer satisfaction and increased revenue for the organisation. This means that operational efficiency is meant to help the organisation achieve its aim and remain competitive it its field. In the context of academic institutions, Lausa (2016, 34) conceptualized operational efficiency as the ability of an organisation to minimize waste and maximize the use of resources to achieve quality services delivery to various stakeholders. For universities, the stakeholders include students, staff, parents, regulatory bodies, and others who affect or are affected by the operations of the institution. In the same vein, Kehinde et al. (2020) also defined operational efficiency in universities as a situation where institutions have been able to successfully create a balanced blend between human resources, technology and process in a way that results in operational effectiveness, increased employee productivity and overall optimal performance. It is essentially the achievement of the maximum output with the available input.

In the context of input to output, organisational input can be in various forms. This will be better understood when input is seen in terms resources. Input can be human resources, infrastructure, financial and other intangible resources such as time (Lausa, 2016). One of the key resources is time. For example, if university employees can attend to more students in each period or shorten the time it takes for information to move from one unit to the other, it signifies efficiency. Another measure of efficiency is to examine how much human resources it takes to achieve a given task. Universities can measure their level of efficiency by the lecturer to students' ratio, the number of non-teaching staff attending to various student's needs; the facilities provided versus the number of students; the financial commitment versus

the number of graduates. Efficiency also goes beyond that as it transcends whether services are rendered to how timely, easily, and accurately they are rendered (Munoz, 2016).

4.1 Dimensions of Operational Efficiency

Kehinde et al. (2020) defined operational efficiency in tertiary institutions as "the process of applying a combination of people, technology, process, research and publication, communication, community service, training and development and effective teach in a cost-effective way which will not in any way reduce the quality of the final output thereby making the tertiary institution to achieve competitive advantage over all its competitors". In line with this, Munoz (2016) identified four dimensions though which the efficiency tertiary institutions can be measured. These are technical, allocative, dynamic, and social efficiency as presented in in figure 3.
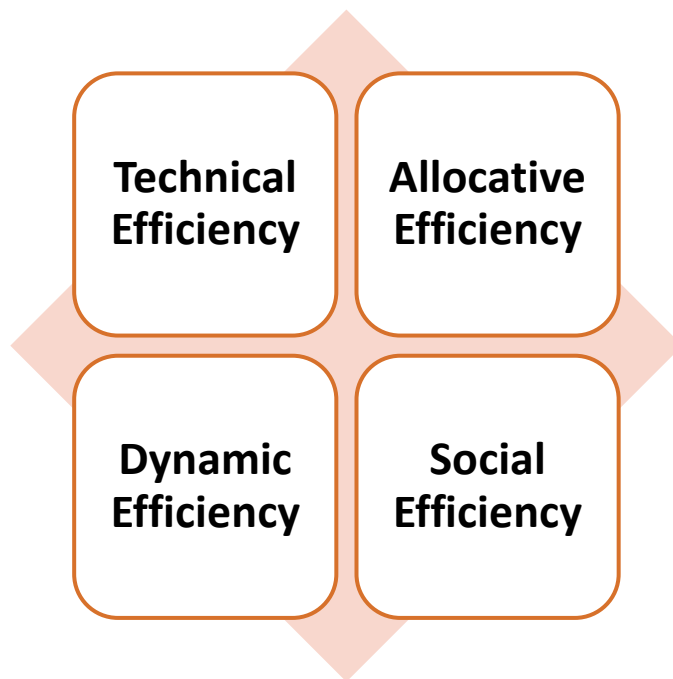

FIGURE 3: Dimensions of Operational Efficiency (Adapted from Munoz, 2016)

4.1.1 Technical efficiency

Technical efficiency focuses on the ability of a university to bring out the maximum output from the combination of its human and technological resources. This means that the university should be able to identify the areas of its operation where technology adoption would yield the best result and which areas are better left to humans to handle. A university should be able to do this so that the gains made in technology adoption is not offset by ineffective human resources and vice versa (Economic Online, 2021). Technical efficiency is more concerned with achieving maximum output from a given mix of inputs. It means that the university is looking for ways of ensuring that each employee individually and collectively, performs to the best of their ability (Munoz, 2016).

4.1.2 Allocative Efficiency

Allocative efficiency means the ability of an organisation to allocate resources to the production of goods and services in such a way that the marginal cost to the organisation is at par to the marginal benefit derived by the consumers (Nasra, 2014). This is important for private tertiary institutions in Nigeria where different fees are charged for various academic programmes based on how lucrative the target profession is. Allocative effectiveness therefore means that a university should allocate resources in a way that will allow it to charge different fees for different courses to the mutual benefit of the institution and the students. Allocative efficiency therefore manifests in budgeting and allocation of resources to each department in the institution.

Effective allocation of resources may however be a challenge when decision makers do not have access to complete and up to date information about enrolment figures, human and financial requirements etc. this means that it will be difficult to know exactly where resources are mostly needed and where available resources are being underused. When those who need a particular item, material or tool are unable to get them, it may affect their efficiency. The use of management information systems may therefore be able to influence efficiency in this area. (Ajah, & Chigozie-Okwum, 2019.).

4.1.3 Dynamic efficiency

Dynamic efficiency is another aspect of operational efficiency. It is seen to improve allocative and productive efficiency in the long run. Dynamic efficiency measures the ability of an organisation to innovate. It is the ability of an organisation to create new products or improve existing ones. It also includes the capacity to find a better approach to goods and services provision. Dynamic efficiency is anchored in organisation learning, judicious resources allocation, and innovation all of which are critical to an organization's ability to adapt to changing conditions. (Dolamore, 2014). Tertiary institutions as centers of innovation are expected to excel in dynamic efficiency. However, this will only happen through access to information made possible by the application of technology (Ajah, & Chigozie-Okwum, 2019)

The concept of operational efficiency was introduced to management of tertiary institutions because of the need for them to operate in a sustainable manner. It is even more relevant in private tertiary institutions where the management has not access to government subsidies by having to devise innovative means to acquire the needed resources. It is therefore important to consider strategies that can lead to effective procurement and deployment of resources (Ibidunni, Ufua, Okorie, & Kehinde, 2019). The focus of operational efficiency on the reduction of redundancy and waste is also appealing to managements of tertiary institution because of the economic imperative of ensuring that scarce resources are not expended on items that add no value to the achievement of organisational objectives (Elbert, 2013).

Without considering the concept of operational efficiency, tertiary institutions may not have any yardstick to detect redundancy and leakages not to talk of taking decisive steps and actions to eliminate them and ensure the judicious use of available resources. (Odunga, Nyangweso, & Nkobe, 2013). The implication for inefficiency in the operations of a tertiary institutions may not lead only to the loss of effective resources but also the source of their revenues. According to Ajadi (2010, 24), private universities in Nigeria depend on the fees received from students for their sustenance. When these students are not satisfied with the institutions due to perceived or apparent inefficiency, they may decide to choose other institutions.

However, in an economically challenged country like Nigeria, a private university cannot charge exorbitant fees due to fierce competition and low income of potential students. To survive in this environment, the operational efficiency of private universities should be higher than that of public universities by ensuring that the revenue generated should be properly managed to achieve the best output (Ajadi (2010). Therefore, tertiary institutions need to attain operational efficiency to ensure continued survival

and retain their ability to deliver on their mandate of developing skilled labour needed for economic development (Baik et al 2011).

However, operational efficiency for universities may not be limited to simply revenue generated. It is seen as the measure of how well the institution can bring together various types of resources such as technology, financial and human resources to ensure utmost productivity and consistently deliver value-added services to its various stakeholders. (Shawk, 2008). It is essentially the systematic management of institution resources to achieve maximum output. It does not just entail reducing cost and increasing profit, it includes innovation, quality assurance and customer's retention by providing services. It should cover intangibles such as how quickly can students get their academic transcripts, how effective is the academic planning process and other functions that lead to students' satisfaction with the operations of the university. This is important because to private universities, the students are the customers, and their satisfaction is highly important to the continued existence of the university (Ajadi, 2010).

Operational efficiency is important to tertiary institutions' strategic goal of remaining competitive and gaining global acclaim, through quality services and efficient resource management focused at satisfying the requirements of various stakeholders such as regulatory bodies, students, and others. However, in order to attain operational efficiency, it is important for organisations to be fully conversant with the concept. For tertiary institutions, operational efficiency seeks to get the best output out of technology, people and process involved in educational services provision (Munoz, 2016).

Akpobasah-Amugen, and Ogunbadejo, (2019) reported that where researchers have access to quality information systems, it improved their research productivity. However, this is not the case in some Nigerian universities and the result is low research productivity. In the same vein, Ajah and Chigozie-Okwum (2019) in their study found that the use of information technology (ICT) in information management would contribute to effective administration in Nigerian universities as it would provide seamless access to information for management staff and other employees in the universities. The authors therefore proposed what they called Digital Nervous System (DNS), a type of management information system that will cover various activities such as students' administration, staff administration, as well as resources and general administration. The system is also expected to enhance operational efficiency in tertiary institutions by ensuring free flow of information across the institution.

Adeleke (2022) also posited that the management information system is a tool for achieving operational efficiency in universities. The author studied the use of management information systems (MIS) in Ni-

gerian private universities and found that the universities are using MIS for various academic administration purposes such as monitoring students' attendance, assessment records, reporting, financial management, and to allocate human and material resources. The study further highlighted the importance of the information and data provided by the MIS to the operations and decision making in tertiary institutions. By providing access to relevant data at the touch of few buttons, MIS helps administrators in their roles of planning, directing, and controlling the activities in their various institutions.

However, the influence of MIS on operational efficiency may be blunted in Nigeria tertiary institutions. This is because managing an effective MIS in Nigerian often face various challenges such as lack of proper information management policy, lack of skilled staff to manage information systems and poor technological infrastructure which often means that the downtime of MIS is often longer than the active periods. (Nwankwo, Ugwude, & Ugwude, 2020).

5 EMPIRICAL RESEARCH METHODOLOGY

Research is a systematic investigation carried out to comprehend phenomena, develop new products, or expand the frontier of knowledge. It entails identifying a problem, developing hypotheses, or outlining research questions to be answered, gathering relevant data, analysing the data, and drawing relevant conclusions. Whether conducted in the sciences, arts, or humanities, research follows the scientific method, which refers to the accepted techniques and steps taken in conducting a study. In order to ensure that research findings are accurate and generalizable, research methodology addresses the framework used for conducting research, such as the research design, data collection instrument, and data analysis methods. (Patten, 2017.)

5.1 Research Method

Research method can be regarded as the overall strategy used by a researcher to integrate the various components of the study in a coherent and logical manner, ensuring that the research problem is effectively addressed, and the research objectives achieved. It serves as the blueprint for data collection, measurement, and analysis. In general, research can be conducted using either a qualitative or quantitative approach. The research method chosen will determine, among other considerations, the research instrument, data collection method, and data analysis method. (Pandey & Pandey, 2021.) It is also driven by the research objectives. The objective of the study is to investigate how the MIS contributes to the operational performance of the institutions by enhancing record management activities, improved response time and organizational agility

This study aims to adopt the quantitative research method of the survey type. The quantitative method calls for the gathering of empirical data from a sample selected from the study population in order to answer questions such as how, who and why, how many. The quantitative research method is concerned with the collection of a large amount of numerical data from many respondents and the data is analysed with statistical software to test hypotheses and generalize. (Inha & Laiho, 2012). The quantitative research requires the use of a questionnaire to collect structured responses from the respondents (Dźwigoł & Dźwigoł-Barosz, 2018)

The quantitative research method is considered very appropriate for the current study as it will enable the researcher to collect data from all relevant members of the commissioner institution. Furthermore,

the use of questionnaire will afford some privacy which will encourage the participants to respond to the questionnaire confidently and accurately. Furthermore, the fact that respondents can fill and return the questionnaire at their convenient time is expected to encourage full participation and the collection of adequate data.

5.2 Population of the study

Population in research refers to the entire group who share similar characteristics that connect them to the subject or matter under investigation. The population of a study can be heterogeneous or homogenous A heterogeneous population is a population made up of different categories of subjects who are all connected to a study. For example, a university has a heterogeneous population with different categories such as students, lecturers, administrative staff, and support staff.   All of them are connected as members of the university community. A homogenous population on the other hand shares similar characteristic such as age, class, and occupations. They are easily grouped together for the purpose of research especially when the subject of study affects a specific population. (Pandey & Pandey, 2021.)

The population of a research therefore includes every person, group or other entity connected to the research subject who can provide the data needed to achieve the objectives of the research (Bovaird and Kevin, 2015). The thesis population, therefore, includes the staff of the commissioning institution. While the institution has both teaching and administrative staff, the study population will consist of the administrative staff who make use of the Management Information system in their daily activities. Thus, the population will include personnel from units such as Registry, Human Resources, Admission, Fee Office, and Academic Planning. The study sample will be selected from these units and departments.

A sample is a portion of the research population that bear similarity to the entire population, selected for the purpose of data gathering. Sampling is often necessary in research when the population is too large, or it will not be economically prudent to collect data from the whole population. (Wilson, Woolfson, Durkin, & Elliott, 2016,) Sampling is important in research as it saves time of the researcher, minimizes the cost of research, and streamlines the data collection by selecting a group representative of the entire population from which data can systematically be collected to represent the view of the entire population. (Pandey & Pandey, 2021.)

A convenience sampling procedure will be adopted to select the study sample. Convenience sampling means that the researcher collects data from available and willing respondents. In this way, if a particular

respondent is unwilling or unable to provide the needed information, the researcher can approach another respondent for the purpose of data gathering. (Dźwigoł & Dźwigoł-Barosz, 2018.) For this study, a sample of at least 30 respondents will be selected from the staff of the commissioning institution for the purpose of data gathering. The respondents will be selected from among those administrative staff who are responsible for the day-to-day running of the institution.

5.3 Validity and Reliability of the Instrument

Validity of a research instrument refers to its ability to measure the constructs it is expected to measure. This means that the questions and statements in the questionnaire must have direct bearing on the subject under investigation and nothing else. Researchers are usually requiring determining the validity of their research instrument (Bovaird and Kevin, 2015). The research instrument will be subjected to content and face validity by the research supervisor. The validity is necessary to ensure that the instrument will be able to measure all the variables outlined in the study. The researcher will incorporate all the corrections and observation made by the experts into the final version of the questionnaire to be administered on the respondents.

Reliability refers to the consistency of a research instrument which allows it to return similar results when used to measure the same constructs repeatedly. Reliability is when a research instrument elicits the same responses from different but similar groups of respondents in different times and places. The instrument for this thesis will also be tested for reliability. (Patten, 2017.) This is to ensure that the instrument will be consistent in measuring the variable across different settings. The reliability will be ascertained through a pre-test of the research instrument.

5.4 Data Collection Procedure

Data collection in research is the process followed in order to obtain the evidence necessary to answer the research questions or test research hypotheses. All scientific studies rely on different types of data in order to make inferences or make a generalization. The data collection, however, depends on the objectives and design of the study. Based on the type of study, a researcher can collect numerical or qualitative data in terms of text, or audio images. This study will adopt a combination of instruments such as a

interview guide and personal observation of the researcher as well as secondary sources such as business reports, news clippings, and research reports. as means of data collection (Bovaird and Kevin, 2015.)

The main instrument for data collection in this study is a structured questionnaire which contains questions drawn from the review of literature as well as the research questions and objectives. The questionnaire includes questions to elicit information about the opinion of the respondents concerning how the management information system affects operational efficiency in the institution. The data collection will be carried out using an online questionnaire. An online survey that the respondents can access through a link will be created and sent to the respondents through various digital channels such as e-mail and WhatsApp. The researcher also trained two research assistants to assist by physically visiting the commissioner and encourage the respondents to fill in the questionnaire and ask necessary follow-up questions.

5.2.1 Method of data analysis

The data collected through the questionnaire designed for the study will be analyzed using a descriptive analysis such as percentage and frequencies. The descriptive statistical analysis is usually employed to aggregate, describe, and present the results in a research and measure constructs. It can also be used to highlight the relationships between research components. The companion to descriptive statistics is inferential statistics. The statistical analysis of hypotheses is known as inferential analysis (theory testing). (Dźwigoł, & Dźwigoł-Barosz, 2018.) The software to be used for data analysis is the IBM SPSS Statistics Software.

6 PRESENTATION AND ANALYSIS OF RESULT

This chapter presents the data collected during the research. The study was conducted between July 11th and 22nd, 2022. The data was collected using an online questionnaire designed using google form. The research instrument used was a questionnaire divided into three parts. The first part collected data on the demographic distribution of the respondents. The second part focused on the extent of implementation of management information system in the institution while the third part is used to examine the impact of the use of MIS on the operational efficiency of the institution. The data is analysed using descriptive statistics. That is, simple frequencies, percentages and means scores are used to measure the responses and answer the research questions.

6.1 Demographic Distribution of Respondents
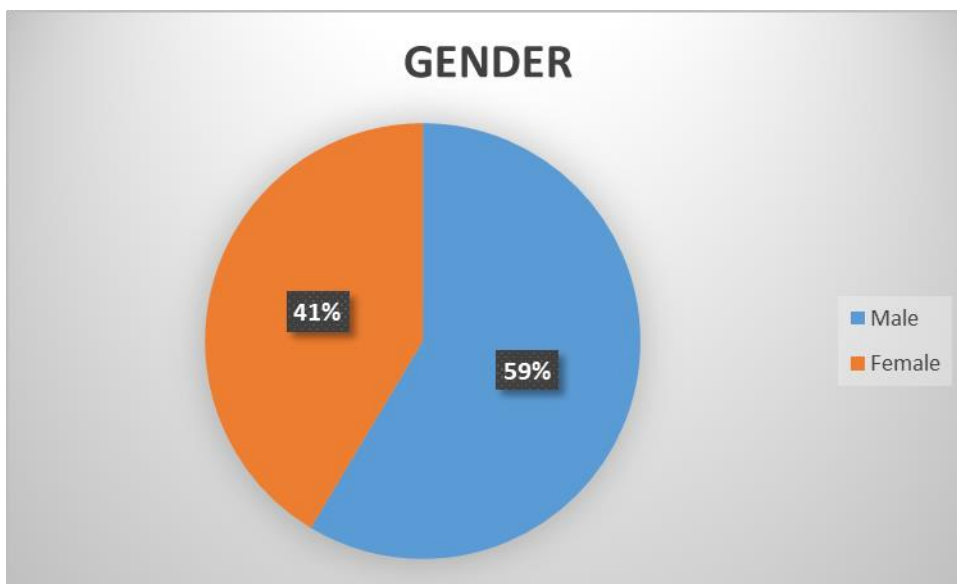
FIGURE 4: The distribution of the respondents by gender

The data presented in figure four shows that 17 or 59% of the respondents are male while 12 or 41% are female. This shows that majority of respondents are male. This may not mean that the organisation has more male employees than female. It is possible that males are more likely to respond to technology-based inquiries than females.
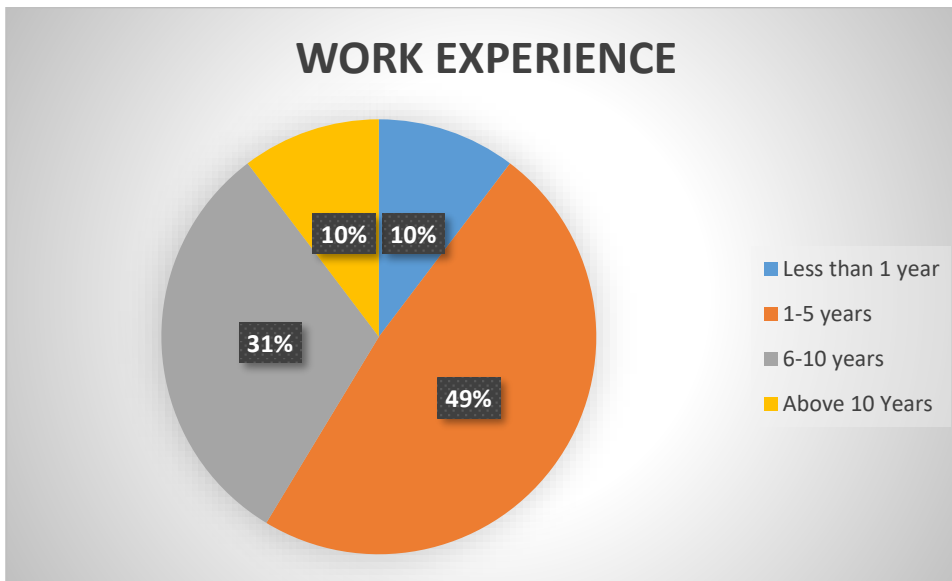
FIGURE 5: The distribution of the respondents by experience.

The respondents were also asked questions about their years of experience. The responses in figure 5 show that 14 or 49% of respondents have been in their job for between one to five years while 9 or 31% have between six to ten years working experience. Those who have experience of less than one-year constitute 10% of the total respondents, the same with those with have experience of 10 year above are also 3 or 10% of the total respondents. The spread of experience among the respondents shows that those who are included in the cut across old and new employees which guarantees a balanced insight and response to the questions.
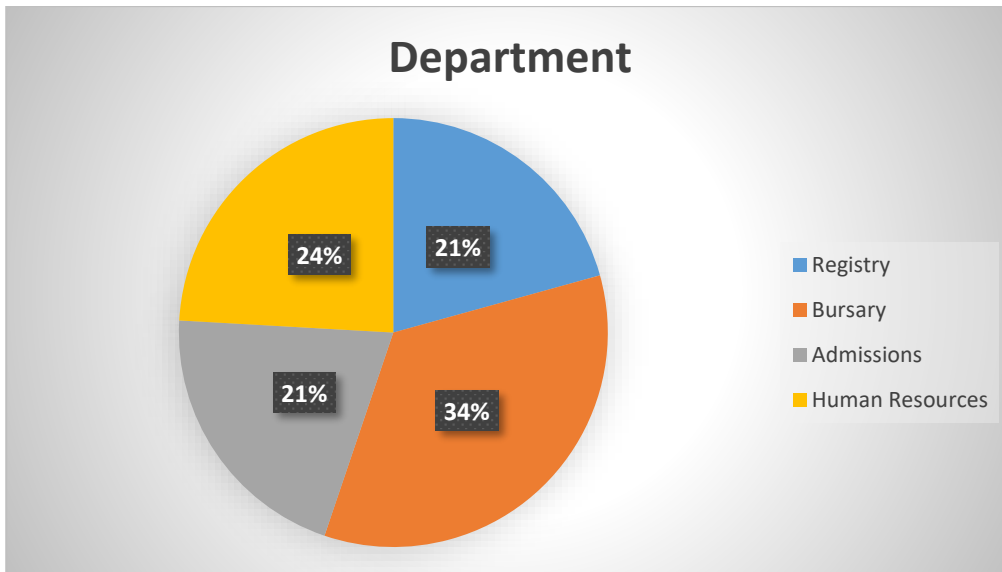
FIGURE 6: The distribution of the respondents according to department.

Data presented in figure six shows that the respondents are mainly from four departments in the institution. From the data presented the 10 or 34% of the respondents are working in the Bursary department, 7 or 24% are working in Human resources department while 6 or 21% are working in the admission department. The same number 6 (21%) are also working in the registry department. This put staff of the bursary department in the majority as it has the highest number of respondents. The breakdown of the respondents shows that they cut across the different offices using MIS in the institution. This is expected to facilitate the proper representation of all experiences and not just that of a section of the MIS users.

6.2 Research Questions

This section presents the results and analysis of the research questions. The analysis is based on the descriptive style using simple frequencies and percentage.

6.2.1 **Extent of Management Information System Application**.

The data presented in table 1below shows the level of implementation of management information system in the organisation under study. The level of implementation is measured by the presence of the components of a system as outlined in literature. The first section focuses on the hardware component. The results show that majority of the respondents agreed that the university provides all the input devices

(Mean = 3.17 out of possible 4.0), it provides adequate computers (Mean = 2.97 out of possible 4.0), adequate output device such as printers, and speakers needed for the MIS (Mean = 3.14 out of possible 4.0). It also provides the required memory capacity (RAM) to make the MIS run several programs smoothly (Mean = 3.14 out of possible 4.0). overall, the average mean score for hardware is 3.11 which indicate high level of availability for hardware in the institution.

Similarly, the results also showed that the institution has procured relevant software for the operation of the MIS. Most of the respondents agreed that the operating system selected for the MIS database is adequate (Mean = 3.38). The respondents also agreed that the databases software is compatible with other application software such as Microsoft Office (Mean = 3.38 out of possible 4.0) and that the database can be accessed on common browsers such as Google, Firefox etc. (Mean = 3.31 out of possible 4.0). it was also reported that the data collection system implemented makes it easier to obtain complete and accurate data (Mean = 3.41 out of possible 4.0). Overall, the average mean for the software component is 3.37 which indicates the quality of the software available for MIS operations in the university.

Another component examined is the laid down process for the operation of MIS. The respondents reported that there are clear written procedures regarding the management information system (Mean = 3.14 out of possible 4.0), easy process for using the MIS which makes it easy for workers to perform their tasks (Mean = 3.03 out of possible 4.0), clear guidelines for tasks such as data entry, processing, and data sharing (Mean = 3.10), clear guidelines for all MIS tasks (Mean = 3.17 out of possible 4.0). Overall, the average mean for the process component of MIS is 3.11 which indicates that there is an effective in place for the use of the MIS.

Regarding the networking component, the respondents mostly agreed that the MIS is connected to the internet and can be accessed remotely (Mean = 3.21 out of possible 4.0), it is easy to share data across the entire university (Mean = 3.17 out of possible 4.0), the MIS is enabled to share data with other external networks (Mean = 3.00 out of possible 4.0) and that the internet connection for the MIS is always stable (Mean = 2.97 out of possible 4.0). Overall, the average mean for networking is 3.08 out of possible 4.0 which indicates that the MIS is highly networked.

The final component is the human component. The responses of the respondents to the statements under human resources indicate that there are adequate technical staff in charge of studying and analysing problems arising in the information system (Mean =3.14 out of possible 4.0), enough computer programmers to troubleshoot the system (Mean = 3.07 out of possible 4.0), regular training for employees to ensure effective use of MIS (Mean = 2.97 out of possible 4.0), management staff often make use of

data from the MIS to prepare long-term and short-term plans (Mean =3.07 out of possible 4.0). Overall, the average mean for human component of the system is 3.06 which also indicate proper attention to the human component of the system. In addition, the average mean for all the component of the MIS examined in this study is 3.13 out of possible 4.0 which indicates a high level of MIS implementation in the university. With all the components of a systems adequately represented, it can be said that the commissioner has really implemented a working management information system designed to be sustainable due to the presence of technical support and the right policy to guide its use.

TABLE 1: **Extent of Management Information System Application.**

Key: VLE = Very Large Extent; LE = Large Extent BA =Barely; NA = Not at All

Hardware	VLE	LE	BA	NA	Mean
The university provides all the input devices needed for the MIS	11 (37.9%)	12 (41.4%)	6 (20.0%)	--	3.17
The university provides adequate computers for the MIS	7 (24.1%)	16 (55.2%)	5 (17.2%)	1 (3.4%)	2.97
The available memory capacity (RAM) is adequate to make the MIS run several programs smoothly	7 (24.1%)	19 (65.5%)	3 (10.3%)	--	3.14
The university provides adequate output device such as printers, and speakers	11 (37.9%)	13 (44.8%)	4 (13.8%)	1 (3.4%)	3.14
Average mean					**3.10**
Process					
There are clear written procedures regarding the management information system	9 (31.0%)	15 (51.7%)	5 (17.2%)	--	3.14
The university procedure for using the MIS makes it easy for workers to perform their tasks.	9 (31.0%)	14 (48.3%)	5 (17.2%)	1 (3.4%)	3.03
There is a clear guideline for tasks such as data entry, processing, and data sharing	8 (27.6%)	17 (58.6%)	3 (10.3%)	1 (3.4%)	3.10
All tasks relating to the use of the MIS must follow certain guidelines	8 (27.6%)	18 (62.1%)	3 (10.3%)	--	3.17
Average mean					**3.11**
Software					
The operating system selected for the MIS database is adequate.	18 (62.1%)	11 (37.9%)	--	--	3.38
The databases software is compatible with other application software such as Microsoft Office	13 (44.8%)	14 (48.3%)	2 (6.9%)	--	3.38
The database can be accessed on common browsers such as Google, Firefox etc.	12 (41.4%)	14 (48.3%)	3 (10.3%)	--	3.31
The data collection system implemented makes it easier to obtain complete and accurate data	14 (48.3%)	14 (48.3%)	--	1 (3.4%)	3.41
Average mean					**3.37**
Networking					
The MIS is connected to the internet and can be accessed remotely	9 (31.0%)	17 (58.6%)	3 (10.3%)	--	3.21
It is easy to share data across the entire university	8 (27.6%)	18 (62.1%)	3 (10.3%)		3.17
The MIS is enabled to share data with other external networks	9 (31.0%)	13 (44.8%)	5 (17.2%)	2 (6.9%)	3.00

The internet connection for the MIS is always stable and is not affected by bad weather	6 (20.7%)	17 (58.6%)	5 (17.2%)	1 (3.4%)	2.97
Average mean					**3.08**
Human Resources					
There are technical staff in charge of studying and analysing problems arising in the information system	7 (24.1%)	19 (65.5%)	3 (10.3%)		3.14
The University has employed programmers who can deal with any issues relating to the database and its configuration	10 (34.5%)	12 (41.4%)	6 (20.7%)	1 (3.4%)	3.07
The university often organize training for employees to ensure effective use of MIS	10 (34.5%)	10 (34.5%)	8 (27.6%)	1 (3.4%)	2.97
Management staff often make use of data from the MIS to prepare long-term and short-term plans	9 (31.0%)	14 (48.3%)	5 (17.2%)	1 (3.4%)	3.07
Average mean					**3.06**

Decision rule 1.00 – 1.49= very low, 1.50 – 2.49= low, 2.50 – 3.49 = high, 3.50-4.00= very high

6.2.2 Impact of MIS on Operational Efficiency in the University

The data presented in table 2 below shows the perceived impact of the use of MIS on the operational efficiency of the Lead City University. This is measured through the responses to the various metrics of efficiency. Most of the respondents agreed that the Use of MIS has enabled the university to properly allocate resources to each department (Mean =3.17 out of possible 4.0). The respondents also agreed that the use of MIS in academic planning has led to smooth organization of examinations and other academic activities (Mean =3.24 out of possible 4.0). Also, there is a general agreement among the respondents that the use of MIS has improved the relationship between management and staff of Lead City University (Mean = 3.14 out of possible 4.0). In addition, the majority agreed that the use of MIS has led to effective utilization of human resources in the university (Mean =3.24 out of possible 4.0) and that it has helped the University to improve the quality of teaching (Mean =3.03 out of possible 4.0), reduced the time it takes for students to process their results and other documents (Mean =3.21 out of possible 4.0), process their admission without having to come to the university (Mean =3.17 out of possible 4.0).

The implementation of MIS has reduced operation cost of the university by eliminating waste (Mean =3.07 out of possible 4.0), led to improvement in the procurement process in the university (Mean =3.00)

and led to reduction in students' complaint about services (Mean =3.17 out of possible 4.0). Overall, the average mean for the perceived impact of MIS implementation on operational efficiency of Lead City University is 3.14 out of possible 4.0. This indicates that majority of the respondents are of the opinion that the implementation of MIS has positively affected the operational efficiency of Lead City University. The generally positive responses by the respondents to the statements and questions designed to bring out the effect of MIS on the performance of the institutions has shown that the MIS is having a positive influence on the performance of the commissioner.

TABLE 2: Impact of MIS on Operational Efficiency in the University

Key: VLE = Very Large Extent; LE = Large Extent BA =Barely NA = Not at All

STATEMENTS	VLE	LE	BA	NA	Mean
The Use of MIS has enabled the university to properly allocate resources to each department.	10 (34.5%)	14 (48.3%)	5 (17.2%)	--	3.17
The use of MIS in academic planning has led to smooth organization of examinations and other academic activities.	9 (31.0%)	18 (62.1%)	2 (6.9%)	--	3.24
The use of MIS has improved the relationship between management and staff	8 (27.6%)	17 58.6	4 (13.8%)		3.14
The use of MIS has led to effective utilization of human resources in the university	11 (37.9%)	14 (48.3%)	4 (13.8%)		3.24
The use of MIS has helped the institution to improve the quality of teaching	8 (27.6%)	14 (48.3%)	7 (24.1%)		3.03
The use of MIS has reduced the time it takes for students to process their results	8 (27.6%)	19 (65.5%)	2 (6.9%)		3.21
The use of MIS has made it easier for students to process their admission without having to come to the university.	10 (34.5%)	15 (51.7%)	3 (10.3%)	1 (3.4%)	3.17
The implementation of MIS has reduced operation cost of the university by eliminate waste	10 (34.5%)	13 (44.8%)	4 (13.8%)	2 6.9(%)	3.07
The implementation of the MIS has led to improvement in the procurement process in the university	12 (41.4%)	9 (31.0%)	5 (17.2%)	3 (10.3%)	3.00
The use of MIS has led to reduction in students' complaint about services	10 (34.5%)	14 (48.3%)	5 (17.2%)		3.17
Average mean					**3.14**

Decision rule 1.00 – 1.49= very low, 1.50 – 2.49= low, 2.50 – 3.49 = high, 3.50-4.00= very high

6.3 Discussion and Suggestions to Commissioner

The results of the data collected and analysed in this study have gone a long way in answering the research questions. However, the results need to be contextualized in order to properly outline what it means for Lead City University and how it can help other universities make decision on the benefits of implementing management information system.

The focus of this study is narrowed down to the basic manifestation of the presence or availability of an information system. According to Meeßen (2019), a system is a combination of certain elements and components that must interact together in order to attain a specific objective. These components are outlined by Odusanya (2019a) to include computer software, computer hardware, people, and processes. In view of the internet age in which all systems are expected to be accessible remotely and be able to communicate with other systems, other scholars have also added networking as a component of information systems (Febiri, 2019; Bourgeois, 2014). It is held that any information system that fails to include all the components is bound to fail (Omohwovo, et al., 2021; Ugwude, 2015.) This is followed in measuring the extent of MIS implementation by the commissioner. The study found that all the components, namely hardware, software, processes, networking, and human resources are available to a high extent. However, there are some shortcomings that can affect the overall efficiency of the system.

For instance, the results indicate that computer terminals were the least available of the hardware. This can affect the overall accessibility of the system and its proper use in meeting the objectives of the institution. The overall level of satisfaction expressed by the respondents toward the software components is however encouraging. There seems to be an improvement on the observations of Yakubu, Dasuki, Abubakar, and Kah, (2020) who reported that many Nigerian universities are adopting software that are not suitable for their needs. According to this study, many universities have rushed to adopt educational technologies based on the recommendations of foreign experts who lack a total understanding of the peculiar needs of the Nigerian educational system. The improvement in software selection is also seen in other components.

The results show a high quality of networking for the system with the only drawback being the internet connection which received an average rating from the respondents. The laid-down process for the use of the system was also adjudged to be of high quality and effectiveness. The same is recorded with the provision of the necessary human resources for the implementation of the MIS. However, while all the

aspects of the human component of the system are rated very high, continuous training for the employee who make use of the system is lower than all other items.

Overall, it can be clearly stated that there is a robust level management information systems implementation in the commissioning institution. This may be contrary to previous findings of MIS use in Nigerian university but it is not out of place as the study of Abu Amuna, Al Shobaki, and Abu-Naser, (2017, 2) has indicated that there is an increasing awareness among Nigerian tertiary institutions that the implementation of MIS can provide access to the necessary information to guide them in the managerial process of making rational decisions, and also assist them in the overall performance of their functions of planning, control, and decision-making. In addition, Bright and Asare, (2019, 2) also observed that educational institutions are implementing MIS due to the realisation that it can improve their core operation which revolves around teaching, learning, and research. This expectation is not wrong as indicated by the perception of the respondents about the contribution of MIS to the effectiveness of organisational operations.

As reported by the respondents, the use of management information systems has contributed to the operation efficiency of the institutions. Using many metrics that have been used to measure efficiency in literature such as waste reduction, reduced time in decision making, quality of decisions made, it can be seen that the use of a management information system in the university has actually led to improvement in several areas such effective allocation of resources, smooth conduct of administrative and academic activities, effective utilization of human resources, reduction in operational costs and the elimination of waste of resources. In addition, MIS use has led to improvement in the procurement process in the university thereby saving cost, a necessity in the era of financial constraints.

The use of MIS has also proven beneficial to students as it has reduced the time it takes for students to process their results and made it easier for students to process their admission and carry out other interactions without having to come to the university. Not surprisingly, it has led to reduction in students' complaint about services and improve the relationship between management and staff.

Most importantly the use of MIS has led to improvement in the quality of teaching. This is naturally possible, when the lecturers have the necessary information about their students, are not overloaded due to lack of an organized calendar and when they operate in an environment where the academic calendar is properly organized. All these findings bode well for the institution as it reflects that the institution as a self-funded institution without government backing must see the students as its lifeblood without which it cannot survive.

6.4 Suggestions to Commissioner

The findings have shown that the commissioner has invested in the implementation of management information, and it is reaping the benefits accruable from such investment. However, it is important to investigate areas where there are minor deficiencies. The findings indicate that, while computer systems available are adequate, they are not abundant enough to cater for a sudden increase in users and the computer systems are provided to cover essential operations. It is therefore essential to procure more computer systems or in the alternative, promote the use of mobile devices and person computer devises to serve as terminals for accessing the information system. This will ensure wide access and enhance the use of the management information system even with the influx of more students.

It was also noticed that while the commissioner has made investment in human resources and technical support for the use of the management information system, it seems to be placing relatively less emphasis on the training and development of the personnel. This should be reconsidered in the light of constant technological advancement which require those who work with information systems and other technologies to be regularly updating their skills. It is therefore suggested that a marginal increase in the effort directed at building the skills of the staff is highly important.

7 CONCLUSIONS

The study was motivated by the need to deepen the adoption of management information systems in Nigerian universities by showing the impact of the use of management information systems on the operational efficiency of Lead City University, Ibadan. The study is considered necessary because of the delays experienced by students in processing academic transcripts, verifying their academic status and initiating contact between their current and past tertiary institutions. The reason also includes the confusion that often arise in scheduling lecture hours, organizing examinations and providing the necessary information requested by key stakeholders such as the Ministry of Education and the National University Commission (NUC). The findings of the study show that the institution has invested in a robust information management system and which it uses to collect, organize, manage, preserve and disseminate information to various stakeholders such as students, staff, parents and regulatory bodies among others. It was also found that the use of this system has a positive impact on the operational efficiency of the institution.

The study included a theoretical part where the concepts of management information systems and operational efficiency of universities are examined. Management information system is a combination of various systems and components that can be adapted to suit the purpose of any organisation. Broadly speaking, it consists of systems such as transaction processing system, office automation system, decision support systems and management reporting systems or expert support systems as it is often referred to. The combination of the information systems that make up management information system will depend on the needs of the institution or organisation setting it up. However, what is uniform is all management information system must have the full complement of components such as software, hardware, processes (or policy), networking, human resources with all of them being of equal importance. For all organisations, the main reason for implementing management information systems is to achieve operation efficiency. This means the improvement of services, customer satisfaction and elimination of waste. This is achieved by ensuring all the dimensions of efficiency namely, technical, allocative, dynamic, and social efficiency.

The research follows a quantitative survey research approach with a structured questionnaire administered through online channels to the respondents. Thirty (30) administrative staff members of the institution were sampled with twenty-nine (29) responses found useful and included in the analysis. The questionnaire items focused on obtaining the demographic information of the respondents. It also has a section which focused on the presence of the relevant components of management information systems

in the institutions. The third section examined the respondents' perception of the impact of the use of MIS on the operational efficiency of the institution.

The results showed that the implementing of a management information system in the institution is very robust with all the components adequately present and capable of meeting its present needs. This has obviously impacted on its operational efficiency as the respondents have a highly positive perception of the impact of the use of management information system in eliminating waste, creating students' satisfaction, improving quality of teaching, and bring about better allocation of material and human resources. This shows that the investment in the implementation of the MIS was worthwhile.

The world has become a global a village and Nigerian tertiary is now being evaluated with the same standards adopted for the best universities all over the world. It is instructive to note that the highest-ranking Nigerian university in Nigeria is not even in the first one thousand in the world (Adeleke, 2021.) This has been largely attributed to poor use of technology, quality of teaching and research and lack of visibility on the global stage. Lead City University as a young university has shown initiative by investing in technology and making it work to its advantage. It can therefore serve as a model for other Nigerian universities aspiring to become a relevant player in the global tertiary education landscape.

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APPENDIX 1

QUESTIONNAIRE

Demographic Information

1. **Gender:** a) Male [ ]; b) Female   [   ]
2. **Department:** a) Registry [ ]; b) Bursary [   ]; c) Admissions [   ]; d) Human Resources
3. **Work Experience**: a) Less than 1 Year [ ]; b) 1- 5 Years [   ]; c) 6 -10 Years [ ]; d) Above 10 Years

1. **Extent of Management Information System Application**

Instruction: Please select the most applicable responses.

VLE = Very Large Extent; LE = Large Extent BA =Barely; NA = Not at All; NS = Not Sure

	Hardware	VLE	LE	BA	NA	NS
1.	The university provides all the input devices needed for the MIS					
2.	The university provides adequate computers for the MIS					
3.	The available memory capacity (RAM) is adequate to make the MIS run several programs smoothly					
4.	The university provides adequate output device such as printers, and speakers					
	Process					
5.	There are clear written procedures regarding the management information system					
6.	The university procedure for using the MIS makes it easy for workers to perform their tasks.					
7.	There is a clear guideline for tasks such as data entry, processing, and data sharing					
8.	All tasks relating to the use of the MIS must follow certain guidelines					
	Software					
9.	The operating system selected for the MIS database is adequate.					

S/N	STATEMENT					
10.	The databases software is compatible with other application software such as Microsoft Office					
11.	The database can be accessed on common browsers such as Google, Firefox etc.					
12.	The data collection system implemented makes it easier to obtain complete and accurate data					
13.	The MIS is protected from intrusion and virus attack with relevant software					
	Networking					
14.	The MIS is connected to the internet and can be accessed remotely					
15.	It is easy to share data across the entire university					
16.	The MIS is enabled to share data with other external networks					
17.	The internet connection for the MIS is always stable and is not affected by bad weather					
18.	The MIS is hosted on a cloud service which makes it available 24/7					
	Human Resources					
19.	There are technical staff in charge of studying and analysing problems arising in the information system					
20.	The University has employed programmers who can deal with any issues relating to the database and its configuration					
21.	The university often organize training for employees to ensure effective use of MIS					
22.	Management staff often make use of data from the MIS to prepare long-term and short-term plans					
23.	Management staff often make use of data from the MIS to prepare budgets					

2. **Impact of MIS on Operational Efficiency in the University**

Instruction: Please select the most applicable responses.

VLE = Very Large Extent; LE = Large Extent BA =Barely NA = Not at All

S/N	STATEMENTS	VLE	LE	BA	NA
1.	The Use of MIS has enabled the university to properly allocate resources to each department.				

2.	The use of MIS in academic planning has led to smooth organization of examinations and other academic activities.				
3.	The use of MIS has improved the relationship between management and staff				
4.	The use of MIS has led to effective utilization of human resources in the university				
5.	The use of MIS has helped the institution to improve the quality of teaching				
6.	The use of MIS has reduced the time it takes for students to process their results				
7.	The use of MIS has made it easier for students to process their admission without having to come to the university.				
8.	The implementation of MIS has reduced operation cost of the university by eliminate waste				
9.	The implementation of the MIS has led to improvement in the procurement process in the university				
10.	The use of MIS has led to reduction in students' complaint about services				