



Information & Communication Technology and Management Accounting Practices: Evidence from Listed Industrial Goods Firms in Nigeria

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Abstract

The study investigated the relationship between information & communication technology systems and Management Accounting Practices of quoted manufacturing companies in Nigeria within the period of 2010 -2019. The specific objectives were to investigate the relationship between Management Information System (MIS) and Costing Management Method (CMM); and Budgeting Management Method of quoted manufacturing companies in Nigeria, and investigate the relationship between Decision Support System (DSS) and Costing Management Method (CMM); and Budgeting management method. Nomothetic and idiographic Philosophy was adopted while a cross-sectional survey was employed. The population of the study was thirteen (13) companies quoted in Nigerian Exchange as of September 2020 in the industrial goods manufacturing sub sector. The unit population was the staff from departments such as Finance and Accounts, Procurements, Operations, and Information and communication Technology (ICT) departments, focusing on top management, middle management and functional management levels. Using purposive sampling technique seven (7) of the quoted companies were chosen for the study. 84 copies of questionnaire were used for data gathering. Descriptive statistics and Spearman's Rank Order Correlation Coefficient, statistics was used for data analysis. The result of the study shows that management information system has a very strong and significant relationship with costing management method and budgeting management method of quoted industrial goods manufacturing companies in Nigeria; Decision support system has a very strong and significant relationship with costing management method and budgeting management method as well. The study concluded that information & communication technology system has a very strong relationship with management accounting practices of manufacturing companies in Nigeria. The study recommends among others that industrial goods manufacturing companies should be encouraged to go fully computerized thereby changing from the traditional management accounting systems to the contemporary systems, this way they would be able to compete with other businesses globally given the trend in globalisation and computerization of operations in this contemporary times. Also they should focus on the development of Decision support systems since this system is very useful for the strategic managers in modelling and forecasting for easy decision making. This would enable them make strategic decisions in the company quickly.

Keywords: Budgeting Management Method (BMM), Costing Management Method (CMM), Decision Support System (DSS), Industrial Goods Manufacturing Companies, Information & Communication Technology (ICT), Management Accounting Practices, Management Information System (MIS), Nigeria

INTRODUCTION

The world all over, manufacturing industries are the most active and important contributors to the economic development of developing economies aside the service sector (Oyereoga, 2015), and thus receives preferential treatment from policy makers. According to Tybout (2000), most developing countries' government promotes manufacturing with special tax concessions and relatively low tariff rates for importers of manufacturing machinery and equipment. Tuan (2010) averred that for the last decades, the manufacturing sector contributed 31.1% of the total GDP, and 29.1% of total employment in Malaysia, South Africa (13%) and Mauritius (16%). in Nigeria, the contribution of the manufacturing sector to the economic growth was 9.29% in 2018 and 9.10% in 2019. A look at the last decades records indicated that the manufacturing industry in Nigeria accounted for as low as 3.91% of GDP in 2006, 4.02% in 2007, 3.6% in 2008, 4.2% in 2009, and 4.5% to GDP in 2010, and 39.67 % in 2011 respectively (Alli, 2012; Oyerooga, 2015).

It is argued that with the huge contribution that manufacturing industry makes towards the developing of the economy; there is the need to put in place necessary mechanism to sustain this sector of the economy. Hence, the need for proper management accounting practices by the manufacturing organizations. This is particularly important given the challenges which have plagued the manufacturing industry in Nigeria in recent times. Aside from financial management and planning challenges that organisations face as a result of the technology and innovations towards accounting and reporting of financial information that will help users make decisions, other challenges include financing, operations & management issues, lack of properly trained workers, distribution & logistics issues, marketing & branding as well as infrastructure issues (including inadequate power supply) amongst others (Aluko, 2016). Another problem is the issue of digitalisation and the need to conform to the modern practices that embraces digitisation.

Management accounting practices include both the traditional techniques and the modern technique. In the early 1980s several innovative management accounting techniques have been developed such as activity-based management, strategic management accounting, and the balanced scorecard (Oyerooga, 2015). Others include cost practices, budgeting, and information for decision making, strategic analysis and performance analysis using management accounting techniques (Horngren et al., 2009). The objectives of this development were to support modern technologies and modern management accounting practices, such as total quality management, cost-volume-profit analysis, absorption costing, marginal costing and just-in-time production systems, and the search for competitive advantage to meet the challenge of global competition. The adoption of modern management accounting practices enables the management to avoid unnecessary cost and meet the profit target of the organization (Oyerooga, 2015). Consequently, it is believed that cost management strategies that focus on reduction of production overhead and administrative overhead embarked upon by the manufacturing organizations that could lead to meeting their profit maximization and wealth creation objectives.

Several studies reviewed showed that there is a need for implementation of management accounting systems so as to ensure timely and accurate accounting information provision and enhancement of performance of the organisations adopting them (Ogunbade & Oyerooga, 2020; Al-Khasawneh et al., 2020; Ejike & Nweze, 2019; Okpala et al., 2018; Gnawali, 2017; Ogunbade et al., 2017; Taiwo, 2016; Oyerooga, 2015; Ada & Ghafazah, 2015; Omuinu, 2015). There is no known study that have considered the systems approach towards implementation of management accounting practices, thereby creating a gap in variables among which this present study attempts to fill. For example, Al-Khasawneh et al.(2020) focused on the relationship between modern management accounting techniques and performance of industrial companies listed in Amman Stock Exchange (ASE). The results showed that modern management accounting techniques had a strongly positive and significant effect on organisational performance.

Conceptual Framework

In this study there are two variables that are identified. They are Information & communication technology system (ITS) which serves as the independent variable and Management Accounting Practices (MAP) serving as the dependent variable. The researcher used the diagram in figure 1.1 to illustrate the interaction of independent variables ITS and the dependent variable MAP. It also shows the dimensions of ITS (and their sub indicators) as Management Information System (MIS), and Decision Support System (DSS); and the measures of Management Accounting Practice as Costing Management Method (CMM) and Budgeting Management Method (BMM)

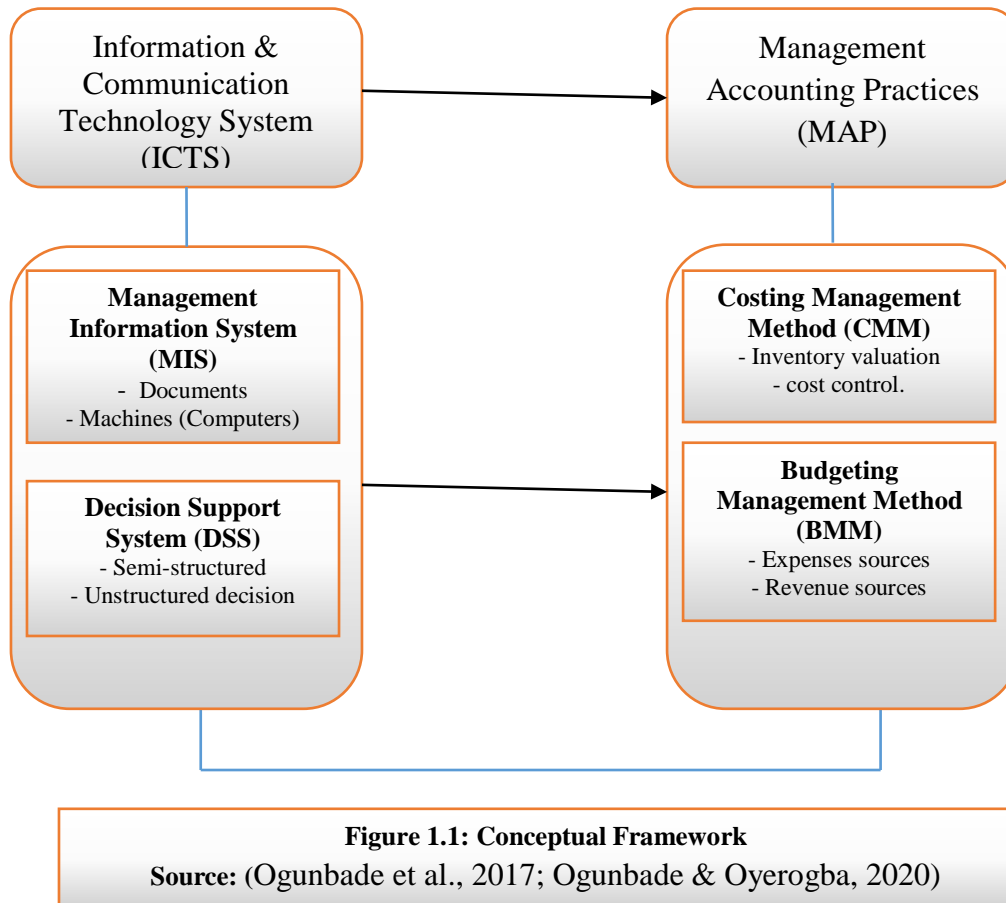


Figure 1.1: Conceptual Framework

Source: (Ogunbade et al., 2017; Ogunbade & Oyerogba, 2020)

Aim and Objectives of the Study

The aim of the study is to investigate the relationship between information & communication technology system and Management Accounting Practices of quoted industrial goods manufacturing companies in Nigeria within the period of 2010 -2019. The specific objectives are to:

1. Investigate the relationship between Management Information System (MIS) and Costing Management Method (CMM) of quoted industrial goods manufacturing companies in Nigeria.
2. Ascertain the relationship between Management Information System (MIS) and Budgeting Management Method (BMM) of quoted industrial goods manufacturing companies in Nigeria.
3. Investigate the relationship between Decision Support System (DSS) and Costing Management Method (CMM) of quoted industrial goods manufacturing companies in Nigeria
4. Ascertain the relationship between Decision Support System (DSS) and Budgeting Management Method (BMM) of quoted industrial goods manufacturing companies in Nigeria

Research Questions

Based on the specific objectives, the following Research questions were raised to include the following:

1. What is the relationship between Management Information System (MIS) and Costing Management method (CMM) of quoted industrial goods manufacturing companies in Nigeria?
2. How does Management Information System (MIS) relate to Budgeting Management Method (BMM) of quoted industrial goods manufacturing companies in Nigeria?
3. What is the relationship between Decision Support System (DSS) and Costing Management Method (CMM) of quoted industrial goods manufacturing companies in Nigeria?
4. How does Decision Support System (DSS) relate to Budgeting Management Method (BMM) of quoted industrial goods manufacturing companies in Nigeria?

Research Hypothesis

HO₁: There is no significant relationship between Management Information System (MIS) and Costing Management Method (CMM) of quoted industrial goods manufacturing companies in Nigeria.

HO₂: There is no significant relationship between Management Information System (MIS) and Budgeting Management Method (BMM) of quoted industrial goods manufacturing companies in Nigeria

HO₃: There is no significant relationship between Decision Support System (DSS) and Costing Management Method (CMM) of quoted industrial goods manufacturing companies in Nigeria

HO₄: There is no significant relationship between Decision Support System (DSS) and Budgeting Management Method (BMM) of quoted industrial goods manufacturing companies in Nigeria.

LITERATURE REVIEW

Information & communication technology (ICT)

Information & communication technology (ICT) is defined as a generic term that covers the acquisition, processing, storage, and dissemination of information. It is the application of computers and communication technology in the task of information handling, information, and information flow from the generation to the utilization levels (Taiwo, 2016). In other words, Information & communication technology is defined as hardware and software products, information system operations and management processes, IT controls frameworks, and the human resources and skills required to develop, use, and control these products and processes to generate the required information (Greenstein-Prosch et al., 2008). IT is also known as computer software and hardware solutions that provide support of management, operations, and strategists in organizations (Choo & Shahryar, 2013). One thing to note as provided in the various definition of IT is that it is any type of technology for the purpose of communication and involves the use of electronic devices and technology to manipulate information, and it is most common amongst firms and not in personal settings. Information & communication technology system includes the like of Enterprise resource systems (ERP), Business intelligence systems, E commerce systems as well as Information and Technology (ICT) system amongst others (Klovienèa & Gimzauskieneb, 2015).

Components of Information & communication technology system

According to Taiwo (2016), the detail of components of information system includes the following 1) the hardware component, 2) software component, 3) data, 4) procedures, 5) internet/network, and 6) people. Each of these components has sub components that are incorporated to enable effective implementation of ITS,

- i) **Hardware** this refers to physical, tangible and touchable components. It is the part that can be touched and seen. They can be further classified into 4 groups, which are:
 - ❖ **Input devices** these are hardware devices used to send data into the computer. Examples are light pen, keyboard and mouse.
 - ❖ **Output devices** these are hardware devices through which information is sent out of the computer. They include speakers, printers and monitors.
 - ❖ **Central Processing Unit (CPU)** this is the part of the computer that performs tasks as it comprises of the microprocessor which is the brain of the computer.
 - ❖ **Storage devices** these are hardware components that store data. There are two type- Primary (stores information temporarily) and Secondary (stores information permanently). Examples are RAM and ROM respectively.
- ii) **Software** this consists of the intangible components that can only be seen. They include computer programs and codes that control the hardware devices. A computer program on the other hand, is a set of instructions written to perform a specific task. There are three categories of software, they are System software (which provides the basic functionality of the computer, these are made up of the Operating system and Support system with different diagnostic tools); Application software (which helps the users to perform specific tasks- typical examples includes the web browsers etc); and the Programing software (which are used by software developers to create, debug, maintain and support other programs and software). Typical examples of programming software are JAVA and BASIC.
- iii) **Data** are raw fact and figures that are processed into information. They are generally stored in the electronic devices until they are needed.
- iv) **Procedures** are the laid down rules and regulations that govern the way information is processed and exchanged. For example, it can be said that whenever the company needs financial information, it should consult its internal data base – which stores both past and present financial reports as when they are produced and utilised.
- v) **Internet/Network** the internet is a global system of interconnected computer networks that use the standard internet protocol suite or other network to link several billion devices worldwide. These days, even the mobile devices have been designed to become internet compatible as such there is timely and easy access to information.
- vi) **People** this refers to the man-power that is involved in the steps of IT activities. They probably determine the success or failure of information systems. Consequently, when a company designs it IT system, the man power must be provided with the relevant skills to manage it otherwise, there could be misuse of the developed IT infrastructure and thus purpose for development defeated.

Thus, management accounting practices involves the use of management accounting systems - the internal systems that an organization uses to measure and evaluate its processes for the management of the organization. Other types of Information systems used for accounting management and decision management and applied and used by various tiers of management (Top, middle, tactical and functional levels) are Management information system (MIS), Decision Support System (DSS), and Transaction Processing System (TPS), Office Automation System (OAS), Expert Support Systems (ESS), and Personal and Work Group Information Systems (WGSS) (Gabriel, 2012; Ada & Ghafazardah, 2015).

Management information system (MIS)

Management Information System (MIS) is a concept of the last decade or two. It has been understood and described in a number way. It is also known as the Information System, the Information and Decision System, the Computer-based information System (Davis et al., 2004). Management Information System is defined as a system which provides information support for decision making in the organization (Barton et al., 2005). Management Information System is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision making function in the organization. Management Information System is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization. Management Information System is defined as a Computer based Information System (Bresfelean et al., 2009).

Furthermore, as cited by Shaqri (2014), Hicks (2003) defines information system as formalized computer system that collects, stores, processes, and reports data from various sources to provide information needed to manage the process of making decisions. Wikinson in Shagri (2014) discussed five tasks or activities that are associated with MIS data collection; data processing; data management; control and security of data and information generation. Through these activities, data from various sources through a process called data processing turn into useful information for the user. Management information systems comprise the physical components of the trailer hardware, software, databases, procedures, and personnel. Hicks (2003) further argued that computing system is formalized system where collected and sorted out by several processes, reports, data from various sources to provide the necessary information and important to obtain important management decisions, and that not all information systems are organized and formalized such as information from unofficial sources other.

Information system should be based on the computer data, often collected and stored information manually through processing, although manual information system has become - much less relevant. The purpose of the system is processing information, the saving and transmitting appropriate information in place, and better information system is the one who performs this function with much less expense. All systems including computer systems consist of inputs, processes and outputs. The process of transforming inputs into outputs is what is known as information management, hence gives rise to the concept of management information system. It is noted that before the 1980s the information system is usually classified as a system for data processing or computing system governing. System data processing was oriented toward conquest, processing, booking (storage) data, while MIS (Management Information System) is directed towards utilization of data to create information governance (Shagri, 2014). According to Ibrahim (2005) computer system helps decision makers in two ways a) Assist managers in the decision-making process by providing the necessary information. b) information system in some cases may even take decisions independently in situations that are repeated when the deployment process does not change, ie in this case differ only incoming variables. This system creates input information regarding normal business activities for middle level managers and top-level managements as well (top managers). Impact of new technology and new information on the destiny of people is not only in carrying out physical but also intellectual works. According to Berim in Shaqri (2014), the main functions that make up the essence of management as a process in contemporary organization are planning, organizing, staffing, leading and controlling. Since managers are responsible for setting goals, they must make decisions that enable their achievement, and those decisions relating to activities as following

- i. Preparation of strategic goals,
- ii. Manage the implementation of strategic decisions,
- iii. The organization of tasks,
- iv. Definition of tasks and resources associated with the appearance of their use,
- v. Coordination and supervision of employees and managers,
- vi. Detection and correction of problems if they occur.

Providing timely and relevant information needed regarding the performance of these activities is of particular importance to managers in each of the mentioned levels of management. Similarly, there are three levels or tier of management where decisions are made, which are the operational, tactical, and strategic level. Decision and tasks are performed the form of planning and control at all levels with the help of information system (Shaqri, 2014). So, providing a framework that incorporates information & communication technology system that will enable them to make these decisions timely and accurately become the key to efficient operations in contemporary organisations.

Decision Support System (DSS)

A decision support system (DSS) is a computerized program used to support determinations, judgments, and courses of action in an organization or a business. A decision support system sifts through and analyses massive amounts of data, compiling comprehensive information that can be used to solve problems and in decision-making (Seagal & James, 2020). Typical information used by a decision support system includes target or projected revenue, sales figures or past ones from different time periods, and other inventory- or operations-related data. As earlier noted, decision-making is an essential component of organizational life. Decision makers receive, and analyses information using many different media, including traditional print, group and interpersonal information exchanges and computer-based tools Decision support systems (DSS) is a generic concept that describes information systems that provide analytical modelling and information to support semi-structured and unstructured organizational decision making. Common features of decision support system include

- a) Problem structure, used in semi structured and unstructured decision context
- b) Intended to support and augment decision makers not replace them, supports most phases of decision making process.
- c) Uses underlying data and model
- d) Interactive DSS is designed to be an interactive decision aid

A decision support system is an integrated set of computer tools allowing a decision maker to interact directly with computer to retrieve information useful in making semi structured and unstructured decisions (Power, 2002). The Decision support system is able to help groups to make the decision. However, it is argued that decision support system should not be responsible for individual decision making. Though while it aids decision making, the individuals have to take responsibility for their own decision and imaginative thoughts. The Decision support system is easy to use. A user should not be required to be computer operator to generate reports. It should be convenient for the user to use decision support system otherwise; the purpose would be defeated (Singh et al., 2012; Ada & Ghazafar, 2015).

Characteristics of a Decision Support System: The primary purpose of using a DSS is to present information to the customer in an easy-to-understand way. A Decision Support System is beneficial because it can be programmed to generate many types of reports, all based on user specifications. For example, the DSS can generate information and output its information graphically, as in a bar chart that represents projected revenue or as a written report. As technology continues to advance, data analysis is no longer limited to large, bulky mainframe computers. Since a Decision Support System is essentially an application, it can be loaded on most computer systems, whether on desktops or laptops. Certain Decision Support System applications are also available through mobile devices. The flexibility of the Decision Support System is extremely beneficial for users who travel frequently. This gives them the opportunity to be always well informed, providing the ability to make the best decisions for their company and customers on the go or even on the spot (Seagal & James, 2020).

Types of Decision Support System: There are several decision support systems. These can be categorized into five types a) communications driven decision support systems, 2) data driven decision support systems, 3) document driven decision support systems, 4) knowledge driven decision support systems and 5) model driven decision support systems (Seagal & James, 2020).

Differences between Management information systems (MIS) and Decision support system (DSS)

MIS and DSS are two abbreviations that are often heard in the field of business management. They differ in a few aspects. It is important to know that as earlier stated; MIS stands for Management Information Systems whereas DSS stands for Decision Support Systems. It is interesting to note that Management Information Systems is a type of link that assists in the communication between managers of various disciplines in a business firm or an organization. Overall, it plays a very important role in building up communication among the corporate people.

Decision Support Systems on the other hand is an improvement of the concept of Management Information Systems. It is true that both differ in terms of their focus. Decision Support Systems focuses more on leadership. It is all about senior management in a firm providing innovative vision. On the other hand, Management Information Systems focuses more on the information gathered and the information that has poured from different quarters. Experts on managerial behaviour say that Decision Support Systems focuses more on decision making. Management Information Systems on the other hand focuses more on planning the report of various topics concerned with the organization that would assist the managers to take vital decisions pertaining to the functioning of the organization (Ada & Ghafazar, 2015).

One of the finest differences between Management Information Systems and Decision support systems as argued by professionals is that Management Information Systems focuses on operational efficiency whereas Decision support systems focuses more on making effective decision or in other words helping the company to do the right thing. Flow of

information is from both sides, up and down in the case of Management Information Systems. On the other flow of information is only upward in the case of Decision Support System. In the case of DSS the report can be flexible whereas in the case of MIS the report is usually not flexible. Management Information Systems is characterized by an input of large volume of data, an output of summary reports and process characterized by a simple model.

On the other hand, Decision support system is featured by an input of low volume of data, an output of decision analysis and a process characterized by interactive model. Furthermore, Management Information Systems is a primary level of decision making whereas Decision support systems is the ultimate and the main part of the decision. This is one of the most talked about different between the two. As a matter of fact, Management Information Systems is all about theory whereas Decision support system is all about practice and analysis. An organization should employ both the systems effectively (Pride & Ferrell, 2006; Ada & Ghafazar, 2015).

Management accounting Practices

Management accounting practices include both the traditional techniques and the modern technique. In the early 1980s several innovative management accounting techniques have been developed such as activity-based management accounting, strategic management accounting, and the balanced scorecard (Oyerogba, 2015). Others include cost practices, budgeting and information for decision making, strategic analysis and performance analysis using management accounting techniques (Hornngren et al., 2009). The objectives of this development were to support modern technologies and modern management accounting practices, such as total quality management, cost-volume-profit analysis, absorption costing, marginal costing and just-in-time production systems, and the search for competitive advantage to meet the challenge of global competition. The adoption of modern management accounting practices enables the management to avoid unnecessary cost and meet the profit target of the organization (Oyerogba, 2015) as a result, it is believed that cost management strategies that focus on reduction of production overhead and administrative overhead embarked upon by the manufacturing organizations that could lead to meeting their profit maximization and wealth creation objectives will be the most adopted one.

Dahal (2018) noted that a larger entity of the cost management system which assists executives in fulfilling organizational objectives is known as management accounting and control system. It is used for planning, monitoring and control of different organizational activities, to optimize the use of resources, to support the process of decision making and to the performance evaluation process. The scope of the Management accounting system can be divided into two broad groups technical considerations and behavioural considerations. Technical considerations fall into two categories (i) the relevance of information generated and (ii) the scope of the system like the value chain, total life cycle costing, target costing, kaizen costing, benchmarking, balanced scorecard etc. whereas the behavioural consideration involves individuals and their behaviour within organizations.

New management accounting practices which are more sophisticated than the traditional techniques have been developed and suggested for practices (Ajibolade, 2013; Bhimani & Bromwich, 2010). The new practices include activity-based costing, balanced scorecard, target costing, life cycle costing, total quality management, just in time, throughput accounting and backflush accounting among several others (Waweru & Uliana, 2008; Mat, 2010; Ogunbade et al., 2017). However, despite the heavy criticisms of the traditional techniques and a lot of benefits ascribed to the modern practices by many authors, the recent literature shows that the traditional techniques are still being used in advanced, emerging and developing economies whereas the new techniques have not been fully embraced by many firms (Ajibolade, 2013; Badem et al., 2013; Oyerogba, 2015).

Costing Management Method

This involves the way the companies manage their cost structure including the use of and provision of information on various costs such as activity based costing, marginal costing absorption costing etc and help the management to make decision with it. In other words, it is the framework applied by the companies to approximate the cost of its products for inventory valuation, profitability analysis, and cost control (Research Prospects, 2018). Cost accounting system or costing system is the framework applied by the corporation to approximate the cost of its products for inventory valuation, profitability analysis, and cost control (Research Prospects, 2018). In the cost accounting system allocation of cost is performed based on either activity-based costing system or traditional costing system. Approximating the actual products' cost is crucial for effective functions (Blocher, 2016). Cost accounting is the kind of accounting system which aims at capturing the corporations' production cost through weighing the inputs costs of every production step plus fixed costs like capital equipment depreciation. Costing system will individually measure and record the costs then comparing of inputs outcomes to actual results or output to assist management of the company in measuring financial performance. Managers and management of companies rely on accounting data in general and specific on cost since any task of the company may be explained via its cost. Cost accounting is seen as the key concept in management accounting as it offers the analytical tools like budgetary control, marginal costing, standard costing, operating costing and inventory control which are applied by management in discharging their reproducibility efficiently. Companies use various costing system

which are normal costing, actual costing, and standard costing that help the company arrive at the best costing system that suits their business to maximize their profits (Mohammad, 2016). The cost systems vary depending on the activity of costing such as job costing, batch costing, process costing and contract to cost.

Job costing refers to the system of allocating manufacturing costs to the individual item or batches of the products (Research Prospects, 2018). It is applied if the goods processed are different from one another. It involves the practice of accumulating data on the costs related to a particular service or production job. The information can be needed to submit cost data to a consumer under the contract in which costs are refunded. Also, the information is important for determining the accuracy of the estimating system of the company that must be capable of quoting prices which permit for a reasonable income (Drury, 2015). The information may also be applied to assigning inventorial costs to processed products. The job costing system requires accumulating the following three kinds of direct information labour, direct materials and overhead costs (Research Prospects, 2018).

Budgeting Management Method

Budgeting Management involves the process of developing and execution of the organisation budgets (expenses and revenue sources) and ensuring budgetary controls so that organisational objectives can be realised to of developing and execution of the organisation budgets and ensuring budgetary controls so that organisational objectives can be realised. It is argued that one of the key elements of management accounting is budgets preparation (Research Prospects, 2018). Budgets are established through applying budgets of prior years and adjusting them to future forecasts. The budgets of a company list all expenses and revenues sources. The company attempt to attain its objectives and goals whereas staying within the budgeted amounts (Edmonds & Olds, 2013). Its ability to manage its spending within its budgets is critical for survival of companies. Managers ensure that at various levels of the organisations, operational activities are done within the budgetary limits of each department. They depend on information on budgetary performance to make decisions on a regular basis. Hence the need to establish a well-defined framework of budgetary controls. Budgetary control refers to a process through which budgets are arranged for the future date and are compared with the actual results in finding out the variances (Horngren, 2017). The comparing of budgeted amounts with the actual amounts will assist the management to locate variances and make corrective actions promptly. The following are key objectives of a budgetary control (Horngreen, 2017)

1. Defining the company's objectives,
2. Offering plans for accomplishing the defined objectives,
3. Coordinating the tasks of different departments
4. Operating various cost centres and departments efficiently and economically,
5. Improving the profitability through eliminating waste,
6. Centralizing the management system,
7. Correcting the variances from set standards
8. Fixing the responsibilities of different individuals in the company.

Advantages of Budgetary controls

Budgetary control must turn out to be an essential tool in the organization in controlling costs and maximizing profits. Some of the merits of budgetary control include It defines the plans, goals, and policies of the company. When there are no specific aims, then the determinations shall be wasted in attaining any other aims (Levitan & Baxendale, 2012). It also fixes targets. Each department is compelled to work efficiently to attain its target. Therefore, it is an effective procedure for managing the activities of different departments of the business unit. Also, it secures good coordination among different departments. In the situation where performance is below anticipation, budgetary control assists the management in finding out the responsibility. It assists in reducing the production cost through eliminating wasteful expenditure (Levitan & Baxendale, 2012). Through facilitating cost awareness among the workers, budgetary control contributes to economy and efficiency. Budgetary control promotes centralized control through the decentralized task. Budgetary control assists in the smooth running of the company because everything is provided and planned for in advance. Budgetary control tells the managers as to where the exploit is needed for solving issues without delay.

Disadvantages of budgetary control

The following are limitations of budgetary control it is difficult to prepare accurate budgets under inflationary situations. Budgets incorporate a huge expenditure that small businesses concern may not afford. Budgets are organized for the next upcoming period that is always undefined. In the future, circumstances can change that will affect the budgets (Mohammad, 2016). Therefore, future risks minimize the use of budgetary control system. Budgetary control is a management tool. Thus, it may not replace managerial skills in making decisions since it is not the substitute for managerial. The budgetary control success relies upon the top management support. When there is lacking top management support, then it will fail. Preparing different kinds of budgets such as operating, and capital helps management to control costs and plan. The alternative procedures of budgeting plus the behavioural inferences of budgets to management help them make sufficient and prompt decisions.

Theoretical Framework

Contingency Theory of Management Accounting

Contingency theory has it that if there are changes in operating environment or any interruptions, there should be an alternative way of managing such interruptions in businesses. Burns and Stalker (1961) discussed why management accounting practices may be unlike when comparing one organization to the other. This can be related to organisations operating in different industries or sectors. In addition, Otley (1980) applied contingency theory to management accounting practices and explained that there is no single general standard accounting practice that can be applied to all organisations. In essence, each organization will have its own management accounting practices. The theory looks at certain influential factors that will assist management to decide on an appropriate management accounting practice. These factors can either be technological changes and the infrastructure of an organization. For example, a manufacturing food company may want to change the technology used to a more modern hygienic and efficient way of handling, processing, and packaging its food. It may then consider installing a computer-based system that mass produces its products. However, the type of qualified personnel that is required to operate such complex equipment will influence the type of management accounting practices selected and production costs.

Dugdale (1994) highlighted which management accounting practices are widely used in manufacturing organisations. Those that were highly favoured were budgeting for controlling costs and performance evaluation. His findings revealed that budgeting plays an important role in the managing and directing process of the organization. This tells managers what costs to expect over the next budgeted period and gives an indication when the company might expect to go through a seasonal change and the impact it will have on the company's cash flows and revenues. Perhaps this is the main reason why this management accounting practice is highly rated over many other practices. Dugdale (1994) further went on to mention that budgeting enables organisations to effectively plan and develop strategies to achieve their goals. In other words, budgeting could be used as a contingency plan of which management information can be generated.

Luther and Longden (2001) also observed that the budgeting process is an integral part of managing and controlling costs in the manufacturing sector, for example, in the UK, South Africa and Australia (Bransah, 2019). Some studies have proposed the neo contingency theory, which implies integrating different approaches (Donaldson, 2001; 2005). These studies of Donaldson represent the evolution of contingency theory (McKinley & Mone, 2003). The contingency theory, also known as the situational approach theory of organization, is significant in management accounting research; hence, it has been tremendously used by researchers in the field (Ajibolade, 2013). Contingency theory has been described as a significant development to the behavioural Management accounting research, which seeks to define specific aspects of an accounting system design that is appropriate for different sets of circumstances (Ajibolade, 2013). The theory which takes its root from organization contingency theory is an approach to the study of organizational behaviour in which explanations are given as to how contingent factors such as technology, culture, and the external environment influence the design and function of organizations. Thus, the theory has generated considerable interest among management accounting researchers. This study hypothesizes that the management accounting practices among manufacturing firms in Nigeria are contingent upon the evolution of information & communication technology system which can be incorporated into enhancing the management accounting information and practices.

Review of Empirical Literature

Al-Khasawneh et al. (2020) study within the Malaysian context investigated the relationship between modern management accounting techniques and organizational performance of industrial sector listed in Amman stock exchange. Survey design was adopted. The questionnaire was used to collect data from 46 companies operating in industrial activities, a total of 152 questionnaires were distributed to employees in the financial business units (FBUs) in the companies, and data of 116 questionnaires were used in the analysis process through Smart- PLS software. The results showed that reveals that Morden management accounting techniques (MMATs) had a strongly positive and significant effect on Organisational Performance.

Ogunbade and Oyerogba (2020) in their study investigated firm culture and management accounting practices among manufacturing firms in Nigeria. This study sought to find out the effects of firm culture on management accounting practices (MAPs). The study used a structured questionnaire to collect data from 220 randomly selected manufacturing firms out of 514 firms and used logistic regression for analysis. This study examined seven dimensions of firm cultures, including innovation/ risk orientation culture, people orientation culture, outcome orientation culture, aggressive culture, stability culture, team-based culture, and attention to details culture. The study established that team-based, attention to details, and stability cultures have a significant influence on the choice of management accounting practices. The study concluded that attention to details culture and team-based culture are barriers to modern management accounting practices, and cautions should be exercised by managers in using these cultures. The study recommended that manufacturing firms in Nigeria should be cautious of their culture and its implication on MAPs. In a more specific term, they should practice cultures that will allow them to choose modern MAPs and take advantage of the benefits attached.

Ejike and Nweze (2019) investigated the impact of management accounting techniques on financial performance of manufacturing companies in Nigeria. The general objective of the study was to investigate the effects of management accounting practices on financial performance of manufacturing companies in Nigeria. This study adopted a descriptive survey design. The target population for this study was the 455 manufacturing companies in Nigeria. Stratified random sampling method was applied to come up with the sample size, since the population in different manufacturing firms was considered heterogeneous, implying that a simple random sample is unrepresentative. The study therefore involved 46 manufacturing companies in Lagos. Analysis was done using Statistical Package for Social Sciences (SPSS), allowing the researcher to present the information in form of tables and figures. The study concluded that information for decision making practices is the most highly used management accounting practice amongst the manufacturing companies in Nigeria, followed by strategic analysis, budgeting, performance evaluation, costing, size and leverage respectively. The study identifies key factors that influence performance and risky areas that require improvements on return on equity, ROE (Net income / Average Equity) has increased as a result of application of management accounting practices. This study recommended the creation and enhancement of awareness among firms of the importance of information for decision making practices as this is the most universally used management accounting practice amongst the manufacturing companies in Nigeria.

Akinola and Odesola (2018) study investigated information and communications technology and inventory management amongst Breweries in Nigeria. Secondary data were used for the study. The population for the study was all brewery companies quoted on the Nigerian Stock Exchange. Purposive sampling technique was used in selecting the three (3) leading brewery companies in Nigeria, quoted in the Nigerian Stock Exchange facts book. Secondary data on ICT/ software costs, inventories, sales turnover/revenue, and assets were sourced from years 2006 to 2015 Annual Reports and Statements of Accounts of the three selected breweries and the Nigeria Stock Exchange facts book. The data collected were analysed using descriptive statistics (tables, mean and standard deviation) and inferential statistics (Ordinary Least Square (OLS) method). The results showed that ICT usage had no significant positive relationship on inventory management. The study concluded that ICT had no significant positive effect on inventory management in the Nigerian Brewery industry. The study recommended that brewery firms in Nigeria should deploy the right software for inventory management.

Dahal (2018) studied the relationship between management accounting and control system (MACS). The study asserts that MACS is used for planning, monitoring and control of different organizational activities, to optimize the use of resources, to support the process of decision making and to the performance evaluation process. The scope of the MACS can be divided into two broad groups technical considerations and behavioral considerations. Technical considerations fall into two categories (i) the relevance of information generated and (ii) the scope of the system like the value chain, total life cycle costing, target costing, kaizen costing, benchmarking, balanced scorecard etc. whereas the behavioral consideration involves individuals and their behavior within organizations.

METHODOLOGY

Nomothetic and idiographic Philosophy was adopted while a cross-sectional survey was employed. The population of the study was thirteen (13) companies quoted in Nigerian stock exchange as of September 2020 in the industrial goods manufacturing sub sector. The unit population was the staff from departments such as Finance and Accounts, Procurements, Operations, and Information and communication Technology (ICT) departments, focusing on top management, middle management and functional management levels. Using purposive sampling technique seven (7) of the quoted companies were chosen for the study. 84 copies of questionnaire were used for data gathering. Descriptive statistics and Spearman's Rank Order Correlation Coefficient, statistics was used for data analysis.

RESULTS AND ANALYSIS

Descriptive Analysis

Table-4.1: Descriptive Statistics result for independent variables

	N	Minimum	Maximum	Mean	Std. Deviation
MIS	80	2.33	4.00	3.7000	.40252
DSS	80	.00	4.00	3.5917	.63639
Valid N (listwise)	80				

Source SPSS version 21 Output of data, 2022

From the descriptive statistics table above, it shows information & communication technology system use enhances the practice of management accounting and that of the dimension of DSS (decision support system) with this variable

having the highest variation amongst the independent variables with a standard deviation of 0. 63639. However, all the dimensions have mean score that is greater than 3, indicating that there are evenly distributed and agreed to the importance of use of ITS for improved management accounting practices in quoted industrial good manufacturing companies in Nigeria.

Table-4.2: Descriptive Statistics for dependent variables

	N	Minimum	Maximum	Mean	Std. Deviation
CMM	80	3.00	4.00	3.7542	.34675
BMM	80	1.00	4.00	3.4333	.66751
Valid N (listwise)	80				

Source SPSS version 21 Output of data, 2022

Similarly, from the descriptive statistics table above, looking at the measures of management accounting practices, it shows that budgeting management method (BMM) is the highest with a standard deviation of 0.66751, while costing management is the least. However, all the constructs have mean score that is greater than 3, indicating that they are evenly distributed and served as good measures for management accounting practices that could relate with the use of information & communication technology system for in the industrial goods manufacturing companies in Nigeria.

Bivariate Analysis and Test of Hypotheses

Test of Hypothesis 1

HO₁: There is no significant relationship between Management Information System (MIS) and Costing Management Method (CMM) of quoted industrial goods manufacturing companies in Nigeria.

Model equation: MAP = f (ITS).....(i)

CMM = f (MIS).....(ii)

Table 4.3: Spearman’s Correlations result for Hypothesis one

			MIS	CMM
Spearman's rho	MIS	Correlation Coefficient	1.000	.865**
		Sig. (2-tailed)	.	.000
		N	80	80
	CMM	Correlation Coefficient	.865**	1.000
		Sig. (2-tailed)	.000	.
		N	80	80

** . Correlation is significant at the 0.01 level (2-tailed).

Source: (SPSS output of Data, 2022)

From the table above, the positive and very large value of rho (0.865**) indicates that there is a very strong rank correlation between Management information systems and costing management method of quoted industrial goods manufacturing companies in Nigeria, and correlation is significant at 0.01 level. Since the p – value (= 0.000) is less than the level of significance (alpha) (0.05), we therefore reject the null hypothesis and conclude that: there is a significant relationship between Management Information System (MIS) and Costing Management Method (CMM) of quoted industrial goods manufacturing companies in Nigeria

Test of Hypothesis Two

HO₂: There is no significant relationship between Management Information System (MIS) and Budgeting Management Method (BMM) of quoted industrial goods manufacturing companies in Nigeria

Model equation: BMM = f (MIS).....(iii)

Table-4.4: Spearman’s Correlations result for Hypothesis two

	MIS	BMM
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Spearman's rho	MIS	Correlation Coefficient	1.000	.959**
		Sig. (2-tailed)	.	.000
		N	80	80
	BMM	Correlation Coefficient	.959**	1.000
		Sig. (2-tailed)	.000	.
		N	80	80

** . Correlation is significant at the 0.01 level (2-tailed).

Source: (SPSS output of Data, 2021)

From the table above, the positive and very large value of rho (0.959**) indicates that there is a very strong rank correlation between management information system and budgeting management method of quoted industrial goods manufacturing companies in Nigeria, and correlation is significant at 0.01 level. Since the p – value (= 0.000) is less than the level of significance (alpha) (0.05), we therefore reject the null hypothesis and conclude that: there is a significant relationship between management information systems and budgeting management method of quoted industrial goods manufacturing companies in Nigeria.

Test of Hypothesis Three

HO₃: There is no significant relationship between Decision Support System (DSS) and Costing Management Method (CMM) of quoted industrial goods manufacturing companies in Nigeria

Model: CMM = f (DSS)..... (viii)

Table 4.5: Spearman’s Correlations result for Hypothesis Seven

			DSS	CMM
Spearman's rho	DSS	Correlation Coefficient	1.000	.942**
		Sig. (2-tailed)	.	.000
		N	80	80
	CMM	Correlation Coefficient	.942**	1.000
		Sig. (2-tailed)	.000	.
		N	80	80

** . Correlation is significant at the 0.01 level (2-tailed).

Source: (SPSS output of Data, 2022)

From the table 4.5 above, the positive and very large value of rho (0.942**) indicates that there is a very strong rank correlation between decision support system and costing management method of quoted industrial goods manufacturing companies in Nigeria, and correlation is significant at 0.01 level. Since the p – value (= 0.000) is less than the level of significance (alpha) (0.05), we therefore reject the null hypothesis and conclude that: there is a significant relationship between decision support system and costing management method of quoted industrial goods manufacturing companies in Nigeria.

Test of Hypothesis Four

HO₄: There is no significant relationship between Decision Support System (DSS) and Budgeting Management Method (BMM) of quoted industrial goods manufacturing companies in Nigeria.

Model: BMM = f (DSS).....(iv)

Table 4.6: Spearman’s Correlations result for Hypothesis Eight

			DSS	BMM
Spearman's rho	DSS	Correlation Coefficient	1.000	.922**
		Sig. (2-tailed)	.	.000
		N	80	80

	Correlation Coefficient	.922**	1.000
BMM	Sig. (2-tailed)	.000	.
	N	80	80

** . Correlation is significant at the 0.01 level (2-tailed).

Source: (SPSS output of Data, 2022)

From the table 4.6 above, the positive and very large value of rho (0.922**) indicates that there is a very strong rank correlation between decision support systems and budgeting management method of quoted industrial goods manufacturing companies in Nigeria, and correlation is significant at 0.01 level. Since the p – value (= 0.000) is less than the level of significance (alpha) (0.05), we therefore reject the null hypothesis and conclude that: there is a significant relationship between decision support systems and budgeting management method of quoted industrial goods manufacturing companies in Nigeria

Discussion of Findings

Management information system (MIS) and Management accounting practices

Looking at the hypotheses that are tested to ascertain the relationship of MIS and management accounting practices measures of costing management method and budgeting management method, they should positive, very strong and significant relationships. For hypothesis one which says that there is no significant relationship between management information system and costing management method of quoted industrial goods manufacturing companies in Nigeria, Nigeria using the value of rho (0.865**), and P- level of 0.000, the alternate was accepted as there is a very strong, positive and significant relationship between management information system and costing management method of quoted industrial goods manufacturing companies in Nigeria. The result shows that 86.5% of the changes in management accounting practices in terms of costing management method is accounted for by MIS aspect of information & communication technology system.

In the same vein, the research hypothesis two states there is no significant relationship between MIS and budgeting management method of quoted industrial goods manufacturing companies in Nigeria, Nigeria, as evident in the statistical results rho (0.959**), a positive, very strong and significant relationship was revealed to exist between MIS and budgeting management method of quoted industrial goods manufacturing companies in Nigeria. The result shows that 96% of the changes in management accounting practices in terms of budgeting management method is accounted for by MIS aspect of information & communication technology system. These results imply when there is a deployment of computer systems that helps in the combination of different layers in organisation, people, and documents will aid man to know the organisation problems and provide appropriate information for the problem in the companies, it can lead to the improvement on the set of techniques applied that help the company managers with the identification, measurement, accumulation, analysis, preparation, interpretation, and communication of financial information that helps management to plan, evaluate, and control within an organization and to assure appropriate use of accountability for its resources. In other words, it can lead to improved way of costing and budgeting management in the companies. Furthermore, looking at the spearman's rank correlation values as well, Management information & communication technology(MIS) and Budgeting management method (BMM) is ranked 1st in the order of the impacts as its value is higher than that of other variables studied, while MIS and CMM is ranked 4th respectively in the ranking order. It further implies that were there is Management information system is in place in the companies, the first management accounting practices measure to be achieved is Budgeting management method, followed by costing management method.

The findings here are in consonance with earlier studies of (Mohammed, 2018; Ada & Shafazadar, 2015; Shagri, 2014) whose study results indicated that the deployment of management information system has positive relation with management accounting practices in organisations. The result here however is contrary to the studies of Akinola and Odesola (2018) as well as that of Ominunu (2015). The study of Akinola and Odesola (2018) that deviates from the result of our study showed that ICT usage had no significant positive relationship on inventory management. The study concluded that ICT had no significant positive effect on inventory management in the Nigerian Brewery industry. That of Ominunu (2015) revealed that organisation in Nigeria have low and poor culture towards the deployment and use of Management accounting and information systems. Some demographic characteristics were observed to be significant in the use of MAS, while none was significant in the use of MIS. Furthermore, there was no significant relationship between management accounting systems and management information systems. The use of Management Information systems in organization does have significant influence on the effectiveness of management accounting system used.

Decision support system and Management Accounting Practices

From the results, decision support systems have shown a significant relationship with management accounting practices measures studied as well corroborating the argument that where there are decision support systems that the reports affected decision-making and management is likely to act based on the information received. However, in most of the cases only about half of the available information was utilized, and these have a way of improving the quality or result obtained (Butterflied, 2016). For hypothesis three which says that there is no significant relationship between decision support system (DSS) and costing management method of quoted industrial goods manufacturing companies in Nigeria, using the value of rho (0.942**), and P- level of 0.000, the alternate was accepted as there is a significant and very strong relationship between decision support system (DSS) and costing management method of quoted industrial goods manufacturing companies in Nigeria.

The result shows that as high as 94.2% of the changes in management accounting practices in terms of costing management is accounted for by decision support systems aspect of information & communication technology system. Similarly, with respect to hypothesis four, which says that there is no significant relationship decision support system (DSS) and budgeting management method of quoted industrial goods manufacturing companies in Nigeria, using the value of rho (0.922**), and P- level of 0.000, the alternate was accepted as there is a significant and very strong relationship between decision support system (DSS) and budgeting management method of quoted industrial goods manufacturing companies in Nigeria. The result shows that 92.2% of the changes in management accounting practices in terms of budgeting management is accounted for by decision support systems aspect of information & communication technology system.

The implication of the result is that where there is the deployment of information systems that provide analytical modelling and information to support semi-structured and unstructured organizational decision making in the companies, improved management accounting practices that can be seen in terms of costing, budgeting and inventory management in the companies can be achieved and vice versa. In other words, there would be improvement in the way companies manages their cost structure including the use of and provision of information on various costs such as activity based costing, marginal costing absorption costing etc and help the management to make decision with it. In addition, it would improvement in the developing and execution of budgets and ensuring budgetary controls so objectives can be realized. Furthermore, looking at the spearman's rank correlation value as well, DSS and CMM is ranked 2nd in the order of the impacts as its value is higher than others apart from that of MIS and BMM (hypothesis two). On the other hand, DSS and BMM is ranked 3rd in the order.

The finding here is in line with that of (Abdarahman et al., 2020; Intakhan, 2018; Oboh & Ajibode, 2017). The study of Abdarahman et al. (2020) investigated the use and benefit of management accounting practices in Libyan oil companies and documented that Libyan oil companies use Contemporary management accounting practices (CMAPs) more than Traditional accounting practices (TMAPs) as CMAPs are more beneficial than TMAPs. Intakhan (2018), study showed that successful managerial accounting practices had the most direct effect toward decision making effectiveness and followed by top management support had direct effect toward accounting competency. Lastly, top management support had direct and indirect effect on successful managerial accounting practices through accountant competency. The results implied that manager should focus on building accountant competency in order to create successful managerial accounting practice and to get the valuable information for right decision making.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded from its analysis that information & communication technology system: Management information system (MIS) and decision support system (DSS) have a very strong and positive relationship with Management accounting practices measures of costing management method and budgeting management method. In addition, Management information systems (MIS) and budgeting management systems have the highest ranking in the order of relationship with rho values (0.959**) among the variables studied. The study therefore suggested the following recommendations:

1. Management of manufacturing companies should adopt the use of information & communication technology system for their operational activities so as to get timely and accurate information that management would need to make decision both internally and externally.
2. They should be encouraged to go fully computerized thereby changing from the traditional management accounting systems to the contemporary systems, this way they would be able to compete with other businesses globally given the trend in globalisation and computerization of operations in this contemporary times.
3. Management should focus on the development of Decision support systems since this system is very useful for the strategic managers in modelling and forecasting for easy decision making. This would enable them make strategic decisions in the company quickly.

4. Emphasis should also be placed on the incorporation of information & communication technology system towards budgeting management method as this method has shown to be the most impacted management accounting practice where there is deployment of ITS.

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