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ICAN STUDENTS' JOURNAL

JOURNAL FOR STUDENTS OF THE INSTITUTE OF CHARTERED ACCOUNTANTS OF NIGERIA

ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS.

MANAGEMENT INFORMATION SYSTEM AND THE FINANCIAL PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN NIGERIA.

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Editor's Note

Readers are welcome to this edition of our journal. In this edition, our lead article entitled **"Management Information System and the Financial Performance of Listed consumer Goods Companies in Nigeria"** examined the effect of management accounting information system on the performance of companies listed under the consumer goods industry sector of the Nigerian Stock Exchange.

The authors embarked on the study to ascertain the effect of sales management system on the profitability of listed firms in Nigeria; to examine the effect of management accounting reporting system on the profitability of listed firms in Nigeria and to investigate the effect of budgetary management system on the profitability of listed firms in Nigeria. The details of all these and lots more are contained in the article.

Our second article with the title **"Artificial Intelligence (AI) and its applications"** focused on the details of what AI is all about and its applications. The author defined AI as a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation.

The Institute held its 51st Annual Accountants Conference in Abuja in November. The details of the conference proceedings are also available in this edition.

As usual, we publish some past questions and solutions to guide our students on how to tackle examination questions in future. The detailed reports of all these and other regular columns are contained in this edition.

Your comments and contributions are welcome. Please contact the Editor via: editor@ican.org.ng or aoowolabi@ican.org.ng

We wish you a merry Christmas and prosperous new year.

NIGERIA MUST RE-EXAMINE COST OF GOVERNANCE AT ALL LEVELS TO BUILD TRUST

By- Akinwunmi Adesina.

The President of African Development Bank, **Dr. Akinwumi Adesina** has appealed to governments at all levels in the country to re-examine cost of governance in order to build people's trust in governance.

Adesina declared this during his presentation of the lead paper at the 51st Annual Accountants' Conference in Abuja on Tuesday, November 30, 2021. The theme of the conference was **Trust in Governance.**

According to him, "leadership is an investiture of trust while trust is the certainty that expectations based on promises, will be met". While noting that the cost of governance in the country was too high, he appealed to leaders to maintain a lifestyle devoid of lavishness and selfishness if they want the citizenry to trust them.

"Lifestyle audits are needed for leaders. Leaders must live within their means, and their means must be honest means. When citizens see their leaders living transparently, being sensitive, not lavish in lifestyle but delivering good governance, they will trust governments".

"But when people feel that their resources are mismanaged or being used for opulence, widening the gap between the leaders and those they are leading, it builds distrust and despondency, which then permeates the fabric of society".

"Leadership is a position of trust. This includes trust in the judicial system. The justice system is what sets the boundaries on acceptable conduct, for people, institutions, governments, and society in general," he explained.

Speaking further, he said that the moment judicial systems are subjugated to the dictates of the executive arm of government or controlled and manipulated by powerful individuals, trust is eroded, adding that any nation that does not respect and uphold the rule of law can never develop, but descend into chaos.

"There is a direct and strong correlation between the rule of law and investments. Think of it: who will want to invest in a place where there is no rule of law, respect for individual rights, freedom of speech, freedom of association, protection of property rights and intellectual property rights, copyrights and patents, and rights to legally acquire and dispose of assets?", he lamented.

He stressed that what is needed is not less government, but better and more accountable governments as the performance of governments therefore depends on the effectiveness of the civil service.

On brain drain common among the youths nowadays, Adesina urged governments to earn the trust of the youths and use them as a potent force for national development.

"Forgotten, undervalued and underused, a lot of youth today have a high level of distrust for governments. That we must change. We must prioritize the youth because what we do with and to our youth will determine our future. We hold our positions in trust for the present and future generations.

Apart from paper presentations, workshops and plenary sessions, there was a gala nite on Thursday popular musicians entertained the participants.

There were also sporting activities, excursions and exhibitions. Other programmes of the conference include District Societies competition where various District Societies won trophies for their performances.

ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS

By- Austine Iyonasuen Agbi

INTRODUCTION

In computer science, artificial intelligence (AI), sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and animals. Leading AI textbooks define the field as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals . Colloquially, the term "artificial intelligence" is often used to describe machines (or computers) that mimic "cognitive" functions that humans associate with the human mind, such as "learning" and "problem solving".

Computer science defines AI research as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals . A more elaborate definition characterizes AI as "a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation.

As machines become increasingly capable, tasks considered to require "intelligence" are often removed from the definition of AI, a phenomenon known as the AI effect. A quip in Tesler's Theorem says "AI is whatever hasn't been done yet". For instance, optical character recognition is frequently excluded from things considered to be AI , having become a routine technology. Modern machine capabilities generally classified as AI include successfully understanding human speech,competing at the highest level in strategic game systems (such as chess and Go), autonomously operating cars, intelligent routing in content delivery networks, and military simulations.

Artificial intelligence was founded as an academic discipline in 1955, and in the years since has experienced several waves of optimism, followed by disappointment and the loss of funding (known as an "AI winter"), followed by new approaches, success and renewed funding. The traditional problems (or goals) of AI research include reasoning, knowledge representation, planning, learning, natural language processing, perception and the ability to move and manipulate objects. General intelligence is among the field's long-term goals. Approaches include statistical methods, computational intelligence, and traditional symbolic AI.

Many tools are used in AI, including versions of search and mathematical optimization, artificial neural networks, and methods based on statistics, probability and economics. The AI field draws upon computer science, information engineering, mathematics, psychology, linguistics, philosophy, and many other fields.

The field was founded on the assumption that human intelligence "can be so precisely described that a machine can be made to simulate it". This raises philosophical arguments about the nature of the mind and the ethics of creating artificial beings endowed with human-like intelligence. These issues have been explored by myth, fiction and philosophy since antiquity. Some people also consider AI to be a danger to humanity if it progresses unabated. Others believe that AI, unlike previous technological revolutions, will create a risk of mass unemployment. In the twenty-first century, AI techniques have experienced a resurgence following concurrent advances in computer power, large amounts of data, and theoretical understanding; and AI techniques have become an essential part of the technology industry, helping to solve many challenging problems in computer science, software engineering and operations research.

Applications of Artificial Intelligence

Healthcare

AI in healthcare is often used for classification, whether to automate initial evaluation of a CT scan or EKG or to identify high risk patients for population health. The breadth of applications is rapidly increasing. As an example, AI is being applied to the high cost problem of dosage issues—where findings suggested that AI could save $16 billion. In 2016, a ground breaking study in California found that a mathematical formula developed with the help of AI correctly determined the accurate dose of immunosuppressant drugs to give to organ patients.X-ray of a hand, with automatic calculation of bone age by computer software.

Artificial intelligence is assisting doctors. According to Bloomberg Technology, Microsoft has developed AI to help doctors find the right treatments for cancer. There is a great amount of research and drugs developed relating to cancer. In detail, there are more than 800 medicines and vaccines to treat cancer. This negatively affects the doctors, because there are too many options to choose from, making it more difficult to choose the right drugs for the patients.

Microsoft is working on a project to develop a machine called "Hanover"[citation needed]. Its goal is to memorize all the papers necessary to cancer and help predict which combinations of drugs will be most effective for each patient. One project that is being worked on at the moment is fighting myeloid leukemia, a fatal cancer where the treatment has not improved in decades.

Another study was reported to have found that artificial intelligence was as good as trained doctors in identifying skin cancers. Another study is using artificial intelligence to try to monitor multiple high-risk patients, and this is done by asking each patient numerous questions based on data acquired from live doctor to patient interactions.

One study was done with transfer learning, the machine performed a diagnosis similarly to a well-trained ophthalmologist, and could generate a decision within 30 seconds on whether or not the patient should be referred for treatment, with more than 95% accuracy.

According to CNN, a recent study by surgeons at the Children's National Medical Center in Washington successfully demonstrated surgery with an autonomous robot. The team supervised the robot while it performed soft-tissue surgery, stitching together a pig's bowel during open surgery, and doing so better than a human surgeon, the team claimed.

IBM has created its own artificial intelligence computer, the IBM Watson, which has beaten human intelligence (at some levels). Watson has struggled to achieve success and adoption in healthcare.

Automotive

Advancements in AI have contributed to the growth of the automotive industry through the creation and evolution of self-driving vehicles. As of 2016[update], there are over 30 companies utilizing AI into the creation of self-driving cars. A few companies involved with AI include Tesla, Google, and Apple.

Many components contribute to the functioning of self-driving cars. These vehicles incorporate systems such as braking, lane changing, collision prevention, navigation and mapping. Together, these systems, as high performance computers, are integrated into one complex vehicle.

Recent developments in autonomous automobiles have made the innovation of self-driving trucks possible, though they are still in the testing phase. The UK government has passed legislation to begin testing of self-driving truck platoons in 2018. Self-driving truck platoons are a fleet of self-driving trucks following the lead of one non-self-driving truck, so the truck platoons aren't entirely autonomous yet. Meanwhile, the Daimler, a German automobile corporation, is testing the Freightliner Inspiration which is a semi-autonomous truck that will only be used on the highway.

One main factor that influences the ability for a driver-less automobile to function is mapping. In general, the vehicle would be pre-programmed with a map of the area being driven. This map would include data on the approximations of street light and curb heights in order for the vehicle to be aware of its surroundings.

However, Google has been working on an algorithm with the purpose of eliminating the need for pre-programmed maps and instead, creating a device that would be able to adjust to a variety of new surroundings. Some self-driving cars are not equipped with steering wheels or brake pedals, so there has also been research focused on creating an algorithm that is capable of maintaining a safe environment for the passengers in the vehicle through awareness of speed and driving conditions.

Another factor that is influencing the ability of a driver-less automobile is the safety of the passenger. To make a driver-less automobile, engineers must program it to handle high-risk situations. These situations could include a head-on collision with pedestrians. The car's main goal should be to make a decision that would avoid hitting the pedestrians and saving the passengers in the car. But there is a possibility the car would need to make a decision that would put someone in danger. In other words, the car would need to decide to save the pedestrians or the passengers. The programming of the car in these situations is crucial to a successful driver-less automobile.

Finance and economics

Financial institutions have long used artificial neural network systems to detect charges or claims outside of the norm, flagging these for human investigation. The use of AI in banking can be traced back to 1987 when Security Pacific National Bank in US set-up a Fraud Prevention Task force to counter the unauthorized use of debit cards. Programs like Kasisto and Money stream are using AI in financial services.

Banks use artificial intelligence systems today to organize operations, maintain book-keeping, invest in stocks, and manage properties. AI can react to changes overnight or when business is not taking place. In August 2001, robots beat humans in a simulated financial trading competition. AI has also reduced fraud and financial crimes by monitoring behavioral patterns of users for any abnormal changes or anomalies.

AI is also being used by corporations. Whereas AI CEO's are still 30 years away, robotic process automation (RPA) is already being used today in corporate finance. RPA uses artificial intelligence to train and teach software robots to process transactions, monitor compliance and audit processes automatically.

The use of AI machines in the market in applications such as online trading and decision making has changed major economic theories. For example, AI based buying and selling platforms have changed the law of supply and demand in that it is now possible to easily estimate individualized demand and supply curves and thus individualized pricing.

Furthermore, AI machines reduce information asymmetry in the market and thus making markets more efficient while reducing the volume of trades. Furthermore, AI in the markets limits the consequences of behavior in the markets again making markets more efficient. Other theories where AI has had impact include in rational choice, rational expectations, game theory, Lewis turning point, portfolio optimization and counterfactual thinking[citation needed].. In August 2019, the AICPA introduced AI training course for accounting professionals.

Cyber security

The cyber security arena faces significant challenges in the form of larges scale hacking attacks of different types which harm organizations of all kinds and create billions of dollars in business damage. Artificial intelligence and Natural Language Processing (NLP) has begun to be used by security companies - for example SIEM (Security Information and Event Management) solutions.

The more advanced of these solutions use AI and NLP to automatically sort the data in networks into high risk and low risk information. This enables security teams to focus on the attacks that have the potential to do real harm to the organization, and not become victims of attacks such as Denial of Service (DoS), Malware and others.

Government

Artificial intelligence in government consists of applications and regulation. Artificial intelligence paired with facial recognition systems may be used for mass surveillance. This is already the case in some parts of China. An artificial intelligence has also competed in the Tama City mayoral elections in 2018.

In 2019, the tech city of Bengaluru in India is set to deploy AI managed traffic signal systems across the 387 traffic signals in the city. This system will involve use of cameras to ascertain traffic density and accordingly calculate the time needed to clear the traffic volume which will determine the signal duration for vehicular traffic across streets.

Law-related professions

Artificial intelligence (AI) is becoming a mainstay component of law-related professions. In some circumstances, this analytics-crunching technology is using algorithms and machine learning to do work that was previously done by entry-level lawyers. [citation needed].

In Electronic Discovery (e-Discovery), the industry has been focused on machine learning (predictive coding/technology assisted review), which is a subset of AI. To add to the soup of applications, Natural Language Processing (NLP) and Automated Speech Recognition (ASR) are also in vogue in the industry.

Video games

In video games, artificial intelligence is routinely used to generate dynamic purposeful behavior in non-player characters (NPCs). In addition, well-understood AI techniques are routinely used for path finding. Some researchers consider NPC AI in games to be a "solved problem" for most production tasks. Games with more atypical AI include the AI director of Left 4 Dead (2008) and the neuroevolutionary training of platoons in Supreme Commander 2 (2010).

Military

Further information: Artificial intelligence arms race, Lethal autonomous weapon, and Unmanned combat aerial vehicle.

The main military applications of Artificial Intelligence and Machine Learning are to enhance C2, Communications, Sensors, Integration and Interoperability. Artificial Intelligence technologies enable coordination of sensors and effectors, threat detection and identification, marking of enemy positions, target acquisition, coordination and deconfliction of distributed Join Fires between networked combat vehicles and tanks also inside Manned and Unmanned Teams (MUM-T).

Worldwide annual military spending on robotics rose from US$5.1 billion in 2010 to US$7.5 billion in 2015. Military drones capable of autonomous action are widely considered a useful asset. Many artificial intelligence researchers seek to distance themselves from military applications of AI.

Hospitality

In the hospitality industry, Artificial Intelligence based solutions are used to reduce staff load and increase efficiency by cutting repetitive tasks frequency, trends analysis, guest interaction, and customer needs prediction.Hotel services backed by Artificial Intelligence are represented in the form of a chatbot, application, virtual voice assistant and service robots.

Audit

For financial statements audit, AI makes continuous audit possible. AI tools could analyze many sets of different information immediately. The potential benefit would be the overall audit risk will be reduced, the level of assurance will be increased and the time duration of audit will be reduced.

Advertising

It is possible to use AI to predict or generalize the behavior of customers from their digital footprints in order to target them with personalized promotions or build customer personas automatically. A documented case reports that online gambling companies were using AI to improve customer targeting.

Moreover, the application of Personality computing AI models can help reducing the cost of advertising campaigns by adding psychological targeting to more traditional socio demographic or behavioral targeting.

Art

Artificial Intelligence has inspired numerous creative applications including its usage to produce visual art. The exhibition "Thinking Machines: Art and Design in the Computer Age, 1959–1989" at MoMA provides a good overview of the historical applications of AI for art, architecture, and design. Recent exhibitions showcasing the usage of AI to produce art include the Google-sponsored benefit and auction at the Gray Area Foundation in San Francisco, where artists experimented with the Deep Dream algorithm and the exhibition "Inhuman: Art in the Age of AI," which took place in Los Angeles and Frankfurt in the fall of 2017. In the spring of 2018, the Association of Computing Machinery dedicated a special magazine issue to the subject of computers and art highlighting the role of machine learning in the arts.[336]

The Austrian Ars Electronic and Museum of Applied Arts, Vienna opened exhibitions on AI in 2019.The Ars Electronica's 2019 festival "Out of the box" extensively thematized the role of arts for a sustainable societal transformation with AI.s

Philosophy and ethics

There are three philosophical questions related to AI:

Is artificial general intelligence possible? Can a machine solve any problem that a human being can solve using intelligence? Or are there hard limits to what a machine can accomplish?

Are intelligent machines dangerous? How can we ensure that machines behave ethically and that they are used ethically? Can a machine have a mind, consciousness and mental states in exactly the same sense that human beings do? Can a machine be sentient, and thus deserve certain rights? Can a machine intentionally cause harm?

Reference

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AAT INDUCTION

ICAN President, Mrs Comfort Olu Eyitayo, mni, FCA with the AAT overall best student for the year 2021, Miss Chioma Adekoya during the 55th AATWA Induction ceremony

MANAGEMENT INFORMATION SYSTEM AND THE FINANCIAL PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN NIGERIA

By- Onodi Benjamin, Ezug Ibiam Oti, Obada Paradise, Josephine Abiahu, Mary-Fidelis Chidoziem

Abstract

This study examined the effect of management accounting information system on the performance of companies listed under the consumer goods industry sector of the Nigerian Stock Exchange. The objectives of the study were; to ascertain the effect of sales management system on the profitability of listed firms in Nigeria; to examine the effect of management accounting reporting system on the profitability of listed firms in Nigeria and to investigate the effect of budgetary management system on the profitability of listed firms in Nigeria. A survey research design was adopted, sampling top and middle management staff of the 20 companies listed under the sector as at the end of 2018. Data collected were analyzed using percentages,tables while simple regression analysis and ANOVA statistical tool were used for testing the three hypotheses developed. The findings indicate that management system (measure with sales management system, management reporting system and budgetary management system) affect the financial performance (measured by profitability) of companies listed on the Nigeria Stock Exchange positively.This shows that accounting information system is an effective decision-making tool for controlling and coordinating the activities of an organization. Therefore, organizations should strive to strengthen their sales-force for effective revenue generation, encourage regular management accounting reporting together with effective budgetary control in other to attain viability in today's dynamic business environment.

Keywords: Management accounting information system, management information system, Sales management system, budgetary control system, financial performance.

Introduction

Accounting as a service provides documentary evidence of the existence of transactions in organizations. By this service, accounting plays the role of business language, providing records of transactions of organizations expressed in monetary terms. Predicated on the going concern concept, accounting is the science and art of collecting, classifying, summarizing and communicating data of financial nature required to make economic decisions (Osisioma, 1990). According to Abiahu (2014), an organization's accounting system provides a systematic means of collating, recording, analyzing and summarizing data and communicating the results to interested users.

Management accounting information system is a tool which, when incorporated into the field of Information and Technology (IT), were designed to help in the management and control of activities related to firms' economic and financial transactions. Accounting information as a part of the company's information system is seen as facilitating decision making within the firm and should be fitted to the firm's environment, requirements of task, and structure. Information is the most important resource in any organization. The flow of information within and outside are captured in financial documents, through the Accounting Information System, to form the basis of the vast number of decision making, to shape the organization and its economic relevance within the polity (Abiahu, 2014; Ozor, 2010).

Accordingly, an accounting information system is the structure that a firm uses to collect, store, manage, process, retrieve and report its financial data to aid decision making. Dey (2007) cited in Amahalu, Abiahu, Obi and Nweze (2018) posits thataccounting information is aunified structure within an entity, thatemploys physical resources and other components to transformeconomic data into accounting information, to satisfy the information needs of a variety of users.

Management accounting information system is an ingredient in all financial managerial decisions. In developed economies, these decisions are worth billions of dollars each year. In the past decade, rapid worldwide technological and socio-political changes have precipitated the "globalization" of the economy, where every industry and sectors' success, and in some cases survival, dependon the ability of organizations to compete globally. Fuelled by this change, organizations of all types, including business, government, education, health care, military, and research

and development, have been rethinking their operations and management approaches. Faced with many of the same demands, such as cutbacks in funding, escalating costs, competition for limited resources, and a demand for higher-quality outcomes, these organizations have all felt the pressure to operate more effectively.

Business managers today, are much more concerned about the effect of competition than they were a few decades ago. They must react to the competitive threats not only from local source but also from regional, national and international sources; also, they must seek to explore all opportunities that are available in the immediate, national and global environments. Deregulation has also increased competitive pressure for organizations to survive, grow and prosper. In such a competitive environment, managers must employ a lot of the resources at their disposal as efficiently as possible to accomplish the objectives and goals of the enterprise.

Management Information System (MIS) provides information in the form of reports and displays to managers and many business professionals. The Management Information System describes the components and resources that takes into account the integrative nature of information flow as well as the structuring of the organization around decision centers, with the primary aim of aiding the proper functioning and monitoring of organizational activities. The management information system has changed the physical layout of offices to accommodate local networks and departmental integrated systems. It is also a formalized procedure to provide management at all levels and in all functions with the appropriate information from all relevant sources to enable them to take timely and effective decisions for planning, directing, evaluating, and controlling the activities for which they are responsible.

Even though management information system supplies decision-makers with facts, it supports and enhances the overall decision-making process. The effective delivery of an enterprise's products and services are supported by the Management Information System (MIS) which has a great influence on the market share portion, revenue generation, sales volume achieved, recruitment of best-qualified candidates, the goodwill of the enterprise and the customers' perception about the organization and its output. These systems should be comprehensive, accessible, flexible and useable at the appropriate levels of the organization's activities.

For years, managers have recognizedthat traditional accounting information aimed at the calculation of profit has been of limited value for planning and control purposes. The need for othernon-accounting information about the external environment such as social, economic, political, and technical development has come to the fore. A major task also facing management in almost every field of endeavour is to plan carefully so that the quantity and quality of information obtained will be adequate to meet its needs. To this end, the place of Information Technology (IT)in the running of any modern business venture.

Currently, most firms continue to increase spending on information system. Moreover, economic conditions and competitions continue to create pressures about the costs of information. As such, most firms focus on developing an information system to support decision systems, communication, knowledge management, and many other managerial processes in organizations.Based on the foregoing, this paper seeks to determine the effect of management accounting information system on the performance of listed manufacturing companies in Nigeria. Specifically, the paper attempts to examine the effect of sales management system on the profitability of listed manufacturing companies in Nigeria, together with the effect of management reporting system on the profitability of listed manufacturing companies in Nigeria as well as the effect of budgeting system on the profitability of listed manufacturing companies in Nigeria.

To achieve these objectives, it is hypothesized that:

1.H01: Sales management system does not have any significant effect on the profitability of quoted consumer goods companies in Nigeria.

2.H02:Management reporting system does not have any significant effect on the profitabilityofquoted consumer goods companies in Nigeria.

3.H03: Budgeting system does not have any significant effect on the profitabilityof quoted consumer goods companies in Nigeria.

Conceptual Clarifications

Concept of Management Accounting Reporting system

Management Information System (MIS) provides communication link that makes the activities and responsibilities surrounding management or managers possible.

The focus in Management Information System coupled with improved processing has led to the reduction in bottlenecks attached to the management process.

Three key elements that stand out in the concept of MIS are development and use, information system, and business goals and objectives (kroenke, 2011). According to Abiahu (2014), a management information system is organized to convert data from internal and external sources into information and communicate in the appropriate form, to managers at all levels in all functions, to enable them to make effective and timely decisions for planning, directing and controlling the activities of the organization. Information System (IS) is a group of components (computer hardware, software, data, procedures and people), that interact to produce information(Kroenke, 2011). These five components are present in every information system, for the system to be effective. Information is knowledge derived from data, whereas data is defined as recorded fact or figures (kroenke, 2011).Accounting information system according to Manchilot (2019) in Ganyam and Ivungu (2019) may be a computer-based electronic system used for collecting, storing, processing and communicating financial and accounting data through financial statements to support and guide the organizational decision-making process. The effectiveness of an MIS system must reflect its alignment with business goals and objectives. Miller (1992) posits that the reason for striving for alignment between the MIS function and organizational goals is to achieve maximize the contribution of Infomation System (IS) investments to the organization. He argued that a measure of successful alignment is the financial return on IS investment. There are different approaches to measure such returns. Economic analysis assesses the impact on financial outputs of the firm relative to inputs; measurement of the costs of the transactions of the firm; as well as cost-benefit analysis which assesses the total costs of a given information system and compares such with the total benefits to the organization expressed in financial terms (Miller, 1992).

Relationship between Accounting information and Management information

Accounting information as part of the management information is very essential in the performance of organizations.

Accounting information system involves the effective combination of resources within the firm to provide actionable information for the organization's performance.

Accounting information performs this transformation whether they are manual systems or computerized. Further, the accounting information of any firm needs to be properly designed to enable managers to fully utilize resources at their disposal efficiently and effectively. In terms of effectiveness, accounting information makes use of accounting techniques and controls within the information technology framework to track all financial transactions of a firm to make available internal and external report on the activities of the business (Grande, Estebanez, &Colomina, 2012).

Similarly, Boocholdt (2009), stated that "accounting information involves data gathering, processing and provision of financial report for management decision making. Zimmerman (2003) stated that accounting information is an effective mechanism for effective performance and profitability of an organization. Therefore, accounting information should satisfy the user's requirement, that is, it should provide users with relevant information on the firm's performance.

Value Relevance of Accounting Information

Beaver and Demski(2011), agrees that value relevance research investigates the rel
tionship between a security price dependent factor and a set of independent accounting factors. Value relevance is measured as the statistical relationship between financial statement information and capital market values or returns of firms. The key commonality in the definitions is that accounting data is deemed value relevant if it has a significant relationship with security market value. The information perspective of value relevance is used for this study to determine the value relevance of accounting data of listed firms. Informational perspective measures the effect of accounting report to individual users without much emphasis on the precise structure of the relationship between accounting information and firm value (Bernard, 2014).

Achieving Efficient Accounting Information

Efficient accounting information is one that provides quality information that would be appropriate, timely, current, and accessible to all users.

A pre-condition for the above to be achieved is the prompt recording and proper classification of transactions from where necessary information is generated on a timely basis.

The information so generated is made available to the right people at the proper time and working conditions. Robinson, Davis and Alderman (2012) see the efficiency of the accounting information from the perspective of systems controls. System controls monitor the system to ensure efficiency and effectiveness of operations. Effective communication should occur in all directions, flowing down, across and up the firm, throughout all components and the entire structure. Monitoring is accomplished through routine activities, separate evaluation of activities or a combination of both.

Sales Management System

The America Marketers Association (AMA, 2019) defines sales management (or sales force administration) as the planning, direction, and control of the personal selling activities of a business unit, including recruiting, selecting, training, equipping, assigning, routing, supervising, paying and motivating as these tasks apply to the sales force. (America Marketers Association, 2019). Sales management is a business discipline which is focused on the practical application of sales techniques and the management of a firm's sales operations. According to the AMA, sales management involves three interrelated processes: the formulation of a strategic sales program;the implementation of the sales program; and the evaluation and control of sales force performance.Thus, sales management process monitors and measures each staff members' ability to either support sales or do the actual selling to customers.Jobber, Lancaster and Jamieson (2004) posit that the prime responsibility of sales management is to ensure that the sales function makes the most effective contribution to the achievement of the company's objectives and goals.

Budgetary control Systems

Osisioma(1989) cited in Eyisi (2003) define budgeting as a systematic and formalized approach for accomplishing the planning, coordination and control responsibilities of management. This implies that budgeting involves the coordination of these plans through management control and responsibilities as to achieve quantified plan which is formalized. A budget is a financial plan for a defined period, often one year. It may also include planned sales volumes and revenues, resource quantities, costs and expenses, assets, liabilities and cash flows.

Budgetary control is a system of controlling costs which includes the preparation of budgets, coordinating the departments and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability. Budgetary control is part of the corporate planning system.

Corporate planning is interwoven with budgeting and it serves as a system for coordinating the setting of objectives, preparing budgets and plans, mapping out strategies, preparing policy and procedures and monitoring of performance and results

To perform the control function effectively, managers need information accurately and timely to monitor progress toward their goals and turn plans into reality. Unless the right information is given, managers in the organization cannot stay on track or anticipate potential problems or decide corrective actions. Key features of budgetary control systems include the setting attainable objectives; assigning executive responsibility; planning the activities to achieve the objectives; comparing the actual result against the plan; taking corrective actions, and reviewing and revising plans in the light of changes.

The purpose of budgeting is to provide a forecast of income and expenditure (and thereby profitability), as well as serving as a tool for decision making. Budgets also provide management with a tool to monitor business performance.

Performance management

Performance management is a systematic process for improving organizational performance by developing the performance indices of individuals and teams. It is a means of getting better results by understanding and managing performance within an agreed framework of planned goals, standard and competency requirements (Armstrong, 2009). Performance management is much more than appraising individuals. It contributes to the achievement of culture change and it is integrated with other key Human Resources (HR) activities, especially human capital management, talent management, learning and development and reward management. According to Armstrong, 2009, performance management represents a process for establishing shared understanding about what is to be

achieved and how it is to be achieved, and an approach to managing and developing people that improve the individual, team and organizational performance. More specifically performance management is concerned with:

1.Aligning individual objectives to organizational objectives and encouraging individuals to uphold corporate core values;
2.Enabling expectations to be defined and agreed in terms of roles, responsibilities and accountabilities (expected to do), skills (expected to have) and behaviours (expected to be);
3.Providing opportunities for individuals to identify their own goals and develop their skills and competencies;
4.Motivating people by providing them with recognition and the opportunity to use and develop their skills and abilities.

The overall objective of performance management is to develop and improve the performance of individuals and teams and therefore organizations. It is an instrument that can be used to achieve culture change in the shape of the creation of a high-performance culture. It aims to develop the capacity of people to meet and exceed expectations and to achieve their full potential to the benefit of themselves and the organization (Armstrong, 2009).

Theoretical framework
Systems theory

The systems theory offers solutions to handle complex situations of the input and output flows. It uses the theory of communication which helps to evolve a system design capable of handling data inputs, processes and outputs with the least possible noise or distortion in transmission from a source to a destination. In general, system theory unit of analysis presents an organization as a complex unit of interdependent parts. An open versus closed system is dependent on the environment for inputs which are transformed by the throughput activities to produce outputs that are exchanged with the environment.Skills and abilities are treated as inputs from the environment, employee behaviors are treated as throughout and employee satisfaction and performance are treated as outputs. In this model, the human resource management subsystem functions to acquire, utilize, retain, and displace competencies.

Resource-Based View Theory

The resource-based theory of the firm is a blend of economics and strategic management concepts, which posits that organizations can only be successful when they gain and maintain a competitive advantage. According to Porter (1985), cited in Barney (2001) competitive advantage is gained by implementing a value-creating strategy that competitors cannot easily available to competing firm must be variable among competitors, and second, these resources must be immobile (i.e. not easily obtained). Three types of resources associated with organizations are Physical (this includes items of plant and equipment and location); Human (employees' experience, knowledge and technical know-how) and Organizational (structure, organization's culture, and social relations).

The theory considers that the competitive position of a firm depends on its specific and not duplicated assets. The most specific (and not duplicated) asset that an enterprise has is its personnel. It takes advantage of their interdependent knowledge. That would explain why some firms are more productive than others.

In summary, this study is anchored on systems theory as the main theory, in that it entails the characteristics and features of management information systems as key management decision and control in organizations. However, the resource-based view theory provides the framework for analyzing the performance of such organization given the role of human resources in implementing an effective management information system.

Empirical review

Ikhatua (2017), conducted a study to ascertain if accounting information contributes to stock volatility in the Nigeria capital market. The study investigated the effect of accounting information on the volatility of stock market returns in Nigeria using the GARCH model. The result from the model showed that accounting information explains and account for stock volatility in the Nigerian stock market. Specifically, information on carrying values, earning per share, and dividend per share are found to be related to stock volatility.

Onaolapo and Odetayo (2016), assert that the accounting information system has a significant effect on organizational effectiveness with a research study carried out in selected construction companies in Ibadan Nigeria. The study examined the effect of accounting information system on organizational effectiveness specifically on the quality of financial report and decision making. Descriptive and inferential statistical tools were used to analyze the data with the aid of the Statistical Package for Social Sciences (SPSS). The hypotheses for the study were analyzed using ANOVA and the results showed that accounting information system affects organizational effectiveness.

Abdul-Kader and Luther (2016), studied Management Accounting Practices (MAPs) in the food and drinks industry in the United Kingdom to understand the level of MAP's in this industry. The research methodology used in this study was a survey questionnaire sent to 650 executives in the industry. In total, 245 usable completed copies of the questionnaire were received and analyzed. Respondents were asked to indicate the frequency of use of 38 management accounting practices (MAPs) using a Likert scale rating as well as to assess the importance of each technique/practice by rating these as 'not important, moderately important or important. The study found that as companies moved into a more uncertain environment, the sophistication level of management accounting practices increased. Likewise, as their power relative to customers' diminished, companies moved up the stages of evolution. Analysis of the management accounting practices used suggested that the management accounting systems employed in many foods and drinks companies were not particularly sophisticated. Taking the industry as a whole, there was little evidence of management accounting directly connected with 'value creation'.

Biwott (2015), carried out a research study on the impact of management accounting information on public sector organizations. The research adopted a cross-sectional survey research design and targeted a population of eighteen ministries of the federal government. Data was collected using primary source and a questionnaire based on a five-point Likert scale, oral interviews were also utilized. Qualitative data obtained were examined using both content analysis and SPSS for quantitative data. The researcher concluded that management accounting information supports decision making in an organization.

Adler, Everatt and Waldron (2015) conducted a survey that asked management accountants in New Zealand manufacturing businesses, to indicate the techniques adopted in their business. While many studies have focused on particular techniques such as ABC or target costing, the researchers provided a questionnaire that included a vast array of management accounting information techniques to provide a fuller set of response options. Their study found that management accounting information is necessary for organizational productivity.

Khurram and Aisha (2014) studied the value relevance of accounting information on stock prices, using the listed banks on Karachi Stock Exchange. A total of nineteen private banks were sampled using the pooled regression technique. Their findings show that earning per share is more value relevant than carrying values, while accounting data explained a high proportion of the stock price. The findings show that the accounting information system influences the economic decision of users by helping them evaluate past, present and future events.

Amahalu, Abiahu, and Obi (2017) studied the effect of computerized accounting system and manual accounting system on the performance of quoted Microfinance Banks in Nigeria. The study adopted ex-post facto research design and using the Paired sample T-test to analyse the research hypotheses, research findings showed that microfinance banks that adopted computerized accounting system reported better financial performance than the microfinance banks using a manual system of accounting.

Also, in their study of management accounting practises in India, Anand, Edward and Robert (2014), studied the responses furnished by 53 CFOs in Indian corporations on their management accounting system. The survey questionnaire which also aimed to verify any significant difference between management accounting information and company growth found a positive relationship between the two variables.
Nielsena, Mitchell and Nørreklit (2015) studied the use of management accounting information in a complex and strategically significant decision-making setting. Using two case study companies with multiple decision participants and constrained information provision capabilities and uncertainties, the study reveals two methodological approaches to decision-making: analytical and actor-based. These methods reveal different ways managers deal with information uncertainty as well as making use of management accounting information and concludes that management accounting information and techniques play important roles concerning organisational complexities and strategic decision making situations.

There are also several recent studies on the value of accounting information for equity valuation, share price and earnings prediction have queried the current financial reporting model in the developed world. Although numerous studieshave been carried out on the effect of accounting information on theperformanceoflisted firms, however, this study will deal with the role of MIS systems on sales management and budgetary control systems as determining factors of firm performance, as such have not been covered in extant literature.

Methodology

This work adopted the survey research design, focusing on companies listed under the Consumer Goods Industry sector of the Nigerian Stock Exchange. These are companies engaged in the production and manufacturing of final goods that are classified for personal use rather than used in the production of other goods and include both durable and non-durable consumables. The consumer goods sector has 20 listed companies and collectively have a market capitalization of N3.81 trillion ($12.4 bn), out of total market capitalization of N24.87 trillion ($81.36 bn) as at March 2018 (NSE, 2018b), thereby accounting for over 15% of market performance of the Nigerian Stock Exchange over the period.

The 2017/2018 Fact book of the Nigerian Stock Exchange disclosed 20 companies that submitted their financial reports to the Exchange as at 31 march 2018 and this formed the population of the study. Using the survey as the main instrument to collect data, the respondents were requested to indicate their perception on the questions using a Liker scale with response ranging from “strongly agree” to “strongly disagree”.

The data obtained were analyzed based on correlation and regression analyses using the statistical package for social sciences (SPSS) and statistical tools such as frequency distribution and percentage analysis.

The respondents were top and middle-level management staff in the 20 quoted consumer goods companies. A total of 80 questionnaire forms were received from the respondents and analysed using the tools specified for the study.

Model Specification

The model for this study is stated as follows;

OP = f (SMS, MRS, BMS)
----------(1)
OP = β0 + β1SMS + β2MRS + β3BMS + e
----------(2)
Where;
OP = Organizational Performance (Profitability)
SMS = Sales Management System
MRS= Management Reporting System
BMS = Budgeting Management System
β0 =Intercept term
β1, β2 & β3 =Slope co efficients
e = error term

Table1: Percentage analysis of respondents’ responses to the questionnaire

S/N	Questionnaire items on independent variables (Sales, reporting & budgeting systems)	SA	A	U	D	SD
1	Sales management system involves planning, directing and control of personnel and selling activities of sales-force.	40(50%)	30(37.5%)	2(2.5%)	4(5%)	4(5%)
2	Efficient management reporting system is the one that provides quality information that would be appropriate, timely, current and accessible to all users.	30(37.5%)	36(45%)	0(0%)	10(12.5%)	4(5%)
3	One of the key features of budgeting system is comparing the actual result against the plan and taking corrective actions.	30(37.5%)	30(37.5%)	12(15%)	4(5%)	4(5%)
4	Reliable information enhances the management decision making of a business.	34(42.5%)	30(37.5%)	4(5%)	8(10%)	4(5%)
5	Proper disclosures of financial information promote the growth of a business	26(32.5%)	30(37.5%)	0(0%)	14(17.5%)	10(12.5%)
6	Adequate timeliness of report of financial information shows business organizations' competence.	40(50%)	24(30%)	2(2.5%)	10(12.5%)	4(5%)
7	Accounting systems practices are integral culture in your organization.	44(55%)	15(18.5%)	5(6.25%)	6(7.5%)	10(12.5%)
8	Adequate measures must be kept for the organization to plan.	35(43.75%)	20(25%)	6(7.5%)	11(13.75%)	8(10%)
9	Proper forecasting measures must be put in place by management to determine suitable mark-up on cost.	40(50%)	20(25%)	0(0%)	15(18.5%)	5(6.25%)
	Questionnaire items on dependent variable (Profitability)					
10	Proper and adequate follow up of customers must be emphasized for growth.	48(60%)	22(27.5%)	0(0%)	7(8.25%)	3(3.75%)
11	Cost reduction must be given prompt and timely attention to make the business profitable.	46(57.5%)	20(25%)	2(2.5%)	10(12.5%)	2(2.5%)
12	Reliable information enhances the management of a business in the decision regarding marketing strategy.	20(25%)	43(53.75%)	3(3.75%)	9(11.25%)	5(6.25%)

13	There is no budget for training and retraining of sales-force in your organization.	5(6.25%)	8(10%)	2(2.5%)	42(52.5%)	23(28.75%)
14	Proper accountability is useful for estimating the earning potential of the firm.	50(62.5%)	15(18.75%)	0(0%)	9(11.25%)	6(7.5)
15	Organizations' integrity about financial information enhances customers' confidence.	42(52.5%)	20(25%)	4(5%)	8(10%)	6(7.5%)
16	Good customer relationship is not only effective but efficient in your organization.	40(50%)	34((42.5%)	0(0%)	4(5%)	2(2.5%)
17	Information and communication technology does not enhance management decision making in product innovation.	10(12.5%)	8(10%)	2(2.5%)	40(50%)	20(25%)
18	Customer benefit and value-added strategies are necessary for profit planning.	44(55%)	15(18.5%)	5(6.25%)	6(7.5%)	10(12.5%)

Source: Field survey, 2019

Data Analysis and test of hypotheses

Hypothesis one:

Table 2: Result of Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.831[a]	.766	.763	.30605

a. Predictors: (Constant), Sales management system

Table 3: Result of Innov[a]te

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.510	1	40.510	45.690	.000[b]
	Residual	6.265	38	.165		
	Total	46.775	39			

a. Dependent Variable: Decision making (Sales Management)

b. Predictors: (Constant), Profitability

Table 4: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.461	.296		1.457	.128
	SALES MANAGEMENT SYSTEM	1.061	.068	.931	14.675	.000

a. Dependent Variable: Profitability

Table 4: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.461	.296		1.457	.128
	SALES MANAGEMENT SYSTEM	1.061	.068	.931	14.675	.000

a. Dependent Variable: Profitability

Based on the model summary, the R2 of 0.766 shows that about 76.6% of the variation in profitability is explained by the sales management system. The remaining 24.6% is as a result of other variables not captured in the model.Based on the ANOVA table, the F-calculated 45.690 is greater than the F-tabulated of 1.96 (from the statistical table) this shows that there is a relationship between sales management system and profitability. From the regression table, the t-statistics of 1.557 means that there is a positive relationship between sales management system and profitability. This means that 1.557% increase in sales management system, will lead to 14.675% increase in profitability.

Decision: Since the P-value of 0.00 is less than 0.05, we reject the null hypothesis and accept the alternative hypothesis and conclude that sales management system has a significant effect on the profitability of listed consumer goods firms on Nigerian Stock Exchange.

Hypothesis two:

Table 5: Result of Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.801[a]	.712	.707	.42636	.813

a. Predictors: (Constant), Management reporting system

b. Dependent Variable: Profitability

Table 6: Result of ANOVA[a]test

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	29.867	1	29.867	18.302	.000[b]
	Residual	6.908	38	.182		
	Total	36.775	39			

a. Dependent Variable: Profitability

b. Predictors: (Constant), Management reporting system

Table 7: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.432	.347		1.246	.220
	MANAGEMENT REPORTING	1.050	.082	.901	12.818	.000

a. Dependent Variable: Profitability

Based on the model summary, the R2 of 0.712 shows that about 71.2% of the variation inprofitability is explained by management accounting reporting. The remaining 28.8% is as a result of other variables not captured in the model.Based on the ANOVA table, the F-calculated 18.302 is greater than the F-tabulated of 1.96 (from the statistical table) this shows that there is a relationship between management reporting and organizational profitability. From the regression table, the t-statistics of 1.246 means that there is a positive relationship between management reportingsystemandorganizational profitability. This means that 1.246% increase in management reporting will lead to 12.818% increase in profitability.

Decision: Since the P-value of 0.015 is less than 0.05, we reject the null hypothesis and accept the alternative hypothesis and conclude that Management reporting system has a significant effect on the profitability of listed consumer goods firms on Nigerian Stock Exchange.

Hypothesis three:

Table 8: Result of Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.845[a]	.793	.790	.46171	.596

a. Predictors: (Constant), Budgeting system
b. Dependent Variable: Profitability

Table 9: Result of ANOVA[a]test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	67.674	1	67.674	17.458	.000[b]
	Residual	8.101	38	.213		
	Total	75.775	39			

a. Dependent Variable: Profitability
b. Predictors: (Constant), Budgeting system

Table 10: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.035	.212		.167	.868
	BUDGETING SYSTEM	.938	.053	.945	17.817	.000

a. Dependent Variable: Profitability

Based on the model summary,the R2 of 0.793 shows that about 79.3% of the variation in profitabilityis explained by budgeting system. The remaining 20.7% is as a result of other variables not captured in the model.
Based on the ANOVA table, the F-calculated 317.458 is greater than the F-tabulated of 1.96 (from the statistical table) this shows that there is a relationship between budgeting system and organizational profitability. From the regression table, the t-statistics of 0.167 means that there is a positive relationship between budgeting system and organizational profitability. This means that 0.167% increase in budgeting system will lead to 17.817% increase in profitability.

Decision: Since the P-value of 0.015 is less than 0.05, we reject the null hypothesis and accept the alternative hypothesis and conclude that budgeting system has a significant effect on the profitability of the listed firms in Nigerian Stock Exchange.

Discussion on Findings

The findings in hypothesis one revealed that sales management system has a significant effect on the profitability of listed firms in the consumer goods industry sector of the Nigerian Stock Exchange. These findings conform with the findings of Hunton (2014)that management accounting information affects organizational profitability. Also, the result of the test of hypothesis two revealed that management reporting system has a significant effect on the profitability of listed firms on the Nigerian Stock Exchange. These findings are in agreement with Adler, EverattandWaldron(2015)that management information system affects organizationalgrowth. The findings in hypothesis three revealed that the budgeting system operated in corporate organizations have a significant effect on the profitability of organizations. This result has also corroborated the views expressed by Osisioma (1989) in Eyisi (2003) indicating that the use of budgetary systems assist in the attainment of corporate objectives, and ultimately, the financial performance of these organizations.

Conclusion

The place of Management Accounting Information Systems in making effective decisions in an organizationcan not be overemphasized. The literature presented in this study exposed the critical role of management accounting information in the decision-making processincorporate organizations towards the attainment of corporate goals. This study has highlighted that management accounting information system should be accessible in supplying highlyneededinformation to guide decision making. This entails a carefully conceived, designed and executed information system capable of building a bridge between the managers of the organizations and the investors.
Based on the findings of this study, management accounting information system should be adequately deployed in every corporate organization to drive corporate sustainability in a rapidly changing business environment. Management information system should be seen as an important tool for the decision-making process in an organization and more encouragement should be given to its use to enhance efficiency and effectiveness of corporate organizations.

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Our goal is to ensure success in ICAN exams. We have, therefore, provided solutions to some past questions to guide candidates in future exams. Although these suggested solutions have been published under the Institute's name, they do not represent the views of the Council of the Institute. ICAN will, therefore, not enter into any correspondence about them.

ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
PART II EXAMINATIONS – SEPTEMBER 2021
QUANTITATIVE ANALYSIS
Time Allowed: 3 hours

SECTION A: PART I MULTIPLE-CHOICE QUESTIONS (30 Marks)

ATTEMPT ALL QUESTIONS
Write ONLY the alphabet (A, B, C, D or E) that corresponds to the correct option
in each of the following questions/statements

1. A process that ensures every element of the population has some known chance of being selected is known as

A. Non- random sampling
B. Simple random sampling
C. Stratified sampling
D. Random sampling
E. Systematic sampling

2. Which of the following is **NOT** an example of non- probability sampling?

A. Convenience sampling
B. Quota sampling
C. Cluster sampling
D. Haphazard sampling
E. Judgments sampling

3. Which of the following is **NOT** a bar chart?

A. Component
B. Simple
C. Percentage component
D. Cumulative
E. Multiple

4. A distribution in which the mode is greater than the median and the median is greater than the mean is referred to as a

A Positively-skewed distribution
B Normal distribution
C Negatively-skewed distribution
D Continuous distribution
E Poisson distribution

5. Which of the following is normally used by an Accountant for making decision when series of values are summarised into a figure?

A. Average
B. Table
C. Chart
D. Regression
E. Correlation

6. Which of the following is **NOT** a measure of partitioning?

A. Quintiles
B. Interquartile
C. Percentiles
D. Deciles
E. Quartiles

E. Quartiles

7. Which of the following is **NOT** a measure of dispersion?

A. Standard deviation
B. Interquartile range
C. Arithmetic mean
D. Mean deviation
E. Quartile Deviation

8. The following data shows the relationship between income (x) of an Accountant and the monthly upkeep given to the wife (y) for a period of 10 months:

□□ = 620, ⊠² = 440, ⊠² = 900, ⊠ = 64, ⊠ = 90.

Calculate the Pearson's correlation coefficient.
A. 0.9412
B. 0.8412
C. 0.4899
D. 0.4889
E. 0.0016

9. A component of time series analysis that deals with a variation caused by unpredictable events such as floods, disasters, wars, etc is known as

A. Secular variation
B. Cyclical variation
C. Seasonal variation
D. Irregular variation
E. Natural variation

10. The weighted index number that uses the arithmetic mean of the quantities or prices of the current and base time points as weighing factors is referred to

A. Fisher's ideal index
B. Laspeyre's index
C. Paasche's index
D. Marshal edge-worth's index
E. Simple aggregate price index

11. A survey of a housing estate showed that 28% of the tenants had GoTV and 78% had Startimes TV subscriptions. The probability that a household picked at random had either a GoTV or a Startimes TV subscription is

A 0.1584
B 0.1707
C 0.2184
D 0.7816
E 0.8416

12. The standard deviation of scores obtained by candidates who sat for Quantitative Analysis March diet of ATSWA examination was 15. If a random sample of 9 candidates gave a mean score of 47, then the calculated test statistic for testing the hypothesis: : 50 : 50 H0 m = H1 m > is given as

A. t = -0.6
B. t = 0.6
C. t = 0.65
D. z = -0.6

E z = 0.6

13. If the cost and revenue functions (both in N) of a small firm producing a local hand sanitizer are respectivelyC(x) = 5x + 2000 and R(x) = 9x , where x is the quantity of the sanitizer produced and sold, then the maximum value of x for the firm to make a profit of at most N10,000 is

A. x £ 1,000
B. x £ 2,000
C. x £ 2,500
D. x £ 3,000
E. x £ 3,500

14. The weekly costs (NC) for AKJIL Plc were plotted against the company's production level (P) for the last 100 weeks. If the regression line for the company is estimated to be C = 1,200 + 500 x, which of the following statements is true about the weekly costs?

A. Fixed costs are N1,200. Variable costs per unit are N5
B. Fixed costs are N1,200. Variable costs per unit are N50,000
C. Fixed costs are N1,200. Variable costs per unit are N500
D. Fixed costs are N12. Variable costs per unit are N5
E. Fixed costs are N 12. Variable costs per unit are N 500

15. When there is a relationship between the change in the quantity demanded and the price of a good or service, the elasticity is known as

A. Income elasticity of demand
B. Gross elasticity of demand
C. Consumer elasticity of demand
D. Equilibrium elasticity of demand
E. Price elasticity of demand

16. A firm has estimated that the sales function P(x) = 25x – 3 and the cost function C(x) = 1500 + 9x2 –13x, where x is the number of items produced and sold. Determine the break-even quantity for the firm.

A. -11.3
B. -10.0
C. -9.4
D. 9.4
E. 10.0

17. Find the amount which would be obtained from a principal of N2,000 at 6% compounded quarterly for 5 years.

A. N2,593.71
B. N2,673.71
C. N2,683.71
D. N2,693.71
E. N2,793.71

18. The cash flows of a mini-project with the discount factors are presented in the table below:

Year	Net cash flow(₦)	Discount factor
0	(750,000)	1
1	200,000	0.833
2	450,000	0.694
3	550,000	0.579

The Net Present Value (NPV) of the project is

A. - N43,750
B. - N47,350
C. N43,750
D. N47,350
E. N50,000

19. Operations Research tools are from

A. Computer Science
B. Economics
C. Engineering
D. Mathematics
E. Statistics

20. A tight constraint will have a shadow price of

A Zero
B One
C Greater than zero
D The value of the right hand side of the constraint
E Less than zero

21. The objective function of Dual Linear Programming problem of the following Primal problem:

Min. P = 1 2 12 26 x x +
Subject to: 1 2 3 4 5, x x + ^{3} and 1 2 1 2 2 6 6, , 0 x x x x + $^{3\ 3}$ is

A. Min.Q 1 2 = + 5 6
B. Max.Q 1 2 = + 5 6 y y
C. Min.P 1 2 = + 3 4 x x
D. Min.Q 1 2 = + 3 4 y y
E. Min.P 1 2 = + 5 6 y y

22. A firm's annual demand is 100,000 units. Each unit costs N400. If the cost of placing an order is N7,000 and the annual holding cost is 20% of the purchase price of a unit, calculate the economic order quantity

A. 4,181.3 units
B. 4,182.0 units
C. 4,183.3 units
D. 4,184.0 units
E. 4,284.3 units

23. Given that EOQ is 250,000 units in a manufacturing industry. If the cost of
placing an order is N8,000 with the holding cost 10% of the purchase price per
unit, determine the annual demand if the cost of each unit is N650.

A. 252,903,250 units
B. 252,904,250 units
C. 252,905,250 units
D. 253,906,250 units
E. 253,907,250 units

24. The formula for average stock level is given as

A. Minimum stock level + 21 of Re-order level
B. Maximum stock level + 21 of Re-order level
C. Minimum stock level + 31 of Re-order level
D. Maximum stock level + 31 of Re-order level
E. Minimum stock level + 41 of Re-order level

Use the following information to answer questions 25 and 26:
The transportation problem of shipping commodities A, B and C to warehouses X, Y and Z is modeled with the unit costs tabulated below:

If the initial solution to the problem obtained using North-West Corner Rule (NWCR) method, is shown in the following allocation table:

Warehouses / Commodities	X	Y	Z	SUPPLY
A	2 10	3	4	15
B	1	2 10	2 q	20
C	4	5	4 r	15
DEMAND	10	15	25	

25. The value of q is
A 25
B 20
C 15
D 10
E 5

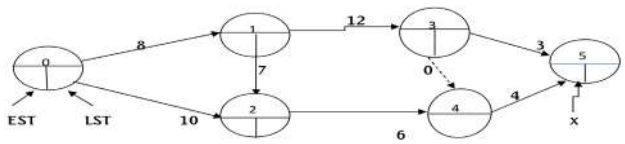
26. The value of r is

A 5
B 10
C 15
D 20
E 25

27. The amount of time,for which a group of activities could be delayed without affecting the overall project duration, is known as

A. Earliest time
B. Free float
C. Independent float
D. Latest time
E Total float

28. The Activity – On – Node network diagram below indicates the Earliest Starting Time (EST) and Latest Starting Time (LST) of a small project.



What is the value of the Earliest Starting Time, x?

A. 20
B. 23
C. 25
D. 33
E 43

29. If the average life span of an electronic component in an Automated Teller Machine (ATM) of a bank is 2.5, then the average number of weekly replacements of 600 components is

A. 150
B. 240
C. 850
D. 1040
E 1200

30. A firm manufactures 4 types of one of its products. The probability distributions for demanding these types of products are as tabulated below:

Type	Probability
A	0.15
B	0.42
C	0.28
D	0.15

Use the random numbers 63 and 38 to simulate the next two demands

A. Type C, Type D respectively
B. Type B, Type D respectively
C. Type D, Type C respectively
D. Type B, Type C respectively
E. Type C, Type B respectively

SECTION A: PART II SHORT-ANSWER QUESTION (20 MARKS)

ATTEMPT ALL QUESTIONS

Write the correct answer that best completes each of the following questions/statements

1. If a regression model y x = - 4.5 6.2 , then the value of regression coefficient is ……..

2. If the coefficient of variation of a data set is100% , then its mean must be equal to its……

3. The marks obtained by the students in an Accounting examination are 12, 11, 10, 7, 8,U and 16. If the mean is estimated to be 10, then the variance is …….

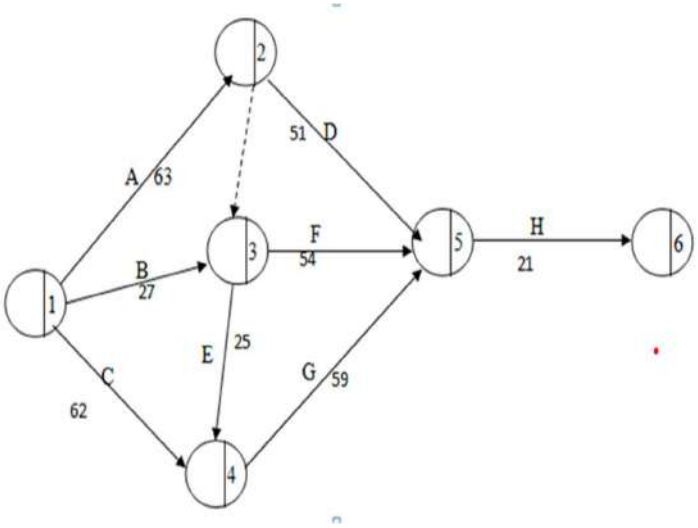
4. Given that the Laspeyre price index is 112.8% and Paasche price index is 113.69%, the Fisher's price index is ……

5. The present value of N1.8 million at 20% simple interest rate over 21 2 years is.....

6. The group of items in a stock at the time, during which inventory is taken is known as ……..

7. For every Linear Programming (LP) problem, there is a corresponding dual form. The original LP problem is known as ……..

Use the following network diagram to answer questions 8 and 9:



8. Find the sum of Earliest Start Times (EST) for activities F and H in weeks.

9. Calculate the Total float for Activity F in months if 30 days make a month.

10. The marks obtained by the students in an Accounting examination are 12, 11, 10, 7, 8,U and 16. If the mean is estimated to be 10, the median is ……

11. The selling price of an item produced by a company is N100. If the total overhead cost is N8,750 and the cost per unit is N 75 , then the number of units that must be produced and sold for the company to break-even is ……

12. A graphical solution to any form of equation is regarded as an .....

13. Currently, the number of methods for solving a Linear Programming problem is ……

14. The value of p in the table below is ……

Time (t)	Value of series (Y)	Trend by LSM $Y = 43 + 7t$	Seasonal variation assuming additive model
1	47		p
2	58		
3	62		

15. Rejection of a null hypothesis when it is true and expected to be accepted leads to ……

16. The two main costs that increase with time in the replacement of items that wear-out gradually are …… and ……

17. Sample is a fractional part of a population for which data can be sought and it must be a .....sample.

18. Operations Research attempts to find …… solution to a problem.

19. An investment has a net present value of N15,000 when the discount rate is 10%. If at the discount rate of 12 %, its net present value is N6,000, then the Internal Rate of Return (IRR) of this investment is …….. %

20. A transportation problem is unbalanced if ……..... is not equal to ……

SECTION A

PART I : MULTIPLE CHOICE SOLUTIONS

1. D
2. C
3. D
4. C
5. A
6. B
7. C
8. B
9. D
10. D
11. E
12. D
13. D
14. C
15. E
16. E
17. D
18. D
19. D
20. C
21. B
22. D
23. D
24. A
25. D
26. C
27. E
28. C
29. B
30. E

PART II: SHORT ANSWER SOLUTIONS

1. -6.2
2. Standard Deviation
3. 10
4. 113.24%
5. N1,200,000 or N1.2million
6. Physical stock
7. Primal Solution
8. 30 weeks
9. 1 month
10. 10
11. 350
12. Estimate/Approximate solution/Approximation
13. Three (3)
14. -3
15. Type I error
16. Maintenance, Repair
17. Representative sample
18. Optimal
19. 13.33 %
20. Total demand, total supply

	RECOGNISED TUITION CENTRES	ADDRESSES	E-MAIL	TELEPHONE	VALID TILL
1	3A Professional Tutors Limited	3A Professional Tutors Limited,(Doseg Int'l College, 41B Akin Mateola Street,By GT Bank, Lilly Estate, Amuwo Odofin, Lagos	info@3AProfessionaltutors.com/ kunleecomat@gmail.com	07030003251, 08033757234	March , 2023
2	Able God Professionals College	47, Ikotun/Egan Road, Market B/stop, Igando, Lagos	agpcentres@yahoo.com	234-8035398818, 08033531527	March 1,2022
3	ABUAD Tuition Centre	Department of Accounting, ABUAD Ado -Ekiti			April. 2021
4	Accountancy Trainining Centre , Makurdi	Uni-Agric Road, Opposite First Gate, Makurdi, Benue State	gealfred@yahoo.com	07038068866, 08053559666,	2018
5	Accuracy Tutors, Aba	Immaculate Girls Secondary School, Umungasi, Aba, Abia State	ijomao@yahoo.co.uk	8068548135, 08053054434	Aug-21
6	Achievers' Tutor Nig. Ltd	Junior Secondary School Phase 3, Gwalalada, Abuja	akinsanwo@gmail.com	8133488948	April. 2020
7	Alternative School, Port Harcourt	Plaza 21, Alcon Road, By Welcome U Supermarket Woji. Port Harcourt. R	iqalternativeschool@gmail.com,a	08176014423, 08176014424	October,2022
8	Assurance Success Point	22, Ijede Road, Itamaga, Ikorodu	successpointassociate@gmail.com	07034608759, 08077595821	May. 2022
9	Best Option Tuition Centre, Makurdi	9, kashim Ibrahim Road, Makurdi, Benue State	terencegoddy@yahoo.com	8034932068	2017
10	Best-Ranked Dynamic Professional Tutors	1, Institute of Continuing Education, off Wire Road, Benin City, Edo State	fisayoacca@gmail.com	234-7033322328	April. 2021
11	Brace Management Solution	Proactive Chamber, 131 Ofada road, Mowe, Ogun State	waleakanbi@yahoo.com, bmanagementsolution@yahoo.	8023509889, 08023509872	Apr-21
12	Brainy Professional Academy	2nd & 4th floor, ANCE Building, Magazine road, Jericho, Ibadan, Oyo State	taofik.adeagbo@gmail.com	907,022,347,108,034,000,000	March. 2022
13	Bratim Training Centre Limited	Ground Floor, National Library Building, Adjacent Reiz Continental Hotel, Central Area, Abuja	tejan@bratim.com	08059125288, 08030408384	2019
14	CIP Consulting ltd	Solid Rock International, FHA, Lugbe, FCT, Abuja	cipconsulting@yahoo.com	234-9096762550	Jan. 2022
15	Crest Professional Tutors, Ijeshatedo, Lagos	Florida House, Plot 133 Apapa/Oshodi Expressway, beside GTBank, Aguntejika B/s Ijeshatedo	crestprofessionals@gmail.com	08056243941, 07025289695, 08033721559	2019
16	Crown Academy	14, Abdulsalam Street, Off old Akute Road, Obawole, Iju, Lagos State	crownacademynigeria@gmail.com	8023181240	Sept.2021
17	Deo-Gratia Professional Tutors, Oshogbo	25, Oyedokun Street, Ago-Wande, Oke -Onitea Road, Oshogbo, Osun State	deogratiasp.t.edu@gmail.com	08060053496	2019
18	Dynamic Stride Professional Ltd, Ibadan	28, Adebayo Street, Kongi layout, New Bodija, Ibadan	dynamicprofessionaltutors@gmail.com	08064904411, 08069198274, 08059134594	2020
19	Edge Educational Services & Logistics	47, Athur Eze Avenue (Emmaus House), Awka, Anambra State	edgelogistics15@gmail.com	8033036184	2018
20	Edo Wyse School of Professional	75/98, Arthur Eze Avenue, by Unizik Temp-Site Junction, Awka, Anambra state	edo-wyse@hotmail.com, fidelisabiah	07038584227, 08065303399	2018
21	Ehibram International Consultancy Ltd	172, Idimu Road, Abule-Odu Bus stop, Idimu , Lagos	ehibrameduconsult@gmail.com	8066759953	Dec. 2021
22	Equitorial Tutors limited	Iponri Grammar School, behind Lead Way Assurance, Iponri	sabamaudil@yahoo.com	8097118222	May. 2022
23	Excel Professional Centre	11, Queen Elizabeth Road, Mokola, Ibadan, Oyo State	excelprofessionalcentreeng@yahoo.com, moolaoluwa@ya	07081488611	2016
24	Excellent Associates Tutors	African Church Model College, College Road, Ifako-Ijaiye, Ogba Lagos	excellentassociates@yahoo.co.uk	08025112972 , 07060616956	2019
25	First access Associate Ltd	Gobi Plaza, 221/223 Idimu Road, Egbeda	firstaccessltd@gmail.com	8023032873	Mar-22
26	First Attempt Associates	15, Udotung Ubo Street, Off Aka road, Uyo Akwa-Ibom State	sunnymanekpo@yahoo.com	8023168512	Sept.2021
27	First Class Associate Tutors	Millbank Hall Secondary School, 26 LASU Isheri road, Agboroko, Bus Stop, Ojoo, Lagos	fcatutor@gmail.com	08028407323, 08131672267	Nov. 2020
28	Foresight Professional Institute	24 Road Opposite H Close, Festac Town, Lagos	foresight_professional@yahoo.com	08033034504, 08024145121	2019
29	Galaxy Professional Tutor & Consultant	L.E.A Primary School, by Mopol Junction, Opposite Diamond Bank Plc, Nyanya, Abuja	galaxytutors11@yahoo.com	08063513106, 08056922440	October,2022
30	GAMP Tuition house	Bamidele Ajala House, Plot 8-9, State Residential Estate, Ise road, Ikere Ekiti	registrar@gamptuitionhouse.com	8034093675	Apr-22
31	Hedge Professional Services Ltd	Suite 323 Lozumba Plaza, Opposite GSS Garki Area 10, Abuja FCT	hedgep323@gmail.com	08033081244, 08033812878	Aug.2021
32	Horizon Business School	13, Edede street, Owerri, Imo State	info@horizonbusinessschool.com	9024241669	April. 2021
33	ICAN Minna Tuition centre	Women Day College, Opposite Keystone Bank, Bosso Shiroro road, Minna	mohammedsoja@yahoo.co.uk	08099529225, 08036875196	March. 2022
34	Ideal Professional Tutors, Ago-Iwoye	Along OOU Mini campus road, Adjacent, Limba Fuel Station, Ago Iwoye	adesanwolobae@yahoo, emmaadesanwo@gmail.com	08053846329, 08056182849, 081381059914	2019
35	Insight Professional Mgt & Consulting	St. Brigid's Convent School, Mokola, Ibadan, Beside St. Gabriel Catholic Church, Mokola	labzkuzle2@yahoo.com	0.07031054988	Oct. 2020
36	Integrity Professional Academy, Warri	253 Warri Sapele Road, Warri, Delta State	pintegrity@yahoo.com 08028808182	08060008880. 08028808182	2018
37	IQ Bryte, Ipaja Lagos	Towergate Private School, Falola Street, Off Church B/Stop Ipaja, Lagos	nicetybase@yahoo.com , iqbryteprofessionals@yahoo.co	08062933469, 08171890482	2019
38	Knight Business School, Oyingbo	80, Murtal Mohammed Way, Ebute-Metta	braingro@yahoo.com	08034034195, 08084369290	2018
39	Legacy Associate Limited	Olatunji HSE/Legacy HSE, 299/295, Ikorodu Rd, Idiroko B/stop, Maryland, Lagos	legacyassociates@ymail.com	07038917831, 08023226913	Jul-22
40	Legend Business School	105, Ogombo Road, Off Abraham Adesanya Estate Round about, Lekki-Ajah	bencisa@yahoo.com	234-8023200577	Jan. 2022
41	Lekki Professional & Associate Ltd	Tollywood Schools, Km 43 Lekki Epe Exppressway Oko Ado By Splash	topefatai@gmail.com	08022222174, 08099445029	April. 2023
42	London College of Science &Tech. Ikeja	110b Oluwole Philips Avenue, off Obafemi Awolowo way, Ikeja	cashflowacademy2017@gmail.com	8188166766	2020

43	Management Education & Training Ltd	43A Seriki Aro Street, Off Ajao Road, Off Adeniyi Jones, Ikeja	ican@meteducationng.com	08034855960, 08138562897, 08143219684	June.2020
44	Maximus Professionals	Palmville College, 41/411 Road, Gowon Estate, Opposite Ponle St.Ipaja, Egbeda	kingsleyodion@gmail.com	08121332706, 08137047329	2019
45	MSL, School of Accountancy & Mgt. Studies	L8, Ahmadu Bello Way, Katsina Round-about, same building with Studio 24, Kaduna, Kaduna State	mucomail@yahoo.com	08038492871	2018
46	Navigation Tutors	Saints Model Colle, Ogun State Housing Corporation, Ota , Ogun State	ipuoledavid@yahoo.com	8032324206	Sept. 2021
47	Networth Professional Academy, V/I	Kings College Annex, Adeyemo Alakija Street, Victoria Island Lagos	networthacademy@gmail.com, info@networthacademy.co	07015688772, 08182429689	2019
48	Nomba Limited	28, Jemila Joy St. off Obafemi Awolowo Rd, Radio B/S, Ikorodu Video lectures-Odyssey Place, Plot 4 TF Kuboye Rd, Oniru Lekki	gwasiu009@gmail.com	8171396487	Aug.2021
49	Onitsha Business School, Onitsha	19A Lady Regina Nwankwu Avenue, GRA, Onitsha, Anambra State	info@onitshabusinessschool.com	08037060685, 08059271049	February, 2023
50	Opsy Consult Limited	Anthens College, 3rd Avenue, C Close , Opposite Immigration Office, Festac Town	opsyawo@yahoo.com	08023743124, 07030272744	Aug.2021
51	Password Professional Tutors, Akoka	Oluwole Pry School Complex, Beside Unilag Main gate, Akoka	pwplimited@yahoo.com	gsm 08097526579	2018
52	Pointon Academy	Govt. Secondary School, Phase 4, Kubwa, Abuja	pointonacadey@gmail.com	08033148445, 08039581008	Aug.2021
53	POSSE Associates Tutors, Enugu	WTC Primary School Compound, Off WTC B/Stop, Near University of Nigeria, Enugu Campus (UNEC	posseassociates@yahoo.com, sesan.sosanolu@yahoo.com	08038036940	2019
54	Potec Training Centre, Abuja	84, Gado NASCO Road, Phase 2, Site 1, Kubwa	osalorp@gmail.com	8060311442	Aug-21
55	Potec Training Centre, Port-Harcourt	1 Chinda Street, Off Stadium Road, Opposite BEKO Port-Harcourt	potectrainingcentre@yahoo.com	8033403848	2019
56	Precept with Passion Consulting	164, Iju Road,Opposite Fagba grammar school & 57, Isheri rd, County B/stop Ogba	consultingpwp@gmail.com	08053642805	2020
57	Professional Tutor for Success	PTS Building, Opposite NUJ Secretariat, Iwo/Ibadan Road, Dada Estate, Oshogbo, Osun State	ptsosogbo@gmail.com, ayoajaye lobe@yahoo.com	08023526689, 08038550380	2019
58	Protrac Associates Limited	68, TOS Benson (Beach) road, opposite Ikorodu library, Ebute, Ikorodu	agbaawo2014@gmail.com	8033050586	May. 2021
59	Real Professional Tutors	Wuse Zone 6, School Compound, behinde Oando filling Station, Abuja	realtutorsltd@hotmail.com	08136111191, 036184645	2018
60	Risk Free Standards Associates Limited	5, Olusoji Idowu Street, Off Association Avenue, Ilupeju, Obanikoro B/Stop, Lagos	riskfreestandards@yahoo.com, seyiolanrewaju@yahoo.co	08023050654, 08039475507, 013423986	July. 2020
61	Safe Associate Limited	31, Ore-Ofe Street, Gbaja, Off Barracks B/Stop, Onitolo, Opposite Laspotech Surulere Campus, Lagos	safeican@yahoo.com, oyemolu@yahoo.co.uk	08038103492, 08023210622,07034030255	2017
62	Salvage Professional School, Ibadan	9, Kabiawu Street, Opp. Veterinary, Mokola Ibadan	salvageconsultants@yahoo.com	8057741108	2019
63	Speedysuccess Professional	391, Old Ojo Road , Rooftop Tanterlizer Building, Satelite Town, Lagos	speedysuccesspro@gmail.com	8148421111, 08029563287	Sept. 2019
64	Springboard Associate	6, Adeyemi Olusegun Street (Near Munirat Filling Station) off University road, Tanke, Ilorin	springboardassociates12@gmail.com	234-8147383987	Jan. 2022
65	SQUAD Associates	Excellent Foundation College, Beside Big Treat, Omole Bus Stop, Agidingbi, Lagos	sqdassociates@gmail.com	08038314631, 08028842327	July. 2020
66	Starry gold Academy	Suit D2 Alhaja Humani Shopping Mall, 82 Kudirat Abiola Way, Oregun , Lagos	starry.gold3@yahoo.com	07038174484 , 08023428420 , 08123189141	2018
67	Students SWOT Associate, Enugu	Govt. Secondary school, opposite shoprite, Abakaliki rd, Enugu	nwabuzorlexy@yahoo.ca	8063582316	October,2022
68	Superiorpoints Associates Limited	148 Olojo Drive, FCMB Building, Opposite Ojo Local Govt Secretariat, Ojo	gomoregbee@yahoo.com	07064963490, 07044913730	2019
69	Sure Success Better Consult, Lokoja	Ule Close, GRA, Lokoja, Kogi State	suresuccess4real@gmail.com	08027870760, 08077175165, 08053956630	2019
70	Synergy Professionals, Iponri	2, Afric Road, Off Funsho Williams Avenue, Iponri, Surulere, Lagos State	synergyprofs@yahoo.com	7050571587, 08038426744	2018
71	Taraba Business School, Jalingo	Opposite Civil Service Commission, 183 Hammaruwa Way, Jalingo	gayinka2006@yahoo.com	Gsm 08060660861	2019
72	Technion Academy Limited, Sango Ota	71, Idiroko Road, Sango Ota, Dental Bus Stop, Oju-ore, Ogun State	adegbola_michael@yahoo.com	08036960102, 08177465141	2019
73	Tekoa Consult, Ijebu Ode	12 Omo owo Street, Along General Hospital, Ijebu - Ode	tekoaconsult@gmail.com	8037272718	Sept. 2019
74	Timerte Tuition	4, Idi-Iroko Road, Leadwell Academy, beside Justrite Supermarket, Ota, Ogun State	timrite74@gmail.com	08033965019, 08028555956	May. 2022
75	Top Professional Solutions,Port Harcourt	5B, Omerelu Street, GRA Phase 1, Port Harcourt	toriyomi@tpsng.com	8022275354	2018
76	Topclass Tutors Limited	27, Moronfolu Street, Pako Bus Stop, Akoka, Lagos	tajudeenalabi6791@yahoo.com	08023003675	August 2022
77	Topnotch Learning Centre Ltd, Abuja	Suite 23, 2nd Floor, O'neal Centre, Plot 360 Obafemi Awolowo Way, Jabi, Abuja	info@topnotcn.ng , www.topnotch.ng	08104012026 , 07059491175	2019
78	Toplalented Tutors, Lekki	SM Fasinro Memorial School, 12, Ayetoro Ajah Ilaje, Ajah, Lagos	chriscapital@yahoo.com	8037447917	July.2021
79	Trace Professional Associates Limited	Answar-ul-Islam Girls High School, Km 27, Lagos/Abeokuta Exp. Ahmadiyya B/S Ijaye Ojokoro	tracepass008@gmail.com,mayowale003@yahoo.com	08064302210,08025870770, 08053949705	2019
80	Treasurerhall Training, Festac, Lagos	Waterfront Plaza, 1st Avenue, Near 1st Gate Festac Town, Lagos	info@treasurehalltraining.com , chidiotumba@gmail.com	08035237320, 07089676799, 08182005099	2019
81	Triumph Dynamics Professional Limited	UMC Demonstration School, Molete, Ibadan, Oyo State	triumphglobal2000@yahoo.com	08034087611	2017
82	Unique Professional Tutors Limited	Govt Junior Secondary Sschool, Tudun Wada, Zone 4, Wuse, Abuja	uniquetutors@yahoo.com	7040500671	Nov. 2020
83	Wellspring Professional Solutions	Management Development Institute, Mary Slessor Avenue, Calabar	wellspringprofessional@gmail.com	234-90782442361	Mar-22
84	Wide-Range Professionals Ltd, Arepo Ogun	Flomic Private School, Plot 2210 Alao Arasi Street, Glory Land Estate, Arepo Ogun State	gbadeyanolushola@yahoo.com	8131140984, 08030454946	2019
85	WYSE Associates Limited	C/O Immaculate College Compound, Maryland, Lagos	wysestudents@yahoo.com, adeniji.adeniyi@gmail.com	08033078065, 08023168451	2019

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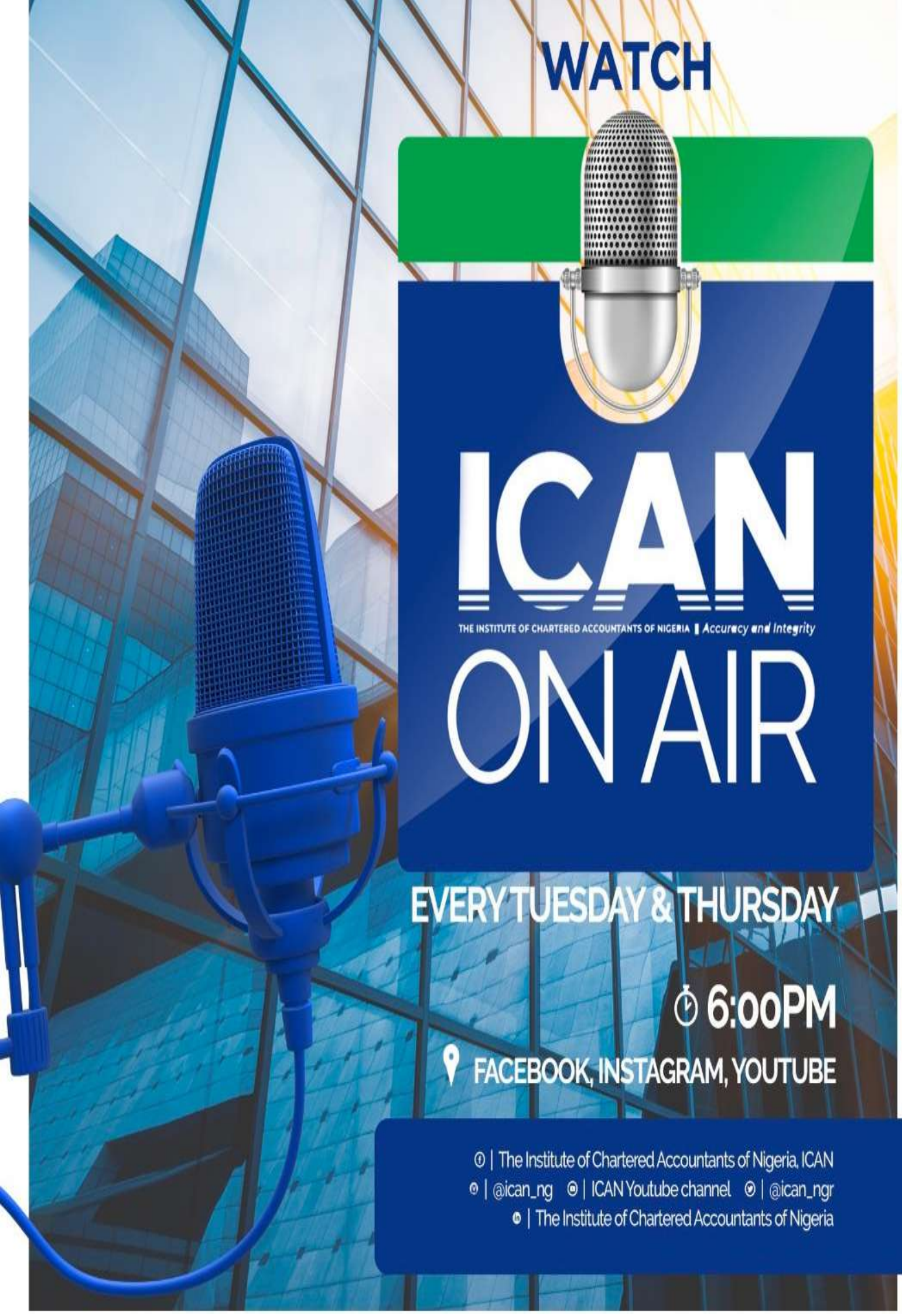
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