

# **INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) AND ACCOUNTING PRACTICE IN NIGERIA: AN EMPIRICAL INVESTIGATION**

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## **ABSTRACT**

This paper empirically investigated the influence of Information and Communication Technology (ICT) on accounting practical (AP). Data were drawn from accountants in accounting firms and the private and public sectors using questionnaire. Analyses were performed by means of descriptive statistics, Pearson's product moment coefficient of correlation and multiple regression with the statistical packages for social sciences (SPSS). Findings indicate a statistically significantly strong positive relationship between ICT and AP. Results of descriptive statistics indicate that power constrains this relationship by 66.73%. Similarly, financial accounting has a greater percentage (48.1%) of ICT usage than auditing and taxation. ICT is a prime factor for improved AP. Investment in power is a prerequisite for organizations to take full benefit of ICT, particularly, in AP.

**Keywords:** Information and Communication Technology (ICT), Accounting practice (AP), Nigeria

## **Introduction:**

Information and communication technology (ICT) has in the present day 21<sup>st</sup> century constituted a major medium for the processing and dissemination of information. Its influence is so pervasive that virtually all aspects of business (formal and informal, profit and non-profit) which impact on the well being of the society have been engulfed. According to Omidinia *et al*, (2012:104-112), ICT is an increasingly powerful tool for participating in global markets, promoting political accountability, improving the delivery of basic services and enhancing local development opportunities. This notwithstanding, the rapid development of ICT as expressed by Omidinia *et al*, (2012:104-112,) affects the development of technology implementation in every aspect of life from business, entertainment, socials and education. Infact, ICT is a web that determines the economic growth of nations. The success of any nation is often decided by the degree and extent of socio cultural, socio economic and political improvement brought to bear through the application of science, technology and mathematics (Nwabueze & Ozioko, 2011).

Jaiyeola (2007: 48-49) examined ICT as a tool for effective performance of chartered accountants and noted that, with the automation of corporate processes which reduces paper work, the 21<sup>st</sup> century accountants are confronted with enormous challenges, either as financial accountants, management accountants, consultants, tax planners or as auditors. These challenges according to him, will invariably position information technology (IT) auditing as the future of the accounting profession. Yeboah *et al*, (2014:121– 132) investigated information systems and accounting practices in Ghanaian public institutions. Findings identified timely delivery of financial statements and the creation of avenue to access financial information as positive effects of ICT, while lack of ICT expertise, suitability and cost of accounting software and data security constituted major challenges to the adoption of ICT.

These studies, on one hand, considered from a theoretical dimension, the role ICT provides to qualified accounting professionals. On the other hand, a study of accounting practice of Ghanaian public institutions was undertaken. The private sector which is the major drivers of every economy was ignored. The purpose of this paper is to empirically investigate the influence of ICT on accounting practice in Nigeria, drawing evidence from accountants in accounting firms and the private and public sectors of the economy. The next sections will discuss literature review, methodology, data presentation and analysis. Others are discussion of findings, conclusion and recommendations.

## **Literature Review:**

### **Theoretical Background of ICT:**

ICT involves the processing and dissemination of information through integrated electronic devices and related software. As documented by Margaret Rouse (Web Result), it is a term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems, etc as well as the various services and applications associated with them such as videoconferencing and distance learning. Similarly, ICT could be seen as a broad based technology (including its methods, management and application) that supports the creation, storage, manipulation and communication of information (French, 1996) in Nwabueze & Ozioko (2011).

ICT Development Index (IDI) ranked Denmark 1<sup>st</sup> on ICT use and access amongst the various countries of the world; with South Korea on the 2<sup>nd</sup> position. The top 30 countries in the rankings include Europe, Australia, Bahrain, Canada, Japan, Macado (China), New Zealand, Singapore and the United States (International Telecommunications Union [ITU], 2014). The African continent is not left out in the effort to attain great heights in ICT acquisition. Amongst the global top 25 countries in internet usage, Nigeria is on the 10<sup>th</sup> position with estimated 57.7m users in 2014, expected to increase to 84.3m in 2018. Egypt is the second African country on the 17<sup>th</sup> position with estimated 36.0m in 2014, to rise to 47.4m users in 2018. South Africa is the 3<sup>rd</sup> African country on the 25<sup>th</sup> position with estimated 22.7m users in 2014 expected to increase to 30.9m in 2018 (Aderibigbe, 2014). Though, Nigeria is leading Africa in internet usage, its global ICT ranking according to World Economic Forum's Global Information Technology Report (GITR) (2015) with regard to Networked Readiness Index which measures a country's ability to implement and take full advantage of ICT is 119; coming behind South Africa 75<sup>th</sup>, Kenya 86<sup>th</sup> and Egypt 94<sup>th</sup> (Nairametrics, 2015).

Investment in ICT infrastructure has been a source of concern to nations wishing to achieve stability in internet access and usage. Whereas the US federal government budgeted about USD 82 billion in 2014 on Information Technology (IT) (Wikipedia), Nigeria budgeted about ₦14.65bn in 2014 (Budget Office, 2014). Though, the ICT industry in Nigeria has attracted about USD 32bn in foreign direct investment (FDI) (Uzor, 2014a), more investment is needed in the sector to actualise the vision of being amongst the first 20 industrialised nations by the year 2020.

### **ICT Resources for Economic Growth and Transformation:**

Full utilisation of the benefits of ICT for economic growth is a function of availability of associated resources. Before 1999 ICT resources and facilities for economic transformation were inadequate in Nigeria. Access to computers, internet facilities and services were limited to very high income earners (Nwabueze & Ozioko, 2011). But with the introduction of the Global System for Mobile Telecommunications (GSM) in 2001, the creation of Ministry of Communications Technology (MCT) in 2011 and an agency for implementing Nigeria's information technology (IT) policy – the National Information Technology Development Agency (NITDA) in 2001, ICT penetration in Nigeria, Africa's most populous nation is on the increase. For instance, as at the end of 2014, Nigeria was ranked 10<sup>th</sup> amongst world's top 25 internet users (Aderibigbe, 2014).

ICT resources that constitute facilitators for economic growth and transformation are computers and their accessories, CD Rom, diskettes, flash drives, etc; the internet, electronic mail (e-mail) and the world wide web (www) (Attama & Owolabi, 2008). Whereas internet provides organisations with vital information for productivity and good governance and electronic mail (e-mail) enhances transmission of messages for business communications, the world wide web (www) which provides the platform for advertisement of products and services (Chiwetalu, 2003) positions nations/organisations on appropriate course of speedy economic growth and sustainable development (Nwabueze & Ozioko, 2011).

These resources, particularly, internet and Broadband have been globally recognised as the foundation for transformation to a knowledge – based economy. Broadband infrastructure is an enabler for economic and social growth in the digital economy with the capacity of making significant improvements in education delivery, health care provision, energy management, ensuring public safety, government/citizen interaction and subsequent organisation and dissemination of knowledge (MCT, 2012). Similarly, increase in the use of computers together with their maintenance will definitely present challenges to Nigerian technicians and impact positively on the economy. The Nigerian Personal Computer (PC) market which is still on its infancy (MCT, 2012) is expected to have a mean annual increase of 21.5% from 2009 to 2014 with a remarkable shift towards mobility which would expand laptop and other mobile PC sales.

ICT has the potentials to unlock the country's economic bottlenecks. Government is expected to create enabling environment and provide sufficient infrastructure for private sector participation. So far, private sector consumption has been identified as the largest growth driver in the expansion and development of ICT in Nigeria (Uzor, 2014b). African countries, according to GITR (2015) need to take full advantage of the potentials provided by information and communication technologies (ICTs) to drive social and economic transformation (Nairametrics, 2015).

### **ICT Industrial Sectors:**

In Nigeria, ICT is propelled by four industrial sectors. They are telecommunications, information technology, postal services and broadcasting (MCT, 2012). According to MCT (2012), remarkable improvement has been made in the telecommunications sector since the introduction of the GSM in 2001. The liberalisation of the sector in 2000 witnessed the evolution of several services and licenses in the areas of fixed telephony, cellular mobile telephony, long distance transmission, global mobile personal communications services, international data access and high speed data transmission. Others are value added services, internet service and unified access service license. At present, there are four (4) active licenses using GSM – Mobile Telecommunications of Nigeria (MTN) Ltd, GLO Nig, Airtel and Etisalat. Consumption in telecommunication services has shifted from a modest 400,000 fixed and 25,000 mobile lines subscribers in

2001 to about 90 million subscribers in 2011. As the most populous African nation, Nigeria remains the largest telecommunications market in the region.

Availability of computers for storing, retrieving, processing and communicating data constitute major component of achieving ICT stability from the perspective of information technology (IT). Prior to 1999, the development in the IT sector of Nigeria was not encouraging recording about 200,000 internet users. But with the launch of National Policy on IT in 2001, the establishment of the Nigeria Internet Registration Association (NIRA) in 2006 to increase exposure in the cyberspace and the passage into law by the National Assembly in April 2007, the NITDA with the mandate to perform various functions including creating a framework for planning, research, development, standardisation, co-ordination, monitoring, evaluation and regulation of IT practices, activities and systems (MCT, 2012), Nigeria occupies 1<sup>st</sup> position in Africa and the 10<sup>th</sup> in the world's top 25 internet users (Aderibigbe, 2014). With increase in local and foreign direct investments (FDIs) in IT equipment and facilities and the creation of enabling environment for private sector participation, the full benefits of ICT may be achieved.

Postal services using post offices have been the popular avenue for communication before the advent of telecommunications, www and the internet. The Nigerian Postal Services (NIPOST) is the operator of postal services in the country. There are other private sector initiatives in the form of courier operators licensed by NIPOST to expand services delivery into various cities. The Postal sector is mandated to perform the duties of collection, transportation and distribution of letter mail, parcels and packages, express and courier dispatches (domestic or foreign), post office counter services, mail box rental services, licensing of private postal operators, providing financial services and providing e-services (MCT, 2012). Severe competition is currently facing this sector as a result of innovations from private courier operators and ICT globalisation. NIPOST is required to introduce modernisations into its operating systems to close the gap.

Another potential ICT sector with far reaching benefits is broadcasting. This is because, it is the most popular medium for reaching the people both in the cities and rural communities. Radio which is the most common broadcast tool, provided in small and big sizes, is relatively cheap and easy to manipulate. The National Broadcasting Commission (NBC) is the dominant operator of broadcasting services in the country. There are other private sector broadcasters, following the deregulation of the sector. The NBC is empowered to advise the Federal Government on the implementation of National Mass Communication Policy (NMCP) with reference to broadcasting, receiving and processing applications for the establishment, ownership and operation of broadcasting stations, recommending applications through the Minister to the President for grant of radio and television licenses and regulating and establishing a National Broadcasting Code as well as setting standards with regard to the content and quality of materials for broadcast. So far, Federal, State and private broadcasting stations include 100 radio stations, 147 television stations, 35 cable retransmission stations referred to as MMDS and four Direct to Home (DTH) stations (MCT, 2012). Efforts are being made to transit from analogue to digital terrestrial broadcasting and broadcasting on the VHF band, though a deadline of June 17, 2015 was initially set (MCT, 2012).

### **ICT Infrastructure:**

The level of ICT development in the country depends on availability of infrastructural facilities. Hardware, Adequate Software, networking and stability of power are considered germane for the citizens to take full advantage of the potentials offered by ICT. In the views of ITU (2003), infrastructure is central in achieving the goal of digital inclusion, enabling universal, sustainable, ubiquitous and affordable access to ICTs by all, taking into account relevant solutions already in place in developing countries and countries with economies in transition, to provide sustainable connectivity and access to remote and marginalised areas at the national and regional levels.

Nations including Nigeria are expected to update their ICT infrastructure for sustainable economic development. Nigeria's ICT policy focus for attaining vision 20:2020 is expected to include National ICT backbone and Broadband infrastructure that will foster digital literacy and internet usage, reasonably priced access to ICT, protection of ICT infrastructure, national physical infrastructure (including power), financial systems infrastructure and the secure and sustained adoption of the national critical internet infrastructure CCTLD.ng (MCT, 2012). Access to right of way (ROW) over public lands and State infrastructure for laying

underground cables is essential prerequisite for successful ICT development. Full participation of Federal and State governments is required for improved ICT infrastructure.

### **ICT and Youth Development:**

Youths represent a very important stratum of the Nigerian population. Estimated youth population in the country between the ages of 0 – 24 years is 110,723,691 or 62.5% out of total estimated population of 177,155,754 with dependency ratio of 84% (Central Intelligence Agency [CIA] 2015). This situation presents unemployment difficulties and poses threat to social ills. Youth involvement in ICT training and competencies can bridge this gap and subsequently improve their economy.

Governments all over the world should provide platforms for youth development along the lines of ICT. This is essential as it provides skills and knowledge for competition in the global labour market. This could be achieved through incorporation of ICT in education curriculum, promoting the use of ICT in partnership with youth – focused bodies and relevant Ministries, Departments and Agencies (MDAs) to deliver information and content that emphasise national unity, tolerance and ethical values, support the delivery of programmes designed to ensure that youths focus on positive applications of ICT, promote incentives and support schemes targeted at youth entrepreneurship initiatives in ICT and ensure that youths are adequately protected in cyberspace (MCT, 2012).

### **Accounting Practice:**

#### **Brief Historical Background:**

Accounting is the process of identifying, measuring and communicating economic information to permit informed judgments and decisions by users of the information (Wood, 1996). Its practice is as old as civilization (Brown, 1968). Ancient bookkeeping originated in Venice as a result of increase in economic activities following the establishment of joint ventures and partnership businesses. Notable was the Renaissance Italy at about 15th century. The book: Merchant of Venice (1418-1449) is a biography of an early businessman which provided detailed accounts of the advanced state of commerce and industry in Italy in the 14<sup>th</sup>, 15<sup>th</sup> and 16<sup>th</sup> centuries (George Jr., 1972). Growth in Venetian business activity which was maritime in nature spurred the Venetian government to build a shipyard – the Arsenal for the protection of their trade. Shortly, problems confronted the Arsenal, of which accounting was first to be recognized as a tool of control (George Jr., 1972). As a result, books of original entry and ledgers were introduced in 1370.

Despite that the merchants of Venice operated journals and ledgers, the origin of modern bookkeeping could be traced to 1494 when Luca Pacioli, an Italian Mathematician and Franciscan Friar published a work on double entry bookkeeping. Infact, Thomas Watt referred to this method of keeping accounts as his “darling science”, describing it as the first general methodologies of management (George Jr. 1972). The introduction of modern bookkeeping methods constituted the stop gap between ancient accounting method and contemporary accounting thought. It served as a control technique to early managers who superintended affairs of commercial organisations following the growth in industrial revolution (Nwanyanwu, 2006: 144 – 150).

The growth in industries and commercial activities increased the demand for accounting services. Social and political developments in most countries ignited the need for accountability by public officers. Consequently, in 1887, the American Association of Public Accountants (AAPA) was formed. It later changed to become the American Institute of Certified Public Accountants (AICPA). In 1897, the Pennsylvania Institute of Public Accountants was established. By the 1800s, professional accounting bodies were established in Scotland and England. Nigeria had their turn in 1965, when the Institute of Chartered Accountants of Nigeria (ICAN) was established through Act of Parliament No.15 of 1965 (Nwanyanwu, 2006: 144 – 150). Contemporary thinking in accounting is on efficiency, accuracy and timeliness of accounting information for decision making. In this direction, accounting practitioners now emphasise the adoption of mechanised accounting system employing computers (Nwanyanwu, 2006: 144 – 150). Further body of knowledge on accounting practice will review financial accounting, auditing and taxation.

### **Financial Accounting:**

Financial accounting is a key subject in accounting profession and occupies a major position in the profession's course content. Knowledge of financial accounting marks the genesis of recording business activities. From the historical perspective, the major accounting problem of the merchants of Venice was how to record the finances associated with their maritime trade. The solution to this, was the introduction of books of original entry and ledgers in 1370 (George Jr., 1972) which are aspects of financial accounting. Financial accounting is perhaps, the first documented aspect of accounting practice in existence. It facilitates the preparation of financial statements comprising statement of financial position, income statements, statements of changes in equity, statement of cashflows, schedule of non-current assets, notes to the items in the statements, value added statement and historical financial summary.

Financial accounting is regulated by standards. Prior to 2012, items disclosed in financial statements were guided by standards produced by the Nigerian Accounting Standards Board (NASB) established in 1982. But with the emergence of International Financial Reporting Standards (IFRS) and International Public Sector Accounting Standards (IPSAS) following global convergence of accounting standards, financial statements in Nigeria become guided by IFRS requirements with effect from 2012.

A network of business activities constitutes the content of financial accounting. Examples include accounting for purchases, sales, trade receivables, trade payables, accounting for sole trader and partnership business, container accounting, royalties, bills of exchange, accounts of charities, clubs, etc. Others are accounts of holding companies, mergers and acquisitions, financial statement analysis, bankruptcy and liquidation, business and share valuations, foreign branch accounts, etc.

### **Auditing:**

Auditing is another major aspect of accounting practice which aims to confirm the accuracy, fairness and conformity to established standards, of information contained in financial statements. By definition, it is the independent examination of, and expression of opinion on, the financial statements of an enterprise by an appointed auditor in pursuance of that appointment and in compliance with any relevant statutory obligation (Consultative Council of the Accountancy Bodies [CCAB]). Because of its confirmatory nature, professional accounting practice is subsumed into auditing.

Auditing is regulated by professional accounting bodies. The Institute of Chartered Accountants of Nigeria (ICAN) regulates private accounting practice in Nigeria. Members are expected to ensure exhibition of established codes of conduct reflecting honesty, independence and integrity in the performance of professional duties (ICAN, 1998).

In addition to regulation by professional accounting bodies, the appointment, removal and duties of auditors in private practice are provided by the companies law. For example in Nigeria, the Companies and Allied Matters Act (CAMA), Laws of the Federation of Nigeria (LFN) 2004 provides some duties for the auditor in private practice. They are the expression of opinion, whether accounting records have been kept by the company and proper returns adequate for the audit have been received from branches not visited, the company's statement of financial position and income statement are in agreement with accounting records and returns and whether the information in directors reports are consistent with the accounts examined. Because of lack of global convergence of auditing standards, each country is expected to establish standards to guide its auditing practices (Pany & Whittington, 1997) by reference to that established by the International Auditing Practices Committee (IAPC). Auditing Standards in Nigeria are developed and reviewed by the Financial Reporting Council of Nigeria (FRCN) established by Act of National Assembly in 2011.

Areas in auditing often considered vital in accounting practice are internal controls, asset verification, inventory and work in progress, liability verification, audit planning, holding company and group accounts, audit evidence, internal and management auditing, professional ethics, legal liability of auditors, etc.

### **Taxation:**

Accounting practice also encompasses taxation. Taxation as stated by Zubairu (2014) is the process involved in administering and collecting tax. It involves policy formulation up to utilization. Tax itself, is a

compulsory levy imposed by the government through its agents on income of individuals and corporate bodies as well as on goods and services.

As it applies to auditing, tax practice is regulated by professional bodies together with appropriate legal framework. The Chartered Institute of Taxation of Nigeria (CITN) is the body charged with the responsibility of monitoring the practice of taxation in Nigeria in compliance with the Companies Income Tax Act (CITA), Cap C21 Laws of the Federation of Nigeria (LFN) 2004 and the Personal Income Tax Act (PITA) LFN 2004. Other legislations also exist for taxation of income, services and products of specialised sectors of the economy. Examples are Petroleum Profit Tax Act (PPTA), Value Added Tax Act, Capital Gains Tax, etc. In addition, the CITN issues standards to guide the practice of taxation in Nigeria. Statement of Taxation Standards (STS) 1 – 8 issued in 2013 is an example.

Tax practice areas include capital allowances computation, company income tax, personal income tax, value added tax, capital gains tax, international taxation, petroleum profit tax, tax planning, withholding tax, filling of tax returns, objection to assessments, etc.

### **Application of ICT in Accounting Practice:**

Complexities in services delivery and the necessity to improve information transmission, reduce cost and time has made it imperative for ICT to be applied in accounting practice. Software have been developed to process and take decisions in financial accounting, auditing, taxation and other related areas of accounting practice. Financial accounting which has remained the most ancient duty of accountants involving the preparation of cash books and ledgers has today been simplified through the evolution of accounting software. In this dimension, Jaiyela (2007: 48 – 49) reports that e-commerce models for exchange of transactions across organisations, enterprise resource planning (ERP) systems involving the use of integrated computer systems to collect data and produce single financial report for all areas of a business are examples. Others are reconciliation software for the preparation of reconciliation statements, accounting packages – Oracle financials, DacEasy, Sage Accounting, Peachtree, QuickBooks, Sun Accounting, etc, for preparation of financial statements and other information required for management decisions as well as software for the preparation of payroll. Also, accounts payable and receivable transactions, inventory control, financial control over assets, analyses of data, provision of current and estimated values of businesses to users of accounting information (managers, board of directors, CEO, investors, bankers, suppliers and customers) (Jordan, 1999) are facilitated by computers in compliance with ICT.

Financial management reforms in some countries are reflective of adoption of ICT in accounting practice. For example in Ghana, a launch of public financial management reform (Yeboah *et al*, 2014:121-132) introduced a new system of record keeping of State budgeting and financial management. The system known as Ghana Integrated Financial Management Information System (GIFMIS) involves seven Oracle E-Business Suites modules – general ledger, accounts payable, accounts receivable, cash management, budgeting, fixed assets and human resource management. According to them, this is expected to constitute the official source of budget creation and management, cash and treasury management, financial control, accounting and reporting for the entire country. Undoubtedly, application of ICT will minimise difficulties involved in recording the veracity of transactions associated with financial accounting component of accounting practice.

Examination of financial statements/reports through auditing of underlying transactions is also facilitated by ICT. Software exist for reviewing the integrity, accuracy and management of an organisations data processing environment. Few of them are ACL, IDEA, GAS, for revenue assurance; Oracle log miner, Sybase audit and other EAM (embedded audit modules) in several applications for database auditing. Others are Detection Master, Team mate for forensic audit; fraud detection software are also available (Jaiyeola, 2007: 48 – 49). Similarly, production of financial reports are enhanced by ICT tools such as Microsoft word and Microsoft excel. Extensible business reporting language (XBRL) is another advanced accounting software that enables continuous and instantaneous reporting; it secures accuracy, efficiency and transparency in financial reporting through the web (Farewell & Pinsker, 2005). Aside this, audit managers and seniors in public accounting firms have applied ICT in the development of audit plans and programmes, organisation of audit activities and supervision and review of the work of junior auditors (Banker *et al*, 2002: 209 – 222).

Taxation services and planning are essential aspects of accounting practice where ICT could be applied. Wastages arising from time spent in filing returns and cost of transportation to tax offices to deliver letters for queries/observations raised could be avoided by taking advantages of ICT. Some countries have resorted to online systems for handling tax matters. In Peru, the National Superintendent Tax Administration, collects and remits tax to the government using a computerised tax system known as “Tributacion Online” (Yeboah, *et al* (2014:121 – 132). The same is applicable in China where an information system known as Online Tax System is used in filling tax returns (Yeboah, 2014: 121 – 132). Nigeria is not left out in the quest to popularise ICT in tax management. Presently, tax collections for company income tax, personal income tax, withholding tax and value added tax, etc are online via paydirect acknowledgement platforms. In addition, issuance of revenue receipts to taxpayers is computerised and communications between taxpayers, tax consultants and the tax authorities are to a great extent, facilitated through e-mail. It is expected that, as investment in ICT increases, accounting practitioners will be relieved of the burden and time associated with manual approaches by shifting to computerised processes.

### **Benefits of ICT in Accounting Practice:**

From the body of knowledge, the arrival of ICT has made accounting practice to be more efficient than ever. Findings from a study of five offices of international public accounting firms with substantial investment in audit software and knowledge sharing applications, indicate significant productivity gains, following ICT implementations (Banker *et al*, 2002). The maintenance of ledgers, papers, spread sheets and other accounting related books manually have been computerised for quick and easy preparation of financial statements and reports (Granlund & Mouritsen, 2003:77 – 83). Reduction in transaction cost, overcoming constraints of distance, transacting across geographic boundaries leading to improvement in activities within organisations (Shanker, 2008) have been made possible with the emergence of ICT in accounting practice. Also, computerized accounting system improves the performance of accounting departments of organisations by increasing just – in – time accounting information (Yeboah, 2014:121 – 132). Cashflow statements income statements, historical financial summary and statements of financial position can now be accessed more readily with computerised accounting system. Accuracy and timely delivery of accounting information, speed and processing of large volumes of transactions, storage and retrieval of data for decision making, cross border information resources via the internet and revenue assurance and cost control techniques (Jaiyeola, 2007: 48 – 49) are immense benefits associated with ICT. Aside the foregoing, the adoption of ICT in accounting practice has made the profession to be more scientific as well as improved reliability of financial reports.

### **Challenges of Adopting ICT in Accounting Practice:**

The main medium for effective ICT adoption in accounting practice is computerisation of accounting systems and business processes. Inadequate knowledge of this fact impairs the desire to full utilisation of ICT in processing accounting related transactions. In this direction, lack of cognition of accounting computerisation by enterprise leaders, particularly those in medium and small sized organisations (Lu *et al*, 2012: 1155 – 1159) poses a challenge. According to them, shortage of funds required for investment in ICT facilities is another factor associated with the adoption of ICT in perfecting accounting transactions. Amongst the important ICT infrastructures is power (electricity). Its shortage or instability is challenging to ICT adoption. As a result, most organisations have resorted to running independent power generating sets to operate business facilities that require electricity. Also constituting an obstacle to effective ICT adoption in accounting practice is lack of professional skill of computer (Lu *et al*, 2012: 1155 – 1159). Other challenges are high cost of computer systems and software, frequent breakdowns of computer systems and high cost of internet anti-virus protective devices. Inadequate business patronage for consistency in utilisation of computer personnel equipments and software are contributory.

### **Methodology:**

A survey design was adopted in obtaining information from the respondents on the variables studied. The explanatory variable, ICT is measured in terms of ICT resources (computers, the internet, electronic mail [e-



mail], world wide web [www] and software) while the criterion variable, accounting practice (AP) is measured in terms of financial accounting, auditing and investigation and taxation. The method of acquisition of ICT (computer) skill for AP was also considered. Data were obtained on other sub-variables considered contextual in the association of ICT and AP. They are power (electricity), high cost of computer and high cost of software. For full coverage of the variables involved in the study, the sets of questionnaire included combinations of close ended; open ended and five (5) point scale Likert type questionnaire.

Twelve (12) questions were developed. Two (2) for respondents' profiles, five (5) for ICT, four (4) for AP and one (1) for contextual variables (CV). The respondents were required to indicate their qualifications and lengths of service in their organisations. They were also required to indicate the type of computer systems used at work, electronic communication approaches and frequently used computer processing devices (Microsoft word, Microsoft excel and Microsoft power point). In addition, they are to state if accounting software is used in processing financial transactions, indicating the type adopted. Areas of AP where ICT is frequently applied and the use of software in processing tax related transactions, indicating the type of software are also to be stated including method of acquisition of ICT skill for AP. Respondents were as well, required to indicate the extent to which the contextual variables moderate effective application of ICT in accounting practice.

The population of the study is one hundred and fifty (150) employees of accounting departments in 30 organisations (5 employees in each organisation) obtained by a pilot study comprising of accounting firms, private and public institutions in the South South region of the country which constitutes the hub of oil and gas activities. 120 were selected for study after eliminating those employed as secretaries, clerks and messengers. This gave a sample size of 80%. In Barbados, Harris (2014: 58 -70) in a similar study, distributed questionnaire to 80 employees, while in Ghana, Yeboah *et al* (2014:121-132) selected and interviewed 40 employees. Results of this study will be far reaching as it focuses on 120 employees. As a guide, the following hypotheses are formulated:

**Ho<sub>1</sub>:** There is no significant relationship between ICT and AP.

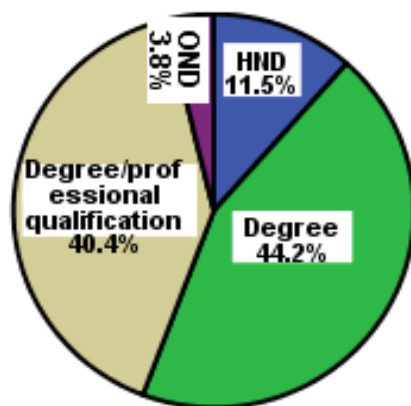
**Ho<sub>2</sub>:** Power, high cost of computer and high cost of software do not significantly affect the influence of ICT on AP.

### Data Presentation and Analysis:

One hundred and twenty sets of questionnaire were distributed to the respondents. From a total of 115 that were returned, 104 were selected for analysis. This gave a response rate of approximately 87%.

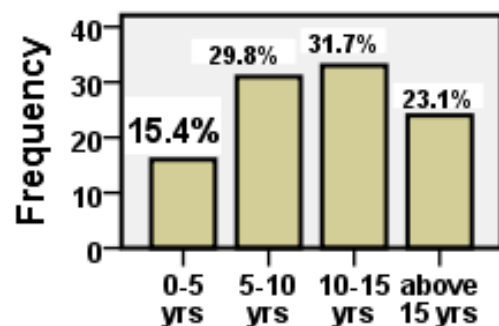
### Profile of Respondents:

**Figure1.Educational Qualifications**



**Educational qualification of respondents**

**Figure 2. Length of Service**



**Length of service of respondents**

The profile of respondents is presented in figures 1 and 2. The pie chart in Figure 1 discloses their educational qualifications. Twelve respondents representing 11.5% have Higher National Diploma (HND), 46 (44.2%) possess degrees, 42 (40.4%) hold degrees and membership certificates of professional accounting bodies while 4 respondents representing 3.8% have ordinary National Diploma (OND). The length of services of the respondents in the organisations studied is shown in figure 2 using a Bar Chart. 16 employees representing 15.4% have been in their organisations between 0 – 5 years, 31 (29.8%) have spent between 5 – 10 years, 33 (31.7%) have lengths of services spanning between 10 – 15 years while 24 (23.1%) have been in the employ of their organisations for more than 15 years. The qualifications of the respondents indicate sufficient knowledge in accounting practice while their lengths of service is a reflection of adequate experience in the recording and production of financial reports. These characteristics confirm that data collected are adequate for the study.

### **Univariate Analysis:**

Tables 1(a) and 1(b) present the descriptive statistics on the variables studied. From Table 1(a), 58 respondents which is 55.8% use desktop computers, 24 (23.1%) use laptops while 22 (21.2%) use i-pad computers for processing accounting transactions. In respect of computer processing devices (CPD) frequently adopted in producing reports, 52 respondents which is 50.0% use Microsoft word, 42 (40.4%) indicate Microsoft excel while 10 (9.6%) indicate Microsoft power point for presentation of seminars and conferences.

Electronic communication approaches often applied in interacting with clients and organisations are e-mail 74 (71.2%), telephone (voice) 17 (16.3%), telephone (text messages) 8 (7.7%) and website (publicity) 5 (4.8%). Data were also collected on the use of accounting software for processing financial transactions. “Yes” responses are 70 (67.3%) while “no” responses are 34 (32.7%). Indications on the type of software used for accounting transactions are Enterprise Resource Planning (ERP) 16 (15.4%), Peachtree 24 (23.1%) and QuickBook 3 (2.9%). Others are Tally 11 (10.6%), Sage 15 (14.4%) and Oracle 9 (8.7%). Twenty six (26) respondents representing 25% do not use any particular software in processing accounting transactions. The implication is that they merely rely on Microsoft word and Microsoft excel for their financial reports and statements.

In Table 1(b), “yes” responses for application of software for taxation services is 57 (54.8%) while “no” responses is 47 (45.2%). Type of software for taxation services and associated responses are Peachtree 9 (8.7%), Sage 23 (22.1%) and Pay – As – You – Earn (PAYE) template 16 (15.4%). Responses from 56 employees representing 53.8% are that no software is adopted for taxation services. Views on overall application of ICT in accounting practice are 50 (48.1%) for financial accounting, 38 (36.5%) for auditing and investigation and 16 (15.4%) for taxation. The methods of acquisition of ICT skill considered essential in driving ICT in business processes are by computer training 71 (68.3%), hands-on computer practice 28 (26.9%) and University education 5 (4.8%).

Responses on the contextual variables which moderate or constrain the association of ICT and AP are shown in Table 1c. Power influences this association to “no extent” 6 (5.8%), some extent 23 (22.1%), moderate extent 22 (21.2%), great extent 36 (34.6%) and very great extent 17 (16.3%). On the average, the influence of power on the association between ICT and AP is 3.3365 or 66.73% on a 5 point scale. Similarly, the influence of high cost of computer (hcc) on the relationship between CS and AP is to no extent 26 (25.0%), some extent 33 (31.7%), moderate extent 25 (24.0%), great extent 14 (13.5%) and very great extent 6 (5.8%) respectively. The mean rating on the extent of the constraining effect of hcc on the influence of ICT on AP is 2.4327 or 48.65%. On the other hand, high cost of software (hcs) moderates the relationship between ICT and AP in the following dimensions: no extent 8 (7.7%), some extent 31 (29.8%), moderate extent 17 (16.3%), great extent 31 (29.8%) and very great extent 17 (16.3%). Opinions indicate 63.46% moderation of the influence of ICT on AP by hcs. The mean scores categorises power as having more effect on the relationship between ICT and AP. This is true when related with the epileptic nature of power supply in the country.

**Table 1a. Descriptive Statistics**

	<b>Frequency</b>	<b>%</b>
<b>Computer system</b>		
Desktop	58	55.8
Laptop	24	23.1
i-pad	22	21.2
<b>Total</b>	<b>104</b>	<b>100.0</b>
<b>Computer Processing Device</b>		
Microsoft word	52	50.0
Microsoft excel	42	40.4
Microsoft power point	10	9.6
<b>Total</b>	<b>104</b>	<b>100.0</b>
<b>Electric Communication Approach</b>		
e-mail	74	71.2
Telephone (voice)	17	16.3
Telephone (text message)	8	7.7
Website (publicity)	5	4.8
<b>Total</b>	<b>104</b>	<b>100.0</b>
<b>Use of Accounting Software</b>		
Yes	70	67.3
No	34	32.7
<b>Total</b>	<b>104</b>	<b>100.0</b>
<b>Type of Accounting Software</b>		
Enterprise Resource Planning (ERP)	16	15.4
Peachtree	24	23.1
quickBook	3	2.9
Tally	11	10.6
Sage	15	14.4
Oracle	9	8.7
None	26	25.0
<b>Total</b>	<b>104</b>	<b>100.0</b>

Descriptive statistics on computer system, computer processing device, electronic communication approach, use of accounting software and type of accounting software used in accounting practice.

**Source:** Survey data, November 2015.

### **Bivariate Analysis:**

The strength of the relationship between ICT (represented by a major variable, computer system [CS]) and AP is presented in Table 2. The coefficient of correlation between these variables is 0.579, indicating a strong positive relationship between ICT, the explanatory variable and AP, the criterion variable. This is significant at 0.01 level. Alternatively, the level of confidence that the analysis is correct is 99%. The hypothesis that there is no significant relationship between ICT and AP is hereby rejected.

Extrapolating from the result of this analysis, the coefficient of determination is 0.335241. Accordingly, ICT explains changes in AP by 33.52%. Other factors aside ICT, account for changes in AP by 66.48%.

**Table 1b Descriptive Statistics**

	Frequency	%
<b>Software for taxation services</b>		
Yes	57	54.8
No	47	45.2
<b>Total</b>	<b>104</b>	<b>100.0</b>
<b>Types of software for taxation services</b>		
Peachtree	9	8.7
Sage	23	22.1
Pay - AS- You – Earn (PAYE template)	16	53.8
None	56	15.4
<b>Total</b>	<b>104</b>	<b>100.0</b>
<b>ICT in Accounting Practice (AP)</b>		
Financial Accounting	50	48.1
Auditing and Investigation	38	36.5
Taxation	16	15.4
<b>Total</b>	<b>104</b>	<b>100.0</b>
<b>Acquisition of ICT Skill for AP</b>		
Computer training	71	68.3
Hands – on – computer practice	28	26.9
University education	5	4.8
<b>Total</b>	<b>104</b>	<b>100.0</b>

Descriptive statistics on the adoption and type of software for taxation services, application of ICT in accounting practice and method of acquisition of ICT skill. *Source:* Survey data, November 2015.

**Table 1c. Contextual Variables**

	<b>PWR</b>		<b>HCC</b>		<b>HCS</b>	
<b>Scale</b>	<b>Frequency</b>	<b>%</b>	<b>Frequency</b>	<b>%</b>	<b>Frequency</b>	<b>%</b>
No extent 1	6	5.8	26	25.0	8	7.7
Some extent 2	23	22.1	33	31.7	31	29.8
Moderate - 3	22	21.2	25	24.0	17	16.3
Great - 4	36	34.6	14	13.5	31	29.8
Very great - 5	17	16.3	6	5.8	17	16.3
<b>Total</b>	104	100.0	104	100.0	104	100.0
Mean	3.3365		2.4327		3.1731	
Standard deviation	1.16261		1.17221		1.24200	

**Key:** Pwr = Power, hcc = high cost of computer, hcs= high cost of software

Descriptive statistics on the extent to which pwr, hcc and hcs moderate the influence of ICT (Computer System) on AP. *Source:* Survey data, November 2015.

### **Multivariate Analysis:**

A measure of the moderating effect of the contextual variables (pwr, hcc and hcs) on the influence of CS on AP is presented in Tables 3a-3c. The introduction of power (pwr), high cost of computer (hcc) and high cost of software (hcs) as explanatory variables improved the explanatory power ( $R^2$ ) of CS on

AP from 0.335241 (33.52%) to 0.480 (48.0%) (See Table 3a). In otherwords, the influence of the contextual variables resulted in CS accounting for 48.0% of changes in AP. This linear combination is statistically significant (Table 3b),  $F(4, 99) = 22.836$ ,  $p=0.000$ .

**Table 2: Correlation Analysis**

	<b>Computer System (CS)</b>	<b>Accounting Practice (AP)</b>
Computer system (CS) Pearson correlation	1	0.579**
Sig. (2-tailed)		0.000
N	104	104
Accounting Practice (AP) Pearson correlation	0.579**	1
Sig. (2-tailed)	0.000	
N	104	104

\*\*correlation is significant at the 0.01 level (2 – tailed).

Correlation analysis between computer system (CS) and accounting practice (AP).

**Table 3a Multiple Regression Analysis**

**Model Summary**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std Error of the Estimate</b>
1	0.693	0.480	0.459	0.53698

a. predictors: (Constant), CS, hcc, hcs, pwr

**Table 3b ANOVA**

<b>Model</b>		<b>Sum of Squares</b>	<b>DF</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
1	Regression	26.339	4	6.585	22.836.	0.000
	Residual	28.546	99	0.288		
	<b>Total</b>	<b>54.885</b>	<b>103</b>			

a. Dependent Variable: AP. b. Predictors: (constant), CS,hcc,hcs, pwr.

**Table 3c: Coefficients**

		<b>Unstandardised Coefficients</b>		<b>Standardised Coefficients</b>			<b>Collinearity Statistics</b>	
<b>Model</b>		<b>B</b>	<b>Std. Error</b>	<b>Beta</b>	<b>t</b>	<b>Sig.</b>	<b>Tolerance</b>	<b>VIF</b>
1.	(constant)	1.072	0.272	3.938	0.000.			
	Pwr	0.170	0.049	0.271	3.501	0.001	0.874	1.145
	hcc	-0.120	0.047	- 0.193	-2.573	0.012	0.938	1.066
	hcs	-0.093	0.044	- 0.158	-2.129	0.036	0.948	
	cs	0.375	0.071	0.415	5.258	0.000	0.841	1.188

a. Dependent variable: AP

Multiple regression analysis between accounting practice (AP), computer system (CS), power (pwr), high cost of computer (hcc) and high cost of software (hcs).

The coefficients indicating the rate by which the explanatory variables CS, pwr, hcc and hcs improve AP are shown in Table 3c. AP is 1.072 if the explanatory variables are zero. A combination of CS, pwr,

hcc and hcs improves AP by 0.375 (37.5%) and 0.170 (17.0%) and decreases it by 0.120 (12.0%) and 0.093 (9.3%) respectively. The regression equation for explaining AP is as follows:

$$AP = 1.072 + 0.375CS + 0.170pwr - 0.120hcc - 0.093hcs$$

Where, AP=Accounting Practice

CS= Computer System

pwr = Power, hcc= high cost of computer

hcs = high cost of software.

The standardised coefficients (Beta) in Table 3c show the rate the explanatory variables contribute to the explanatory power of the equation. The adoption of computer system (CS) in accounting practice (AP) improves AP more by 37.5%. This is followed by power (pwr) or electricity which contributes 17.0% to AP. Though, CS is a major tool in mechanised AP, its high cost (hcc) affects rate of acquisition by users and thus negatively impact AP. It is -0.120 which is a reduction of 12.0% in AP. Similar to this, is high cost of software (hcs) which as a result of its high cost imposes financial constraints and, therefore, diminishes AP. In the equation, it is -0.093 representing a reduction of 9.3% in AP.

The relationship of these explanatory variables with AP are statistically significant,  $p=0.001$ ,  $0.012$ ,  $0.036$  and  $0.000$  for pwr, hcc, hcs and cs respectively. Power is a major factor in the application of ICT in AP. Its presence increased the strength of relationship between ICT (represented by CS) and AP from 0.579 (Table 2) to 0.693 (Table 3a) accounting for changes in AP by 48.0% ( $R^2$ ). This is an improvement of 14.48% when compared with  $R^2$  of 33.52% arising from the result in Table 2. Without power, CS cannot be applied in AP. Its contribution of a mere 17.0%, though, significant, is the reaction of respondents to the epileptic power supply experienced. Results indicate that the contextual variables, power, high cost of computer and high cost of software significantly influence the relationship between ICT measured in the terms of computer system and accounting practice (AP). The hypothesis that the contextual variables, power, high cost of computer and high cost of software does not significantly influence the relationship between ICT and AP is hereby rejected.

### **Discussion of Findings:**

Results indicate frequent use of desktop computers in accounting practice than other types of computers. It is 55.8% for desktop as against 23.1% and 21.2% for laptop and i-pad respectively. This is consistent with the work of Oladapo (2007:261-277) where computer system in use for services including accounting which was rated 44.1% are desktop 91.9%, laptops 60.3% and notebooks 17.6%. The leaning to desktops is because Secretaries and middle level managers who perform a greater proportion of organisation's functional activities are more in number than senior executives and partners in accounting firms. The later use more of laptops and few i-pads. In another dimension, computer processing devices in use in accounting practice are more for Microsoft word (50%) as opposed to Microsoft excel (40.4%) and Microsoft power point (9.6%). In the same manner, e-mailing is frequently adopted for communication (71.2%) in comparison to others: telephone 16.3%, text messages 7.7% and website 4.8%. Again, studies by Oladapo (2007:261- 277) in which MS word, MS excel, internet and voicemail (telephone) were rated 67.6%, 55.9%, 66.9% and 12.5% respectively provide supportive evidence. The frequency in the use of Microsoft word is because word processing using already developed templates are more active in accounting practice than power point services which occur occasionally. Also, the preponderance in the use of e-mail is because it provides tangible evidence which is considered vital in decision making than telephone or text messages.

Survey results indicate that accounting software are applied in accounting practice in the organisations studied. They vary from Enterprise Resource Planning (ERP), Peachtree, Tally, Sage, Quick Book and Oracle. The list is not exhaustive and differ from one study to another; for example, studies by Yeboah *et al*, (2014:121-132) and Harris (2014:58-70) indicate usage of software such as Sun Accounting, Sage accpac, Extensible Business Reporting Language (XBRL), Enterprise Resource Planning (ERP), etc. However, 25% of the respondents indicate lack of software in processing accounting transactions in

their organisations. This provides evidence of inadequate ICT penetration in Nigeria. In Ghana, Yeboah *et al*, (2014:121-132) in a similar study, documented 5% absence of accounting software on organisations surveyed. Also, analysis indicate that computer skill essential for ICT application is mainly acquired through private computer training 68.3% as against hands-on computer practice 26.9% and University education 4.8%. University education, thus, does not provide requisite ICT skill in comparison to other approaches. This assertion agrees with findings by Oladapo (2007:261-277) where acquisition of computer literacy through “learnt at school” was rated 5<sup>th</sup> out of five computer skill acquisition approaches. Curriculum for computer science in University education may need to be reviewed to improve ICT skill.

In another development, analysis portrays power (electricity) as having more constraint on the association of ICT and AP. This constraining effect is 66.73% when compared to others: high cost of computer 48.65% and high cost of software 63.46%. Results accord with those of Oladapo (2007:261 – 277) in which power was ranked 1<sup>st</sup> and the cost of hardware and software came 2<sup>nd</sup> out of twelve (12) constraints in the use of ICT. In the work of Yeboah *et al* (2014: 121 – 132), power and cost of software were not found to be significant in the association of ICT and AP. This is because they studied public institutions which are able to provide stand-by generators to augment supply from the National grid. In addition, they have sufficient fund to acquire software and computers. This study draws data from accounting firms, private and public sectors most of which, due to financial constraints cannot provide generators to constantly power their operations when there is national power failure.

Bivariate analysis indicate a strong positive relationship between ICT (measured in terms of computer system [CS]) and AP, documenting a coefficient of correlation of 0.579, accounting for approximately 33.52% changes in AP. The many benefits of ICT in AP: computerisation of ledgers for quick and easy preparation of financial statements (Granlund & Mouritsen, 2003: 77 – 33); reduction in transaction cost, over-coming constraints of distance, transacting across geographical boundaries (Shanker, 2008); accuracy and timely delivery of accounting information, speed and processing of large volumes of transactions, storage and retrieval of data for decision making (Jaiyeola, 2007: 48 – 49) provide corroborative evidence. The multivariate analysis incorporating power, high cost of computer and high cost of software as second explanatory variables improved the strength of relationship between ICT and AP ( $r$ ) from 0.579 to 0.693. As a result, ICT taking into cognisance the effect of power accounts for changes in AP by 0.480 (48.0%). The increase in the explanatory strength of ICT in AP from 33.52% to 48.0% showcases power as an important factor in the adoption of ICT in AP, despite its instability; high cost of computer and software notwithstanding.

### **Conclusion and Recommendations:**

ICT has a statistically significantly positive relationship with AP, accounting for changes in AP by 33.52%. Power extensively constrains this association by 66.73%. Financial accounting occupies a greater percentage of ICT usage 48.1% than auditing and investigation and taxation. To enhance ICT application in accounting practice, more interest in the use of software is required. Organisations are encouraged to increase investment in computer system acquisition as well as in training personnel in computer skill acquisition. This study is of essence, as it enriches literature in the area of ICT in a developing economy such as Nigeria.

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