

UNDER PEER REVIEW

Achieving Best Practice In Nigerian Banking Sector Through Information and Communication Technology (ICT) Management.

ABSTRACT

The revolution potential of the new Information and Communication Technology lies in their capacities to instantaneously convert vast network of individuals and organizations across great geographical distances at very little cost. This paper dwells on Achieving Best practice in Nigerian banking sector through information and communication technology (ICT) management. The study made use of secondary data sourced from the Central Bank of Nigeria statistical bulletin, the National Bureau of Statistics and archives of the four (4) selected banks (using their websites) for the variables between 1986 and 2011. The model for the study has as its dependent variable the banks net incomes and its explanatory variables are investment on ICT, other asset investment and annual operating cost. Using the Pooled regression techniques; our study revealed that there is a strong positive relationship between the banks net income and the annual investment in ICT by the selected banks. That is, ICT has greatly impacted positively and significantly on bank operations in Nigeria given the period of study. The study, therefore recommended that training of staff and personnel to handle the information technology system of the bank should be recurring and up to date so as to keep abreast with world best practices.

Keywords: Best practice, Information and Communication Technology, Vast network, Operating cost, Explanatory variables.

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Comment [bs3]: banks' net income

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1.0 Introduction

The increasing competitive pressure as a result of technological development, globalization, changing customer demand has led to survival challenges of many banks in the developing countries and demanded for improvement in quality of customer service and speed to enhance profitability performance and cost reduction.

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Today, information technology (IT) has become a key element in economic development and a backbone of knowledge-based economies in terms of operations, quality delivery of services and productivity of services. Therefore, taking advantage of information technologies (IT) is an increasing challenge for developing countries. There is now growing evidence that Knowledge-driven innovation is a decisive factor in the competitiveness of nations, industries, organizations and firms. Organizations like the banking sector have benefited substantially from e-banking, which is one among the IT applications for strengthening the capacity to compete favourably and access a reasonable market share.

Comment [bs10]: Information Technology

1.1 Statement of problem

Information Technology Management is basically information handling tools, a varied set of goods, application and services that are used to produce, store, process, distribute and exchange information (Davenport, 1994). They include the old Information and Communication Technology of radio, television and telephone and the new Information and Communication Technology of computers, satellite and wireless technology and the internet. These different tools are now able to work together and combine to form our 'networked world', a massive infrastructure of interconnected telephone services, standardized computing hardware, the internet, the radio, and the television, which reaches into every corner of the globe.

The revolution potential of the new Information and Communication Technology lies in their capacities to instantaneously convert vast network of individuals and organizations across great geographical distances at very little cost. As such, Information and Communication Technology have been key enablers of globalization, facilitating worldwide flows of information, capital ideas, people and products. They have transformed businesses, markets and organizations, revolutionized learning and knowledge sharing, empowered citizens and communities and created significant economic growth in many countries. Information and Communication Technology have amplified brain power in the same way that the 19th century industrial revolution amplified muscle power (Ehikhamenor, (2003).

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Studies at the company and country levels have shown that Information and Communication Technology is positively related to corporate and national economic performance. Economic growth depends heavily on the efficient and effective use of the country's resources, which include land, capital, labour and increasingly today, knowledge and technology. Technological progress is stimulated by an attempt to respond to some unmet need, or by attempting to perform activities in a more effective and efficient way.

In recent years, with the coming of the digital age, there has been a growing awareness of the significance of Information and Communication. Financial institutions have understood that

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poor information and communication system have an impact on every aspect of its performance from operational effectiveness to strategic management.

The Nigerian banking sector has witnessed tremendous changes linked with the development in information system over the years. The quest for survival, global relevance, maintenance of existing market share and sustainable development have made the exploitation of many advantages of information technology through the use of automated devices imperative in the industry. The development of e-banking as a result of advancement in information system poses a lot of challenges to regulatory authorities in the system.

1.2 Objectives of study

The objective of this study is to examine how best practice in Nigerian banking sector can be achieved through information and communication technology (ICT).

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1.3 Research Hypotheses

The hypotheses that shall guide this study are as stated below:

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Null Hypothesis: Best practice in Nigerian banking sector cannot be achieved through Information technology.

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Alternative Hypothesis: Best practice in Nigerian banking sector can be achieved through Information technology.

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2.0 Conceptual and theoretical Framework

2.1 Information and Communication Technology

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Information and Communication Technology (ICT) is the automation of processes, controls, and information production using computers, telecommunications, softwares and other gadget that ensure smooth and efficient running of activities. It is a term that largely covers the coupling of electronic technology for the information needs of a business at all levels. ICT has surpassed the role of support services or only electronic data processing; its fields of applications are slightly global and unlimited. Its devices especially the Internet and modern computer email facilities have further strengthened early modernizations like the telephone and fax. Other ICT devices include data recognition equipment, factory automation hardware and services, telecomputing and teleconferences using real time and online system (Adeoti, 2005).

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Alawode and Emmanuel (2009) defines Information and Communication Technology (ICT) as the automation of processes, controls, and information production using computers, telecommunications, software and ancillary equipment such as automated teller machine and debit cards. It is a term that generally covers the harnessing of electronic technology for the information needs of a business at all levels. Communication is the conveyance or transmission of information from one point to another through a medium. An example of how ICT has had an impact on the Banking Industry is that its emergence allows banks to apply credit-scoring techniques to consumer credits, mortgages or credit cards. Hence, products that used to be

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highly dependent on the banks' evaluation of its customers have now become more standardized. Other examples of ICT impact on the **Banking Industry** include the increased process efficiency, which can reduce costs in banks, and the branch renewal.

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In the words of **Khalifa (2000)**, Technology generally refers to the application of knowledge for the execution of a given task. It entails skills and processes necessary for carrying out activities in a given context. Information technology, the technology that empowers information, is a term that generally covers the harnessing of electronic technology for the information needs of a business at all levels. It refers to the automation of processes, controls, and information production using computers, telecommunication software and ancillary equipment such as Automated Teller Machines, and debit card.

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It was defined by the Nigerian National Policy for Information Technology (2001) as: computer, ancillary equipment software and firmware (hardware) and similar procedures, services (including support services) and related resources, any equipment or inter connected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, transmission or reception of data or information”.

Information and Communication Technology (ICT) is the automation of process, controls and information production using computers, telecommunication, software and ancillary equipment such Automated Teller Machine and Debit Cards. It is a term that generally covers the harnessing of electronic technology for the information needs of a business at all levels. **Laudon D. and Laudon J. (2001)**, assert that Information and Communication Technology deals with the physical devices and software that link various computer hardware components and transfer data from one physical location to **another**.

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2.1 History of the Banking Sector in Nigeria and the Advent of ICT

Formal banking is a relatively old economic activity in Nigeria, dating back to before the emergence of the country itself as a distinct nation. While Nigeria emerged as a distinct country in 1914 with the merger of the Northern and Southern Protectorates with the Colony of Lagos, the first bank in the country was established in 1894. However, the industry at this time and for some time after was largely unregulated and thus a lot of instability and bank failures characterized the system. However, with political independence looming in the 1950s, the government took control of the regulation of the industry bringing stability back into the sector. This remained the situation until the late 1980s when the deregulation of the economy that accompanied the Structural Adjustment Programme the country embarked upon brought the sector back into public focus.

The Nigerian banking sector has since undergone considerable reforms over the last 25 years. The financial deregulation and economic liberalization policy of the 1980s changed the structure of the sector from an oligopolistic, financially repressive and highly regulated sector to one that is deregulated and highly competitive. In 1980, there were 20 commercial banks and 6 merchant banks in Nigeria with a network of 740 and 12 branches respectively. This rose to 30 commercial and 12 merchant banks in 1986 with 1,367 and 65 branches respectively, and in 1991 there were 65 commercial and 54 merchant banks with 2023 and 84 branches

respectively. A depression in the financial system that took place in the mid-1990s reduced the number to 51 commercial and 38 merchant banks in 1999 (Tella, 2006).

Further reform of the system in the late 1990s saw the removal of the commercial/ merchant bank dichotomy in favour of the adoption of the term Universal bank. By the early 2000 therefore there were 89 Universal banks in Nigeria. Another reform of the sector in 2004 / 2005 brought the sector back under greater regulation principally in the form of a huge increase in the regulatory capital requirement from one billion Naira to twenty-five billion Naira. This led to a spate of merger and consolidation agreements among the firms in the industry reducing the number of the Universal banks to 25.

Another round of reform of the sector was commenced in 2010. This involved government bailout of 5 of the firms in the banking industry and restructuring of the top management of the affected banks. These were aimed at improving corporate governance and removing some structural deficiencies perceived to be inherent in the industry and which pose significant threat to the survival of many of the firms in the industry. From inception up to the period of deregulation, the operation of the banks in Nigeria were characterized by paper oriented methods rather than technological based system with attendant slowdown in pace of operation, employee productivity and general performance (Osabuohein, 2008). Hence, before the deregulation of the economy that took place in the 1980s, the use of ICT in the Nigerian banking system was limited.

However, Idowu, Alu and Adagunodo (2002) averred that Nigerian banks have since realized that the way in which they can gain competitive advantage over their competitors is through the use of technology, and this has engendered a growing rate of technology adoption in the Nigerian banking operations (Salawu and Salawu, 2007).

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Ehikhamenor (2003) noted that earlier desire for the use of ICT was characterized by long period of inertia largely attributable to the absence of an enabling policy and infrastructural environment. The decisive step in the incorporation of IT into banking operation in Nigeria actually started in 1999 being a consequence of stronger government commitment to the development of a national IT infrastructure. Banks not only became financiers of this initiative but also beneficiaries (Ehikhamenor, 2003). The formulation of a National Policy on Information Technology in 2001 created further awareness on the possibilities offered by IT and impacted positively on economic sectors with the banking sector as a pioneer.

2.2 Advantages of Information and Communication Technology

The Information and Communication Technology provides business with a number of benefits such as reduction of the cost, time elimination and error minimization (Chip 2003). Other benefits include:

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1. Enabling Parallelism
2. Facilitating integration
3. Enhancing Decision making
4. Minimizing points of contact.

Enabling parallelism involves moving from sequential structure of processes cycle-time problem resulting from delays, processes disruptions and handoffs; facilitating integration involves moving from the division of labour approach into 'the case management' approach. It eliminates unnecessary tasks and improves communication and quality of services. Enhancing decision making involves reducing the number of levels in an organization's hierarchies. It improves the decision making process while minimizing points of contact involves elimination of intermediaries at different levels and distance in the exchange of information required in any process.

The conceptual model process of Kobu (2002) expresses the relationship between Information Technology, and level of customer services. In the model, other elements such as organizational structuring and behavioural change for achieving better result are declared. Organizational restructuring eliminates barriers for a smooth flow of information and materials along the supply chains. The smooth flow of information can be facilitated by the use of various Information Technologies to improve the integration of various functional areas. Delivering quality goods at competitive prices in a timely fashion is the basic aim of Business Process Reengineering. So the coordination through the supply chains is the important point for achieving the required aim and Information and Communication Technology is the enabler for coordinating all parts of supply chains. The behavioural changes should precede the reengineering. Therefore the issues of training and education, employee empowerment, teamwork and incentive schemes should be given priority in BPR. Information Technology is the important point for improving the customer level because the element has direct influence on BPR and other elements of successful BPR.

Speaking on the uses of ICT to the banking sector, Agboola et al, (2002), put forward that today, a variety of ICT products are increasingly being used in the banking industry of the Less Developed Countries in response to increased sophistication of the customers and greater competition emanating from the increased globalization of the financial services industry. These products include Automated Teller Machines (ATMs), telephone banking, MICR cheques, Electronic Funds Transfer, Electronic Data Interchange, Electronic Home and Office Banking, Electronic Fund Transfer at Point of Sale, Electronic Letter of Credit, Electronic Card, Debit Card, Electronic Cash, Electronic Billing, Local Area Network, Wide Area Network, etc (Agboola 2006; Shokan 2005).

ICT products relevant to banks can be summarized into three groups viz (Agboola et al, 2002):

(i) Bankers Automated Clearing Services: which involves the use of Magnetic Ink Character Reader (MICR) for cheque processing; MICR is a system that provides for encoding of cheques and documents with characters in magnetic ink so that they can be electronically read. It is capable of encoding, reading and sorting cheques for timely clearing.

(ii) Automated Payment Systems: which include products such as Automatic Teller Machine – ATM (a remote cash dispenser that assists customers to have access to withdrawal outside the banking hall), Plastic Cards (microchips such as credit cards, debit cards, and store value cards that store electronic cash to use for online and off line micro payments) and Electronic Funds Transfer -EFT (an electronic tool that is used to effectively transfer the value of exchange

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process for goods and services, ideas or information from one bank account to another account in another bank). Electronic Letter of Credit, Electronic Cheque and Electronic Cash fall under automated payment system

(iii) Automated Delivery Channels: which include interactive television and the Internet. The device enables customers to carry out transactions with their banks through connection between the customer's terminals

2.3 Review of Previous study Information Technology and Business Process

Research on determinations of bank profitability has focused on both the returns on bank assets, equity and net interest rate margins. It has traditionally explored the impact on bank performance on bank specific factors such as risk, market power and regulation costs. More recently, research has focused on the impact of macroeconomic factors on bank performance.

In a study of the US banks for the period between 1989 and 1993, Agbazo (1997) finds that net interest margins reflect primarily credit and macroeconomic risk premier. In addition, there is evidence that net interest margins are positively related to core capital, non-interest bearing reserves and management quality, but negatively related to liquidity risk.

Sounders and Schumacher (2000) apply the Ho and Sainder (1981) model to analyze the determinations of interest's margin in six countries of the European Union and the US during the period of 1988 to 1995. They find that macro economic vitality and regulation have a significance impact on bank interest rate margin. Their results also suggest an important trade-off between ensuring bank solvency as defined by high capital to asset ratios, and lowering the cost of financial services to consumers as measured by low interest rate margins.

Gelos (2006) studies the determinants of bank interest margins in Latin America using bank and country level data. He finds that spreads are large because of relatively high interest rates (which in the study is a proxy for high macroeconomic risk, including from inflation), less efficient banks, and higher reserve requirements.

Athanasoglou et al (2006) studied the profitability behaviour of the South Eastern European banking industry over the period of between 1998 and 2002. The empirical results suggest that the enhancement of bank profitability in those countries requires new standards in risk management and operating efficiency, which according to the evidence presented in the paper crucially affect profits. A key result is that the effect of market concentration is positive, while the picture regarding macro economic variables is mixed. Athanasoglou (2006) apply a dynamic panel data to study the performance of Greek banks over the period between 1985 and 2001. It found some profit persistence, a result that signals that the market structure is not perfectly competitive. The result also shows that the profitability of Greek banks is shaped by bank specific factors and macroeconomic control variables which are not under the direct control of bank management. Industry structure does not seem to significantly affect profitability using accounting decompositions as well as panel regression Al-Haschemi (2007) stretches the determinant of bank net interest rate margins in the SSA countries. He found that credit risk and operating inefficiencies (which signal market power) explained most of the

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variation in net interest rate margin across the regions. Macroeconomic risk has only limited effects on net interest margin in the study.

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More recently, a number of studies have emphasized the relationship between macro economic variables. Sanders and Allen (2004) surveyed the literature on pro-cyclicality in operational credit and market risk exposures such cyclical effects mainly resulted from systematic risk emanating from common macro-economic influences or from interdependencies across firms as financial markets and institutions consolidate internationally. They may ultimately exacerbate business cycle fluctuation due to adverse effects on bank lending capacity. Using equity return, data over the period between 1973 and 2003, Allen and Bali (2004) examined the catastrophic risk of financial institutions. Results suggest evidence of procyclicality is both catastrophic and operational risk measurements, implying that macroeconomic systematic and environmental factors play a considerable role in determining the risk and returns of financial institutions.

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2.4 Empirical Literature on ICT Technology Investment and Corporate Performance

Literature is replete on business value of Information and Communication Technology. The central issue is whether the tremendous amount of Information and Communication Technology capital invested has had any impact on the performance of the investing firms. However, in this review, the intention is not to give details of prior work rather than an attempt to discuss key findings as well as the major hurdles researcher and practitioners face in this area.

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Prior research on Information and Communication Technology in the banking services sector falls into one of the following two categories namely; descriptive analysis of the use of Information and Communication Technology and the value it generates and measurement of the business value of Information and Communication Technology. The first category is primarily based on case studies at the firm or industry level and offers useful insights about significant issues while research in the second category (the measurement of Information and Communication Technology on business value) consists of studies on the impact of specific technologies and that of the overall use of Information and Communication Technology. One of the studies in the first category conducted by Weill (1992) classified Information and Communication Technology into three categories based on the management goals supported by the system. The study of the value of manufacturing sector identified significant productivity gains due to transactional Information and Communication Technology, but did not find any positive impacts for strategic or informational (Information and Communication Technology infrastructure) systems still another study by Bryiyofsson and Hitt (1993) used firm level data on 380 large firms for the period from 1987 to 1991 to measure whether Information and Communication Technology had made a substantial and statistically significant contribution to firm output. Thus, so far, empirical findings reported in the literature on impact of Information and Communication Technology investment at firm or industry level, are mixed.

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Another study was undertaken by Calderon (2001). The study covers a period of three years (1991 – 1994) and examined the relationship between the effectiveness of Information and Communication Technology and financial growth of public trade financial companies in South

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Korea. It measures Information and Communication Technology effectiveness based on user satisfaction, support for internal business process and system reliability. It reveals that Information and Communication Technology effectiveness and financial growth of Korea banks are significant. This shows an insight into the thesis that enterprises with high business information intensity will show a positive association between effective Information and Communication Technology and economic performance.

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The second study, though not particularly on banking sector, was conducted by Tam (1998) between 1983 and 1991, on the impact of Information and Communication Technology investment on business performance in four Newly Industrialized Economies (NIEs) in Asia namely: Hong Kong, Singapore, Malaysia and Taiwan. In this study, three pieces of evidence seem to emerge that are generally observed across country boundaries. First, Information and Communication Technology investment is not correlated with a shareholders return. Secondly, there is little evidence that the level of computerization is valued by market in developed countries. Thirdly, there is no consistent measurement of Information and Communication Technology investment as indicated by the mixed results across different performance ratios.

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In the second category, Stainer and Taixeira (1990) with their wealth of experiences with many of the large American Banks in McKinsey and company's financial services consulting practice presented arguments about why Information and Communication Technology investments in the major lines of the commercial banking business create value for banking customers, but destroy profitability for the firms that service them.

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Bansal et al (1993) discussed the advances in risk management technology and suggested the use of business value linkage to identify the benefits of such Information and Communication Technology investments. Banks and Kanffman(1998) showed that ATM membership choice has a significant and positive influence on a bank branch's market share of local deposits based on a study of a group of Pennsylvania banks. Lichtenberg (1995) found that the earliest adopters of ATM were able to achieve a sustainable gain in the market share based on an analysis of the Federal Deposit Insurance Corporation data in USA. Alpar and Kim (1990) used a tremendous cost function to measure the impact of the use of Information and Communication Technology on economic performance of banks. Based on their analysis of the Federal Reserve Banks Functional Cost Analysis (FCA) data, they concluded that Information and Communication Technology has been cost reducing and labour savings. Based on the same data set, Parsons and Denny (1993) found that although, not all banks benefit from Information and Communication Technology spending, some banks does. Parsons et al (1990) also used a translog cost from two Canadian banks and found that Information and Communication Technology investment did not increase total factor productivity. In a similar study, Davamanirajan et al (2002) focused on the trade services application in global wholesale banking and used the product function approach to estimate the impact of Information and Communication Technology in this application. In this study, the estimate of the output elasticity of Information and Communication Technology is positive and statistically significant. In addition, they find that the return on investment of Information and Communication Technology (increase in dollar revenue per dollar spent in Information and Communication Technology) is about 100% per year, holding labour input constant. The study

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also provides another instance of direct evidence that Information and Communication Technology has a favourable impact on productivity on the financial services sector.

The contradictory findings on the value of Information and Communication Technology are symptomatic of the difficulties of conducting such an analysis. Several authors have called this a measurement problem (Stainer and Taixira 1990, Parsons and Denny 1993 and Devamanirajan et al (2002). The concerns expressed by the authors are also in broad agreement. Overall, they agree that in the study of this nature one has to content with two complex issues: measurement and data. Because Information and Communication Technology impact cannot be assessed in isolation, conformity effects of other inputs (e.g. labour and non Information and Communication Technology capital) have to be taken into consideration. The problem is further compounded by the lack of quality data on Information and Communication Technology investment.

2.5 Empirical Literature on ICT and Nigerian Banking sector

In the case of Nigeria, very little empirical research has examined Information and Communication Technology impact on corporate performance. One of such limited studies was conducted by Idowu et al (2002) on the growth of the banking industry in Nigeria. This study assesses the perception of banking customers on the quality of banking services using a questionnaire survey. The study sampled five commercial banks namely; Wema Bank Plc, Union Bank, Omega Bank, Corporative and Access Bank. It examined our major issue: impact of Information and Communication Technology on bank services but in three different perspectives namely; the effect of Information and Communication Technology on banking services, effect of Information and Communication Technology on customer services and on bank productivity measured in term of speed of operation. It concludes that Information and Communication Technology has contributed immensely to growth of the banking industry in Nigeria.

The second study is that conducted by Oyeyinka (1996) on Information and Communication Technology in the finance sector. It examined the adoption of computers in Nigerian Banks with specific ways that computers affect the organization of work and constraints to its adoption. The study covered twenty (20) financial institutions comprising of twelve (12) commercial banks, five (5) merchant banks, one (1) development bank and two (2) mortgage institutions. Although, the study did not set out evaluated productivity gains, it concludes that given the enthusiastic adoption of computers by Nigerian banks, the perceived benefits may have outweighed the costs of adoption.

In the same vein, Ehikhamenor (2003) conducted a study to determine the expectation and success of Information and Communication Technology implementation on the banking sector in Nigeria. The study was a survey of 56 banks in Lagos. It concludes that almost all sampled banks have Information and Communication Technology policy which is meant to achieve full application of Information and Communication Technology: to meet organizational goals; to secure competitive advantage and to be up to date. According to this study, only 55% of the banks actually achieved some measure of successfully implementation. The expected benefits of investment in Information and Communication Technology were realized in only relatively

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The mix-up stems out of the fact that there is no conceptual framework on best practices as had earlier been pointed out.

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few banks. Thus less than 40% of the banks were poised to maximize the benefits of Information and Communication Technology through major investments.

Omoyi (2005) conducted a similar study on the impact of Information Technology on Competitive Strategy and Corporate Performance of Nigerian Banks. The study utilized data collected from seventeen (17) sampled banks to measure their level of commitment to the use and deployment of Information and Communication Technology. Multiple regression analysis was employed by the study to establish the relationship between Information and Communication Technology investment and the competitive strategy of Nigerian banks. The study concluded that at 5% level of significance, Information and Communication Technology investment is significantly related to earning per share and deposit base of the banks but strategic commitment of banks to the use of Information and Communication Technology has no contributions to the profitability of banks. These few studies undertaken to determine the impact of Information and Communication Technology in banking in Nigeria indicate that there is paucity of literature on impact of Information and Communication Technology on corporate performance in the banking sector. Besides, the ones available have not been specific on financial performance. Thus, this present study fills this gap in the literature. Though the study looks at the impact of Information and Communication Technology at the firm level, it takes a very broad perspective because it includes all classes of banks in terms of size age and geographical spread among other variables.

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Unlike the previous studies that have been concentrated in the Western and Eastern parts of the country, this study is widespread geographically. It adopts sample from the North, West and Eastern parts of the country. It includes new generation banks and considers financial information of the banks before and after consolidation. Besides, the study considers banks performance measure cutting across profitability, efficiency and Information and Communication Technology. This method is unprecedented in the context of the impact of Information and Communication Technology on bank performance in Nigeria.

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In addition, while studies such as Idowu (2002) and Ehikhamenor (2003) and Omoyi (2003) embarked on survey of opinions on the effect of Information and Communication Technology on banks, this study uses very objective criteria (such as the documents of the banks and information from bank experts), to Information and Communication Technology on profitability and efficiency via such performance measures as ROE, GE and EPS. Unlike other studies the questionnaire elicited fact and supported by physical observation rather than the subjective opinion of respondents as done by other researcher.

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EPS, GE and ROE should be written in full as they are being used for the first time.

Irechukwu (2000) itemized some bank services that have been revolutionized through the use of ICT as including account opening, customer account mandate, and transaction processing and recording. Information and Communication Technology has provided self-service facilities (automated customer service machines) from where prospective customers can complete their account opening documents direct online. It assists customers to validate their account numbers and receive instruction on when and how to receive their cheque books, credit and debit cards. ICT products in use in the banking industry include Automated Teller Machine, Smart Cards, Telephone Banking, Electronic Funds Transfer, Electronic Data Interchange, Electronic Home and Office Banking.

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Harold and Jeff (1995) contend that financial service providers should modify their traditional operating practices to remain viable in the 1990s and beyond, they claim that the most significant shortcoming in the banking industry today is a wide spread failure on the part of senior management in banks to grasp the importance of technology and incorporate it into their strategic plans accordingly. Woherem (2000) claimed that only banks that overhaul the whole of their payment and delivery systems and apply ICT to their operations are likely to survive and prosper in the new millennium. He advises banks to reexamine their service and delivery systems in order to properly position them within the framework of the dictates of the dynamism of information and communication technology. The banking industry in Nigeria has witnessed tremendous changes linked with the developments in ICT over the years.

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Brücher, Scherngell et al. (2003) opined that ICT adoption will improves three critical domains which are efficiency, quality, and transparency in any organisation. Agboola et al (2002) discussed the dimensions in which automation in the banking industry manifest in Nigeria. They include: Bankers Automated Clearing Services: Automated Payment Systems, Automated Delivery Channels.

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Comment [bs81]: Not in the list of references. The surnames of other authors should be included.

Ovia (2001) concluded that banking in Nigeria has increasingly depended on the deployment of Information Technology and that the IT budget for banking is by far larger than that of any other industry in Nigeria. He contended that On-line system has facilitated Internet banking in Nigeria as evidenced in some of them launching websites. He found also that banks now offer customers the flexibility of operating an account in any branch irrespective of which branch the account is domiciled.

Woherem (2000) revealed that Nigeria banks since 1980s have performed better in their investment profile and use of ICT systems, than the rest of industrial sector of the economy. An analysis of the study carried out by African Development Consulting Group Ltd. (ADCG) on IT diffusion in Nigeria shows that banks have invested more on IT, have more IT personnel, more installed base for PCs, LANs, and WANs and a better linkage to the Internet than other sectors of the Nigerian economy. The study, however pointed out that whilst most of the banks in the west and other parts of the world have at least one PC per staff, Nigerian banks are lagging seriously behind, with only a PC per capital ratio of 0.18.

Comment [bs82]: Nigerian

Comment [bs83]: These words are being used for the first time. Please kindly write them in full.

Ovia (2005) opined that the revolution in ICT has made the banking sector changed from the traditional mode of operations to presumably better ways with technological innovation that improves efficiency. ICT can enhance efficiency via its use and in recent times banks have been encouraged by the rapid decline in the price of ICT gadgets. This has perhaps increased the bank level of ICT usage. The increase might have also been attributable to business environment that became relatively flexible to accommodate new forms of technological change as a result of reforms in the country.

According to Wali (2010) the relationship between ICT and the various organisational activities is similar to government & civil servants while Governments outlines policies and civil servants execute those policies. ICT acts as a tool for the actualization of various organizational activities in order to implement and enforce policies.

Osabuohien,(2008) established that while the gender of the bank officials does not affect efficiency in ICT use, factors such as age, educational qualification, computer literacy and type of ICT gadgets, were significant in influencing banks. intensity of ICT usage. Also ICT was found to impact positively the speed of banking service delivery, as well as productivity and profitability. Banks should incorporate ICT into their strategic plans for effective performance in payment and delivery systems. This calls for proper analysis to determine the type, nature and extent of ICT products required for effectiveness and efficiency. It is imperative for bank management to intensify investment in ICT product to facilitate speed convenience and accurate service.

Comment [bs84]: This comment will be suitable as part of the recommendations.

Obviously speaking, from the previous studies examined above, it is no gainsaying the fact that in the overall ICT have made significant impact on the banking sector as a whole, however we still deemed necessary to still proceed with this owing to the fact time changes could affect research studies. As such, in this study we are interesting in finding out if best practice can be achieved in the banking system in Nigeria through information and communication technology.

Comment [bs85]: Appears not relevant. Please kindly delete.

3.0 Research Methodology

The study seeks to examine the impact of Information and Communication Technology on the Performance of the selected Nigerian Banks. This chapter presents the overall research design and approach to the whole study, including methods of data collection and procedure that will be adopted in data analysis.

Comment [bs86]: Appears not relevant and should be deleted.

3.1 Research Design

The study adopts a survey type of research design. There are two variables: independent and dependent. The dependent variable is the performance of the banks which is measured in terms of net income. The independent variable is the information communication technology investment which constitutes the three various investments: information communication technology investment, investment in other Asset, and Operating Costs (i.e. investments in non-information communication technology labour and overheads). In addition to the above, the study equally seeks to examine the relationship between information communication technology -related problems and bank profitability.

Comment [bs87]: investments in other Assets

Comment [bs88]: This objective is not included as part of the objective in the 'Objective of the Study' on page 3.

It is also observed that there is no justification for each of the variables used.

Justification can be in form of the superiority of each of them to other variables or by reference to previous works that had used them for similar purpose.

Comment [bs89]: Entire banking industry? Why are the staff included?

3.2 Population of the Study

The population of the study constitutes the entire banking industry and its staff. However, the impossibility of including all the members of the population makes sampling imperative. As a result, the study concentrated on four (4) mega banks; they include First Bank Plc, Guaranty Trust Bank Plc, Union Bank Plc and Zenith Bank Plc.

So, the study purposively selected banks whose statements of Accounts are ready and accessible during these periods. The study made use of data from four (4) sampled banks. The sampled banks are arranged alphabetically in table 3.1 below:

Comment [bs90]: for the period 1998-2012

There should be justification for any period used in a research work. What makes the period 1998-2012 unique in the Nigerian banking industry?

Table 3.1: List of Sampled Banks.

The study utilized data collected from eight sampled banks. The sampled banks are arranged alphabetically as follows:

Comment [bs91]: four

S/n Name	Type of Generation
1 First Bank Plc	Old Generation bank
2 Guaranty Trust Bank	New Generation Bank
3 Union Bank	Old Generation Bank
4 Zenith Bank Plc	New Generation Bank

Source: NDIC and CBN Publications (2012)

In each of these banks, the researcher collects data bordering on information communication technology investments, modern information communication technology applications, as well as issues concerning information communication technology related problems. The sampled banks and data collected bordering on these issues was coded for the purpose of convenience as well as to conceal identity of these sampled banks. By concealing identity of the banks, it implies that the study respects bank's sensitivity to information and a long standing tradition of secrecy.

3.3 Sources of Data Collection

In this study, secondary sources were used to collect information on such issues as the profile of the sector, historical evolution of information communication technology in banking, typologies of information communication technology using in banking sector, bank profitability and information communication technology-related problems in the Nigerian Banking sector, among other issues.

Apart from the use of the textbooks, journal, articles and Newspapers, Magazines as secondary sources of information, this study finds particularly useful, publications of organizations such as Central Bank of Nigeria (CBN), National Deposit Insurance Corporation (NDIC), Research and Data Service Limited Lagos (REDASEL) as well as the Annual Reports and Statement of Accounts of various banks. The study gets information on the number of licensed banks in Nigeria, the addresses of their head offices, the number and names of quoted banks on the floor of the stock Exchange, among other issues, from such National Deposit Insurance Corporation (NDIC) publications as banking supervision report, NDIC Annual Reports and Statement of Accounts as well as NDIC quarterly reports. In the same token, the study gets vital information from such as Central Bank of Nigeria (CBN) publications as CBN Annual Reports and Statement of Accounts, Economic and Financial Review and Bulletin.

Comment [bs92]: Please kindly delete.

3.4 Sources of data

The secondary source was used to collect data on the dependent variable of the study; which is banks' financial profitability. To measure financial profitability of the sampled banks,

organizational performance relative to competitors for a period of eleven years (1998 – 2012) will be used.

The accounting measures that were used in this study are Net income and investments in assets and operating costs. From net income, the following ratios were generated: Return on Equity (ROE) which measures firm's profitability and potential growth, Return on Asset (ROA) that measures the effectiveness at which firm's assets are being used to generate profits and Earnings Per Share (EPS), which measures the overall profit generated for each share in existence over a particular period.

Net income is simply the gross income accruable to a bank at a particular accounting period less operating expenses, interest and taxes. Information communication technology investment is the aggregate of investments in information communication technology capital and information communication technology labour, other investments is the aggregate of earnings assets, which include short-terms funds, short-terms investments, loans and leases, cash and interest bearing deposits with other banks, while operating cost is the aggregate of interest expenses, management expenses and taxes.

3.5 Data Analysis Techniques

This study relies on both qualitative and quantitative analysis of data to establish the needed relationship between information communication technology investment and banks corporate performance. In presentation and analysis of data, the study used quantitative tools for analysis and subsequently used qualitative means to expatiate on the quality of information provided. To this end, the study employs both parametric statistics and nonparametric statistics as well as inferential to analyze the needed relationships in the study.

Comment [bs93]: This objective is not in agreement with the objective stated on page 3

3.6 Model Specifications

Here, our study shall make use of four (4) banks; two (2) old generation banks, namely; First bank and Union bank and two (2) new generation banks, namely; Zenith bank and Guaranty Trust bank. The variables that shall be used in a pooled data form are the net income of these banks representing profitability as dependent variable while annual cost on investment, operation cost and investment on other assets shall serve as the independent or explanatory variables.

Comment [bs94]: Profitability is being used here as a proxy for Best Practices without being stated anywhere in the work.

The model more or less appears like the determinants of profitability of Nigerian banks.

Comment [bs95]: cost on ICT investments

Our pooled regression model is as presented below:

$$\text{NetIncomet} = a + \beta_1 \text{Annuictvest} + \beta_2 \text{AnnuOpercost} + \beta_3 \text{Annuvestosset} + e_i$$

Comment [bs96]: NetIncomt

Comment [bs97]: Annubpvest

Where:

a = Intercept

Netincomt = Corporate performance at time t measured by Net income.

Annubprvest = Annual ICT Investment

AnnuOpercost = Annual Operating Costs
 Annuestosset = Annual Investment on Other Assets
 ei = Error Term

Decision Rule

Accept Null Hypothesis (H0) if the t-values obtained for the parameter estimates is greater than 2 at the 5% significant level, otherwise reject the Null Hypothesis.

That is, in order to test the significance of the relationship of the variables identified by the hypothesis above, the study will use the rule of thumb of 2 at the 0.05 or 5% level of significance.

Comment [bs98]: Should be deleted. The standard rule and not the rule of the thumb is to accept the null hypothesis once it is not statistically significant at 0.05

3.7 Research Technique

This study used the pooled regression research technique analysis results to be presented as well.

This was obtained through the E-views software package. E-views are software packages used for analysing time series data to show the nature of relationship between variables in a model.

4.1 Presentation of results

Using the pooled regression analysis technique the results obtained is as presented below. It was obtained through the E-views software package. E-views are software packages used for analysing time series data to show the nature of relationship between variables in a model.

4.2 The Pooled Multiple Least Square Regression Results

The pooled multiple regression result is as presented below:

NETINC =	-6.0674	+ 0.9185	ICTINV	+ 1.3679	OPCOST	-0.1866	INVASS
S.E	(582.27)		(0.2421)		(0.6776)		(-0.1855)
t	(-0.0104)		(3.7935)		(2.0189.)		(-1.0060)

R2 = 0.36, F-stat = 10.55 (Prob.: 0.00) d.w. = 1.77 N = 60

(See full E-views software results at appendix 11)

Comment [bs99]: Only one appendix is attached.

It is observed that the abbreviations used for the variables in 'model specifications' differ from those used in paragraph 4.2. There should be consistency.

4.2.1 The Panel Multiple Regression Model result interpretation

The above presented panel regression results will be analysed in relation to our statement of hypothesis which were promptly responded to by the result.

Recall our statement of hypotheses one, which is given as thus:

Stated Hypothesis

H0: Management practices of ICT do not have significant impact on corporate performance.

Hi: Management practices of ICT do have significant impact on corporate performance

The panel regression model shows that the t-values for the operation cost (OPCOST) which is 4.51 and more than 2, given the rule of thumb at the 5% level of significant. We can conclude that it is statistically significant, since it is greater than the rule of thumb of 2. This means that management practice of ICT in the banking sector has impacted greatly corporate performance in Nigeria. As such, we reject the Null hypothesis one that Management practice of ICT does not have significant impact on corporate performance and accept the alternative that Management practices of ICT does have significant impact on corporate performance in Nigeria.

The R2 value of 0.43 implies that the multiple regression models have explained about 43% of the variations between the dependent variable and the independent variables in the model.

The F-Stat value of 28.99 is more than the critical value of 5.72 even at the 1% level of significance and Degree of freedom. Since the F-stat value of 28.99 is greater than the critical value of 5.72, it implies that our panel multiple regression models in the overall are very significant. Even the probability value validated this result.

The Durbin-Watson value of 1.55 suggests the absence of negative or positive autocorrelation.

Conclusion

This paper is on achieving Best practice in Nigerian banking sector through information technology (IT), our study using four (4) banks in Nigeria, namely, First bank, Union, Zenith bank and Guaranty Trust bank; reveals that with the use of information technology bank services in Nigeria have greatly improved. Besides, it has also impacted positively on the profits of these banks as well as reduced their investment on other assets. It goes to say that the advent of information technology has brought to the banking industry in Nigeria. Given the fact that, the use of Information and Communication technology (ICT) has now become one of the major quality of best practices in the global banking system, no bank that want to compete at the global level should claim ignorance of this factor. And it is on this basis that we make the following recommendations:

Recommendations

The research study on achieving best practice in the Nigerian banking industry through information technology has been quite revealing and it has informed these recommendations:

Comment [bs100]: The hypothesis is not in agreement with the one earlier stated on page 3.

Comment [bs101]: Operating Cost. The abbreviation is not in agreement with the one used in 'model specifications'.

Comment [bs102]: Delete.

Comment [bs103]: Is it management practice on ICT or investments on ICT?

Comment [bs104]: This finding may be misleading as it is not stated anywhere in the paper that investment on ICT is a proxy for management practice on ICT.

Comment [bs105]: 0.36

Comment [bs106]: 36%

Comment [bs107]: The adjusted R^2 is used for multiple regression analysis.

Comment [bs108]: 10.55

Comment [bs109]: The source of this figure is not known

Comment [bs110]: 1.77. For autocorrelation not to exist, the DW must be 2 or very close to 2.

Comment [bs111]: Information Technology

Comment [bs112]: Services, profitability or best practices. Which of them has actually improved?

Comment [bs113]: This is not shown anywhere in the work.

A descriptive statistics (graphs) showing the trends in each of the variables over the years would have made the discussions and conclusion more robust.

Comment [bs114]: Please kindly delete the statement 'it goes to say.....industry in Nigeria'. It is an incomplete statement.

Comment [bs115]: qualities

Comment [bs116]: intends

That banks that are yet to embrace the information technology system should as a matter of urgency do so.

Those that are using IT already should endeavour to improve on what they have and what they are doing at present so as to meet with the standard of best practices the world over.

That the banks should not rest on their present attainment owing to the fact that the IT world is a very innovative world, and as such they should be prepared for day to day innovation and improvement in existing status quo.

Training of staff and personnel to handle the information technology system of the bank should be recurring and up to date so as to keep abreast with world best practices.

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Comment [bs117]: The bulk of the works in the list of references are not in the body of the work.

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E-views Software Results

Dependent Variable NETINC

Method: Pooled Least Squares

Date: 07/08/13 Time: 20:31

Sample: 1998 2012

Included observations: 15

Number of cross-sections used: 4

Total panel (balanced) observations: 60

Variable Coefficient Std. Error t-Statistic Prob.

C

INVASS?

ICTINV?

OPPCOST?

-6.067414

-0.186636

0.918469

1.367944

582.2691

0.185519

0.242115

0.677564

-0.010420
-1.006019
3.793529
2.018915
0.9917
0.3187
0.0004
0.0483
R-squared
Adjusted R-squared
S.E. of regression
Log likelihood
Durbin-Watson stat
0.361084
0.326857
1429.861
-518.9865
1.765246
Mean dependent var
S.D. dependent var
Sum squared resid
F-statistic
Prob(F-statistic)
2754.300
1742.770
1.14E+08
10.54949
0.000013

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