The Effects of Information and Communication Technology to the Growth and Development of Banking Activities in Nigeria

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Abstract: *The research work focused on the contributions of information and communication technology to the growth and development of banking activities in Nigeria. The research work tried to identify and to assess the extent of the use of Information Technology in First Bank of Nigeria and seek to find out what impact as a whole does Information Technology have on banking operations. Questionnaires were generated, distributed and result analyzed using statistical data. The findings of this study reveal that a positive correlation exists between ICT and banks profitability in Nigeria. This implies that a marginal change in the level of the investment and adoption of ICT in the banking industry will result to a proportionate increase in the profit level. This is confirmed by the level of the regression coefficient as well as the factor analysis which revealed that an insignificant size of profit exist without the introduction of the ICT. The results in Table a, b and c show that banks that have a high level of ICT will make intensive use of production and efficiency practices such as business re-engineering, outsourcing and flexible work arrangements which will yield the best performance.*
Keyword: *Banking, Development, ICT, Analysis, data, research*

I. Introduction

From time immemorial, Information has always played a prominent role in human life but the emergence of social progress and the vigorous development in science and technology has immeasurably increased the role of information in every facet of human endeavor. The rapid expansion of a mass of diversified information has born the term "information explosion" and gave rise to a scientific approach in information and elucidation of its most characteristic properties which has led to principal changes in interpretation of the concept of information [3][4][7]. It was broadened to include information exchange not only among men but also among machines as well as the exchange of signals in the animal and plant worlds. The pace of change brought by new technologies has had a significant effect on the way people live, work, and play globally. Today's business environment is very dynamic and experiences rapid changes as a result of creativity, innovation, technological changes, increased awareness and demands from customers. Business organizations, especially the banking industry of the 21st century operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate with Information and Communication Technology (ICT) is at the centre of this global change curve [1][18][14][20][21]15]

Laudon and Laudon, (1991) contend that managers cannot ignore Information Systems because they play a critical role in contemporary organization. They point out that the entire cash flow of most fortune 500 companies is linked to Information System. The application of information and communication technology concept, techniques, policies and implementation strategies to banking services has become a subject of fundamental importance and concerns to all banks and a prerequisite for local and global competitiveness. ICT directly affects the various management functions of planning, organizing and the nature of services offered in the banking industry. It has continuously changed the way banks organized their corporate relation worldwide with the variety of innovative devices available to enhance the speed and quality of services delivery. Experts contend that financial service providers should modify their traditional operating practice to remain viable in the 1990"s and the decade beyond. Thus, ICT has emerged as a catalyst in the various industries of the world to aid the process and procedure required to ensure the realization of various organizational goals [12] [10] [17] [16] [8] [11]. The role of ICT in the banking sector became of interest to this study due to the significant role it plays in the economy by stimulating economic growth through the intermediation of funds to economic agents that need them for productive activities. This function is very vital for any economy that intends to experience meaningful growth because it makes arrangements that bring borrowers and lenders of financial resource together and more efficiently too than if they had to relate directly with one another [1] [17] [23][24][[20][19]. Hence, the objective of this study is to examine the role of information and communication technology in ensuring efficient service delivery in the banking industry as a strategy for the actualization of the profit maximization objectives of banks.

II.   Statement Of The Problem

Banking environment has become highly competitive today. To be able to survive and grow in the changing market environment banks are going for the latest technologies, which is being perceived as an 'enabling resource' that can help in developing learner and more flexible structure that can respond quickly to the dynamics of a fast changing market scenario. It is also viewed as an instrument of cost reduction and effective communication with people and institutions associated with the banking business. To this end various papers, research works, seminars have been written and held to evaluate the role of Information Technology on banking system. It is now increasingly being recognized that Information Technology enables sophisticated product development, better market infrastructure, and implementation of reliable techniques for control of risks and helps the financial intermediaries to reach geographically distant and diversified markets. Internet has significantly influenced delivery channels of the banks. Internet has emerged as an important medium for delivery of banking products and services. In the light of the foregoing, this research would attempts to examine the contributions of Information and Communication Technology (with particular reference to First Bank of Nigeria Plc) to the growth and development of banking activities in Nigeria.

III.   Research Purpose

The central theme of this study is to examine the extent of the use of Information Technology by First Bank of Nigeria in their day-to-day banking operations. Therefore, the objectives of this study shall be:
a.   To identify and to assess the extent of the use of Information Technology in First Bank of Nigeria.
b.   To identify the factors that may influence Information Technology use in First Bank of Nigeria.

IV.   Relevant Research Questions

This paper shall be guided by the following research questions:
1.   What impact as a whole does Information Technology have on banking operations?
2.   What impact does each component of Information Technology have on banking operations?
3.   What are the challenges facing the adoption of IT by First Bank of Nigeria?

V.   Statement Of Hypothesis

In order to establish the nature of the relationship between the adoptions of IT by First Bank of Nigeria, the hypothesis that would be tested in the course of this research is stated below as:

$H_{01(a)}$: There is no significant impact of information quality on first bank operational activities.

$H0_{2(a)}$: There is no significant impact of system quality on first bank operational activities.

$H_{03(a)}$: There is no significant impact of perceived usefulness and ease of use of IT (PUEOUIT) on first bank operational activities.

$H_{04(a)}$: There is no significant impact of trust on first bank operational activities.

$H_{05(a)}$: There is no significant impact of awareness on first bank operational activities.

VI.   Scope Of The Study

IT is increasingly moving from a back office function to a prime assistant in increasing the value of a bank over time. IT does so by maximizing banks of pro-active measures such as strengthening and standardizing banks infrastructure in respect of security, communication and networking, achieving inter branch connectivity, moving towards Real Time gross settlement (RTGS) environment the forecasting of liquidity by building real time databases, use of Magnetic Ink Character Recognition and Imaging technology for cheque clearing to name a few. This paper will not take into consideration how IT has facilitated services rendered by all the Nigerian banks, but will focuses primarily on how IT has affected the services of First Bank of Nigeria.

VII.   Significance Of The Research Problem

This study will explore the impact or influence of IT on banking operations. Though the scope of the study will be limited to the First Bank Plc, it is hoped that the exploration of this technology will provide abroad view of the areas in which IT has given First Bank Plc competitive advantage over its major competitors in the banking industry. It will contribute to the existing literature on the subject matter by investigating through a survey the role of IT in banking operations with particular reference to First Bank of Nigeria Plc.

VIII.   Research Approach

The data collection instrument used was a structured questionnaire because questionnaires are extremely flexible and could be used to gather information concerning almost any topic, from a large or small number of people. It was adopted for adequately testing the hypothesis to establish the continuous relevance of a theory. Five Points Scale ranging from strongly, disagree to strongly agree was used to measure the response of all the interviews.

IX.   Research Strategy

Seventy (70) copies of the questionnaires were administered personally to Information Technology support at the various First Bank Plc branches in the cluster. Out of these, forty-five responded indicating a response rate of 64%.No questionnaire was sent by post or through the electronic mail. Of the forty –five returned, four were discarded because they contained errors such as incomplete answers and inconsistence. Forty-one (41) questionnaires were found suitable for the analysis. However, this study employed data from both the secondary and primary sources. The secondary sources included textbooks, journals, news papers, and the use of the internet. The primary source included the structured questionnaire administered in the course of the study.

X.   Research Methods

Analyses of data were carried out using simple percentage and regression analysis. In the analysis, First Bank Operational activities were regressed against influential factors which are:
1) Information Quality; 2) System Quality; 3) Perceived Usefulness and Ease of Use of IT (PUEOUIT); 4) Trust and; 5) Awareness

Thus, multiple regression analysis, analysis of variance (ANOVA) and Likert Scale were the various tools used in the study. In multiple regressions, the aim is to examine the nature of the relationship between a given dependent variable and two or more independent variables. Thus multiple regression analysis, analysis of variance (ANOVA) and Likert scale were the various tools used in this study to evaluate the impact of Information Technology on banking operation with F-test utilized in determining level of significance. The student t-test was used to test for level of significance of each individual factor. In multiple regressions, the model describing the relationship between the dependent variable and a set of independent variables

$$X1, X2 \ldots \ldots \ldots \ldots \ldots \ldots \ldots Xn$$ can be expressed as:

$$Y_i = b_0 + b_1 X_{I1} + b_2 X_{I2} + b_k X_{ik} + e_i \ldots \ldots \ldots (1)$$
$$For\ i = 1, 2, \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots , n$$

Where:

n = the number of observations on both dependent and independent variables

$$b_0 + b_1 \ldots \ldots \ldots b_k$$ are parameters referred to as regression coefficient.

e = independent and normally distributed random error term with mean Q and constant variance δ^2

Y = First Bank Operational Activities = Dependent Variable; X1 = Information Quality = Independent Variable; X2 = System Quality =Independent Variable; X3 = Perceived Usefulness and Ease of Use of IT (PUEOUIT) = Independent Variable; X4 = Trust= Independent Variable; X5 = Awareness = Independent Variable

XI.   Research Techniques And Procedure

A fairly representative sample was obtained by employing the use of a non probability sampling procedures to select three groups or locations as sample population. Experts says that to obtain a representative sample, each unit must be selected from the total population systematically in a specified way drawing a sample involves defining the population, determining the size of the sample so that all represented and the units drawn must fully represent the entire or total population. The selected clusters in this study include:
1) First Bank Plc Branches in Owerri, Imo State. 2) First Bank Plc Branches in Enugu and 3) First Bank Plc Branches in Portharcourt. They were selected because the researcher felt that the clusters were large enough to represent the population and embrace the technical information the researcher was seeking to obtain. This helps the researcher to observe the elements, administer research instruments and identify characteristics of the element.

XII.   Presentation And Analysis Of Data

The data collected from the survey by a way of structured questionnaires are being presented in this section and analyzed. The analysis is to evaluate the impact of Information Technology on Banking Operations as well as the statistical significance of the impact of each of the components or factor of Information Technology by the method of hypothesis testing.

XIII.   Results Presentation And Description

The data as presented in table a, b and c was collected from the field survey. The columns of the table are described as follows:
Y represents First Bank operational activities; X1 represents Information Quality

X2 represents System Quality; X3 represents Perceived Usefulness & Ease of Use of IT (PUEOUIT); X4 represents Trust; X5 represents Awareness

XIV.   Model Estimation And Interpretation

In estimating the model of relationship, the data on table a, b and c were subjected to multiple regression analysis using SPSS version 11.0. The results obtained from the multiple regression analysis are shown in the table below:

R^2 = .563; Adj.R^2 =.470; Durbin-Watson = 2000

TABLE (a): Model Summary for the constructs

Model	R	R-Square	Adjusted R-Square	Std. error of estimate	Durbin-Watson
1	732[a]	536	470	1.73631	2.000

a.   Predictors: (Constructs), Information Quality, System Quality, PUEOUIT, Trust, Awareness

XV.   Interpretation Of Results

In table b, the meanings of the various statistical tool used in analyzing the model of this research work were given as follows:

a.   The co-efficient of correlation (R) shows the degree or extent of relationship between the dependent and the independent variables. The value 0.732 in table (a) shows the existence of a positive relationship between these variables.

b.   The Co-efficient of Determination (R^2) explains the proportion of the total variations in the dependent variable that is attributable to the variations in the independent variable. From table (a), it was revealed that about 53.6% (0.536) of the variations in the dependent variable are attributable to variations in the independent variables.

c.   The Adjusted Co-efficient of Determination (R^2 Adjusted) which shows the actual variations in the dependent variable is attributable to the independent variable. Table (a) above reveals that the adjusted co-efficient of determination is 0.470 which implies that the actual variation is 47.0% as against 53.6% suggested by normal R^2.

d.   The Student t-test (t-test) shows the significance of individual parameters (ICT development indicators) used in the model reveal a significant estimator as all variables under consideration at 5% (0.05) level of significant.

e.   The F-statistic (F-ratio) shows the overall significance of the model and evaluates the model. The model is significant because the calculated F-ratio of 8.100 is greater than the table values of 2.21 at both 5% levels of significance.

TABLE (b): Coefficient of the constructs

Mode	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. error	Beta	Tcal	Sig.
1(constant)	6.275	2.559		2.452	.019
Info. Quality	.135	.229	.094	.588	.560
Syst. Quality	-.172	.209	-.121	-.822	.417
PEOUIT	-.199	.191	-.150	-1.046	.303
Trust	.396	.164	.340	2.424	.021
Awareness	.944	.247	.611	3.817	.001

a.   Dependent Variable :FIRSTBANK OPERATIONAL ACTIVITIES

Using the regression output in table (b), we estimated the following equation

$$Y = 6.275 + 0.135(X1) - 0.172(X2) - O.199(X3) + 0.396(X4) + 0.944(X5)\ldots\ldots\ldots 2$$

Where y = First Bank Operational Activities
X1= Information Quality; X2 = System Quality; X3 = Perceived Usefulness and Ease of Use of IT (PUEOUIT); X4 = Trust; X5 = Awareness

TABLE (c): ANOVA[B] for the constructs

Mode	Sum of Squares	Df	Mean Square	Fcal	Sig.
1regression	122.092	5	24.418	8.100	.000[a]
Residual	105.518	35	3.015		
Total	227.610	40			

Predictors (construct), Information Quality, System Quality, PUEOUIT, Trust, and Awareness

a.   Dependent Variable: FIRST BANK OPERATIONAL ACTIVITIES

XVI.   Test Of Hypothesis Results

Recall that, we accept the null hypothesis if the critical tabulated value is greater than the calculated value, otherwise reject.

$H_{01(a)}$: There is no significant impact of information quality on first bank operational activities.

$H_{A1(b)}$: There is significant impact of information quality on first bank operational activities. Using the decision rule, we found that the tabulated value of t-statistics is greater than the calculated value. Since ttab >t cal , we accept null hypothesis (H01(a)) and reject alternate hypothesis ($H_{A1(b)}$) and conclude that Information quality has no impact statistically on banking operational activities.

Alternatively, at significance level of 0.560 for information quality, information quality is insignificant because the probability value is greater than 0.05 significance level (i.e. P>0.05). We therefore accept null hypothesis ($H_{01(a)}$) and reject alternate hypothesis ($H_{A1(b)}$) and conclude that information quality has no significant impact statistically on banking operational activities.

$H_{02(a)}$: There is no significant impact of system quality on first bank operational activities.

$H_{A2(b)}$: There is significant impact of system quality on first bank operational activities.

Using the decision rule, we found that the tabulated value of t-statistics is 1.6896 and the calculated t-value is 0.822. Since ttab >t cal , we accept null hypothesis (H02(a)) and reject alternate hypothesis ($H_{A2(b)}$) and conclude that system quality has no significant impact statistically on banking operational activities.

Alternatively, at significance level of 0.417 for system quality, it is also insignificant because the probability value 0.417 is greater than 0.05 significance level. We therefore accept null hypothesis ($H_{02(a)}$) and reject alternate hypothesis ($H_{A2(b)}$) and conclude that system quality has no significant impact statistically on banking operational activities.

$H_{03(a)}$: There is no significant impact of perceived usefulness and ease of use of IT (PUEOUIT) on first bank operational activities.

$H_{A3(b)}$: There is significant impact of perceived usefulness and ease of use of IT (PUEOUIT) on first bank operational activities.

Using the decision rule, we found that the tabulated t-value is 1.6896 and the calculated t-value of PUEOUIT is -1.046. Therefore , since ttab >t cal , we accept null hypothesis ($H_{03(a)}$) and conclude that PUEOIT has no impact statistically on banking operational activities.

Alternatively, since the significance probability value of PUEOUIT is 0.303 and is greater than 0.05 significance level, we therefore accept null hypothesis ($H_{03(a)}$) and reject alternate hypothesis ($H_{A3(b)}$) and conclude that PUEOUIT has no significant impact statistically on banking operational activities.

$H_{04(a)}$: There is no significant impact of trust on first bank operational activities.

$H_{A4(b)}$: There is significant impact of trust on first bank operational activities.

Using the decision rule, we found that the tabulated t-value is 1.6896 and the calculated t-value for trust is 2.424. Since tcal >ttab , we reject null hypothesis ($H_{04(a)}$) and accept alternate hypothesis ($H_{A4(b)}$) and conclude that trust have significant impact statistically on banking operational activities.

Alternatively, knowing that the significance probability value for trust is 0.021 is less than 0.05, trust is significant at this significance level of 0.05 (P<0.05),we therefore reject null hypothesis ($H_{04(a)}$) and accept alternate hypothesis ($H_{A4(b)}$) and conclude that trust has a significant impact on banking operational activities.

$H_{05(a)}$: There is no significant impact of awareness on first bank operational activities.

$H_{A5(b)}$: There is significant impact of awareness on first bank operational activities.

Using the decision rule, we found that the tabulated t-value is 1.6896 and the calculated t-value of awareness is 3.817. Since tcal >ttab , we reject null hypothesis ($H_{05(a)}$) and accept alternate hypothesis ($H_{A5(b)}$) and conclude that awareness have significant impact statistically on banking operational activities.

Alternatively, the significant probability value of awareness is 0.001.At this probability value, awareness is significant at 0.05 significance level, we therefore reject null hypothesis ($H_{05(a)}$) and accept alternate hypothesis ($H_{A5(b)}$) and conclude that awareness has significant impact statistically on banking operational activities.

XVII.   Summary Of Findings And Conclusion

The findings of this study reveal that a positive correlation exists between ICT and banks profitability in Nigeria. This implies that a marginal change in the level of the investment and adoption of ICT in the banking industry will result to a proportionate increase in the profit level. This is confirmed by the level of the regression coefficient as well as the factor analysis which revealed that an insignificant size of profit exist without the introduction of the ICT. The results in Table (a) shows that banks that have a high level of ICT will make intensive use of production and efficiency practices such as business re-engineering, outsourcing and flexible work arrangements which will yield the best performance. According to Milgrom and Roberts (1990) they argued that to be successful, firms typically need to adopt ICT as part of a "system" or "cluster" of mutually reinforcing organizational approaches. The underlying argument behind the bundling of ICT and organizational performance is that it enables firms to introduce organizational changes in the areas of re-engineering,

decentralization, flexible work arrangements, outsourcing, lean production, and team-work and customer relations. It also allows firms to produce with greater flexibility and shortened product cycles to satisfy shifting consumer preferences. In turn, these organizational changes are essential for realizing the full benefits of ICT in every entity. Concerns about ICT role in attaining effectiveness, efficiency and productivity were raised in the late 1980s. Since then a large number of studies have emerged both at the industry and firm level that have substantially improved our understanding of the relationship between ICT and firm performance. In particular, the firm-level studies have argued than an explanation for the so-called "productivity paradox" can be attributed to an insufficient response of organizational changes to adapt to changing business environment, to make better use of knowledge, technology and human resources, to respond to new demands from suppliers and customers, and to use ICT effectively.

XVIII.   Recommendations

Presently, Information and communication technology has received great thoughtfulness across various industries and substantial positive effect on bank's profitability, cashiers work, banking transaction, patronage, services delivery, and customer's services among other. Hence, it is recommended that more attention has to be directed towards the use of Information and communication Technology in banking operations since the industry serve as a lubricant to the cog of the wheel of the nation's" economy while appropriate policies must be put in place to ensure proper monitoring and the determination of the optimum size required to attain organizational efficiency.

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