

IMPACT OF INFORMATION COMMUNICATION TECHNOLOGY USAGE ON THE PERFORMANCE OF SELECTED DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT

The study examines the impact of ICT Usage on the Performance of selected Deposit Money Banks in Nigeria. Despite the gains derivable from implementing ICT in modern commercial banking operations, commercial banks in Nigeria still face crucial challenges in adopting and implementing ICT in their operational activities. The main objective of the study was to investigate and analyze the impact of ICT usage on the performance of selected Deposit Money Banks in Nigeria. The study adopted quantitative research method for analysis and the population of the study was 170 respondents where the sample size used was 119 respondents. Simple regression and other statistical tools via SPSS were used to analyze the data collected. Base on the findings, it shows that ICT usage has significant impact on strategic decision, competitive advantage and customers' satisfaction of the three selected Deposit Money banks in Nigeria. The study established that there is a significant impact of ICT usage on the operational performance of the selected commercial banks in Nigeria. The study concluded from the findings that ICT usage in the operations of conventional banking system in Nigeria enhances their operational performances in terms of strategic decisions making, improving competitive advantage and better customer satisfaction through service innovativeness. The study recommends that top management of the banks should adopt and implement ICT that will boost their business intelligence, use of robots in banking operations and higher profitability

Keyword: Deposit Money Bank, Information Communications Technology, Operational Performance, Profitability, Sustainability.

1.1 Background to the Study

The competitive strengths of modern strategic business leaders is directly proportional to the quality of technology adopted to cope with the dynamic business environment especially in the era of globalization. Innovative strategies therefore become imperative for achieving sustainable profitability in modern business organization. Organizations leveraging on information and communication technology have improved operational performances in modern corporate settings. The effects of ICT are seen in improvement in productivity and economic growth at the level of the firm. (Meshack, Charles & Mercy 2020). Advancements in technological infrastructure have led many businesses into aggressive service delivery so as to attain higher levels of operational performance. A PWC, (2016) report identified technology as one of the forces that are disrupting the role, structure, and competitive environment for financial institutions and the markets and societies in which they operate. It is now becoming obvious that the accelerating pace of technological change is the most creative force and also the most destructive in the financial services ecosystem today. Therefore, the application of information and communication technology strategies to banking services has become a subject of fundamental importance and concerns to all banks and a prerequisite for local and global competitiveness.

In modern business enterprises, technologies have become instrument used to promote communication, cost effectively, within and outside the organization. This has manifested in positive changes in the way corporate organizations respond to the needs of their customers. Technological infrastructure have also become a strategic tool used in gathering data and information flow which aid in decision making processes, especially in

financial institutions which deal with huge databases. (Danni, 2021)

In Nigeria, financial institutions have adopted and implemented new technological advancements to enhance smooth operations in dealings with their customers. This has differentiated their ratings in terms of addressing customer complaints and this has variably led to increase in level of customer satisfaction through internet self-banking operations (Offei and Nuamah-Gyambrah, 2016). One vital effect of ICT adoption and implementation in modern banking industry specifically in deposit money banks in Nigeria is that it creates sustainable value chain in operational activities which enhances their strategic and operational performance on the long run. The ICT adoption helps commercial banking institutions to ensure effective communication flow within their organizational structure and align communication with the external environmental variables.

Despite the gains derivable from implementing ICT in modern commercial banking operations, commercial banks in Nigeria still face crucial challenges in adopting and implementing ICT in their operational activities (Agboola and Salawu, 2008). The coming of information technology, the transaction of businesses especially in the financial sector was difficult and stressful; hence, the low performance level of banks in Nigeria. Technology has indeed influenced the performance of all Nigerian Banks in the last decade. This period has been associated with the provision of dynamic customers focused on banking services, improved regulation and high profitability.

The recent novel COVID-19 Pandemic has given more impetus to the progressive adoption of new ICT infrastructure in commercial banking system in Nigeria. These have affected changes in strategic business

decisions, competitive advantage and customer satisfaction in deposit money banks in Nigeria. Based on this development, the study investigates the effect of ICT usage on operational performance of three selected commercial banks in Nigeria. The study seeks to establish the correlative role of ICT usage on the key performance indicators namely: strategic decisions, competitive advantage and customer satisfaction.

The main objective of the study is to investigate and evaluate the correlative contributions of ICT on operational performance of three selected commercial banks in Nigeria. The following are specific objectives of the study:

1. To determine the extent to which ICT usage has significantly impacted on strategic decisions of three selected commercial banks in Nigeria.
2. To ascertain the extent to which ICT usage has significantly improved competitive advantage of three selected commercial banks in Nigeria.
3. To examine the extent to which ICT usage has significantly impacted on customer satisfaction of three selected commercial banks in Nigeria.

The study focused on the effect of ICT on the operational performance of three selected commercial banks in Nigeria, namely: Zenith Bank Plc., Guaranty Trust Bank Plc. (GTB) and First Bank, Nigeria. The independent variable from the study is the information and communication technology (ICT) usage, while the dependent variable centered on key operational performance of strategic decisions, competitive advantage and customer satisfaction.

2.0 Literature Review

Concept of Information and Communication Technology (ICT)

Technology can be described as dynamic and complex strategic resources that modern digital organizations adopt and implement to enhance their operational activities and performance. Technology is a strategic tool to enhance innovativeness in service industry specifically in the modern money deposit banking system and operations. Technologies are modern machinery that the banking industry uses to enhance changes in innovative strategies in competitive markets (Kiani, Yang, Ghani and Hughes (2021); Kiani, Kanwal and Wang, (2019) and enhances strategic growth and attain competitive strengths and advantage (Kiani, et al., 2021; Covin & Wales, 2019; Ingram, Peake, Stewart and Watson, (2019).

Information and Communication Technology (ICT) is an advance concept from technological variables that play the role of enhancing easy flow of information and communication to attain sustainable operational efficiency and performance in modern commercial banking operations. ICT is a modern technological variable that enhances easy flow of digital business opportunities and investment flow in modern business settings (Uyar, Khalil, Cemil, Mohammed and Friedrich 2021; Adam 2020). Bhujabal, and Sethi, (2020) also supported that ICT plays significant role in the smooth operation and implementation of foreign direct investment. Makanga and Paul, (2017) assert that operational and business performance measurement in business enterprises is vital to ascertain the rate of sustainability in achieving organizational goals and objectives. It is also a tool to make sure results attained are comparable over a period of time in an organization.

ICT Usage and Operational Performance of Commercial Banks in Nigeria

ICT infrastructures have played critical roles in the operational performances of modern commercial banking system in Nigeria in different perspectives. Commercial banking system in Nigeria operates on highly competitive and innovative atmosphere as a result of the increase in advancement and improvement in modern ICT infrastructures. Customers service delivery in the commercial banking sectors have being effectively sustainable and profitable in their operational activities as results of modern adoption and implementation ICT and other technological variables. Several studies recently have deeply and tremendously proven that adoption and implementation of ICT infrastructures have immensely and significantly contributed to development and improvement in operational sustainability and profitability of money deposit banks and in the banking system in their different perspectives (Nguyen Van Thuy et al., 2021; Wiredu et al., 2020; Adegbe et al., 2020; Kyeremeh et al., 2019; Nwakoby et al., 2018).

Adegbe, et al., (2020) asserted in their study that many banks in Nigeria failed in smooth and effective operations due to failure to inculcate ICT infrastructures in the strategic operational and this has caused drastic negative changes in operational performance in Nigeria. Adegbe, et al., (2020) in another way round asserted that adoption and application of ICT can change the dimension of business operational failure in banking system if adequately implemented smoothly to fit in with competitive marketing environment in the banking sectors. Kyeremeh et al., (2019) in their study assumed evidently that ICT has taking over all manual activities in the banking to become internet and machine base operations and this has dramatically changes improvement in their strategic and operational sustainability

on the long run. In the nutshell the adaptation and implementation of ICT has introduced the following E-applications in the commercial banking sector:

1. The advent of modern ICT infrastructures has led to introduction of Electronic banking system (E-banking or Online banking or Digital banking) which has tremendously improve efficiency and effectiveness in the modern commercial banking system.
2. The advancement and adoption of modern digital ICT infrastructures have led to the improvement in mobile banking operations smoothly and effectively in the commercial banking system in Nigeria
3. The adoption and implementation of ICT variables in operations of deposit money banks in Nigeria has led to the advancement in the use of Automatic Teller Machines (ATMs) it is capable of performing virtually 85% banking services ranging from cash withdrawal, cash deposit, transfer of money; access statement of account and many other functions the commercial banks performed internally.
4. The adoption and advancement in application of ICT has holistically change the strategic and operational performances in productivity and has led to the improvement and attainment in their strategic goals and objectives in commercial banking system in Nigeria. This has changes positively their operational sustainability and profitability on the long run.
5. The adoption and implementation of advance ICT application has bring advancement improvement in technological innovation, organizational innovativeness and competitiveness that enhance competitive strengths and competitive advantage in commercial banking system in Nigeria.

6. The innovativeness in the money deposit banking system has led to improvement and incremental growth in customer satisfaction that has lead high customer loyalty and retention in the commercial banking system in Nigeria.

Strategic Decision and Performance

Strategic decision making is one of the key determinants of performance in the service industries. Measuring performance in every corporate setting exposes the level of management strengths and weaknesses in terms of efficiency and effectiveness in the utilization of resources to attain strategic goals and objectives. Business and operational performance comprises the ascertainment and assessment of all strategic business units' operational performances in alignment with the expected goals and objectives standard of the organizations and how it has impacted on the long term financial and operational growth of the organization. Operational performance can be viewed and measured in different perspectives based on the organizational structure and design. The level of technological innovation, ICT infrastructural adoption and implementation in product and process development in terms of quality product, self-marketing brands and packages of firms are indicators of operational performance. Effective and efficient management of customer complaints with ICT variables in corporate enterprise leads to increase and retention of reliable customers.

Competitive Advantage

Effective business strategies confer competitive advantages on firms. This can be achieved via the adoption of ICT infrastructure that can improve product and service quality, reduce customers' complaints. Efficient long term improvement from growth in sale volume and increment in market share of a firm as a result of innovativeness and

declining rates of complaints are signs of sustainable operational and business performance Almansour, (2012); Isaiah, Selvam, Vinayagamoorthi, Kasilingam and Manappan, (2015). Holistically operational performance can be traced internally and externally in sustainability of strategic business growth and improvement of organizations.

Customers' Satisfaction

The customers and other stakeholders' satisfactory perception in corporate image of an enterprise with high percentage of confidentiality is a deep signal of high strategic operational performance. Operational performance are deeply affected and determined by environmental contexts however strategic thinkers and effective business leaders need to be mindful of alignment and integration of corporate strategy with changing business contexts in order to maintain profitable business growth and sustainable operational performance. Technology and innovation are issues that trigger in strategic managers, the drive for deploying effectively, ICT to enhance operational performance of corporate enterprises. Having the right technologies and ICT infrastructure in workplace with the right motivated workforce equipped with strategic thinking can build up quality innovative products and services that will decline customers' complaints, reduces operational cost and these can enhance productivity and attractive operational performances holistically (Offei, et al., 2016).

Concept of Deposit Money Banks

Commercial banks that based their operations on accepting deposit; operate on short term loans and credit facilities and practice retail banking system. Commercial banking system also known as money deposit bank operates on different level of account that helps their

operations to attain sustainability and profitability. The money deposit banks operate on saving account, current account and time /fixed deposit account and many others advises and intermediary roles in their operations. Commercial banking system operates on the rules and regulation of the apex bank of every nation. Nwakoby et al., (2018) and Investopedia, (2017) described commercial banking system as set of financial institutions that engaged in accepting deposits of various kinds and advancing loans and credit facilities to their various customers and target markets. They performance different critical roles in their strategic operations ranging for from:

1. Accepting deposits from their various customers that comes of saving, demand deposit and time or fixed deposit.
2. They play the role of giving loans and credit facilities to various SMEs and corporate enterprises to enhance their operational performance and boost strategic and operational sustainability.
3. They perform advisory and intermediary functions to their various customers on how to enhance and improve their business operational activities and attain sustainable in their business performances.
4. Mostly commercial banking system operates on retail banking system that their target markets are mostly individual or group of people not on focusing on corporation as the core function of merchant banks.

Theoretical Framework

The study reviewed the following theories in alignment and integration with the study on ICT adoption and effect on the improvement of money deposit banks in Nigeria:

Contingency Theory:

This theory has significant alignment and integration with the current study and the theory was propounded by Fred, (1964) to address the way to think urgently on solution to attack and act swiftly on unforeseen new and unfriendly situations that surface in organizations. Contingency theory posits that there are no specific organizational resources or best approaches that are suitable to address unforeseen issues that attack the organizations. The theory posits that organization should adopt and implement the variation in ICT infrastructures and technological variables as relevant tools to address changes from business contexts complexities and variability. Also the complex and dynamic variation from other business contexts ranging from complexities from technological variables and economic dynamic have affect positively the adoption and implementation of advancement application in modern ICT infrastructures in commercial banking system. Shams and Solima, (2019) and Walls and Barnard (2020) and Alnoukari, (2020) sees contingency theory as strategic theory to pad with unforeseen change in business situations to sustainable operational performances specifically during this novel corona virus pandemic.

Innovation Diffusion Theory:

This is another concrete theory that has significant alignment and supported this study. Innovation diffusion theory was invented by Rogers (1962) to explain the diversification of innovation trends in modern corporate settings. The theory posits that swift adopters to new digital innovation and modern digital ICT infrastructures in organizational settings holistically will perceive positive behavioural changes in holistic strategic and operational performances than the late adopters in competitive market environment. This theory sees ICT quick adoption and application in

modern money deposit banking system as strategic and competitive strengths to change position and improve operational sustainability in the competitive market in the banking industry. Alnoukari, (2020) sees innovation diffusion theory as strategic instrument to fast track innovativeness in modern corporate enterprises specifically in the modern conventional banking industry.

Theoretical bases for the Study

The above theories reviewed have significantly play supportive strengths in this study however, for the purpose of this study, the study adopted innovation diffusion theory to the study. The theory vividly exposes the need to adopt and implement ICT infrastructures to improve in innovation strengths and strategies that will help modern commercial banking firms to have place in competitive markets and trend with competitive advantage. The theory has also showed how money deposit banks can attain strategic and operational sustainability in their operational activities.

Empirical Review

The study on ICT effect on three selected conventional banks in Nigeria reviewed several related experimental studies that play significant contributions in expressing and supporting more the discussion of the findings to this study. Nguyen, et. al., (2021) conducted a study on ICT and Bank Performance: Empirical Evidence from Vietnam and the main objective of the study was to ascertain the predictive future of adopting and implementing information and communication technology infrastructures in attaining sustainable and profitable operational performances of money deposit banks in Vietnam.

Rahman, et al., (2021) conducted a study on the role of ICT investment and diffusion in

the economic growth: a threshold approach for the empirical evidence from Pakistan. The study aimed to investigate and assess the strengths and capabilities of ICT infrastructures on investment and transmission of economic growth of Pakistan. The study ascertained the rate of ICT innovation adopted and investment within the period of 2013-2018.

Wiredu, et al., (2020) conducted a study on the impact of information and communication technology (ICT) on rural banks management. a case study of Atiwa-rural bank limited in Ghana. The study aimed to investigate and evaluate the contributing effect of ICT infrastructures adoption and application in rural banking and the holistic contributory impact of ICT invention in Ghana. 300 customers form population for the study was selected from the (Anyinam) Branch of Atiwa Rural Bank Limited.

Adegbie, et al., (2020) conducted another study on information and communication technology and sustainable performance of selected listed deposits money banks in Lagos state, Nigeria. The study aimed to investigate the effect of ICT adoption and application on the strategic and operational performances sustainability of commercial banks in Lagos, Nigeria. The study used cross-sectional survey research design and well-structured questionnaire to collect data for analysis.

Falck, et al., (2020) conducted a study on returns to ICT skills. The main objective of the study investigates how vital ICT variables adoptions are critical strategic tools in modern labour market environment. 19 nations were selected as sample size using two instrumental-variable models to ascertain technologically indifference among the selected countries and German provinces. Finding from the study concluded statistically and significantly that the return of ICT skills has improve most top and high operational

and economical performing countries globally and highly concluded the ICT skills and variables are strategic strengths for positive and dramatic changes in nation's economic capabilities and competency.

Ohiani, (2020) also conducted a similar study on technology innovation in the Nigerian banking system: prospects and challenges. The aim of the study is investigate and assess the effect of technological innovation (ICT tool) on the operational performances on the sustainability and profitability on banking industry in Nigeria. The study used secondary data from CBN and NDIC within the period of 2013-2017 to ascertain the rate of digital banking effects on operational performance and used structured questionnaire to collect data from the banks customers in Lagos Island.

Kyeremeh, Prempeh and Afful, (2019) carried a research study on effect of information communication and technology (ICT) on the performance of financial institutions (a case study of Barclays bank, Sunyani branch). The study aimed to investigate the contributory impact of ICT adoption in the survival of operational performance of service delivery efficiency in banking system in Ghana. The study used qualitative research method and structured questionnaire were also used in data collection.

3.0 Methodology

Research Design

The study used descriptive research design to describe the contributing effects of ICT variables on the operational performances of selected commercial banks in Nigeria.

Sources of Data Collection

Primary sources of data for this study were data collected from the field in the course of conducting this study under the control and watch of co-researchers, experts and superiors in this field of study.

Population and Sample Size Determination

The study selected three (3) commercial banks that have their regional office in Abuja, Nigeria to ascertain whether there are concluding effects of ICT and operational performance in the commercial banking industry operational activities. These banks were selected based on their reputable financial operational performance in recent years and they are effective assessed and evaluated based on the previous operational performance and sustainability. The selected commercial banks are Zenith Bank Plc., Guaranty Trust Bank Plc. (GTB) and First Bank Nigeria Limited. Within the selected banks, the targeted potential respondents are various management staff and junior staff who are strategic thinkers and key players in making decisions and taking responsibilities on the ICT application to foster operational performance in their reputable bank's operations. See table of potential respondents.

Table 1.1 Breakdown of the Population Distribution

S/N	Selected Commercial Banks	Top Managers	Junior Staff	Total
1	Zenith Bank Plc.	12	43	55
2	Guaranty Trust Bank Plc. (GTB)	13	46	59
3	First Bank Nigeria Limited	12	44	56
Total		37	133	170

Source: Field Survey, (2021)

The study used Taro Yaro Yamane’s (1964) sample size determination formula

$$n = \frac{37 \times 119}{170}$$

Yare Yamane’s (1964) formula

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{170}{1 + 170(0.05)^2}$$

$$n = \frac{170}{1 + 170(0.0025)}$$

$$n = \frac{170}{1 + 0.425}$$

$$n = \frac{170}{1.425}$$

$$n = 119.30$$

$$n = 119$$

Top managers $n = \frac{4403}{170}$
 $n = 25.90$
 $n = 26$

Junior Staff $n = \frac{133 \times 119}{170}$
 $n = \frac{15827}{170}$
 $n = 93.1$
 $n = 93$

To cross check: **26+ 93= 119 (Sample size)**

Validity and Reliability of the Instrument

The validity and reliability of the instrument for the questionnaire test according to Sekran, (2001) is 0.7 Alpha values for each instrument under study. The researcher tested the validity of these variables under study by conducting a pilot test at four (4) randomly selected from Micro-finance banks that were located in Abuja where, 20 copies of questionnaire were administered to staff using stratified method and the result showed that, the instruments used are valid. See table 3.6.1 below.

Using Bourley’s proportional allocation formula:

$$n = \frac{n(n)}{N}$$

Where n = Element within the sample frame. i.e number allocated to each top managers and junior staffs .

n = Sample or proportion of the universe used for the study (total sample size)

N = Population of the study

Table: 3.1 Cronbach’s Alpha Computation table

Variables	Pre-test	Cronbach’s Alpha
ICT Usage	0.62	0.82
Strategic Decisions	0.51	0.71
Competitive Advantage	0.53	0.78
Customer Satisfaction	0.43	0.83

Source: Researcher’s Computation (2021)

From the test conducted, the Alpha values were seen to be reliable because, the pilot study was tested and the values gotten were not significant but a pre-tested where the highest value gotten was 0.62. However, another test was conducted, it gave us alpha values that were above 0.70 from both the dependent and the independent variables.

Method of Data Analyses

The study used various statistical tables, percentage, descriptive statistical tools in analysis of variables and regressions to whether there is correlation on the study using SPSS to analyze the stated hypotheses appropriately in order to ascertain statistical result and conclusions on this study.

Estimation of Study Variable

$$SD = a + b_1ICT + e \dots\dots\dots 1$$

$$CA = a + b_2ICT + e \dots\dots\dots 2$$

$$CS = a + b_3ICT + e \dots\dots\dots 3$$

Where,

SD, CA and CS are strategic decisions, competitive advantage and customer satisfaction. They are proxies of the Dependent Variable (Operational Performance)

a = constant

ICT is Information and Communication Technological (Independent Variable).

b₁, b₂, b₃, b₄ b₅ are regression coefficients which measure the degree of the responsiveness of the dependent variables to the independent variables

e = residual or stochastic term (which reveals the strength of b₁X₁+ b₂X₂ + b₃X₃+b₄X₄ X₅ ; if e is low, this implies that the amount of unexplained factors is low, then the residual R₁ and R₂ will be high and vice versa.

4.1: Data Presentation and Analysis

Table 4.1: Response Rate

	Respondents	No of Questionnaire administered	No of Questionnaire returned	Percentage (%)of Returned Questionnaires
1	Management	40	28	24.35
2	Junior Staff	100	87	75.65
	Total	140	115	100

Source: Field Survey, (2021)

Table 4.1 shows that 140 copies of questionnaire were administered to management and staff of these selected banks in excess in order to get higher response rate, instead of 119 sample size; 115 copies were retrieved, constituting 100 percent response rates which were used for the analysis. Out of these, 28 of them representing 24.35 percent

were retrieved from management and 87 respondents representing 75.65 percent were retrieved from junior staff of these selected banks. A larger percentage of the copies of the questionnaire were administered to junior staff of these banks because we are measuring the performance of these banks.

Hypotheses Testing

4.2.1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940 ^a	.884	.882	.44894

a. Predictors: (Constant), ICT

From table 4.6.1 which is the model summary, the overall coefficient of multiple correlations, coefficient of multiple determination and adjusted form are 0.940, 0. 0.884 and 0.882 respectively. This clearly indicates that there is a strong relationship between ICT usage and performance of three selected commercial banks in Nigeria and hence we reject the null

hypotheses. In fact the adjusted R² implies that ICT usage is responsible for 88.2% variation in performance of three selected commercial banks in Nigeria. In order words, the predictors (ICT) explained up 88.2% of variation occurring on the variability of the dependent variable (performance of three selected commercial banks in Nigeria).

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	.284	.085		3.332	.001
ICT	.234	.048	.231	4.875	.000
Usage	.041	.049	.007	2.137	.001
	.007	.480	.620	11.963	.000

Source: Authors computation
 Dependent Variable: SD, CA, CS

Drawing from table above, hypotheses one to three would be scientifically interpreted via values of the predictors in line with the objectives of the study; therefore the tests of hypotheses are presented as follows

Hypothesis 1:

Model 1

$$SD = a + b_1ICT + e \dots\dots\dots 1$$

H₀₁: ICT usage has no significant impact on strategic decisions of three selected commercial banks in Nigeria.

The beta coefficient of the Information Communication Technology (ICT) to Strategic decision is (0.231). This shows a positive relationship between Information Communication Technology (ICT) and strategic decision, and was statistical significant at 5% with p-value of (0.000). A unit change in Information Communication Technology (ICT) would bring about 23.4% average changes on strategic decision, holding

other factors constant. Base on this, we therefore reject the null hypothesis and accept the alternative hypothesis that ICT usage has a significant impact on strategic decision of three selected commercial banks in Nigeria.

Hypothesis 2

Model 2

$$CA = a + b_2ICT + e \dots\dots\dots 2$$

H₀₂: ICT usage has no significantly improve competitive advantage of three selected commercial banks in Nigeria.

The beta coefficient of ICT to Competitive advantage is (0.007), it shows a positive relationship between ICT and competitive advantage and was statistical significant at 5% with p-value of (0.001). A unit change in ICT to competitive advantage would bring about 0.7% average changes on competitive advantage, holding other factors constant. Base on this, we therefore reject the null

hypothesis and accept the alternative hypothesis that ICT usage has a significant impact on competitive advantage of three selected commercial banks in Nigeria.

Hypothesis 3

Model 3

$$CS = a + b_3ICT + e \dots \dots \dots 3$$

H03. ICT usage has no significant impact on customer satisfaction of three selected commercial banks in Nigeria.

The beta coefficient of ICT usage to customer satisfaction is (0.620), it shows a positive relationship between ICT usage and customer satisfaction and was statistical significant at 5% with p-value of (0.000). A unit change in ICT usage to customer satisfaction would bring about 62.0% average changes on customer satisfaction, holding other factors constant. Base on this, we therefore reject the null hypothesis and accept the alternative hypothesis that ICT usage has a significant impact on customer satisfaction of three selected commercial banks in Nigeria.

Discussion of the Findings

Based on the work done so far in this section, especially in the above tables, together with other questions administered through the questionnaire, it was discovered that ICT usage impacts on the performance of three selected money deposit banks in Nigeria. This finding has alignment and connection with the finding of Nguyen Van Thuy et al (2021) and Rahman, et al., (2021) which concluded that that there significant contributory correlation and effects between the adoption and implementation of ICT infrastructures and the operational performances of commercial banks in Vietnam and investment change in Pakistan.

- i. Finding from the first hypothesis stated that ICT usage has a significant impact on strategic decisions of three selected commercial banks in Nigeria. The finding was also supported by the findings of Nguyen Van Thuy, et al (2021); Ohiani, (2020) and Falck, et al., (2020) that ICT usage in commercial banking sector has strategically improve effective and efficient decisions on productivity and operational performances.
- ii. Finding from the second hypothesis agreed that ICT usage has a significant impact on competitive advantage of three selected commercial banks in Nigeria. The finding agreed with Lalitha, (2021) in the literature review that ICT adoption and implementation in modern corporate settings has become a strategic variable to enhance the advancement in innovation and competitive strengths and to ensure consistency in efficiency and effectiveness in many sectors and industries globally.
- iii. Finding from the third hypothesis agreed that ICT usage has a significant impact on customer satisfaction of three selected commercial banks in Nigeria. The was supported by the findings of wiredu, et al., (2020) and Adegbe, et al., (2020) which agreed that ICT usage have significantly improve customers' satisfaction in Atiwa Rural Bank Limited in Ghana and built retention and customer loyalty in Lagos Nigeria.

5.1 Conclusion and Recommendations

Conclusion

ICT in banking sector specifically conventional banking system becomes strategic tool to change the top management strategic thinking on how to meet with dynamism and complexity arising from the

change business contexts especially the changes from the competitive structure, which have prompt them to increase the rate of adoption and implementation of newer technological variables in their banking operations in Nigeria to meet customer need immediately. Findings from the three hypotheses tested in the study statistically agreed and concluded concretely that the usage, adoption and implementation of ICT infrastructures in modern commercial banking system in Nigeria increases and improves innovativeness in their strategic and operational performances holistically by enhancing the effectiveness of strategic decisions, adopt as strategic tool to gain competitive advantage and competitive strengths and improve the rate of customer satisfaction.

The study also concluded that ICT is the pillar and the backbone of deposit money banks to operate sophisticatedly in modern digital age that can enhance smooth innovative and operational sustainability and profitability. Because modern digital banking age and system highly rely and depend on ICT drives to attain operational convenience and to meet with competitive pressures and dynamism from business contexts especially to meet with the trauma from the novel corona virus pandemic.

Recommendations

From the research findings and conclusion the study comes out with following recommendations:

- i. Strategic managers in deposit money banks in Nigeria need to fast track their strategic thinking toward adopting and implementing newer ICT infrastructures that drive their business intelligence system to attain sustainable operational decisions and performances.
- ii. Sustainable financial budget and competent strategic resources should be set aside to invest in modern digital ICT infrastructure to attain smooth competitive advantage and competitive strengths in modern commercial banking system.
- iii. Adoption of artificial intelligence and robotic banking system will be advisable to enhance future smooth operational banking convenience to target customers and to enhance operational performance.

Contribution to Further Studies

Further study should be targeted at the effect of robotic banking system and operational performance of commercial banks in Nigeria banking system.

REFERENCES

- Adam, I.O., (2020). Examining e-government development effects on corruption in Africa: the mediating effects of ICT development and institutional quality. *Technol. Soc.*, 101245
- Adegbie Folajimi Festus, Kehinde Olawale Kazeem, Owolabi Babatunde Ayodeji. Information and Communication Technology and Sustainable Performance of Selected Listed Deposits Money Banks in Lagos State, Nigeria. *International Journal of Sustainability Management and Information Technologies*. Vol. 6, No. 1, 2020, pp. 18-35 doi: 10.11648/j.ijsm.20200601.13
- Agu, C., & Aguegbogh, E. (2020). *ICT and Bank Performance in Sub-Saharan Africa: A Dynamic Panel Analysis*.
- Almansour, Y. (2012). "The Impact of Total Quality Components on Small and Medium Enterprises" *Financial performance in Jordan,* *Researchers World*, vol. 3, no. 1, pp. 87-91

- Alnoukari, M. (2020) An examination of the organizational impact of business intelligence and big data based on management theory. *Journal of Intelligence Studies in Business*. 10 (3) 24-37.
- Bhujabal Padmaja & Narayan Sethi & Purna Chandra Padhan (2021) ICT, foreign direct investment and environmental pollution in major Asia Pacific countries; *Environmental Science and Pollution Research*; <https://doi.org/10.1007/s11356-021-13619-w>
- Bhujabal P, Sethi N (2020) Foreign direct investment, information and communication technology, trade, and economic growth in the South Asian Association for Regional Cooperation countries: an empirical insight. *J Public Aff* 20(1):e2010. <https://doi.org/10.1002/pa.2010>
- Bick, A.; Blandin, A.; Mertens, K. (2020) Work from Home after the Covid-19 Outbreak [Internet]; Report No.: ID 3650114; *Social Science Research Network*: Rochester, NY, USA,. Available online: <https://papers.ssrn.com/abstract=3650114> (accessed on 28 August 2021)
- Carroll, N., & Conboy, K. (2020). “Normalising the “new normal”: Changing tech-driven work practices under pandemic time pressure”. *International Journal of Information Management*. , Article 102186. <https://doi.org/10.1016/j.ijinfomgt.2020.10.2186>. Checkland, P., & Scholes, J. (1990). *Soft systems methodology in action*. John Wiley & Sons
- Chan, A.K.M.; Nickson, C.P.; Rudolph, J.W.; Lee, A.; Joynt, G.M. (2020) Social media for rapid knowledge dissemination: Early experience from the COVID-19 pandemic. *Anaesthesia*, 75, 1579–1582.
- Carstens A. (2018). *Big tech in finance and new challenges for public policy*. Keynote address presented at FT Bank. Summit, London, Dec. 4
- Chen, C.; Ye, A. (2021) Heterogeneous Effects of ICT across Multiple Economic Development in Chinese Cities: A Spatial Quantile Regression Model. *Sustainability*, 13, 954. <https://doi.org/10.3390/su13020954>
- Covin, J. G., & Wales, W. J. (2019). Crafting high-impact entrepreneurial orientation research: Some suggested guidelines. *Entrepreneurship Theory & Practice*, 43(1), 3-18.
- De Mendonça, W.L.; Costa, P.H.; Cançado, E.C.; Lima, F.; Canedo, E.D.; Bonifácio, R.; Amaral, .H. (2020) *From dusk till dawn: Reflections on the impact of COVID-19 on the development practices of a R&D project*. In *Proceedings of the 34th Brazilian Symposium on Software Engineering*, New York, NY, USA, 19–23; pp. 596–605. Available online: <https://doi.org/10.1145/3422392.3422446> (accessed on 28 August 2021).
- Díaz-Roldán, C.; Ramos-Herrera, M.d.C.(2021) Innovations and ICT: Do They Favour Economic Growth and Environmental Quality? *Energies*, 14, 1431. <https://doi.org/10.3390/en14051431>
- Ekwonwune, E.N., Ekwuonwu, D.U., Elebri, L.C. and Uka, K.K. (2017) ICT as an Instrument of Enhanced Banking System. *Journal of Computer and Communications*, 5, 53-60. <http://dx.doi.org/10.4236/jcc.2017.51005>
- Falck Oliver, Alexandra Heimisch-Roecker, Simon Wiederhold (2020) Returns to ICT Skills, *JEL classification*: J31; L96; K23
- Fred K. (1964). Contingency Theory. FSB (Financ. Stabil. Board). (2019). *FinTech and market structure in financial services: market developments and potential financial stability implications*. Report, FSB, Basel, Switz. <https://www.fsb.org/wp-content/uploads/P140219.pdf>
- García-Martínez, J.-A.; Fuentes-Abeledo, E.-J.; Rodríguez- Machado, E.-R. (2021) Attitudes towards the Use of ICT in Costa Rican University Students: The Influence of Sex, Academic Performance, and Training in Technology. *Sustainability*, 13, 282. <https://doi.org/10.3390/su13010282>

- Gupta, S., & Yadav, A. (2017). The Impact of Electronic Banking and Information Technology on the Employees of Banking Sector. *Management and Labor Studies*, 42, 379-387. <https://doi.org/10.1177/2393957517736457>
- Ingram, A., Peake, W. O., Stewart, W., & Watson, W. J. (2019). Emotional intelligence and venture performance. *Journal of Small Business Management*, 57(3), 780-800.
- Investopedia, (2017) . Available from <https://www.investopedia.com/terms/b/bank-deposits.asp> [Accessed 29, August 2021].
- Isaiah, O. M., Selvam, M., Vinayagamoorthi, V., Kasilingam, L., & Mariappan, R. (2015). Efficiency Measurement of Kenyan Commercial Banks. *Mediterranean Journal of Social Sciences*, 6(4), S2, 621-631. <http://dx.doi.org/10.5901/mjss.2015.v6n4s2p621>
- Johnson, N.; Veletsianos, G.; Seaman, J. (2020) U.S. faculty and administrators' experiences and approaches in the early weeks of the COVID-19 Pandemic. *Online Learn*, 24, 6–21.
- Kiani, A., Ali, A., Kanwal, S., & Wang, D. (2019). How and when entrepreneurs' passion lead to firms' radical innovation: Moderated mediation model. *Technology Analysis & Strategic Management*, 32(4), 443-456.
- Kiani, A., Yang, D., Ghani, U., and Hughes, M. (2021). Entrepreneurial passion and technological innovation: The mediating effect of entrepreneurial orientation. *Technology Analysis & Strategic Management*, in press.
- Kyeremeh, K., Prempeh, K. B. and Afful Forson, Matilda (2019) *Effect of Information Communication and Technology (ICT) on the Performance of Financial Institutions (A Case Study of Barclays Bank, Sunyani Branch)*, Munich Personal RePEc Archive, MPRA Paper No. 95994, <https://mpra.ub.uni-muenchen.de/95994/>
- Lalitha. B.S (2021) Impact of ICT Adoption on Students Learning; *Journal of Advances in Education and Philosophy*, DOI: 10.36348/jaep.2021.v05i04.001
- Lee, Y.-C.; Malcein, L.A.; Kim, S.C(2021). Information and Communications Technology (ICT) Usage during COVID-19: Motivating Factors and Implications. *Int. J. Environ. Res. Public Health*, 18, 3571. <https://doi.org/10.3390/ijerph18073571>
- Leng C, Ma W, Tang J, et al. (2020) ICT adoption and income diversification among rural households in China. *Applied Economics* 52: 3614–3628.
- Makanga, R.O. & Paul, S.N. (2017). Influence of strategic management practices on performance of Kenya power and lighting company ltd, Nairobi County, Kenya. *The Strategic Journal of Business & Change Management*, 4(4), 289-306.
- Maulina Erna and Kameswara Natakusumah (2019) *Determinants of supply chain operational performance; Uncertain Supply Chain Management* 8, 117–130
- Ma W, Grafton RQ and Renwick A (2020) Smartphone use and income growth in rural China: empirical results and policy implications. *Electronic Commerce Research* 20: 713–736.
- Nguyen Van Thuy et al (2021) ICT and Bank Performance: Empirical Evidence from Vietnam; *Journal of Contemporary Issues in Business and Government* Vol. 27, No. 2, P-ISSN: 2204-1990; E-ISSN: 1323-6903; DOI: 10.47750/cibg.2021.27.02.433
- Nwakoby N. P., Charity P. S. and Ofobruku, S. A. (2018) Impact Of Information And Communication Technology On The Performance Of Deposit Money Banks In Nigeria; *International Journal of Management and Sustainability*, Vol. 7, No. 4, pp. 225-239; DOI: 10.18488/journal.11.2018.74.225.239
- OECD (2020), *Digital Disruption in Banking and its Impact on Competition* <http://www.oecd.org/daf/competition/digital-disruption-in-financial-markets.htm>

- Omulo, G. and Kumeh, E.M (2020) Farmer-to-farmer digital network as a strategy to strengthen agricultural performance in Kenya: a research note on “Wefarm” platform. *Technological Forecasting and Social Change* 158: 120120.
- Papadopoulos, T., Baltas, K. N., & Balta, M. E. (2020). “The use of digital technologies by small and medium enterprises during COVID-19: Implications for theory and practice”. *International Journal of Information Management.* , Article 102192. <https://doi.org/10.1016/j.ijinfomgt.2020.102192>.
- Parra Carlos M., Manjul Gupta, Patrick Mikalef (2021) Information and communication technologies (ICT)-enabled severe moral communities and how the (Covid19) pandemic might bring new ones; *International Journal of Information Management* 57, 102271
- Rahman, H.Ur, Ghulam Ali, Umer Zaman, and Carlo Pugnetti.(2021). Role of ICT Investment and Diffusion in the Economic Growth: A Threshold Approach for the Empirical Evidence from Pakistan. *International Journal of Financial Studies* 9: 14. <https://doi.org/10.3390/ijfs9010014>
- Rogers M. (1962). Innovation Diffusion Theory.
- Shams, S. and Solima, L. (2019). Big data management: implications of dynamic capabilities and data incubator. *Management Decision*, 57(8), 2113-2123.
- Uyar Ali, Khalil Nimer, Cemil Kuzey, Muhammad Shahbaz, Friedrich Schneider (2021) Can e-government initiatives alleviate tax evasion? The moderation effect of ICT; *Technological Forecasting & Social Change* 166, 120597
- Walls, C. & Barnard, B. (2020). Success Factors of Big Data to Achieve Organizational Performance: Theoretical Perspectives. *Expert Journal of Business and Management*, 8(1), 1- 16.
- Wiredu, J., Labaran, U. I., Nketiah, E., & Osibo, B. K. (2020). The Impact of Information and Communication Technology (ICT) on Rural Banks Management. A Case Study of Atiwa-Rural Bank Limited in Ghana. *American Journal of Industrial and Business Management*, 10, 1681-1706. <https://doi.org/10.4236/ajibm.2020.101010>
- Venkatesh, V. (2020). “Impacts of COVID-19: A research agenda to support people in their fight”. *International Journal of Information Management.* , Article 102197. <https://doi.org/10.1016/j.ijinfomgt.2020.102197>.
- Zhu Zhongkun, Wanglin Ma and Chenxin Leng (2021) ICT adoption and tourism consumption among rural residents in China; *Tourism Economics XX(X)*; DOI: 10.1177/13548166211000478
- Effect of operational effectiveness, organizational effectiveness and financial performance (indicators) are interrelated” (Richter et al., 2017, p. 110

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