

IMPACT OF ELECTRONIC BANKING SUPPORT INFRASTRUCTURE AND SERVICES ON CUSTOMERS' SATISFACTION IN KADUNA STATE, NIGERIA

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Abstract

The use of electronic banking to improve operation efficiency in bank service delivery has been facing challenges ranging from data breach by fraudsters, network downtime, frequent power interruption and lack of suitable legal and regulatory framework for e-banking. To mitigate these challenges, banks have deployed Electronic Banking Support Infrastructure and Electronic Banking Support Service. This study adopted survey research design. Primary data were collected through informal interview, focus group and structured questionnaire administered to a sample of 400 respondents in the study areas of which 360 sets questionnaire were correctly filled and returned. To analyze the data from the respondents, statistical technique were employed. This includes; frequency distribution table and multiple regression analysis. The result showed that electronic banking support infrastructures and electronic banking support services have significant impact at 5% level of significance on the customers' satisfaction in Kaduna State. Based on the findings it was recommended that banks should enhance security at ATM centers and report all internal and external fraud to boost customer's confidence. Central Bank of Nigeria should regulate the activities of telecommunication operators since banks cannot monitor them. Additionally government at all level should provide reliable power supply to improve financial operations as enable some bank products like ATM to function 24hours/ 7 days and to reduce their running cost.

Keywords: E-banking, EBSI, EBSS, CS and Service Delivery

INTRODUCTION

Financial industry has witnessed evolution globally as a result of continuous innovations in information technology. Globalization which brought about new ways of doing business in the banking sector has witnessed dramatic increase in the world financial market, with global capital flows risen to 14.8% of world Gross Domestic Product and total of \$7.2 trillion in 2006 (IMF, 2008).

However, this development gave birth to other challenges which tend to undermine the efficiency of the E-banking in Nigeria. For instance, there have been increasing cases of data breaches by internet fraudsters, network downtime, business e-mail compromise (BEC), denial of service, e-mail account compromise malware, security issues, user error and bad internet connections. Adewuyi (2013) notes that customers' complaints, grievances and dissatisfaction can be reduced by banks through proper service delivery and review mechanism.

Nyadzayo (2010) defines customer satisfaction as "the customer's fulfillment response. Satisfaction is not static, but changes over time, people exposure and insatiable appetite for a better life contribute to it. Customers are not only concern about the safety of their fund but

wants convenience and quick transactions. E-banking provides the customer with such convenience.

ICT development Index (IDI) revealed that investment on ICT have risen from \$50m to \$32B between the periods 1999 to 2014 (Nwokike, 2016). This investment by both Government and private sectors on ICT has grown over the years yet more need to be done to match the investment on ICT infrastructure and customer satisfaction. This huge investment on ICT has not translated to customer satisfaction, this is because not much investment has been done on the training and retraining of the bank personnel and customers that utilize this technologies. According to Abioye (2017), sad and painful tales of bank customers who have lost their life savings and entire business funds to fraudsters have raised many questions of whether E-banking is a blessing or curse to the financial service industry. Emejo (2019), was of the view that Fraudulent cases in Nigerian banking sector increased by 56.3% representing 26,132 reported cases in 2017 from 16,751 cases in 2016 and 37,817 in 2018. The banking industry lost ₦15.15bn when compared to the ₦2.37b lost in 2017. Worku, Tilahun and Tafa (2016), posited that low level of financial literacy of the public, level of readiness and capacity of financial institutions to provide services that will help maximize infrastructure benefit to customers has given rise to the problems of dissatisfaction. As a step to check these challenges and restore customers' confidence in the E-banking, many banks deploy electronic bank support infrastructure (EBSI) and electronic banking support services (EBSS). EBSI are those secondary infrastructures that are deployed to ensure that customers receive maximum satisfaction from e-banking. These secondary infrastructures can be classified into tangible and intangible infrastructure. The tangible EBSI include all the physical infrastructure that support the operation of e-banking which include standby power source, Automated Teller Machine (ATM) gallery, Closed Circuit Television (CCTV), Point of Sale (POS) personal computer amongst others. The intangible electronic banking infrastructure include the software such as backup servers, data management backup and recovery, web linking and electronic authentication. EBSS is defined as services offered by bank staff for the enhancement of customer's satisfaction. It is a complementary roles played by personnel in the security unit of the bank, fraud desk officers and customer service desk (back office staff) for the smooth running of E-banking operation and quick resolution of any complaint or issues arising from the use of E-banking products. EBSI & EBSS represent all working tools through which the banking industry can penetrate the global financial market.

Despite several studies on the impact of E-banking and customer satisfaction worldwide, there is no study on the impact of e-banking support infrastructure and support services on customers' satisfaction conducted in Kaduna State. In view of this, the following questions were raised:

- i. Does EBSI have any significant impact on customer satisfaction?
- ii. Does EBSS have any significant impact on customer satisfaction?

It is against this background, that the study examines the impact of EBSI and EBSS on customer's satisfaction in Kaduna State. In order to achieve these objectives the study proposes the following statement of null hypothesis:

Ho₁: EBSI do not have any significant impact on customer satisfaction in Kaduna State, Nigeria.

Ho₂: EBSS do not have any significant impact on customer satisfaction in Kaduna State, Nigeria.

2.0 Literature Review

E-banking covers range of services. For many banks, inclination to e-banking services improves customer services which over time changes as a result of globalization and technologies. Banks have adopted e-banking to reduce the high cost associated with traditional banking. In Nigeria, e-banking has emerged as a new medium of delivering banking product and services to customers. This innovation in the Nigerian banking industry is intended to provide customers with more valuable services including convenience and easy access to their money and other banking information that they may need. Many institutions in the Nigerian banking industry have inclined to e-banking in the broader sense which includes the use of smart cards for banking. According to Gentiana (2015), EBSI cover ranges of supportive equipment to effectively perform e-banking services. It is believe that investment in EBSI and EBSS is aimed at efficiency and customer's satisfaction. EBSI tend to encompass a variety of component, which include both technical and managerial expertise to provide customer satisfaction. Byrd and Turner (2000) provided definition of information technology infrastructure, as the shared information technology resources consisting of a technical physical base of hardware, software communication technologies data and core norms and knowledge that combine to create information technology services that are typically unique to an organization. Broadbent and Weil (1997) observed that information technology infrastructure consists of the knowledge and capabilities required to handle organizational information technology resources and that it serve as foundation for competitive positioning of business initiative. EBSI is the middle man between products & service delivery and technology in the banking institution. As the use of electronic banking products and services becomes more relevant, the enforcement of backups and recovery procedures are very essential as it provides contingency planning for network downtime and provide backup servers for storage of customer's file.

The use of e-banking products and services has expose the bank to both internal and external fraud. To checkmate this fraud banks has put some measures such as, authentication methods includes passwords and Personal Identification Numbers (PIN), micro based devices such as smart card or other type of token, Biometric Identifiers and fraud screening operations. There are also inbuilt security features in most of the e-banking facilities to forestall fraud. This includes several cameras that are inbuilt in an ATM. These cameras take photographs of every customer that operate any transaction on ATM. EBSI & EBSS are essential to the customers and these devices must be flexible to the users to enable them maximize their benefit. It seems that most ATM gallery are mostly installed in an open space with no shield provided for the customers in terms of their comfort and privacy but rather so much discomfort which in turn result to dissatisfaction. Customers often encounter ATM breakdown and long queue as a result of non-availability of funds in the few active ATMS, thereby taking customers to the era of long queue and time wastage. These devices should be re-engineered to reduce breakdown. Also, to tackle the growing insecurity within the ATM premises, banks have deployed the use of CCTV to monitor every human activity within the ATM and other e-banking facilities. The activities of criminals has become a source of concern to customers and bank management. Customers have been physically attacked and dispossess of their money after completion of transaction at ATM gallery. This has impaired on customers confidence and safety in the use of e-banking products. Bank in a bid to stem this ugly trend has deploy security men at ATM gallery and other e-banking product to ensure the safety of e-banking customers before and after transaction.

E-banking devices rely on electricity to function properly, the issue of power infrastructure has not been addressed by the government to help ease of doing business in Nigeria. Public-private partnership has not really function as expected. Nigeria has the capacity to generate

12,522 megawatts (MW) of electric power only if the current challenges are fixed but is able to generate 5000 MW which is insufficient for its population (Fashola 2016).

EBSI and EBSS are key to maintaining sustainable growth, retention of existing customers and attracting of potential customers as satisfied customers will be loyal and also make referral to others. EBSI are not problem hitch free some of these problems emanates from ATM card seizure, debit without payment, illegal charges, network downtime and activities of fraudsters. The critical roles of the backup staff are important to quick resolution of these problems to improve quality of services.

Theoretically, several theories have provided explanation on advanced technology and customer satisfaction. These theories are Innovation Diffusion Theory and Contrast Theory, they are discussed below.

Innovation Diffusion Theory (IDT)

Diffusion of Innovation is a theory propound by Everett Rogers in 1983. This theory has shown that technological innovation is communicated through a particular channel over time among the members of a social system. From the concept of innovation diffusion, customers and organization adopts technology to perform activities that are advantageous. The five stages (steps) of this theory are: awareness, interest evolution, trial and adoption Therefore most banks have adopted ICT to improve their efficiency and service delivery. This technology is achieved through the development of website and mobile application that suits the customer's needs. Simon & Thomas (2016) and Ying & Mengqing (2011) adopt innovation diffusion theory.

Technology Acceptance model (TAM)

Technology Acceptance Model (TAM) was develop by Davis in 1989, it is an information systems theory that shows how users accept and use technology. According to Davis, ease of use and perceived usefulness are the most important determinants of actual system use

This study is anchored on innovation diffusion theory. This is because the innovation diffusion theory explained that the motive behind the adoption of ICT by deposit money banks is to enhance the efficiency of their operation and improve the customer satisfaction.

Empirically, few literatures have been done on EBSI, EBSS and customer satisfaction. Hammoud, Rima and El-Baba (2018) examined the relationship between the dimension of e-banking service quality and customer satisfaction to determine the dimensions that have the strongest influence on customer satisfaction. Data was gathered using the instrument of questionnaire. The data were statistically analyzed using structured equation modelling with SPSS. The findings show that reliability, efficiency and ease of use, responsiveness, communication, security and privacy all have significant impact on customer satisfaction with reliability being the dimension with the strongest impact. Babatunde and Salawudeen (2017) examined the impact of electronic banking in Nigerian banking industry and financial institution. Primary data was obtained through questionnaire and secondary data through publication. Both descriptive and inferential statistics were used for data analysis. In addition, simple frequency count, percentages and chi-square were used in data analysis. The findings revealed that the adoption of electronic banking has enhanced the bank's efficiency. Repapour and Peykanr (2017) compared customer satisfaction with the quality of e-banking services among state, private and altered banks in Isfahan using descriptive survey method. The study adopts stratified sampling method and instrument of questionnaire for data collection. The findings revealed that there is a significant difference between the beauty of the website and privacy between the banks.

Roozbahani, Hojati and Azad (2015) in a study titled the role of e-payment tools and e-

banking in customer satisfaction use descriptive survey method. The instrument of questionnaire was used for data collection. Statistical package social science software and Pearson correlation were used to analyze the data. The result showed that there is a positive relationship between e-payment tools and e-banking. Adeyemi, Ola and Oyewole (2014) investigates the impact of internet banking on the customer satisfaction level in banking sector in Nigeria. A structured questionnaire was used to collect data from a sample of 90 respondents. Data collected were analyzed using regression analysis with the aid of statistical package for social science (SPSS). The result showed that internet banking and quality service were significant predictor of customer satisfaction.

3. Methodology

The population of this study is 1,085,994 who represent customers that are of eligible age for holding a bank account and are financially inclusive in 2017. The sample size of 400 respondents from the three senatorial districts of Kaduna state was chosen. These local government areas are nine in number, three from each local government area. They include: Zaria, Lere, Sabon-Gari, Igabi, Kaduna South, Kaduna North, Zango, Jema'a and Kachia. The choice of the local government was based on the heavy economic activities, population density, as well as perceived high concentration of E-banking services. The sample size derived by applying Yamane (1973) as follows:

$$S = \frac{N}{1 + N(M^2)}$$

Where: S is the desired sample; 'N' is the population size; and 'ME' is the margin of error allowed to determine the sample size:

$$S = \frac{1,0}{1 + 1,0(0.0)^2} = 400$$

The determination of the number of respondents for each of the sample LGCs was done proportionately as follows.

$$N_{oR} = \frac{p_{o e h L}}{T P . o t h e 9 s c L G} \times s c s$$

Furthermore, in order to examine the impact of electronic banking on customer satisfaction in Kaduna State, Nigeria, the study mathematical model is specified as follows;

$$CS = f(EBSI, EBSS) \quad \text{Equation.....1}$$

Where;

CS represents Customer Satisfaction.

EBSI represent E-banking support infrastructure

EBSS represent E-banking support services

Equation 1 can be rewritten in a stochastic format thus:

$$CS = \beta_0 + \beta_1 EBSI + \beta_2 EBSS + \varepsilon \quad \text{Equation.....2}$$

Where;

α = intercept

β_0, β_1 and β_2 are the parameters estimate

ε = Measurement error. In this model, the main parameter of interest will be β_1 in terms of sign and significance. Thereafter, econometric analysis using multiple regressions was employed.

4. Data Presentation and Analysis

This section presents empirical analysis of 360 returned questionnaire out of 400 distributed

which represents 90%. The questions raised are focused on the e-banking support infrastructure and e-banking support services which include tangible and intangible infrastructure such as ATM gallery, Network super facilities, power generator, security (CCTV), backup servers, electronic authentication and data management. backup The responses of e-banking customers' are based on their perception as it relate to the impact of e-banking support infrastructure on customer satisfaction are reported as follows in table 2.

Table 2

Impact of e-banking support infrastructure on customer satisfaction

Responses	Frequency	Percent	Ranking	Weighted mean	Ave mean
Excellent	70	19.4	5	350	
Very Good	120	33.3	4	480	
Good	130	36.1	3	390	
Poor	40	11.1	2	80	
Very Poor	0	00.0	1	0	
Total	360	100.0		1300	1300/360 = 3.6

The table 2 results show that 320 represent 88.9% of the total respondents rated that e-banking support infrastructure (EBSI) has positive significant impact on customer satisfaction, while 40 representing 11.1% rated that e-banking support infrastructure (EBSI) as poor and has no significant impact on customer satisfaction (CS). Subsequently, the weighted average mean score of the respondents on five likert scale is $3.6 > 3.0$ criterion value. This implies that in general the respondents rated that e-banking support infrastructure (EBSI) to a very large extend have significant impact on customer satisfaction (CS) in the study areas.

Table 3

Impact of e-banking support services on customer satisfaction

Responses	Frequency	Percent	Ranking	Weighted mean	Ave mean
Excellent	66	18.3	5	330	
Very Good	170	47.2	4	680	
Good	14	3.9	3	42	
Poor	72	20.0	2	144	
Very Poor	38	10.6	1	38	
Total	360	100.0		1234	1234/360 = 3.4

From the result 69.4% of the respondents are of the view that bank support services contribute to customer satisfaction, moreso, EBSS provided to customers by bank staff significantly have effect on their level of satisfaction. Likewise, 30.6% of the respondents stated that EBSS did not contribute to satisfaction. The reason could be attributed to nonchalant attitude of some bank staff, lack of adequate training, proper orientation and insincerity on the part of the management.

However, a semi-structured interview was conducted among the respondents. 20 respondents which represent 6% agreed that EBSI have a positive impact on customer satisfaction. They cited the use of CCTV on the e-banking premises and the use of security personnel at various e-banking outlets. This has improve customers' comfort and enhance security of the e-banking customer. Also, 15 respondents who represent 4% strongly agree that source and back-up servers were commended by e-banking customers as this have improved the quality of services rendered by banks that offer e-banking. This have reduced the operational downtime emanating from power outage and network downtime.

However, 5 respondents which represent 1% disagreed that EBSI have much impact on customer satisfaction. They are of the opinion that the persistent of long queue at the ATM gallery is due to network down time and poor maintenance of ATM machine have a negative impact on customer satisfaction.

Moreso, 18 respondents which represents 5% agreed that EBSS have improved customer satisfaction. They agree that the activity of back office staff have improved the quality of services. They also agreed that the deployment of security personnel at ATM galleries and other e-banking products have enhance the safety of e-banking customers.

However, 7 respondents representing 2% disagreed that EBSS have any significant impact on customer satisfaction. This was attributed to the unprofessional manner that some of the back-office staff carry out their duty. They argue that most banks do not give adequate training to their staff

Furthermore, 10 respondents out of the 360 respondents participated in focus group discussion. All the respondents agreed that EBSI and EBSS have greatly improved the quality of services and must be sustained. They also agreed that customer satisfaction have greatly improved as a result of the deployment of EBSI and EBSS.

The hypotheses test of this study adopts multiple regression analysis in testing hypotheses. The results are reported in table 4 as follows:

Table 4.

Multiple Regression Output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.156015	0.105313	10.97693	0.0000
EBSI	0.379592	0.052778	7.192299	0.0000
EBSS	0.210341	0.043656	4.818117	0.0000
R-squared	0.768980	Mean dependent var	4.041667	
Adjusted R-squared	0.767033	S.D. dependent var	0.920783	
S.E. of regression	0.444431	Akaike info criterion	1.227006	
Sum squared resid	70.31679	Schwarz criterion	1.270185	
Log likelihood	-216.8611	Hannan-Quinn criter.	1.244175	
F-statistic	394.9968	Durbin-Watson stat	0.056087	
Prob(F-statistic)	0.000000			

Source: E-view 9 output (2018).

Mathematically,

$$CS = 1.1560 + 0.3795EBSI + 0.2103EBSS$$

$$T\text{-tests} = (10.9769) \quad (7.1922) \quad (4.8181)$$

$$P\text{-value} = (0.0000) \quad (0.0000) \quad (0.0000)$$

$$F\text{-test} = 394.9968, R^2 = 0.7670, DW = 0.0560$$

Table 4 presents the regression analysis of each of the explanatory variables stated in the model formulated. This explained the contribution of each of explanatory variables to changes in dependent variable. The results show that one percent improvement in e-banking support infrastructure (EBSI) effect a 0.3795% increase in customer satisfaction. Also, one percent improvement in e-banking services (EBSS) lead to 0.21% changes in customer satisfaction (CS). This finding is in agreement with Otisa at el (2012) which showed that improvement in ICT service delivery will result to customer satisfaction

Furthermore, the regression result shows that R^2 , which measures the goodness-of-fit, is 77%. This means that 77% of the changes in customer satisfaction are explained by the

improvement in EBSI & EBSS. The F-test = 394.9968 and Prob (F-statistic) = 0.0000 shows that the overall model is statistically significant at 5% level while the DW = 0.0560 show there is the presence of positive serial autocorrelation. The regression analysis, shows that, all the apriori signs meet the expected signs, all the variables were statistically significant at 5% level of significance based on the student's t-test and p-value (0.0000). E-banking support infrastructure and support services do not have any significant impact on customer satisfaction in Kaduna State, Nigeria.

Test of Hypotheses

The results shows that EBSI is positively related to CS. The result also indicates that as EBSI and EBSS increases by 1%, CS also increases by 0.3795% and 0.2103 respectively. The EBSI and EBSS are shown to be statistically significant at 5% level of significance using the t-value and p-value. Base on this result the null hypotheses which states that EBSI and EBSS do not have any significant impact on customer satisfaction are rejected and the alternative hypotheses are accepted.

5. Conclusion and Recommendations

The findings revealed that EBSI and EBSS are critical to enhancing and offering value to both banks and esteemed customers by improving the quality of service, thereby enhancing customers retention, loyalty, reduced customer complaint. It has been revealed that adequate security enhances customer satisfaction as it makes them feel valued and safe. Good customer support be it in area of infrastructure or services are essential tools to boost bank's competitiveness. The inbuilt security facilities (CCTV) and security personnel must at all times work 24hours/7days. Well trained staff are better equipped in complaint handling. Banks should tackle modern security that are brought about by new banks innovation in line with changing realities which must be properly communicated to the customers, this will go a long way in reducing data security breach. Government should make sure that issue of reporting fraud committed both by insiders and outsiders are recorded. This will boost confidence among customer in their use of e-banking facilities. There is also need for banks to harmonize and standardize the e-banking support infrastructure and services rendered to customer, to engender uniformity. This will assist customers in transacting at any time and location convenient for their life style, without the fear of unfair charges and denial outside their banks.

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