

# Electronic Banking and Customer Satisfaction in Commercial Banks

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## Abstract

*This study examined electronic banking and customer satisfaction in commercial banks. It was carried out to determine the influences of automated payment system, automated delivery channel and automated information-sourcing service on customer satisfaction in commercial banks. The study adopted cross-sectional survey research design. Convenience sampling technique was used to locate 224 bank customers from whom primary data were obtained for the study through a structured questionnaire. The data obtained were analyzed and interpreted descriptively using simple percentages and frequencies, whereas, the hypotheses of the study were tested using simple linear regression. The findings revealed that automated payment system, automated delivery channel and automated information-sourcing service had significant positive effects on customer satisfaction in commercial banks. Hence, the study recommended that commercial banks should provide more automated service delivery channels such as internet banking, mobile banking, chat banking and video banking, to enable customers in urban and especially rural areas to get seamless access to banking services without necessarily visiting branch offices; commercial banks should consistently enlighten customers on how to use automated payment systems, such as ATM service, internet mobile payments, POS (point of sale) kiosk and bank card payment, to make payments for goods and services purchased. By enlightening customers of the value of automated payment systems, commercial banks will be able to encourage more adoption of the systems by customers; and commercial banks should guarantee minimal or no disruptions in E-banking service delivery by eliminating downtime, slow processing and other technical issues that result in delayed transaction processing. Furthermore, we have suggested based on the limitations of this study that future researchers should extend the scope of their studies to include bank management in order to determine how*

*the deployment of E-banking systems is impacting the effectiveness of banking service delivery in developing African countries.*

**Keywords:** Electronic Banking, Customer Satisfaction, Automated Payment System, Automated Delivery Channel, Automated Information-sourcing Service

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## **INTRODUCTION**

From the 1960's to the early 2000's, the Nigerian banking industry was characterized by traditional systems of banking that relied on brick-and-mortar physical interactions between banks and customers in overcrowded banking halls to deliver services to customers (Osumaet *al.*, 2021). During this period, Adetiloyeet *al.* (2021) maintained that only a few Nigerian elites, government workers and the business class owned bank accounts, because of the high account maintenance costs maintained by commercial banks. As a result, the conventional banking system in use at the time was fairly adequate to meet the banking needs of the few bank customers being served. However, the liberalization of Nigeria's financial sector, growing pace of financial technological innovations and high consumer demand for banking services have propelled commercial banks to revolutionize their systems of banking, leading to the introduction of a modernized banking model known as electronic banking. According to Rajiet *al.* (2021), electronic banking is a system of banking which allows customers to gain access to and initiate financial or non-financial banking operations remotely via secure and personalized electronic devices or platforms.

The proliferation of electronic banking systems in Nigeria has been driven by the digitization of the global financial system, which is moving towards a cashless system of banking that is expected to reduce financial crimes and provide customers with more ease as well as security (Michaelet *al.*, 2021). Particularly, the deployment of electronic banking systems in Nigeria surged significantly during the COVID-19 pandemic nationwide lockdown, which prevented customers from visiting banking halls to carry out banking transactions (Nwadike, 2020). During that time, Ahmedet *al.* (2021) observed that banks deployed a number of electronic banking systems such as mobile/internet banking, POS (point of sale) Kiosk banking, chat banking, video banking, USSD (Unstructured Supplementary Service Data) service, IVR (interactive voice response) service and a host of others in their effort to provide uninterrupted access to banking services for customers amidst the lockdown. However, given the large number of bank customers in Nigeria – 52.1 million customers as of January 2022 (Iwayemi, 2022), the banking industry is yet to possess adequate, functional modern technological innovations to provide banking services to Nigerians across the country, especially in rural areas, where most of the unbanked population resides (Ohiani, 2021) Consequently,

bank customers still face the risk of having their savings or account details stolen by cybercriminals using their debit/credit cards or other methods (Femi, 2021). More often than expected, there are still incidents of failed customers' transactions on Automated Teller Machines (ATMs), mobile and internet banking systems possibly because commercial banks are unable to promptly deploy smart technologies to restore services and recover customers' transactions (Ugbodaga, 2021).

These issues of inconsistent service delivery have resulted in series of complaints by customers; and in worst cases, customers tend to boycott commercial banks for financial technology companies like PalmPay, MoniePoint, Opay, among others (Olowogboyega, 2023). To that end, commercial banks have rolled out a series of electronic banking technologies such as automated payment systems, automated delivery and automated information-sourcing channels in the hope of persuading and encouraging customers to continue patronizing their services. However, due to increased cases of identity theft, account hacking, and other forms of cyber threats alongside inadequate internet connectivity, some Nigerians are skeptical and afraid of using electronic banking services, as observed by Chukwu and Idoko (2021). Similarly, only a small percentage of Nigerians (51.59 percent) own a smartphone or other digital communication devices like personal computers (Ceci, 2021), which further prevents Nigerians from adopting and using electronic banking services of commercial banks. In light of this stalemate, this study was therefore designed to explore the relationship between electronic banking and customer satisfaction in commercial banks in order to generate demonstrable empirical evidence that outlines how commercial banks could apply electronic banking systems to enhance customer satisfaction. Hence, this study pursued the following objectives:

- i. To determine the effect of automated payment system on customer satisfaction in commercial banks;
- ii. To examine the effect of automated delivery channel on customer satisfaction in commercial banks;
- iii. To assess the effect of automated information-sourcing service on customer satisfaction in commercial banks.

## **LITERATURE REVIEW**

This unit delves into existing literature relevant to electronic banking and customer satisfaction in commercial banks. It explores the account of previous scholars on topic issues related to the study, such as E-banking, customer satisfaction and major E-banking platforms in Nigeria. A review of empirical studies is also presented on the basis of which a conceptual model was developed for the study.

### **Electronic banking (E-banking)**

Electronic banking (internet banking) is an electronic payment system that enables customers of a bank or other financial institutions to conduct a range of financial transactions through the financial institution's website, short code or mobile application software (Harold & Kumar, 2012). It is typically a part of the core banking system operated by banks and is in contrast to branch banking which was the traditional way customers accessed banking services. It uses computer and electronic technology in place of cheques and other paper transactions. Electronic banking transactions are initiated through devices like debit/credit cards or codes that allows customers, or other authorized users have access to customers' bank account (Jadalla & Al-zawahiri, 2013). Similarly, Jefferson and Hair (2010) maintain that many financial institutions use Automated Teller Machines (ATMs) or debit cards and Personal Identification Numbers (PINs) for this purpose. Some use other types of debit cards that require customers' signature or a scan such as Radio Frequency Identification (RFID) or other forms of contactless technology that scan customers' information without direct contact with customers. Bradley and Patrick (2017) maintain that online banking refers to banking services where depositors can manage more aspects of their accounts over the Internet, rather than visiting a branch. They further assert that online banking typically comprises a secure connection to a customer's bank information through the customer's home computer or another device. It is a computerized service that allows a bank's customers to get online with the bank via telephone lines or other electronic devices to view the status of their account(s) and transaction history.

### **Customer satisfaction**

Customers' satisfaction is the degree to which customers are happy with their purchase or experience with a company (Robertson, 2019). It indicates the fulfillment that customers derive from doing business with a firm. In other words, it is how happy customers are with their transaction and overall experience with a company. Customers derive satisfaction from a product or a service based on whether their need is met effortlessly, in a convenient way that makes them loyal to the firm. Hence, customers' satisfaction is an important step to gain customer loyalty. In the views of Paulet *al.* (2010), customers' satisfaction is a measure of how products and services supplied by a company meet or surpass customer expectations. It is the number of customers, or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified satisfaction goals. In a competitive marketplace where businesses compete for customers, customers' satisfaction is seen as a key differentiator and increasingly has become a key element of business strategy. According to Bernazzani (2018), customers' satisfaction is a metric used to quantify the degree to which a customer is happy with a product, service, or experience. Prakash and Mohanty (2012) view customers' satisfaction as the degree to which products or services provided by a company meet a customer's expectation.

## **Major electronic banking platforms in Nigeria**

### ***Automated payment system***

Automated payment system is an innovative banking system that enables customers to make payments for products and services purchased remotely without having to visit a physical bank (Mamudu, 2021). According to Aprigliano *et al.* (2019), automated payment system is an electronic system that allows customers with a bank account to initiate and execute payment operations via the internet or any other electronic device. These systems take away the risk of moving physical cash around by customers to meet their needs; instead, they enable customers to make a variety of payments in several currencies to recipients nationally and internationally. Under the spectrum of automated payment systems used by Nigerian commercial banks include ATM (automated teller machine) service, internet mobile payment, POS (point of sale) kiosk, bank card payment, among others. In the view of Nguyen (2020), moving toward the goal of a cashless and digital global economy, financial service institutions around the world are rolling out automated payment systems that enable customers to make payments to whomever in virtually every corner of the world even without leaving their homes.

The prominence of automated payment system has resulted in the emergence of several automated payment networks around the globe such as Paypal, WePay, Amazon Pay, Stripe and among others. These companies exist primarily to enable bank customers to make payments to recipients across the world (Nguyen, 2020). In Nigeria, commercial banks have created systems such as ATM service, internet mobile systems, POS (Point of sale) kiosks and debit/credit cards designed to enable customers to make automated payments. Through such a system, customers do not have to undergo much stress to make payments for goods and services, thereby enhancing their access to banking services capable of satisfying their banking needs. The foregoing viewpoint suggests that automated payment system enhances customer satisfaction in commercial banks.

*H<sub>1</sub>: Automated payment system has a significant effect on customer satisfaction in commercial banks.*

### ***Automated delivery channel***

Automated delivery channel is a network of electronic modes through which commercial banks deliver banking services to customers regardless of their physical location (Mamadiyarov, 2021). It is an electronic system that enables commercial banks and other financial service institutions to deliver financial services to customers through the internet or other electronic devices such as smartphones, personal computers, tablets and ipads. In the view of Haralayya (2021), automated delivery channels are electronic platforms developed by commercial banks to facilitate customers' access to banking services remotely in their homes or places of work. This entails that with the aid of

automated delivery channels, customers can use their electronic devices such as mobile phones and personal computers to contact banks, carry out transactions and satisfy their banking needs even without physically visiting bank branches. To deliver banking services to customers, Nigerian commercial banks have deployed the following automated delivery channels, among others: internet banking, mobile banking, chat banking, and video banking.

In the face of overpopulation of banking halls, increased customers' pressure for delay-free service access, and developments in modern financial technologies, deposit money banks are increasingly automating their processes of banking services delivery to customers (Haralayya, 2021). Instead of requiring customers to physically locate and visit a physical bank branch to carry out financial or non-financial bank transactions, commercial banks are rolling out innovative technologies that enable customers to carry out secure transactions from the comforts of their residences or places of work without the stress of physical movement. Using these technologies, customers can carry out a whole range of financial and non-financial transactions, such as account enquiry, wireless money transfer, cash withdrawal, utility bills payment and a host of others. As such, automated delivery channels have enabled commercial banks to provide services to customers regardless of their physical location to satisfy their banking needs. The foregoing viewpoint suggests that automated service delivery channels enhance customer satisfaction in commercial banks.

*H<sub>2</sub>: Automated service delivery channel has a significant effect on customer satisfaction in commercial banks.*

### ***Automated information-sourcing service***

Automated information-sourcing service is a service that uses digital technologies to deliver information on customers' banking activities to customers for informed decision-making (Nogalski & Hiep, 2022). It is an electronic system that delivers banking information to customers through the internet or any other electronic devices such as smartphones, personal computers, tablets and ipads. With an automated information-sourcing system, customers do not need to bear the stress to locate and visit a bank branch just to obtain information about their bank transactions or banking products/services they wish to patronize. Rather, customers can use the internet or other electronic devices to request information (such as account enquiry, bank statements, and utility bills details) from their banks remotely and have such information delivered to them almost instantly (Chaimaaet *al.*, 2021). Under the spectrum of automated information-sourcing services offered by Nigerian commercial banks include the following, among others: mobile application software, email, USSD (unstructured supplementary service data) service, and IVR (interactive voice response) service.

*Anyadighibe, Ebitu, Ezekiel, James & Asueze. Electronic banking & customer satisfaction ...*

Information is critical when it has to do with digital banking, because without information, customers will not understand how electronic banking systems operate and how to utilize them for banking operations. This is why deposit money banks around the world are creating innovative channels such as websites, text messages, emails and social media platforms in order to convey timely and valuable information to customers to enlighten and enable them make informed financial transactions and decisions, even without visiting a physical bank (Abdullahiet *al.*, 2019). In doing so, commercial banks are able to cut out the delay and stress customers could have encountered in locating a physical brand and accelerate access to banking services to customers to satisfy their banking needs. The foregoing viewpoint suggests that automated information-sourcing channels significantly enhance customer satisfaction in commercial banks

*H<sub>3</sub>: Automated information-sourcing channel has a significant effect on customer satisfaction in commercial banks.*

### **Review of empirical studies and conceptual model**

Rajiet *al.* (2021) carried out a study to determine the effect of electronic banking on customer satisfaction in Kwara State, Nigeria. To that end, a total of 390 bank customers provided data for the study through the administration of an online questionnaire in Illorin Metropolis by the researchers. Regression and correlation analyses were carried out on the data obtained and the findings revealed that security, transactional speed, ease to use, reliability, and responsiveness significantly and positively influenced customer satisfaction. Michaelet *al.* (2021) conducted a study to assess electronic banking and customer satisfaction in Nigeria money deposit banks. The study obtained primary data from 2400 customers and 100 personnel of Guaranty Trust BankPlc in Abuja Metropolis using a structured questionnaire. Consequently, the hypotheses developed for the study were tested statistically using regression and correlation analyses. The findings of the study revealed that ATM (Automated Teller Machine) banking, POS (Point of sale) banking, and mobile banking had significant positive influences on customer satisfaction in Guaranty Trust Bank Plc, Abuja.

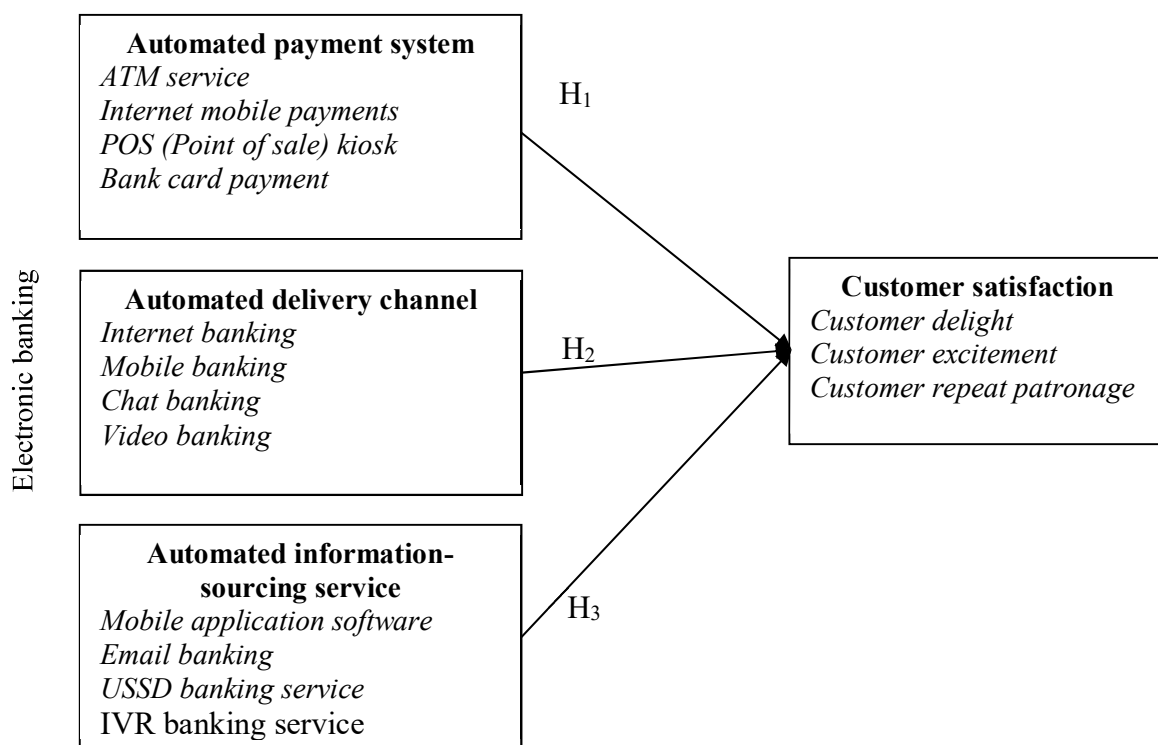
Asiyanbi and Ishola (2018) conducted a study to determine the impact of E-banking services on customer satisfaction in selected bank branches in Ibadan metropolis, Oyo state, Nigeria. To obtain data necessary for the study, the researchers administered a structured questionnaire to 100 customers of commercial banks in Ibadan Metropolis. Data analysis was performed using descriptive statistics, whereas the hypotheses of the study were tested using Pearson correlation analysis and t-test. The study, therefore, found that ATM (Automated Teller Machine), internet banking and electronic transfer significantly and positively influenced customer satisfaction in Nigerian commercial banks. Also, a study conducted by Isibor, *et al.* (2018) was geared towards assessing the impact of electronic banking technology on customers' satisfaction and economic growth

in Nigeria. The study obtained primary data by administering a structured questionnaire to 107 customers of commercial banks in Sango Ota, Ogun State. The data obtained were analyzed using descriptive statistics while the hypotheses of the study were tested using paired sample t-test. Consequently, the findings of the study revealed that electronic banking (mobile banking, internet banking, POS banking, and ATM banking) has significantly improved customer satisfaction in commercial banks and enhanced Nigeria's economy.

Furthermore, the study carried out by Altobishiet *al.*(2018) aimed to examine the effect of E-banking on customer satisfaction in the Jordanian banking sector. A structured questionnaire was administered to obtain primary data from 175 bank customers in Jordan. The hypotheses developed for the study were tested using Pearson's correlation. Consequently, the findings revealed that E-banking (convenience, cost, ease of use, personalization and customization and security) had a significant positive relationship with customer satisfaction in Jordanian banks. Similarly, Ijeomaet *al.* (2020) carried out a study to determine the effect of electronic banking on customer satisfaction in Imo State, Nigeria. To obtain primary data for the study, the researchers administered a structured questionnaire to 54 customers of commercial banks in Owerri Metropolis. The study applied Pearson's Product Moment Correlation to test the hypotheses developed. Consequently, the findings of the study revealed that ATM, POS (Point of sale) banking and mobile banking had significant positive relationships with customer satisfaction in commercial banks.

Also, Osumaet *al.* (2019) conducted a study to determine the influence of electronic banking on customers' satisfaction in selected deposit money banks in Ota, Ogun State. The study obtained primary data from 342 customers of commercial banks in Ota, Ogun State using a structured questionnaire. Descriptive statistics were used for data analysis while multiple linear regression was performed to test the hypotheses of the study. Consequently, the findings of the study revealed that electronic banking (internet banking, mobile banking, ATM banking, chat banking and POS banking) had a significant positive effect on customer satisfaction in deposit money banks. Similarly, Nwekpaet *al.* (2020) conducted a study to examine the influence of electronic banking on customer satisfaction in Fidelity Bank Plc in Nigeria. The study obtained primary data by administering a structured questionnaire to 41 customers of Fidelity Bank Plc in Ebonyi State, Nigeria. The hypotheses developed for the study were subjected to statistical testing using Pearson Product Moment correlation analysis. Consequently, the findings of the study revealed that online credit card payment system, electronic cash system, and ATM banking system had significant positive relationships with customer satisfaction in Fidelity Bank Plc.

From the review of the afore-listed studies, it was observed that the popular opinion of most of the existing scholars support the notion that electronic banking contributes positively to customer satisfaction. Based on the position of existing scholars, this study has hypothesized that there is some sort of relationship between electronic banking and customer satisfaction in commercial banks in Nigeria. To that end, the conceptual model presented in FIG. 1 was developed to portray the hypothesized relationship between electronic banking and customer satisfaction in commercial banks in Nigeria.



**FIG. 1:** Conceptual model of the study

**Source:** Researcher's model (2023)

## METHODOLOGY

This study was survey-based; specifically, cross-sectional survey research design was adopted for the study, whereby the data collection procedure occurred on a one-time basis, without lengthy repetitions. Given that the study aimed to determine the current status of the relationship between electronic banking and customer satisfaction in commercial banks, cross-sectional research design was suitable to provide a snapshot of this relationship using current data obtained in the present time, rather than historical data accumulated from the past. The target population of the study comprised customers of commercial banks in Calabar Metropolis. In light of the inaccessibility of accurate up-to-date public records of bank customers in Calabar, and the refusal of commercial banks to tender information about customers in Calabar, the target population for this study was numerically unknown. As such, we resorted to using the Topman sample size determination procedure to statistically arrive at a definitive sample size for the study as follows:

$$n = \frac{Z^2Pq}{e^2}$$

- Where
- n: Sample size required
  - Z: Tabular statistical unit (1.96)
  - P: Probability of positive response (0.76)
  - q: Probability of negative response (0.24)
  - e: Margin of error (5%)

To determine the probabilities of positive (P) and negative (q) responses in the formula, the researcher conducted a pilot survey by randomly interviewing 50 respondents along Calabar Road, which hosts the headquarters of most commercial banks in Calabar. Out of the 50 respondents interviewed, 38 (representing 76 percent) said that they had either savings, current or fixed-deposit accounts in commercial banks, while 12 respondents (representing 24 percent) said that they had no account with commercials. Hence, the Probability of Positive Response (P) was 0.76, while the Probability of Negative Response (q) was 0.24. Using this information, the Topman formula was applied thus:

$$\begin{aligned} n &= \frac{1.96^2(0.76 \times 0.24)}{0.05^2} \\ &= \frac{3.8416(0.1824)}{0.0025} \\ &= \underline{0.7007} \end{aligned}$$

0.0025

= 280.28

n = 280 bank customers approximately

To select the sample to participate in the questionnaire survey, we adopted convenience sampling technique, particularly because the population of the study was infinite. Hence, convenience sampling technique enabled us to survey only respondents who were actual bank customers, easily accessible and readily available to participate in the survey. The data used for the study were obtained from the structured questionnaire. The instrument’s measurement scale was a 5-point Likert Scale containing the following metrics: Strong Agree (SA = 5), Agree (A = 4), Undecided (U = 3), Disagree (D = 2) and Strongly Disagree (SD = 1). The variable – automated payment system – was measured by statements 1 – 4; the variable – automated delivery channel – was measured by statements 5 – 8; the variable – automated information-sourcing service – was measured by statements 9 – 12; while the variable – customer satisfaction – was measured by statements 13 – 15. Data obtained from the field were analyzed using simple linear regression analysis.

For reliability testing, Cronbach’s alpha reliability method (see table 1) was adopted and generated alpha coefficients not less than 0.7. During the pilot survey, we administered draft copies of the questionnaire to 50 bank customers found at the branch of a commercial bank in Calabar. These respondents were asked to respond to the questionnaire statements on the spot and return the instrument for reliability testing. We ensured that respondents who participated in the pilot survey did not take part in the actual survey by eliminating the selected bank branch from the banks visited during the actual survey. This was necessary to mitigate the possibility of respondent biases as a consequence of prior exposure to the questionnaire statements.

Table 1: Questionnaire reliability coefficients

Variables	No. of items	Cronbach’s alpha coefficients
Automated payment system	4	.821
Automated delivery channel	4	.735
Automated information-sourcing service	4	.817
Customer satisfaction	4	.771
	<b>15</b>	

Source: Authors’ analysis via SPSS 2023

## **RESULTS AND DISCUSSION OF FINDINGS**

A total of 280 copies of the questionnaire were administered to customers of commercial banks in Calabar, out of which 224 copies (representing 80.0 percent) were successfully retrieved, while 56 copies (representing 20.0 percent) were not returned. This analysis is therefore based on the data obtained from 224 respondents.

**Table 2: Descriptive statistics of research variables**

S/N	Item	N	Mean	Standard Deviation	Remark
<b>Automated payment system</b>					
1	ATM service	224	3.862	1.777	Agree
2	Internet mobile payments	224	4.815	1.625	Strongly agree
3	POS (Point of sale) kiosk	224	3.921	1.982	Agree
4	Bank card payment	224	4.661	1.671	Strongly agree
<b>Automated delivery channel</b>					
5	Internet banking	224	4.762	1.662	Strongly agree
6	Mobile banking	224	4.222	1.760	Agree
7	Chat banking	224	3.951	1.961	Agree
8	Video banking	224	3.716	1.851	Agree
<b>Automated information-sourcing service</b>					
9	Mobile application software	224	3.961	1.982	Agree
10	Email banking	224	4.261	1.782	Agree
11	USSD banking	224	4.167	1.961	Agree
12	IVR banking service	224	4.061	1.652	Agree
<b>Customer satisfaction</b>					
13	Customer delight	224	3.888	1.861	Agree
14	Customer excitement	224	3.658	1.888	Agree
15	Customer repeat patronage	224	4.556	1.609	Strongly agree

Source: Authors' analysis via SPSS 2023

From the results in Table 2, all the parameters of automated payment system were accepted at a 5.00 maximum evaluation point, with the minimum acceptable point being

3.00. Mean values were 3.862, 4.815, 3.921 and 4.661 respectively for ATM service, internet mobile payments, POS (Point of sale) kiosk and bank card payment. The data also shows that all the parameters of automated delivery channel were accepted at a 5.00 maximum evaluation point, with the minimum acceptable point being 3.00. Mean values were 4.762, 4.222, 3.951 and 3.716 respectively for internet banking, mobile banking, chat banking and video banking. The results also show that the parameters of automated information-sourcing service were accepted at a 5.00 maximum evaluation point, with the minimum acceptable point being 3.00. Mean values were 3.961, 4.261, 4.167 and 4.061 respectively for mobile application software, email banking, USSD banking and IVR banking service. Finally, the results also show that the parameters of customer satisfaction were accepted at a 5.00 maximum evaluation point, with the minimum acceptable point being 3.00. Mean values were 3.888, 3.658 and 4.556 respectively for customer delight, customer excitement and customer repeat patronage.

### Hypotheses testing

For the sake of hypothesis testing, the hypotheses tested were the null hypotheses; and the decision rule was to reject the null hypothesis if p-value was less than 0.05; and vice versa.

### Hypothesis one

**Ho:** Automated payment system has no significant effect on customer satisfaction in commercial banks in Calabar.

**Test statistic** = Simple linear regression analysis

**Decision criteria:** Accept the alternative hypothesis if ( $P < .05$ ) and reject the null hypothesis, if otherwise.

**Table 3: Model summary of the effect of automated payment system on customer satisfaction in commercial banks**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.643 <sup>a</sup>	.426	.422	.73724

a. Predictors: (Constant), Automated payment system

Source: Authors' analysis via SPSS (2023)

**Table 4: ANOVA<sup>a</sup> of the effect of automated payment system on customer satisfaction in commercial banks**

Model	Sum of Squares	Df	Mean Square	F	Sig.
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1	Regression	52.510	1	52.510	165.126	.003 <sup>b</sup>
	Residual	70.663	222	.318		
	Total	123.173	223			

a. Dependent Variable: Customer satisfaction

b. Predictors: (Constant), Automated payment system

Source: Authors’ analysis via SPSS (2023)

**Table 5: Coefficients<sup>a</sup> of the effect of automated payment system on customer satisfaction in commercial banks**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.911	.210		18.653	.000
	Automated payment system	.130	.160	.643	9.149	.003

a. Dependent Variable: Customer satisfaction

Source: Authors’ analysis via SPSS (2023)

Tables 3 to 5 present the regression results of automated payment system and customer satisfaction in commercial banks. The results in Table 3 shows that the relationship between automated payment system and customer satisfaction is 64.3 percent (as seen in the R column), which indicates a very strong degree of relationship. The coefficient of determination ( $R^2$ ) of 0.426 (in Table 3) indicates that up to 42.6 percent of the variability in the dependent variable (customer satisfaction) is accounted for by the independent variable (automated payment system). This implies that a unit change in application of automated payment systems by commercial banks will affect customer satisfaction by up to 42.6 percent when other factors are held constant.

Also, given that F-test (165.126,  $P < 0.05$ ,  $t = 9.149$ ), the findings revealed that automated payment system had a significant positive effect on customer satisfaction in commercial banks. This finding corresponds with the studies of Michael *et al.* (2021); Ijeoma *et al.* (2020); and Osuma *et al.* (2019), which revealed that ATM, mobile/internet banking, POS banking and electronic card payment (key components of automated payment systems) had significant positive influences on customer satisfaction in commercial

banks. The implication of this finding in the context of this study is that the maintenance of automated payment systems (such as ATM, mobile/internet banking, POS banking and electronic card payment) by commercial banks enhances their ability to deliver services to customers that satisfy their banking needs.

### **Hypothesis two**

**Ho:** Automated delivery channel has no significant effect on customer satisfaction in commercial banks in Calabar.

**Test statistic** = Simple linear regression analysis

**Decision criteria:** Accept the alternative hypothesis if ( $P < .05$ ) and reject the null hypothesis, if otherwise.

**Table 6: Model summary of the effect of automated delivery channel on customer satisfaction in commercial banks**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.508 <sup>a</sup>	.487	.483	.74484

a. Predictors: (Constant), Automated delivery channel

Source: Authors' analysis via SPSS (2023)

**Table 7: ANOVA<sup>a</sup> of the effect of automated delivery channel on customer satisfaction in commercial banks**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	60.008	1	60.008	210.554	.002 <sup>b</sup>
	Residual	63.165	222	.285		
	Total	123.173	223			

a. Dependent Variable: Customer satisfaction

b. Predictors: (Constant), Automated delivery channel

Source: Authors' analysis via SPSS (2023)

**Table 8: Coefficients<sup>a</sup> of the effect of automated delivery channel on customer satisfaction in commercial banks**

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
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		B	Std. Error	Beta		
1	(Constant)	3.494	.178		19.645	.000
	Automated delivery channel	.106	.152	.508	11.123	.002

a. Dependent Variable: Customer satisfaction

Source: Authors’ analysis via SPSS (2023)

Tables 6 to 8 present the regression results of automated delivery channel and customer satisfaction in commercial banks. The results in Table 6 shows that the relationship between automated delivery channel and customer satisfaction is 50.8 percent (as seen in the R column), which indicates a strong degree of correlation. The coefficient of determination ( $R^2$ ) of 0.487 (in Table 6) indicates that up to 48.7 percent of the variability in the dependent variable (customer satisfaction) is accounted for by the independent variable (automated delivery channel). This implies that a unit change in the utilization of automated delivery channels by commercial banks will affect customer satisfaction by up to 48.7 percent when other factors are held constant.

Also, given that F-test (210.554,  $P < 0.05$ ,  $t = 11.123$ ), the findings revealed that automated delivery channel had a significant positive effect on customer satisfaction in commercial banks. This finding is corroborated by the studies of Michael *et al.* (2021); Asiyanbi and Ishola(2018) and Isibor, *et al.* (2018), which revealed that ATM banking, mobile banking and POS banking (key forms of automated service delivery channels) had significantly enhanced customer satisfaction in commercial banks. The implication of this finding in the context of this study is that the use of automated delivery channels (such as ATM banking, mobile banking and POS banking) by commercial banks reinforces their ability to deliver services that satisfy customers’ banking needs.”

**Hypothesis three**

**Ho:** Automated information-sourcing service has no significant effect on customer satisfaction in commercial banks in Calabar.

**Test statistic** = Simple linear regression analysis

**Decision criteria:** Accept the alternative hypothesis if ( $P < .05$ ) and reject the null hypothesis, if otherwise.

**Table 9: Model summary of the effect of automated information-sourcing service on customer satisfaction in commercial banks**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
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1	.714 <sup>a</sup>	.533	.529	.72755
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a. Predictors: (Constant), Automated information-sourcing service

Source: Authors' analysis via SPSS (2023)

**Table10: ANOVA<sup>a</sup> of the effect of automated information-sourcing service on customer satisfaction in commercial banks**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	65.662	1	65.662	253.521	.001 <sup>b</sup>
	Residual	57.511	222	.259		
	Total	123.173	223			

a. Dependent Variable: Customer satisfaction

b. Predictors: (Constant), Automated information-sourcing service

Source: Authors' analysis via SPSS (2023)

**Table11: Coefficients<sup>a</sup> of the effect of automated information-sourcing service on customer satisfaction in commercial banks**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.664	.252		10.571	.000
	Automated information-sourcing service	.235	.172	.714	7.271	.001

a. Dependent Variable: Customer satisfaction

Source: Authors' analysis via SPSS (2023)

Tables 9 to 11 present the regression results of automated information-sourcing service and customer satisfaction in commercial banks. The results in Table 9 shows that the relationship between automated information-sourcing service and customer satisfaction is 71.4 percent (as seen in the R column), which indicates a very strong degree of correlation. The coefficient of determination ( $R^2$ ) of 0.533 (in Table 9) indicates that up to 53.3 percent of the variability in the dependent variable (customer satisfaction) is accounted for by the independent variable (automated information-sourcing service). This implies that a unit change in utilization of automated information-sourcing service

by commercial banks will affect customer satisfaction by up to 53.3 percent when other factors are held constant.

Also, given that F-test (253.521,  $P < 0.05$ ,  $t = 7.271$ ), the findings revealed that automated information-sourcing service had a significant positive effect on customer satisfaction in commercial banks. This finding is in line with the study of Hammoud *et al.* (2018), which revealed that email banking (a component of automated information-sourcing system) had a significant effect on customer satisfaction in commercial banks. The finding is also supported by the study of Michael *et al.* (2021), which revealed that mobile banking (an automated information-sourcing system) had a significant positive influence on customer satisfaction in Guaranty Trust Bank Plc, Abuja. This finding implies that the maintenance of automated information-sourcing services by commercial banks enables them to effectively improve customers' satisfaction.

## CONCLUSION AND PRACTICAL IMPLICATIONS

This study explored the influence of electronic banking on customer satisfaction in commercial banks. It was geared towards verifying whether or not electronic banking could be used by commercial banks to improve customer satisfaction towards their services. To that end, primary data were obtained from customers of commercial banks. The data obtained were descriptively analyzed and interpreted using simple percentages and frequencies. To generate findings for the study, the hypotheses developed for the study were tested statistically. Consequently, the results obtained revealed that automated payment system, automated delivery channel and automated information-sourcing service have significant positive effects on customer satisfaction in commercial banks. The implication of this finding is that commercial banks could effectively improve customers' satisfaction towards their services through electronic banking tools. Therefore, the study reaches the conclusion that in the Nigerian context, electronic banking has a significant positive influence on customer satisfaction in commercial banks. On the basis of the findings made, we have drawn key practical implications for practitioners in the Nigerian banking industry. Firstly, commercial banks should provide more automated service delivery channels such as internet banking, mobile banking, chat banking and video banking, to enable customers in urban and especially rural areas to get seamless access to banking services without necessarily visiting branch offices. Secondly, we believe that commercial banks should consistently enlighten customers on how to use automated payment systems, such as ATM service, internet mobile payments, POS (point of sale) kiosk and bank card payment, to make payments for goods and services purchased. By enlightening customers of the value of automated payment systems, commercial banks will be able to encourage more adoption of the systems by customers. Finally, commercial banks should guarantee minimal or no disruptions in E-banking service delivery by eliminating downtime, slow processing and other technical

*Anyadighibe, Ebitu, Ezekiel, James & Asueze. Electronic banking & customer satisfaction ...*

issues that result in delayed transaction processing. This will ensure that bank customers are consistently satisfied with their experience with the services of commercial banks particularly on electronic platforms.

### **Research limitations and further studies**

This study was restricted to commercial banks in Nigeria; as such, its findings and generalizations may not apply to the banking sectors of other countries, particularly the Western world. The sampling frame only comprised bank customers with no emphasis on bank management to determine how electronic banking has affected the effectiveness of service delivery. Based on these limitations, we suggest that more studies should be replicated in other developing countries especially in Africa to determine how E-banking is impacting customer satisfaction with commercial banks. Also, future researchers should extend the scope of their studies to include bank management in order to determine how the deployment of E-banking systems is impacting the effectiveness of banking service delivery in Nigeria and other developing African countries.

### *Conflict of interest statement*

All the authors of this research work are in absolute agreement on the publication of the work and we hereby declare no conflict of interest.

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