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Deployment of Electronic Banking System: The Nigerian Experience

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Abstract
All over the world today, there is a paradigm shift from the conventional method of banking for a technology-based method through the use of Information and Communication Technology (ICT). There is no doubt that the citizens of developed economies across the globe are already enjoying the full benefits of this new banking method generally referred to as electronic banking (e-banking). The same cannot be said of their developing economies counterparts who are still "struggling" to grasp the new banking method concepts. Nigeria as a developing nation has made a giant stride in the implementation of this new method of banking. In this work, the researchers investigated if the year of adoption of electron banking technology is dependent on bank customer's age. To achieve that, 300 questionnaires were randomly distributed to bank customers. Out of this, 269 questionnaires were returned representing 89.7% of the distributed questionnaires. Again, about 7% (21) of the returned questionnaires were invalid, thereby leaving a total analyzed questionnaire of 248, representing 82.7%. The Chi-square statistic tool was deployed for the analysis. The result of the analysis showed that the year of adoption of electronic banking technology is dependent of the age of the bank customers in the study.

1. Introduction

Electronic banking is a method of banking in which the customer conducts transactions electronically via the Internet. It is a new banking technology. Whereas the western world has experienced electronic banking, developing economies are yet to come to terms with this terminology. There is no doubt that Nigeria as a developing nation has experienced a measurable level in electronic banking; the country needs to do more to be able to accept the Central Bank of Nigeria cashless policy, which encourages e-banking.

Electronic banking (e-banking) is sometimes referred to as Internet banking and is a means by which a user with an electronic device (computer or mobile phone) and a browser can get connected to his bank's website to perform any of the virtual banking functions. In this system of banking, the bank has a centralized database that is web-enabled. All the services that the bank has permitted on the Internet are displayed in menu [1].

2. Related Literatures

In this section, we will review some of the literatures relating to e-banking. E-banking may take various forms which may include mobile banking, credit/debit card usage, online purchase of goods and services, use of automated teller machine, etc.

2.1. Mobile Banking

The spread of mobile phones across the developing world is one of the most remarkable

technology stories of the past decade. Buoyed by prepay cards and inexpensive handsets, hundreds of millions of first-time telephone owners have made voice calls and text messages part of their daily lives. However, many of these same new mobile users live in informal and/or cash economies, without access to financial services that others take for granted. Indeed, across the developing world, there are probably more people with mobile handsets than with bank accounts [2].

[3] stated that mobile banking has emerged as a wireless communication channel for creating value by customers in banking transactions. Today, the main focus has been the field of modern methods of banking services, supply of banking and financial services using mobile phones.

Accordingly, [4] new technology-based financial services, such as mobile phone banking and the use of smartcards, have the potential to substantially increase people's access to finance.

2.2. Credit/Debit Cards

A credit card is a plastic card having a magnetic strip, issued by a bank or business authorizing the holder to buy goods or services on credit. On the other hand, a debit card is a plastic card that resembles that of credit card but functions like a check and through which payments for purchases or services are made electronically to the bank accounts of participating retailing establishments directly from those of card holders. Here, it may be good to differentiate between a debit and a credit card. With debit cards, when an order is placed on goods and service, the customer's account is debited by the financial institution of the customer. In that case, the customer must have sufficient funds in the account to cover for such an order. But with credit card, the customer may borrow money from the financial institution and use such money to place an order for goods and services. The common debit cards in Nigeria are master and visa cards. With debit card, account is checked for adequate funds, and if everything is satisfactory, cash is issued.

A debit card transaction involves the purchase of a good or service. In this case, the consumer presents a debit card (which again was issued by the bank holding the checking account) to a merchant, and the consumer either enters a PIN (online debit) or signs a receipt (offline debit) to verify the consumer's identity. The merchant, in turn, sends information about the transaction across one or more debit card networks, and if the transaction is approved, the consumer receives the good or service and the checking account is correspondingly debited [5].

2.3. Internet Banking

Internet banking otherwise referred to as online banking enables bank customers to handle `account management and perform account transactions directly with the bank through the Internet. Most banks offer customers the option of online banking. With this technology, customers are able to have access to all of their accounts through an Internet connection using the bank's own website or a commercial software package.

The advancement in Information and Communication Technology has imparted on our daily lives. This advancement is being experienced by individuals, organizations and government. The banking industry is not left out and as such has made progress in Information and Communication Technology. The innovative product emerging from technological improvements is Internet technology and has an expansive usage. Consumer spending via Internet is increasing at a significant rate. Progressively, more groups and organizations sense that Internet can be used to facilitate development by taking advantage of its easy access to information and the transfer of technology. Increased competition in the banking sector and customer demand is forcing banks to provide their services online [6].

2.4. Online Shopping

Online shopping is a form of electronic commerce which allows consumers to directly buy goods or services from a seller over the Internet using a web browser. In Nigeria, this is not yet common. However, there are few online shops in Nigeria such as Konga, Jumia, Kaymu, Dealday, etc.

Online shopping has been a growing phenomenon in all four corners of the world, in particular amongst countries possessing highly developed infrastructure available for marketing activities through the Internet. Today, Internet is not only a networking media, but also a global means of transaction for consumers. Internet usage has grown rapidly over the past years and it has become a common means for information transfer, services and trade [7].

3. Data Collection

In order to investigate the relationship between years of adoption of electronic banking in Nigeria and bank customers age, questionnaires administration was deployed to collect data used for this research. A total of 300 questionnaires were administered, but only 248 returned and valid questionnaires were used. A sample of the administered questionnaire is labeled Appendix A. The summary of data collected is presented in table 1 below:

Table 1. *Data Collected Summary*

S/N	Variable Description	Frequency
1	Gender :	
	Male	136
	Female	112
2	Age (years):	
	Below 20	21
	Between 20 –29	64
	Between 30–39	79
	Between 40 –49	58
	Above 49	26
3	Electronic Banking in Use:	
	Mobile Banking	55
	Credit/Debit Card	164
	Internet Banking	17

S/N	Variable Description	Frequency
	Online Shopping	9
	Others	3
4	Adoption of Electronic Banking (years):	
	Less than 2	41
	Between 2-4	66
	Above 4	141
5	Bank(s) Used For Electronic Banking:	
	GTB	73
	Skyebank	21
	Ecobank	34
	UBA	53
	Others	67
6	Purpose for Electronic Banking:	
	Business	31
	Saves time	195
	Cheaper	14
	Payments	6
	Others	2
7	Major Electronic Banking Challenge :	
	Power Outage	24
	Inefficient Services	140
	Server Down times	71
	Service Inexperience	5
	Others	9

In order to investigate the relationship between the age of bank customers in the study and the number of years of adoption of electronic banking, a cross tabulation of the variables of interest (Customer age and adoption of electronic banking in years) was carried out and the result is presented in table 2 below:

Table 2. *Years of Electronic Banking Adoption and Age Observed Frequencies*

E-banking Adoption (years)	Age(years)					
	below 20	20-29	30-39	40-49	Above 49	Total
< 2	3	28	24	7	3	65
2-4	5	22	8	12	15	62
>4	0	27	26	39	29	121
Total	8	77	58	58	47	248

Table 2 above is referred to as a contingency table. Contingency table is a tabular arrangement of count data representing how the row factor frequencies relate to the column factor and often used to analyze and record the relationship between two or more discrete variables (i.e. binary, categorical [9].

4. Test of Hypothesis

Hypothesis testing is a form of statistical inference that uses data from a sample to draw conclusions about a population parameter or a population probability distribution. The first step is to make an assumption about the parameter or distribution. This assumption is called the null hypothesis and is denoted by H0, while the alternative is H1.

[8] defined a test statistic as standardized version of statistic and that it is the main component of a hypothesis test. It is a random variable used to determine how close a specific sample result falls to one of the hypotheses being tested.

The hypothesis is:

H0: Years of Adoption of Electronic Banking Technology and Customer age are independent

H1: Years of Adoption of Electronic Banking Technology and Customer age are dependent

The test is to be carried out at 5% ($\alpha = 0.05$) level of significance.

The test statistic is chi-square, $\aleph^2 = \sum_{i=1}^{n} (O_i - e_i)2/e_i$

The decision rule is reject H0 if computed value of $\varkappa^2$ is greater than $\varkappa^2$ α table.

5. Data Presentation and Analysis

Table 1 shows that majority of the respondents are male. Also, more respondents are within the age bracket of 30-39 and that most deploy debit/credit cards for electronic banking. Result also show that more respondents have adopted electronic banking for more than 4 years and that electronic banking saves time. Finally, inefficient services have been identified by most respondents as one major challenge facing electronic banking in Nigeria.

The test statistic is computed by carrying out cross tabulation from the data collected from the administered questionnaire shown in table 2. Using table 2 above, table 3 is computed as the table of expected frequencies (Ei) and is shown below:

Table 3. *Years of Electronic Banking Adoption and Age Computed Expected Frequencies*

E-banking Adoption (years)	Age (years)				
	below 20	20-29	30-39	40-49	Above 49
< 2	2.097	20.181	15.202	15.202	12.319
2-4	2.000	19.250	14.500	14.500	11.750
>4	3.903	37.569	28.298	28.298	22.931

Table 4 below shows table of both observed and expected frequencies. This would be used to compute Chi-square statistics. In the table, the expected frequencies are enclosed in square bracket.

Table 4. *Years of Electronic Banking Adoption and Age Computed Expected frequencies*

E-banking Adoption (years)	Age (years)				
	below 20	20-29	30-39	40-49	Above 49
< 2	3	28	24	7	3
	[2.097]	[20.181]	[15.202]	[15.202]	[12.319]
2-4	5	22	8	12	15
	[2.000]	[19.250]	[14.500]	[14.500]	[11.750]
>4	0	27	26	39	29
	[3.903]	[37.569]	[28.298]	[28.298]	[22.931]

$$\aleph^2 = \sum_{i=1}^{n} (O_i - e_i)2/e_i$$

$$= \frac{(3-2.097)^2}{2.097} + \frac{(28-20.181)^2}{20.181} + \frac{(24-15.202)^2}{15.202} + \frac{(7-15.202)^2}{15.202} + \frac{(3-12.319)^2}{12.319} + \frac{(5-2.000)^2}{2.000} + \frac{(22-19.250)^2}{19.250} + \frac{(8-14.500)^2}{14.500} + \frac{(12-14.500)^2}{14.500} + \frac{(15-11.750)^2}{11.750} + \frac{(0-3.903)^2}{3.903} + \frac{(27-37.569)^2}{37.569} + \frac{(26-28.289)^2}{28.289} + \frac{(39-28.289)^2}{28.289} + \frac{(29-22.931)^2}{22.931}$$

$$= 41.838$$

The degree of freedom, df is (r-1)(c-1), where r is the row number and c is the column number, which is 8.

At $\alpha = .05$, $\aleph^2$table is 21.955.

Decision Rule: Reject Ho if computed $\aleph^2$ is greater than $\aleph^2_{.05}$ table.

Conclusion: Since 41.838 > 21.955, we reject Ho and accept H1, which means that years of adoption of electronic banking technology and customer age are dependent.

6. Conclusion

From the data collected and used for this analysis, the computed $\aleph^2$ suggests that the null hypothesis should be rejected in favor of the alternative hypothesis indicating that years of adoption of electronic banking technology and customer‘s age are dependent.

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