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### An Empirical Investigation of the Level of Users' Acceptance of E-Banking in Nigeria

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## **Abstract**

Nigeria was depicted to be the fastest growing telecommunications nation in African. Presently, all members of the Nigeria banking industry have engaged the use of Information and Communication Technology (ICT) as a platform for effective and efficient means of conducting financial transactions. This paper focuses on determining the level of users' acceptance of the electronic banking services and investigating the factors that determine users' behavioral intentions to use electronic banking systems in Nigeria.

The survey instrument employed involved design and administration of a total of 500 survey questionnaires within the Lagos metropolis and its environs. An extended Technology Acceptance Model (TAM) was employed as a conceptual framework to investigate the factors that influence users' acceptance and intention to use electronic banking. To test the model, data was collected from 292 customers from various commercial banks in Nigeria. The model measured the impact of Perceived Credibility (PC), Computer Self-Efficacy (CSE), Perceived Usefulness (PU), and Perceived Ease of Use (PEOU) on customer attitude and customer attitude on customer adaptation.

The result of this research shows that ATM still remains the most widely used form e-Banking service. Banks' customers who are active users of e-Banking system use it because it is convenient, easy to use, time saving and appropriate for their transaction needs. Also the network security and the security of the system in terms of privacy are the major concerns of the users and constitute hindrance to intending users.

**Keywords: Technology Acceptance Model (TAM), perceived credibility, computer self-efficacy, customer attitude, and e-banking.**

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## **INTRODUCTION**

Nigeria's slow adoption of electronic banking practice is rapidly changing for the better. Awareness of electronic payments in Nigeria is increasing and it accounted for #360 billion worth of transaction in 2008 (Adeyemi). Findings have shown that with improved technological development and provision of basic infrastructure there will be improved e-Commerce and e-Payment services with overall reduction in the amount of currency in circulation (Ayo et al., 2008).

Revolution started in Nigeria banking system in 2003 with the introduction of Guideline of Electronic Banking by the Central Banking of Nigeria. This was accompanied by bank reformation exercise in June 2004. The reformation exercise left Nigeria with 25 strong and reliable banks against 89 banks previously in existence. The surviving banks of the recapitalization exercise have enormously engaged the use of ICT as a platform for

effective and efficient delivery of banking services (Ayo et al., 2007).

The banks' huge investment in telecommunication networks and various e-Banking services delivery could be seen as an effort towards measuring up with global standard. This is among other reasons such as increased customer demand, increased competition among banks themselves, derive minimized cost, new entrants, and better service delivery (Muniruddeen, 2007).

While e-Banking services are numerous in number, there is not enough evidence of consumer acceptance and their stance towards the use of the services. For us to accept that e-Banking has fully gained prominence in Nigeria, customer's acceptance, attitude and confidence in the system need to be validated. Muniruddeen (2007) indicated that half of the people that have tried e-Banking services will not become active users of the system. Findings have also shown that insecurity; inadequate operational facilities like telecommunication and electric supply are among hindrances to online banking in Nigeria (Ezeoha 2005; Chiemeka et al., 2006).

The goal of this study is to examining the factors that influence users' acceptance of e-Banking taking to consideration their attitude and confidence in the use of the system. The impact of perceived usefulness (PU), perceived ease of use (PEOU), perceived credibility (PC), computer self-efficacy (CSE), and customer attitude is sought to determine the level of users' acceptance of the various e-Banking services. The rest of this paper is arranged as follows: section two presents the literature review on e-Banking and technology acceptance model. Section three presents the research model and hypothesis, section four presents analysis and results, and section five presents the conclusion and implication of the study.

## **LITERATURE REVIEW**

### **Electronic Banking**

The advent of Internet, electronic commerce, communication technology and users' response to this technology has opened opportunity for many businesses including the financial institution. Adoption of electronic banking service delivery is fast gaining ground in Nigeria. Different e-Banking channels such as electronic cards, internet banking and mobile banking services have been introduced.

Electronic banking offers benefits to both banks and customers. Pikkarainen et al. (2004) mentioned two fundamental reasons underlying online banking development and penetration. First, that banks get significant cost savings in their operation through e-Banking services. It has been proved that online banking channel is the cheapest delivery channel for banking products once established. Second, that banks have reduced their branch networks and downsized the number of service staff, which has paved the way to self-service channels as quite many customers felt that branch banking took too much time and effort.

On the other hand, customers enjoy self-service, freedom from time and place constraint, and reduced stress of queuing in banking hall. Therefore, time and cost

savings and freedom from place have been found the main reasons underlying online banking acceptance. It was indicated that electronic banking services delivery are the cheapest, the most profitable and wealthiest delivery channel for banking products (Pikkarainen et al., 2004).

However, not all bank customers engage in the use on e-Banking services. There are multiple reasons for this. First, customers need to have an access to the Internet in order to utilize some e-Banking facilities such as Internet and Mobile banking facilities. Furthermore, most new online users need first to learn how to use the service. Second, nonusers often complain that online banking is incomprehensible, difficult to use and has no social dimension, i.e. the lack of face-to-face situation at branch (Karjaluoto 2001; Mattila et al., 2003). Third, customers are afraid of security issues (Ezeoha, 2005).

### **Technology Acceptance Model (TAM)**

User's attitude towards and acceptance of a new information system is important on successful adoption of the information system (Davis, 1989). The quality and effectiveness of a system can only be validated with its level of users' acceptance. A system that satisfies users' needs boosts satisfaction with the system and is an indicator of the system's success (Pikkarainen et al., 2004).

To improve the delivery of efficient and effective system by designers and developers, it is important to study the reasons why people decide to use or not to use an information system. Technology Acceptance Model (TAM) is an information system theory that models how users come to accept and use a technology. TAM proposed by Davis (1989) is an extension of Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB). The Technology Acceptance Model explained the relationship between beliefs (perceived usefulness and perceived ease of an information system) and users' attitude, intentions, and actual usage of the system. The TAM posits these two theoretical constructs; perceived usefulness (PU) and perceived ease of use (PEOU) as fundamental determinants of user's acceptance of an information system.

TAM posits that user's acceptance of a new information system is determined by his intention to use the system which is determined by users' attitude. Users' attitude in turn is determined by the two behavioral beliefs; perceived usefulness and perceived ease of use (Davis, 1989). Much research had been conducted using TAM and it has become the most widely accepted model among information system researchers (Muniruddeen, 2007).

Many research works had been conducted using TAM and introducing other variables which are validated as having impact on usefulness, ease of use, attitude, users' acceptance and intention (Hanudin 2007; Muniruddeen 2007; Pikkarainen et al., 2004). Davis sited that future research on technology acceptance should address the impact of other variables on usefulness, ease of use and user acceptance and intention. Validity of TAM can be increased by exploring the nature and specific influences of technological and usage-context factors that may affect user's acceptance. For instance, Hanudin (2007) concluded that credibility is the heart of Internet banking system and found computer self-efficacy as a major influence on perceived ease of use.

In the context of electronic banking, Muniruddeen (2007) employed the extended TAM to examine individual’s perceived security and privacy of Internet banking in Malaysia. Siu-Cheung and Ming-te (2004) also extended the model with Subjective Norm and Social Cognitive Theory (self-efficacy) by Bandura (1982) to explain the intention to use Internet banking in Hong Kong. Jahangir and Begum (2008) also employed the extended TAM with attitude as defined by Theory of Reasoned Action to determine the customer adaptation of e-Banking.

Therefore, perceived ease of use and perceived usefulness alone may not fully determine the user’s intention to adopt electronic banking, thus the need to examine additional factors that may better predict the acceptance of electronic banking. Computer self-efficacy, perceived credibility (security and privacy), perceived risk, quality of Internet connection, and perceived enjoyment among others are external variables that have been introduced into TAM in extending its validity on examining user’s acceptance of online banking, Internet banking, e-Commerce and Internet usage.

**RESEARCH MODEL AND HYPOTHESES**

Extended TAM is being widely used and proven model of investigating user’s adoption of information systems. This extension refers to the introduction of external variables and measuring their impact on the acceptance to use an information system. Extended TAM is adopted as the theoretical framework adopted in this research. The proposed research model in this study is shown in Figure 1 below. The extended TAM includes external variables “perceived credibility”, “computer self-efficacy”, and “customer attitude”.

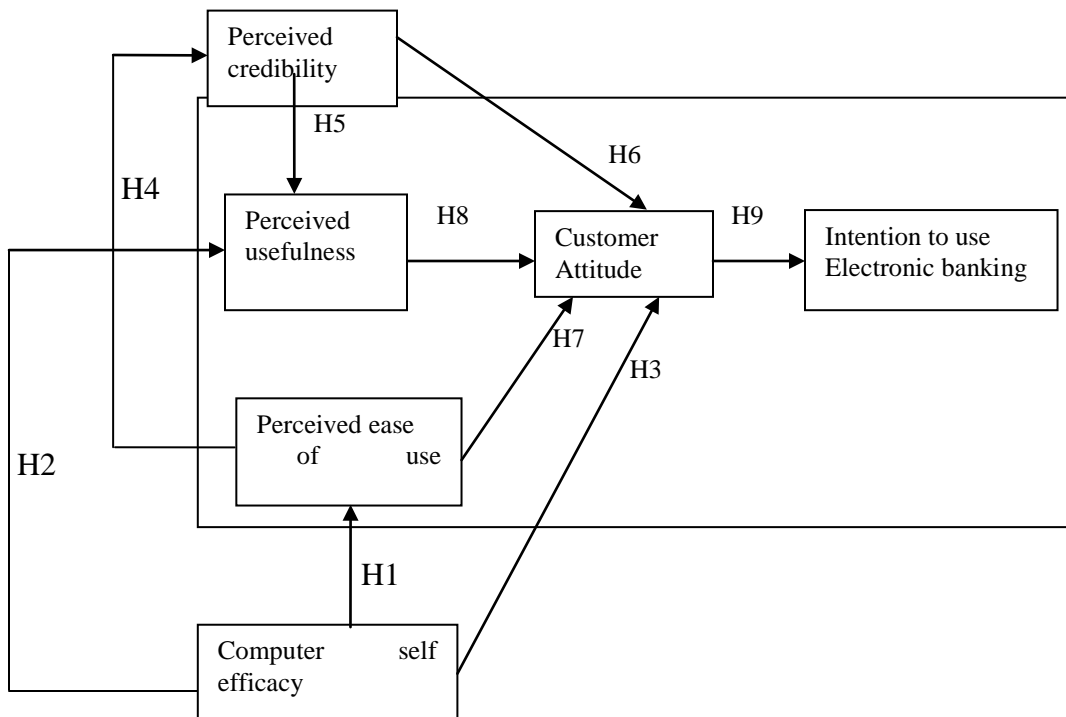


Figure 1: The research model

**Computer Self efficacy**

The importance of perceived ease of use is supported by Bandura who defined self efficacy as "judgments of how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982). Self-efficacy beliefs are theorized to function as proximal determinants of behavior.

The proposed relationship between computer self-efficacy and perceived ease of use is based on the theoretical argument by Davis (1989). Studies have also shown that there exists empirical evidence of a causal link between computer self-efficacy and perceived ease of use (Hanudin 2007; Reid et al., 2008). Hanudin, in his research found that computer self-efficacy had a positive effect on both perceived usefulness and perceived ease of use on Internet banking among young intellectual in Malaysia. Thus, in order to further determine factors affecting users' acceptance of electronic banking in Nigeria, we propose the following hypotheses:

H1: Computer self-efficacy has a positive effect on perceived usefulness.

H2: Computer self-efficacy has a positive effect on perceived ease of use.

H3: Computer self-efficacy has a positive effect on customer attitude.

**Perceived Credibility**

According to Hanudin (2007), perceived credibility is a determinant of behavioral intention to use an information system. Perceived credibility consists of two important elements: privacy and security. Security refers to the protection of information or systems from unauthorized intrusions (Egwali, 2008). Fear of inadequate security is one of the factors that have been identified as impediments to the growth and development of e-Commerce including electronic banking adoption (Ezeoha, 2005).

For the purpose of this research, "perceived credibility" (PC) is defined as users' perception of protection of their transaction details and personal data against unauthorized access. PC is about personal belief that a user has in the system to carry out a transaction securely and maintain the privacy of personal information. Perceived credibility has also been tested and confirmed to have a significant effect on perceived ease of use and perceived usefulness (Karjaluoto 2002; Muniruddeen 2007). Therefore, for studying the effect of perceived credibility on user's acceptance in Nigeria electronic banking services, we pose the following hypotheses to determine its effect on user's intention:

H4: perceived credibility has positive effect on perceived ease of use of e-Banking

H5: perceived credibility has positive effect on customer perceived usefulness of e-Banking

H6: perceived credibility has positive effect on customer attitude towards the use of e-Banking

**Perceived ease of use**

Similarly, perceived ease of use (PEOU) is a major factor that influences customer

attitude towards the use of an information system (Jahangir, 2007). PEOU is defined as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989). Hence an application perceived to be easier to use than another is more likely to be accepted by users. By applying these to electronic banking context we hypothesize that:

H7: Perceived ease of use (PEOU) has a positive effect on customer attitude.

### **Perceived usefulness**

People tend to use an application to the extent they believe it will aid their performance. Davis defined PU as “the degree to which a person believes that using a particular system would enhance his or her job performance”. We hypothesize that:

H8. Perceived usefulness (PU) has a positive effect on customer attitude.

### **Customer attitude**

Attitudes as defined Davis (1989) and Karjaluoto et al., (2002) is the users’ desirability to use the system. Researchers have noted attitude as the driver of consumer utility. It reveals the perceptions of usefulness, credibility and individual preferences (Jahangir et al., 2007). Consumer’s attitude is argued to have a strong, direct and positive effect on consumers’ intention to actually use new information system (Jahangir, et al., 2007).

TAM posits that attitude is based on the salient belief which a person has about the consequences of a given behavior and his or her appraisal of those consequences. Customer attitude is formed based on characteristic beliefs about the object and perceived importance of those characteristics in making the decision to adopt. Electronic banking users’ attitude varied in terms of perceptions regarding product information, form of payment, delivery terms, service offered, risk involved, privacy, security, personalization, visual appeal, navigation, entertainment, and enjoyment. With this understanding of consumer’s attitude, we therefore post the following hypotheses to determine that:

H9: Customer attitude have a positive effect on customer acceptance of electronic banking

### **Research Instrument**

Questionnaire is the survey instrument used in this research. The research design was divided into two sections. The first section consists of demographic profile and the e-Banking usage of the respondent. The second section consist of 30 questions; 5 questions on perceived ease of use, 5 questions on perceived usefulness, 7 questions on perceived credibility 7 questions on computer self-efficacy, 3 questions on customer attitude, and 3 questions on intention to use.

The questionnaire items were adopted from the following prior studies (Reid et al., 2008; Jahangir et al., 2008; Muniruddeen 2007; Pikkarainen et al., 2004; Karjaluoto et al., 2002) The participants were asked to indicate their perception on a likert scales (1- 5) with response ranging from “strongly disagree” to “strongly agree”. The collected data

were analyzed based on correlation and regression analyses using the statistical package for social sciences (SPSS).

## ANALYSIS OF DATA AND PRESENTATION OF RESULT

### Demographic profile and e-Banking usage

Two hundred and ninety two questionnaires were analyzed. The percentage of male respondent to female respondent is almost equal. 42.9% of respondents are females while 55.7% are males. 50 percent of the respondent is aged between 20 – 30 years; 19.9 percent were below 20, 17.9 were age between 31 – 40 years, and 11.9 percent above 40 years of age. Most of the respondents had bachelor degree (58.4%). The occupation of the respondents include: civil service, trading, education, manufacturing and IT and Telecommunication. The household income of the respondent varied from less than #50,000 per month to over #150,000 monthly income (#150,000 = \$1,000). A detailed demographic profile of the respondents is presented in the table below.

**Table 1: Demographic profile of respondents**

	Frequency	Valid Percentage
Gender:		
Male	166	56.7
Female	126	42.3
Total	292	
Age:		
Under 20	59	19.9
21 – 30	148	50.0
31 – 40	53	17.9
41 – 50	23	7.8
51 – 60	4	1.4
60 yrs and above	5	2.6
Total	292	
Education:		
High Sch	46	15.5
Bachelor degree/PND	173	58.4
Post graduate	49	16.6
Others	15	5.1
No response	9	3.8
Total	292	
Occupation:		
Civil service	32	10.8
Trading	21	7.1
Manufacturing	16	5.4
Education	88	29.7
IT & Telecomm	56	18.9
Others	79	26.7
Total	292	



Income		
Less #50,000	96	32.4
#50,000-100,000	56	19.2
#100,000-150,000	39	13.3
Above #150,000	65	32.7
No response	36	12.1
Total	292	

E-Banking usage of the respondents was also determined. Respondents were asked to indicate the rate at which they use any of the various form of e-Banking system. The frequency distribution of their e-Banking system usage is illustrated in Table 2. Among all e-Banking system, ATM has the highest level of usage. 44.6% of the respondent claimed to always use ATM, 22.3% almost always use ATM and 12.2% use ATM on the average. Mobile banking system was observed to be the least used. 44.3% responded not to have ever used mobile banking system for their banking transaction.

**Table 2: Electronic Banking Usage**

	Mobile banking		ATM		Phone banking		EFTs		Internet banking		POS	
	Feq.	%	Feq.	%	Feq.	%	Feq.	%	Feq.	%	Feq.	%
Never	131	44.3	32	10.8	128	43.2	101	36.1	122	41.2	102	34.5
Almost Never	15	5.1	9	3.0	32	10.8	30	10.1	46	13.5	20	6.8
Average	45	15.2	36	12.2	43	14.5	61	20.6	47	15.9	53	17.9
Almost Always	17	5.7	66	22.3	13	4.4	20	6.8	14	4.7	40	13.5
Always	20	6.8	132	44.6	20	6.8	16	5.4	15	5.1	28	9.5
No response	62	20.0	17	5.7	55	18.6	57	19.3	55	18.6	48	16.2

**Reliability Analysis**

Cronbach’s Alpha test was conducted for all the constructs to determine the internal consistency across items for each measure. The Cronbach’s alpha values (Table 3) for all dimensions range from 0.74 to 0.91, exceeding the minimum alpha of 0.7 (Pallant, 2004). This indicates good reliability on all measures.

**Table 3: Reliability Analysis**

Determinants	Number of Items	Cronbach’s alpha
PU	5	0.910
PEOU	5	0.877
PC	7	0.726
CSE	7	0.752
ATT	3	0.744
BI	3	0.752

### Correlation Analysis

A correlation analysis was conducted on all variables to explore the relationship between the variables. The analysis of bivariate correlation was subject to two tailed tests at 0.01% and 0.05% levels of significance. The result of correlation analysis shows all positive figures (see table 4). This suggests that correlations are positive between customers' attitude towards the use of e-Banking and its variables; i.e. perceived credibility, computer self-efficacy, perceived easy of use, and perceived usefulness.

**Table 4: Correlation analysis of the variables**

		PU	PEOU	CSE	PC	Attitude	BI
PU	Pearson Correlation	1	.673(**)	.404(**)	.380(**)	.575(**)	.512(**)
	Sig. (2-tailed)		.000	.000	.000	.000	.000
PEOU	Pearson Correlation	.673(**)	1	.319(**)	.322(**)	.505(**)	.437(**)
	Sig. (2-tailed)	.000		.000	.000	.000	.000
CSE	Pearson Correlation	.404(**)	.319(**)	1	.385(**)	.380(**)	.315(**)
	Sig. (2-tailed)	.000	.000		.000	.000	.000
PC	Pearson Correlation	.380(**)	.322(**)	.385(**)	1	.447(**)	.371(**)
	Sig. (2-tailed)	.000	.000	.000		.000	.000
Attitude	Pearson Correlation	.575(**)	.505(**)	.380(**)	.447(**)	1	.599(**)
	Sig. (2-tailed)	.000	.000	.000	.000		.000
BI	Pearson Correlation	.512(**)	.437(**)	.315(**)	.371(**)	.599(**)	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	

\*\* Correlation is significant at the 0.01 level (2-tailed), N=296.

### Hypothesis Testing

The result of multiple regression analysis indicates that computer self-efficacy and perceived credibility are significantly associated with the perceived ease of use of e-Banking system. H1 is confirmed with the study results which show that computer self-efficacy has a positive relationship with perceived ease of use (t = 3.915, Beta = 0.229, p-value=0.000). The result is consistent with previous studies conducted by Muniruddeen (2007) and Hanudin (2007).

**Table 5: Regression result**

	Regression1	Regression 2	Regression 3	Regression 4
Constan	1.729	2.240	0.786	0.863
	<b>PU</b>	<b>PEOU</b>	<b>Attitude</b>	<b>BI</b>
PC	0.243 (0.000)	0.209(0.000)	0.220 (0.000)	
CSE	0.327 (0.000)	0.240(0.000)	0.120(0.042)	
PU			0.347(0.000)	
			0.197(0.000)	
F-statistic	41.907(0.000)	25.517(0.000)	52.380(0.000)	164.710(0.000)
R <sup>2</sup>	0.222	0.148	0.419	0.359

H2 is confirmed, this indicates that computer self-efficacy has a significant effect on perceived usefulness ( $t=5.407$  Beta = 0.302,  $p$ -value = 0.000). H3 is also supported, which means computer self-efficacy has a positive effect on customers' attitude to use e-Banking ( $t = 2.046$ , Beta= 0.104,  $p$ -value = 0.042).

The result also shows that perceived credibility is significantly associated with perceived ease of use, perceived usefulness and customer attitude. H4 confirmed that perceived credibility has a significant effect on perceived ease of use ( $t = 4.005$ , Beta = 0.234,  $p$ -value = 0.000). H5 is also confirmed. This indicates that perceived credibility has significant effect on perceived usefulness ( $t = 4.720$ , Beta = 0.264). Further, H6 confirmed that perceived credibility is significantly associated with customer attitude ( $t = 0.225$ , Beta = 4.463,  $p$ -value = 0.000).

To further determine the factors responsible for customer attitude, the impact of perceived ease of use and perceived usefulness on customer attitude were determined. H7 confirmed that perceived ease of use positively affects customer attitude ( $t = 2.953$ , Beta = 0.180,  $p$ -value = 0.003). H8 is also accepted indicating that perceived usefulness has a positive effect on customer attitude ( $t = 5.135$ , Beta = 0.327,  $p$ -value = 0.000). Finally the result of the single linear regression between customer attitude and behavioral intention shows that customer attitude has a positive effect on behavioral intention ( $t = 0.599$ , Beta = 0.599,  $p$ -value = 0.000). H9 is also confirmed. It shows that customer has a positive significant on behavioral intention to use e-Banking system.

## **CONCLUSION**

This paper has provided an awareness of the factors that determine users' acceptance of information systems using e-banking as the focus. By extending TAM, the authors have been able to support the argument by other researchers who claimed that perceived usefulness and perceives ease of use is not sufficient to determine the consumer's behavioral intention to use information system.

Perceived credibility and computer self-efficacy were selected as additional factors to TAM construct because of their potent influence on the use electronic system where there is high level of corruption and low literate level. The result of the statistical analysis showed that all the four factors used to access users' attitude towards the acceptance of e-banking have influence on the acceptance of the system.

The result of this study clearly reflects that users find e-banking system useful, convenient, and easy to use. Perceived usefulness is the critical factor in explaining users' adoption of e-banking. Credibility of the system is a major concern for both users and intending users and should be given more attention. Privacy of data and security measures of the e-Banking technology are the issues that bother the minds of users. The items of perceived credibility in terms of mean score showed that users of e-Banking system are worried about the security of the system. It also reflects that there is low level of trust in the security measure of e-banking technology and the ability of e-Banking systems to protect privacy.

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