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## **Mobile Banking – Adoption and Challenges in Nigeria**

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### **ABSTRACT**

Mobile banking or m-banking is becoming a prominent feature in banking operations in Nigeria with more and more banks adopting this technology in order to provide the growing population of their customers with fast, accessible, reliable and quality services. The technology of mobile banking has emerged as a possible powerful provider of bundle of banking services. The mobile banking system involves the use of a mobile device (e.g. phone) to pay for goods or services either at the point of sale or conduct of banking transactions anywhere and anytime. The study evaluated the attitude of bank customers towards the adoption of M-banking services and challenges of mobile phone in conducting banking transactions in Nigeria with analytical focus on Enugu State. The survey research approach was adopted and data were collected from 200 respondents that include bank staff and customers of selected banks in Enugu metropolis. The analysis of data was conducted using descriptive statistical technique. The study revealed that the level of adoption of mobile banking in Enugu State is still low among the middle aged respondents compared to the aged. A massive awareness program to publicize the purpose and benefits derivable from the use of mobile banking should be encouraged. This, it is hoped, will boost the level of adoption of mobile banking services because of the convenience and accessibility offered by this banking platform.

**Keywords:** Mobile Banking, Mobile Phone, Technology

### **INTRODUCTION**

The level of adoption of new technologies in the Nigerian banking industry has continued to increase over the last decade. One of such technologies adopted by the Nigerian banking industry is mobile banking. The launch of the Global System for Mobile Communication (GSM) network operated on the 900/1800MHz spectrum in 2001 by the government of President Olusegun Obasanjo significantly facilitated the introduction of mobile banking in Nigeria.

Mobile banking refers to provision and availability of banking and financial services with the help of mobile telecommunication devices. The scope of services offered may include facilities to conduct bank and stock market transactions, to administer accounts and access customized information.

With the development of the technologies in mobile communication, virtually every aspect of human relationships is being impacted upon. Mobile phones function as handheld personal computer in their

rights. Cell phones are relatively cheap these days and have enough compiling and computational power to become a digital mattress and digital bank for the masses.

Several banks around the globe have offered mobile banking and financial services for years. Japan and South Korea are the world leaders in the adoption of mobile banking technology. In the United State, 30% of household are estimated to be using M-banking in 2010 alone (Odumern, 2013:9). The number of Mobile Banking users in China increased by 150 percent between 2010 and 2011 (Odumern, 2013:12). In Europe, many bank customers are willing to pay extra for utilizing mobile banking.

According to Odumern (2013:9), Nigeria currently has over 90 million active mobile subscribers making the country a fertile ground for the use of m-banking. Mobile banking is mostly operated via SMS or mobile internet and can also use special programs called clients download to the mobile device.

### 1.1 Statement of the Problem

With the rapid growth of E-payment system, mobile banking is now acting as a means of carrying out banking transaction through cell phones. M-banking is the logical step in the evolution of banking transactions as m-banking replaces the bank branches and internet replaces the mail banking (Agu, 2013:10):

According to the Central Bank of Nigeria (2012:2), the introduction of cashless policy was aimed at driving development and modernization of the country's payment system in line with Nigeria's vision 2020 of being among the top 20 economics of the world by the year 2020. The policy is also believed to aid an efficient and modern payment system which is positively correlated with economic development and is key enabler for economic growth. To ensure success of this policy, all banks are expected to deliver electronic banking channels and encourage customers to use mobile banking facilities.

The problems of the study therefore are;

- a) That the level of adoption of mobile banking in Enugu state is not significant and not geared towards achieving the development and modernization of the country's payment system in line with Nigeria's vision 2020 goal.
- b) The exclusion of mobile operators who already own the technology from leading the implementation of mobile banking services.
- c) The Central Bank of Nigeria's (CBN) decision to prevent mobile operators from leading the rollout of mobile banking because it does not regulate the mobile operators.
- d) Mobile banking is an emerging technology and the number of mobile banking subscriber's increases day by day.

With the increase in number of users, the concern for security also increases. Different kinds of security attacks are on the increase such as vishing, phishing smishing, spoofing, lost and stolen cell phones, cracking and cloning, man in the middle attack (MIM), viruses, malware and malicious code. The problem of the study therefore, is to evaluate the level of adoption of mobile banking, service standard and challenges of using the technology of mobile phones by bank customers in the conduct of banking transactions in Enugu State

### 1.2 Objectives of the Study

The objectives of the study are as follows;

- a) To determine those factors that influences the level of adoption of m-banking in Enugu State.
- b) To ascertain the level of service standard with the use of mobile phones in conducting banking transactions in Enugu State.
- c) To identify challenges in the usage of technology of m- banking.
- d) To proffer solution to the identified challenges in the implementation of m-banking system in Enugu State.

## 2.0 REVIEW OF RELATED LITERATURE

### 2.1 Theoretical Framework

The theoretical framework of this study is built around the models of branchless banking by Wikipedia (2010:2). Branchless banking is a type of banking model that allows financial institutions and other commercial actors to offer financial services outside the traditional bank premises. The customer does not

need to visit a branch or central location of a bank. Transactions may be completed through technological platforms such as the mobile phone, internet and automatic teller machine (ATM). Branchless banking has emerged as a promising new approach to accelerating financial transactions by changing the cost and risks of distributing financial services, like mobile network operators to contemplate reaching a large number of unbanked people.

With the increasing penetration of telecommunication globally and its greater reach, mobile-based business models are proving to be instrumental in realizing branchless banking. This is also taking financial inclusion to higher level by enabling low-cost, real-time transactions and over secure networks.

## 2.2 Concept of Mobile Banking

Drexelius and Herzog (2001:22) defines mobile banking as the ability to conduct bank transactions via a mobile device, or more broadly to conduct financial transactions via a mobile terminal. This definition is a suitable working one as it includes not only basic services such as bank account statements and funds transfer but also electronic payment option as well as information based financial services such as alerts on account limit or account balance, access to stock brokering.

Mobile banking (also known as M-banking, Mbanking, or SMS banking), is a term used for performing balance cheques, account transactions' payment, credit applications and other banking transactions through a mobile device such as mobile phones or Personal Digital Assistant (PDA). The earliest mobile banking services were offered over SMS. With the introduction of the first primitive smart phones with wireless application protocol (WAP) support enabling the user of the mobile web in 1999, the first European banks started to offer mobile banking on this platform to their customers. (Retrieved from <http://en.wikipedia.org/wiki/M-banking:2012>)

Kiesonski (2000:41 in Petrova 2013:2), defines mobile banking as the "ability to bank virtually anytime anywhere". This definition needs to be expanded to include the two different types of customer account access, a web based interface and simple text- messaging interface.

According to W.F.I. (2011:14), before 2004, the internet was the only way of using mobile banking in Japan, which enabled customers to browse the merchants' website through a web browser. However, customers still had to use their credit/debit for payments. In 2004, NTT DoCoMo started using FeliCa contact less IC chips developed by Sony for mobile devices, which can carry personal and financial information that facilitates remote payments and substituted mobile devices for cash and cards at merchants' point of sale.

According to Okoegwale (2008:1), mobile banking refers to the provision of banking and financial services with the help of mobile telecommunication devices. The scope of services offered may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information. Also known as M-Banking in Nigeria or in some instances SMS Banking etc. It is a term used for performing balance checks, account transactions, payments and transaction services via mobile devices. Some mobile banking applications in Nigeria use pre programmed configuration settings.

Okoegwale (2008:1) observes that Mobile Banking in Nigeria started from the transaction based activities whereby bank customers are notified via SMS when transactions are conducted on their account or via ATM. This is one way event and only for informational purposes only. Guaranty Trust Bank was one of the earliest banks to provide this service to its customers.

Nigerian banks are now deploying full-fledge banking via the mobile phones with array of services which were only possible in the banking halls before. Zenith Bank, UBA, Guaranty Trust Bank, Diamond and Access Banks are the fore runners of this innovation in Nigeria.

Despite the watch and see attitude that some very leading banks are showing about mobile banking in Nigeria, the mobile device remains the only and most available feasible means to provide mass market alternative to branch banking in Nigeria. The internet has only a penetration rate of 6 percent in a population of 140 million but mobile technology is close to 50 percent penetration with prospects for further growth.

Mobile devices are the most promising way to reach the masses and to create a tie-in among current customers, due to their ability to provide services anytime, anywhere, high rate of penetration and potential to grow. Deployment of 3G will enable banks to offer more robust mobile banking technologies.

### 2.3 Mobile Banking Architecture

There are three types of mobile banking architecture available for mobile phones to enable mobile banking. Up and until 2010, most of the mobile banking was performed via SMS or mobile web (UK.essays.com, 2013:3). With the advancement in mobile phones and following the success of Apple's iPhone and other operating system based phones, mobile banking is increasing through the special client applications. They include;

- a) SMS or MMS based Mobile Banking.
- b) Mobile Website.
- c) Mobile client Application.

#### 2.3.1 SMS or MMS Based Mobile Banking.

Short Messages Services (SMS) based mobile banking was the first mobile banking service offered. It is based on plain text message interaction. SMS banking works in two different modes: Pull mode and Push mode.

##### 1. Pull mode;

Pull mode is one way text message system where the bank sends a text message to the users informing them about certain account situations. It can be used to promote other mobile banking services.

##### 2. Push mode;

Push mode is a two way message system where users send text messages to the bank requesting a specific transactions or services with predefined request codes and the bank replies with specific information pertaining to the transactions or services through plain text messages (Kevin and Haar, 2012:16).

SMS and MMS are two different kinds of text messaging system. SMS is a short form of short messages services which includes sending or receiving plain text messages from the bank. It has a limitation on the number of characters that can be included in a message. MMS, known as Multimedia messaging services, is the second type of messaging services which can carry larger text messages and works on the same platform as SMS. To use message based mobile banking, a customer has to enroll his/her cell phone to the bank and the bank sends a text message with a one time password. Each bank has its own SMS banking number and commands for mobile banking. The message based system has some advantages. It is cost effective and with familiar technology, virtually available in each and every cell phone regardless of manufacturer, model or carrier. It provides two-way communication between the bank and the user, so either the bank or the customer can initiate communication.

MMS does not transmit or store confidential information in the mobile device (Print Friendly.Com, 2012:3). However, SMS cannot carry a larger message and account information. It has to be limited to certain number of characters which limits its use.

#### 2.3.2 Mobile Website Based Mobile Banking Architecture:

This architecture includes the use of the internet browser of the mobile device to access the bank's internet via a wireless network or their carrier's internet service. The biggest advantage of this architecture is that most of the processing is done at a remote server at the bank and much less information is stored in the mobile device. On the other hand, it does not require instillation of special software and most of the phones today are capable of using internet browsers (Ukessay.com/essay, 2013:4).

#### 2.3.3 Mobile Client Application Based Mobile Banking Architecture.

This architecture requires the download and installation of mobile client application to the mobile device. With the help of the application; a bank can provide a wide range of services to their customers. This approach has some advantages and some disadvantages.

First of all, users have to learn a new application. The applications are also susceptible to attacks and only customers can initiate communication. The older phones are not capable of running this application because of technical limitations. The use of internet requires a data plan that increases the cost on the part of customers. A data plan requires using client application based mobile banking architecture, which increases the cost on the part of customer. Some of the banks charge an initial cost for downloading and installing the mobile client application.

#### 2.4 Operational Modalities of Mobile Banking

According to Wikipedia (2010:21) the workings of mobile banking depend on one's bank. Mobile banking services are offered mostly via Java based applications and/or SMS. Some banks will offer both options but others will only offer one option. Java based mobile banking applications will require Java enabled mobile phones. So they will not run on all types of phones. Even when a phone is a Java-enabled, it may not even be able to support a Java based mobile banking applications. If your bank offers Java application for mobile banking, you can download it at the bank, or at their Website.

Java based mobile banking applications are easier to use, because users can easily navigate their transactions through menus. Hence users do not have to memories SMS commands for transaction making them more users friendly. Java bank platforms communicate with the bank via SMS or internet. Mobile Banking application may also be available for native platform like Android, IOS, Blackberry, Windows Phones etc. Such mobile banking application will also have the same ease of use advantage of Java based application.

SMS based mobile banking platforms have the advantage of being platform neutral. They can be used on all types of phone usually no download is required. However, you have to memories codes required to engage in banking transactions. For example, Transfer 30000 1324 1234567890. This means; Transfer N30, 000 to account number 1234567890, 1324 could mean the PIN for authorizing the transaction. Mobile banking usually works with plastic payment card like interswitch or another payment card branded by a bank. You activate the service by entering details of your plastic card (ATM/debit card) into your phone following the instructions of your bank. After activating your card on your phone you can start conducting transaction with your mobile banking platform.

#### 2.5 Mobile Banking and Mobile Money

Mobile banking is different from mobile money. Some services can be paid for using mobile banking platform. Mobile money is a lot more versatile for making payments for goods and services. Mobile money enables you to create an E-wallet on your phone for making payment and are not essentially tied to your bank account. In fact, you do not even need a bank account to use mobile money. On the other hand, mobile banking cannot be used if you do not have a bank account. The two also have different objectives. Mobile banking is aimed at reducing congestion in banks by reducing the need for customers to visit the bank for every transaction that would have brought them to bank on their mobile phone. Mobile money is aimed at reducing the circulation of cash in the economy. It enables people pay for goods and services without need for cash. So, mobile banking is banking biased while mobile money is payment biased. However, both can converge or work hand in hand. For example, it could be possible to fund the mobile money e-wallet from your mobile banking platform.

#### 2.6 Challenges and Prospect of Mobile Banking

Wikipedia (2010:5), observes that the key challenges in developing a sophisticated mobile banking applications are;

- a) Handset operability
- b) Mobile banking security
- c) Scalability and reliability
- d) Application distribution.

- a) **Handset operability:** There are a large number of different mobile phone devices and it is a big challenge for banks to offer mobile banking services on any type of device. Some of these devices support Java Me and other support SIM application Toolkit, a WAP browser, or SMS only. This is because of the manner in which mobile phones applications evolved over time and the device manufacturers focused on particular standard and this led to a proliferation of applications (*Okoegwale, 2008:2*)
- b) **Mobile banking security:** Security of financial transactions, being executed from some remote location and transmission of financial information over the air, is the most complicated challenges that need to be addressed jointly by mobile application developers, wireless network services providers and the bankers' IT departments. The above aspects need to be addressed to offer a secure infrastructure for financial transaction over wireless network: If the bank is offering a

smart-card based security, the physical security of the device is more important. There should be authentication of the device with service provider before initiating a transaction. This would ensure that unauthorized devices are not connected to perform financial transactions.

- c) **Scalability and Reliability:** Another challenge for the banks is to scale-up the mobile banking infrastructure to handle exponential growth of the customer base. With mobile banking, the customer may be sitting in any part of the world (anytime, anywhere banking) and hence banks need to ensure that the systems are up and running in a true 24x7 fashion.
- d) **Application Distribution:** Due to the nature of connectivity between bank and its customers it would be impractical to expect customers to regularly visit banks or connect to website for regular upgrade of their mobile banking application. It will be expected that the mobile application itself check the upgrades and updates and download necessary patches (so called "Over the Air" Updates). However, there could be many issues to implement this approach such as upgrade/synchronization of other dependent components.

### 2.6.2 Security Attacks, Threats and Countermeasures

Some of the security attacks and their countermeasures (Mitigants) are as follows;

- a) **Vishing:** Vishing according to Ukessays.com (2014:4) is a social engineering attack over the telephone system. It is a type of phishing and it is a combination term of voice and phishing. Mostly it uses features facilitated by Voice over IP (VOIP), to gain access to private, personal and financial information from the public (information of the users). It is used to get the authentication information of the user mostly for financial gain. *Retrieved from <http://en.wikipedia.org/wiki/vishing> 2014:4).*
- b) **Phishing:** Phishing is another kind of social engineering attack in an electronic communication to acquire sensitive information like user names, passwords and credit card details by redirecting unsuspecting users to a fake website with the use of an authentic looking e-mail. It can also be carried out by instant messaging (*Retrieved from <http://en.wikipedia.org/wiki/Phishing>*).
- c) **Smishing:** Smishing is also a social engineering attack similar to phishing. The name is derived from 'SMSphiSHING'. It uses the text message system of the phone to get private, personal, and financial information of the user. A website URL embedded in the text message may act as a 'hook'. However, the phone number that connects to the automated voice response system has become more common (*Retrieved from <http://en.wikipedia.org/wiki/Smishing> 2014:4*).
- d) **Spoofing:** Spoofing is an attack where a person or program successfully masquerades as another with falsified data. A spoofing attack causes the telephone network to display a number on the recipient's caller-id-display. This number is familiar and looks like it came from legitimate source, which is not an origination source actually (*Retrieved from <http://en.wikipedia.org/wiki/spoofing-attack>*).
- e) **Lost and stolen phones:** This is one of the biggest threats for mobile banking. Mobile phones are small and portable and could be easily lost or stolen. Authentication, authorization and confidentiality are the areas to be considered when mobile devices are lost or stolen. In 2001, 1.3 million devices were lost or stolen in UK. In 2006, over 1 billion phones were sold worldwide (*Jin and HU et al 2014:5*). Of these, 80 million were smart phones, which have operating system and store all kinds of information. A survey found that 34 percent of users did not even use a PIN. This threat increases with the increase in the number of phones.
- f) **Man-In-the Middle attack (MIM):** MIM is considered a threat to the confidentiality and integrity of phone users. It is a form of active eavesdropping in which attacker makes independent connections to victims by positioning him/herself in between two victims to take control of communication between them with the intention of interception and alteration of information and relays it to others, making them believe that it came from the other person and not from the attacker. The attacker must be able to intercept all messages and alter them while it is in transit. It is also known as active wiretapping or traffic intercepting. The chances of this kind of attack increases with the use of wireless connection compared to other more secured connections (*Retrieved from [http://en.wikipedia.org/wiki/Man-in\\_the\\_middle-attack](http://en.wikipedia.org/wiki/Man-in_the_middle-attack), 2013*)



g) **Viruses, malware and malicious code:** Malicious code is software in the form of viruses, malware or worms. These kinds of software can be inserted into a system without the knowledge of the user. The primary intent of inserting the software is to gain private, personal and financial information of the user and compromises the integrity and confidentiality of the system. It affects the victims' private data, applications, operating or sometimes just annoys the users. Mobile browsers are susceptible to the same kind of security risks as home or office computers. Mobile browsers are little safer at this point compared to computers. With the increase of mobile banking, the numbers of these kinds of software will increase. However, at present, the increasing number of viruses and Trojan horses is the biggest concern to mobile banking security. The mobile devices running windows operating system are a favorite target for the hacker community (Hang and Evangelis 2013:5).

### 2.6.3 Security countermeasures

Security of mobile banking is an important and a crucial issue. In addition to that, wireless communication increases the vulnerability of the system. Therefore, more robust security system is necessary to protect the private personal and financial information of the users. The most plausible and effective of security measures is user authentication.

#### User authentication

Authentication is the process of identification of something or someone as authentic. There are three different ways by which someone can be authenticated. Clarke and Furnell (2005:6) stated that the three categories are based on the factors of authentication: what you know, what you have or what you are. Each of these factors has a range of elements. Research according to them, reveals that for better security, at least two or preferably three factors be verified. If two elements are required for authentication it is called a two-factor authentication while two or more than two factors authentication is known as multi-factor authentication.

Authentication techniques based on what the user knows including a combination of the pin number, the user name, the password and the one time password for mobile banking. Research has shown security concerns with this technique as user uses weak password write it down or share with others. Therefore, to increase the protection of the mobile device pin protection or distributed pin verification scheme has been suggested in which one-half of the pin is stored in the mobile device and rest of the half is stored in a remote machine in the network. So the attacker can get only half of the pin from the phone's memory (Retrieved from <http://en.wikipedia.org/wiki/Authentication>)

Authentication techniques based on what user has. This includes ID card, cell phone, credit card etc. Use of any of the above forms is not a reliable technique as the user must have the physical possession of them (Clarke, et al 2005:6).

## 3.0 METHODOLOGY

### 3.1 Population, Sample Size and Sampling

The population used in this study is bank customers of selected banks that are engaged in mobile banking services. There are 24 commercial banks in Nigeria. Four (4) quoted banks were systematically selected for the purpose of the study. The selection was through multi-stage sampling. The 24 commercial banks were grouped into two clusters – one cluster for banks established before 1990 called the old generation banks and another cluster for banks established on or after 1990 called the new generation banks. Two banks were selected randomly from each cluster. Access Bank and Sky Bank were chosen for new generation banks while the old generation banks are Wema Bank and First Bank in Enugu State. The population size of this study is 200. The sampling frame of this study comprises male and female customers of the four quoted banks that conduct banking transactions with their mobile phones.

### 3.2 Design, Instrument for Data Collection and Test Statistics

Survey approach was adopted and data were collected from 200 respondents randomly. Forty (40) staff and one hundred and sixty (160) customers each were picked from the four (4) selected banks. The instrument used in collecting data for this study was questionnaires that were administered to the respondents by the researchers.

The questionnaire is in two sections. The first section collected demographic information such as age, sex and educational qualifications while the second section contained 10 questionnaire items that measure the rate of adoption, service standard and challenges inherent with m-banking in Enugu State. Five (5) point likert-type rating ranging from 1 (strongly disagree) to 5 (strongly agree) was adopted. Out of the 200 questionnaire distributed, 180 responded, given a response rate of 90%

#### 4.0 PRESENTATION AND ANALYSIS OF DATA

##### 4.1 Data Presentation

Data collected through the questionnaire are presented below in tables and frequency distribution.

**Table 1: Demographic Information**

Bank	Male	%	Female	%	Total	%
Access Bank Plc	15	8.33	20	11.11	35	19.44
Sky Bank Plc	18	10	23	12.78	41	22.28
Wema Bank Plc	22	12.22	27	15	49	27.22
First Bank Plc	25	13.89	30	16.67	55	30.56
<b>Total</b>	<b>80</b>	<b>44.44</b>	<b>100</b>	<b>55.56</b>	<b>180</b>	<b>100%</b>

Source: Field Survey, 2015

Table 1 shows that out of 180 questionnaires distributed, 15 or 8.33% respondents from Access Bank are male while 20 or 11.11% are female. Sky Bank has 18 or 10% respondents as males and 23 or 12.78% as females. Wema Bank plc has 22 or 12% respondents as males and 27 or 15% as females. First bank plc has 25 or 13.89% as males and 30 or 16.67% as females' respondents. The sex distribution therefore has about 55.56% respondents as females and the remaining 44.44% as males.

**Table 2: Distribution of Age across the Banks**

Banks	18-25	%	26-35	%	36-45	%	46-above	%	Total	%
Access Bank plc.	10	5.56	20	11.11	6	3.33	6	3.33	42	23.33
Sky Bank plc	12	6.62	18	10.00	9	5.00	8	4.44	47	26.11
Wema Bank plc	14	7.78	16	8.89	5	2.78	5	2.78	40	22.23
First Bank plc	15	8.33	22	12.22	7	3.89	7	3.89	51	28.33
<b>Total</b>	<b>51</b>	<b>28.34</b>	<b>76</b>	<b>42.22</b>	<b>27</b>	<b>15</b>	<b>26</b>	<b>14.44</b>	<b>180</b>	<b>100</b>

Source: Field Survey, 2015.

In table 2 above, it could be observed that the highest proportion of the respondents i.e. 76(42.22%) were in the 26-35 years age bracket, followed by 18-25 years age group with 51(28.34%) respondents across the banks. Respondents between the ages of 36-45 were 27(15%) while those at 46 and above were 26 or 14.44% of the distribution. We observed that more than 70.56% of the bank customers and staff are youths i.e. (18-35years), thus creating age balance between the bank customers and staff. It shows that the adoption of Mobile Banking in Enugu State is still low among the middle aged respondents.

**Table 3: Distribution of Educational Qualification**

Banks	WASC	%	OND/NCE	%	BSC/OND	%	MSC/PhD	%	Total	%
Access Bank plc	6	3.33	10	5.56	20	11.11	6	3.33	42	23.33
Sky Bank plc	9	5	12	6.67	18	10	8	4.44	47	26.11
Wema Bank plc	5	2.78	14	7.78	16	8.89	5	2.27	40	22.23
First Bank plc	7	3.89	15	8.33	22	12.22	7	3.89	51	28.33
<b>Total</b>	<b>27</b>	<b>15</b>	<b>51</b>	<b>28.34</b>	<b>76</b>	<b>42.22</b>	<b>26</b>	<b>14.44</b>	<b>180</b>	<b>100</b>

Source: Field Survey, 2015.

Table 3 shows the educational qualification of the respondents, most of them have first degree i.e. BSC/HND which represents about 76 or 42.23%. 51 or 28.34% hold OND/NCE, 26 or 14.44% have Master's degree and other professional qualifications. 27 or 15% of the respondents hold WASC. Further studies revealed that the banks under study usually engage degree holders that are between the ages of 26-

35 years old. The reasons could be to have a crop of workers that can easily adapt to the ever changing technological environment and also put in considerable years of service for the banks to recoup their investment in terms of training. Therefore, the educational background of respondents revealed that the population for this research is well educated.

**Table 4: Distribution of respondents on the adoption, service standard and challenges of mobile banking by customer and bank staff of commercial banks in Enugu State**

	Questions	SA	A	D	SD	U	Total
1	Utilization of mobile banking has a positive impact on the services standard of banks	50 (27.79)	46 (25.56)	40 (22.22)	34 (18.89)	10 (5.56)	180 (100)
2	Network problem occasioned by poor ICT infrastructure is one of the contributory factors that hinder the effectiveness of mobile banking services in Nigeria	49 (27.22)	50 (27.79)	41 (22.78)	28 (15.56)	12 (6.67)	180 (100)
3	The use of mobile banking makes getting account balance faster	28 (15.56)	12 (6.67)	50 (27.77)	41 (22.78)	49 (27.22)	180 (100)
4	Security concern is one of the major problems affecting the patronage of mobile banking services in Nigeria	46 (25.56)	50 (27.77)	34 (18.89)	40 (22.22)	10 (5.56)	180 (100)
5	Mobile banking services increases customer loyalty and patronage.	34 (18.89)	40 (22.22)	46 (25.56)	50 (27.77)	10 (5.56)	180 (100)
6	I am aware of mobile banking services and can conduct mobile banking transactions without assistance.	40 (22.22)	49 (27.22)	50 (27.77)	30 (16.67)	11 (6.11)	180 (100)
7	Handset operability is a major challenge in conducting mobile banking	50 (27.77)	49 (27.22)	41 (22.78)	12 (6.67)	28 (15.56)	180 (100)
8	Mobile banking is popular with bank staff and customers of banks in Enugu State.	12 (6.67)	28 (15.56)	50 (27.77)	49 (27.22)	41 (22.78)	180 (100)
9	Mobile banking services are highly efficient and have improved quality services delivery.	41 (22.78)	28 (15.56)	49 (27.22)	50 (27.77)	12 (6.67)	180 (100)
10	The use of mobile banking has helped to reduce long queue in banks	49 (27.22)	12 (6.67)	50 (27.77)	41 (22.78)	28 (15.56)	180 (100)

Source: Field survey, 2015

Note: SA= strongly agree, A= Agree, D= Disagree, SD= strongly disagree, U= Neutral.

Table 4 above was used to measure and analyze the degree of adoption, service standard and challenges of mobile banking in Nigerian banks. The response was on whether the utilization of mobile banking has a positive impact on the service standard of banks in Enugu State. About 95 (55.33%), agree that mobile banking has a positive impact on the service standard of banks in Enugu while 74 (41.11%), disagrees. 69 (22.23%), agrees that mobile banking is popular with bank staff and customers of banks in Enugu state while 99 (54.99%), disagrees. 99 (54.99%), agrees that network problems occasioned by poor ICT infrastructure is one of the contributory factor that hinders the effectiveness of mobile banking services in

Nigeria, while 69 (22.23%), disagree. 96 (53.33%), agrees that security concern is one of the major problem affecting the patronage of mobile banking services in Nigeria. While 74 (41.11%), disagree with the statement. 89(54.99%), agree that they are aware of mobile banking services and can conduct mobile banking transactions without any help. While 80(44.44%), disagree. 99(54.99%), agree that handset operability is a major challenges in conducting mobile banking in Enugu State. While 53(29.45%), disagree.

## 5.0 SUMMARY OF FINDINGS

Table 1 of this analysis reveals that 80% of the respondents were males, and 55.56% were females. Therefore, it shows that majority of the staff and customers of banks sampled are males. Table 2 shows that 42.22% of the respondents were ages 26-35, (28.34%) of the respondents were ages between 18-35 years. It shows that the adoption of Mobile Banking is still low among the middle aged in Enugu State.

Table 3 shows that 42.22% of the respondents hold BSC/HND, 28.34% of the respondent hold OND/NCE, 14.44% have Masters and other professional qualifications.

Table 4 reveals that majority of the respondents that is, 33.33% agree that the utilization of mobile banking has positive impact on the services standard of banks, while 41.11% disagree. 95(50%) of the respondents agree that network problem occasioned by poor ICT infrastructure is one of the contributory factor that is hindering the effectiveness of the mobile banking. While 69(38.34%) disagree. Security concern is one of the major problems affecting the patronage of mobile banking service in Nigeria. This agreement was backed up by 53.33% of the respondent, while 41.11% disagreed to the view. 54.99% of the respondents agree that handset operability is a major challenge in conducting mobile banking.

### 5.1 Further Findings

Generally, in the cause of this research, we discovered that mobile banking is still a trend; some industry reports conclude that mobile banking services do not have any real impact on bank profits. This makes banks more reluctant to adopt mobile banking especially in countries where other banking methods are well established or the market is relatively small.

The next reason behind the lack of consumer interest in adoption of mobile banking is the perceived voice-centric nature of the mobile phone. It was discovered that despite the huge investment into bringing the mobile data services into the market place, consumers have not yet changed their buying habits.

### 5.2 Conclusion

It has been observed that mobile banking model is evolving in Nigeria rapidly; it requires direct contact with education of telecom subscribers. The focus of the licensed providers needs to remain on the unbanked population for the initiative to reach the height of success it deserves. The mobile banking has a great potential for growth in Nigeria. The increase in the number of mobile banking users' also increases security issues and threats. Banks should address these security issues and build a safe and secure mobile banking system. To increase the level of adoption, mobile banking should depend on the provision of secure, reliable and easy to customize user interface which can be implemented on a multi-standard, multi-functional mobile device designed for a long life and rugged service (Petrova, 2013:3).

### 5.3 Recommendations

Based on the findings of the study, the following recommendations are proffered, which if fully implemented, will boost the level of adoption of mobile banking in Nigeria and help to achieve government objective of financial inclusion.

- a) Massive awareness program should be undertaken to publicize the purpose and benefits of the mobile banking system.
- b) Publicity through radio, direct contact, and maintaining of bill boards, fliers', social media and TV adverts should be encouraged.
- c) The cashless policy should be vigorously pursued to discourage carrying of huge cash by customers.
- d) Incessant network failure and breakdown should be checked.

- e) There should be provision of secure, reliable and easy to customize user interface to boost mass adoption of mobile banking.
- f) Skilled manpower and ICT- experts should be employed by every bank in other to stop and prevent fraudulent personnel and hackers from manipulating the banks data and stealing money from the banks account.
- g) Provision and maintenance of public network system such as telephone (Nitel) should be enhanced. The availability of these basic infrastructures is fundamental to the efficient functioning of the mobile banking services.
- h) The level of Mobile Banking patronage is low and requires concerted efforts of the telecoms operators and the finance institutions to fast track the development of M-banking services to serve the teaming populace.
- i) The number of telecoms operators that offer mobile banking services should be increased for improved access, and there should be improved awareness programmes to increase the number of subscribed customers.

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