Research Paper

Bank Account Tracker Using Android Mobile Phone for (Stanbic Ibtc Bank)

Ugwoke, F.N. and Ibeh Lucky C.

Department of Computer Science, Michael Okpara University of Agriculture,Umudike, Abia State, Nigeria.

ABSTRACT:- In present trend usage of apps had became a new trend because of availability of web services on mobiles. By considering these improvements in mobile technology knowing information of money transactions through mobile in less time can be useful application for users. This Android application allows user to keep track of current balance in different bank accounts held by the user and the transactions of those accounts. Account tracker explains about implementing a app for android mobiles which will help users to know about bank balances in different banks and there transactions information. In present trend usage of apps had became a new trend because of availability of web services on mobiles. By considering these improvements in mobile technology knowing information of money transactions through mobile in less time can be useful application for users. In this application initially users need to install app and update details like listing out different banks and adding new bank accounts.

Keywords:- Bank, Account, Tracker and Android application.

I.   INTRODUCTION

Mobile banking is a system that allows customers of a financial institution to conduct a number of financial transactions through a mobile device such as a mobile phone or tablet. Mobile banking differs from mobile payments, which involve the use of a mobile device to pay for goods or services either at the point of sale or remotely, analogously to the use of a debit or credit card to effect an EFTPOS payment.

The earliest mobile banking services were offered over SMS, a service known as SMS banking. With the introduction of smart phones with WAP support enabling the use of the mobile web in 1999, the first European banks started to offer mobile banking on this platform to their customers.

Mobile banking has until recently (2010) most often been performed via SMS or the mobile web. Apple's initial success with Iphone and the rapid growth of phones based on Google's Android (operating system) have led to increasing use of special client programs, called apps, downloaded to the mobile device. With that said advancements in web technologies such as HTML5, CSS3 and JavaScript have seen more banks launching mobile web based services to complement native applications. A recent study (May 2012) by Mapa Research suggests that over a third of banks have mobile device detection upon visiting the banks' main website.

The significance of mobile banking goes well beyond developing countries and financial inclusion. By providing a clear disaggregation of the components of banking, it throws light on the nature of financial services in general. In particular, it brings out the distinction between payments and banking and suggests that much of the debate on the reform of banking in developed economies in relation, for example, to the separation of commercial and investment banking has been confused. By identifying the different components of financial services so clearly, mobile banking helps to establish where the focus of regulation should lie in all financial systems.

Based on the 'International Review of Business Research Papers' from World business Institute, Australia, following are the key functional trends possible in world of Mobile Banking.

With the advent of technology and increasing use of Smartphone and tablet based devices, the use of Mobile Banking functionality would enable customer connect across entire customer life cycle much comprehensively than before. With this scenario, current mobile banking objectives of say building relationships, reducing cost, achieving new revenue stream will transform to enable new objectives targeting higher level goals such as building brand of the banking organization. Emerging technology and functionalities would enable to create new ways of lead generation, prospecting as well as developing deep customer

relationship and mobile banking world would achieve superior customer experience with bi-directional communications. Among digital channels, mobile banking is a clear IT investment priority in 2013 as retail banks attempt to capitalize on the features unique to mobile, such as location-based services.

Mobile banking is used in many parts of the world with little or no infrastructure, especially remote and rural areas. This aspect of mobile commerce is also popular in countries where most of their population is unbanked. In most of these places, banks can only be found in big cities, and customers have to travel hundreds of miles to the nearest bank.

In July 2005, Google acquired Android Inc., a small startup company based in Palo Alto, CA. Android's co-founders who went to work at Google included Andy Rubin (co-founder of Danger), Rich Miner (co-founder of Wildfire Communications, Inc), Nick Sears (once VP at T-Mobile), and Chris White (one of the first engineers at WebTV). At the time, little was known about the functions of Android Inc. other than they made software for mobile phones. At Google, the team, led by Rubin, developed a Linux-based mobile device OS which they marketed to handset makers and carriers on the premise of providing a flexible, upgradeable system. It was reported that Google had already lined up a series of hardware component and software partners and signaled to carriers that it was open to various degrees of cooperation on their part.

Android is a software stack for mobile devices that includes an operating system, middleware and key applications. Android is a software platform and operating system for mobile devices based on the Linux operating system and developed by Google and the Open Handset Alliance. It allows developers to write managed code in a Java-like language that utilizes Google-developed Java libraries, but does not support programs developed in native code. The unveiling of the Android platform on 5 November 2007 was announced with the founding of the Open Handset Alliance, a consortium of 34 hardware, software and telecom companies devoted to advancing open standards for mobile devices. When released in 2008, most of the Android platform will be made available under the Apache free-software and open-source license.

II.   OBJECTIVES OF THE STUDY

The objective of studying the banking system is to provide a mobile tracking system that has good security improved with users having passwords, easy access and plentiful applications for smart phones.

Banks typically let you access accounts via texting, mobile browsers or downloadable applications. Texting is the simplest method for many. It's best for alerts, especially when your account is low. Using your Web browser accesses your online account. It's the way most people do their mobile banking. But downloadable applications are expanding quickly.

Hence the application further developed can enable users to;
- List of bank accounts
- Add new bank account
- Update an existing account
- Delete bank account
- List recent 10 transactions
- Search transactions by date and amount
- Show details of a single transaction
- Delete a transaction.

In Android, every application runs in its own process, which gives better performance in security, protected memory and other benefits. Therefore, Android is responsible to run and shut down correctly these processes when it is needed. It is important that application developers understand how different application components (in particular Activity, Service, and Broadcast Receiver) impact the lifetime of the application's process.

Significance of the Study

The significance of this study is providing a clear disaggregation of the components of banking, it throwing light on the nature of mobile financial services. It brings out the distinction between payments and banking and suggests the Mobile account tracking solutions. By identifying the different components of financial services so clearly, mobile bank account tracking helps to establish where the focus of regulation should lie in all financial systems.

III.   RESEARCH METHODOLOGY, SYSTEM INVESTIGATION AND ANALYSIS
Research Methodology

This chapter outlines the method that will be used for the study and adopts the following structure: research design, population and sample, population description, data collection methods, research procedures and data analysis and methods.

A Methodology does not set out to provide solutions but offers the theoretical underpinning for understanding which method, set of methods or so called "best practices" which can be applied to a specific case. The methodology approach used for this project; is the top – down approach (also known as stepwise design and in some cases used as a synonym of decomposition) is essentially the breaking down of a system to gain insight into its compositional sub-systems. In a top-down approach an overview of the system is formulated, specifying but not detailing any first-level subsystems. Each subsystem is then refined in yet greater detail, sometimes in many additional subsystem levels, until the entire specification is reduced to base elements. A top-down model is often specified with the assistance of "black boxes", these make it easier to manipulate.
Undertaking a research study to find answers to a question, implies that the process;
1. Is being undertaken within a framework of a set of philosophies (approaches);
2. Uses procedures, methods and techniques that have been tested for their validity and reliability;
3. Is designed to be unbiased and objective.

Method of Data Collection Used
There are two types of data
Primary Data: Collected for the first time
Secondary Data: Those which have already been collected and analyzed by someone else.
Hence various methods are listed below;

Sampling
The survey method was used in this study. A random sample of 35 STANBIC IBTC account holders was selected in Ohafia, Abia State. In determination of the sample size, geographical location of the individuals was considered in order to have both urban and rural variables represented. The respondents from the individuals were people knowledgeable with the questions at hand.

Data Collection
Data was collected using interview method; the account holders were interviewed provided relevant and necessary data towards understanding the processes involved in their bank transactions as well as how easy and conveniently they operate.
The exercise obtained core information and supplementary information were obtained by reading relevant publications of STANBIC IBTC.

System Investigation
This study explores factors influencing adoption to mobile account tracking. Based on extended Technology Acceptance Model (TAM), five factors was identified which influence consumers' behavioral intention to adopt mobile account tracking: perceived usefulness, perceived ease of use, perceived credibility, perceived self-efficacy, and perceived financial cost. Based on data derived from the research, results indicate that all factors except for perceived financial cost have a significant impact on behavioral intention towards mobile banking usage. Perceived usefulness is the most influential factor explaining the adoption intention. It was also found that consumers' perceptions are different between mobile banking users and non-users. For users, perceived ease of use is the important factor while perceived self-efficacy significantly influence non-users' adoption intention. Implications from these findings help banking institutions to strategically frame their service model for broader mobile banking adoption.
Table:1

		Frequency	Percentage
M-banking adoption	Yes	96	58.18%
	No	69	41.82%
	Rarely	35	32.71%
Frequency of M-banking usage	At Times	39	36.418.69%
	Often	2013	5%
	Very Often		12.15%
Gender	Female	52	31.52%
	Male	113	68.48%
Age	18 - 25	35	21.21%

| | 25 - 35 | 96 | 58.18% |
| | 35 – 50 | 25 | 15.15% |
| | Above 50 | 9 | 5.45% |

Table 1 Demographic Information on Subjects

System Analysis

The system analysis in this project was carried out using a top-down approach. The analysis were broken down according to those who have access to mobile phone, internet access, Account Holders, preferred banking service method and furthermore.

This study revealed that only 75% of Ohafians have access to formal financial services through banks while 15% are served through micro finance institutions. 10% are served through informal institutions like pyramid schemes and self help groups. 88% of Ohafians own a mobile phone while a further 12% can access one through family or friends. 65% of Ohafians make use of android Mobile Phones.

It can be seen therefore that the high penetration of Android mobile phone in Ohafia can serve to help the high percentage of unbanked small business access financial services through m-banking. The mobile phone industry can therefore be seen as an ideal partner to offer financial services to unbanked segments of the population. The figure below lucidly represents this information
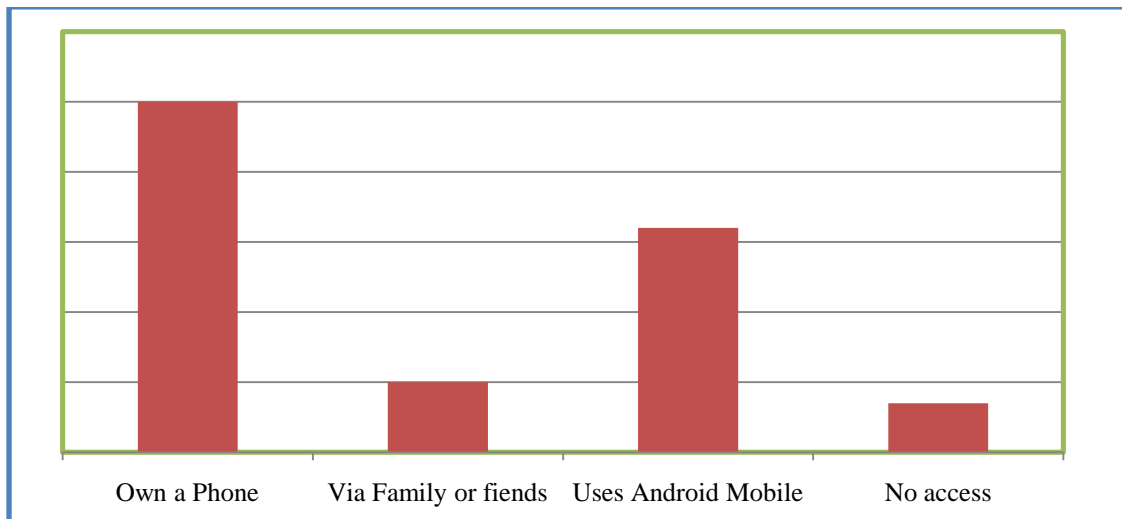
**Fig 1 Overview of Mobile Phone Access in Ohafia**

This study revealed that there are a low number of people using mobile bank account tracking service in Ohafia than all other financial services Options. ATM bank branches fall a distance second at 22%. Banking halls are also relatively available.
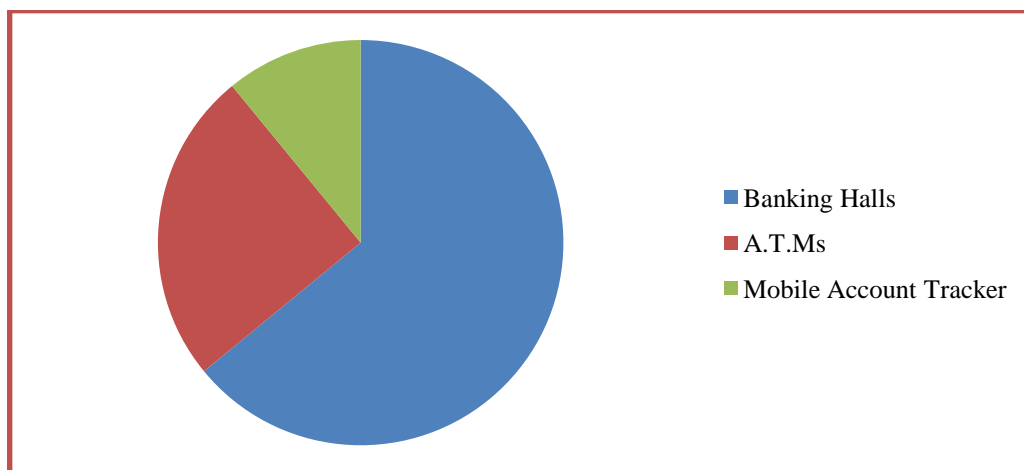
Fig 2 Financial Services Infiltration in Ohafia

Attitudes towards Mobile banking

This study sought to establish individuals□ view of Mobile banking among users as well as non users with and without bank accounts. A series of questions were asked to respondents and results of those who answered in the affirmative were recorded and analyzed. The respondents were grouped into three distinct cohorts based on whether they were: Users of mobile banking service, Non users of Mobile banking but with bank accounts, Non users of Mobile Banking and without bank accounts. The questions and subsequent results were as below;
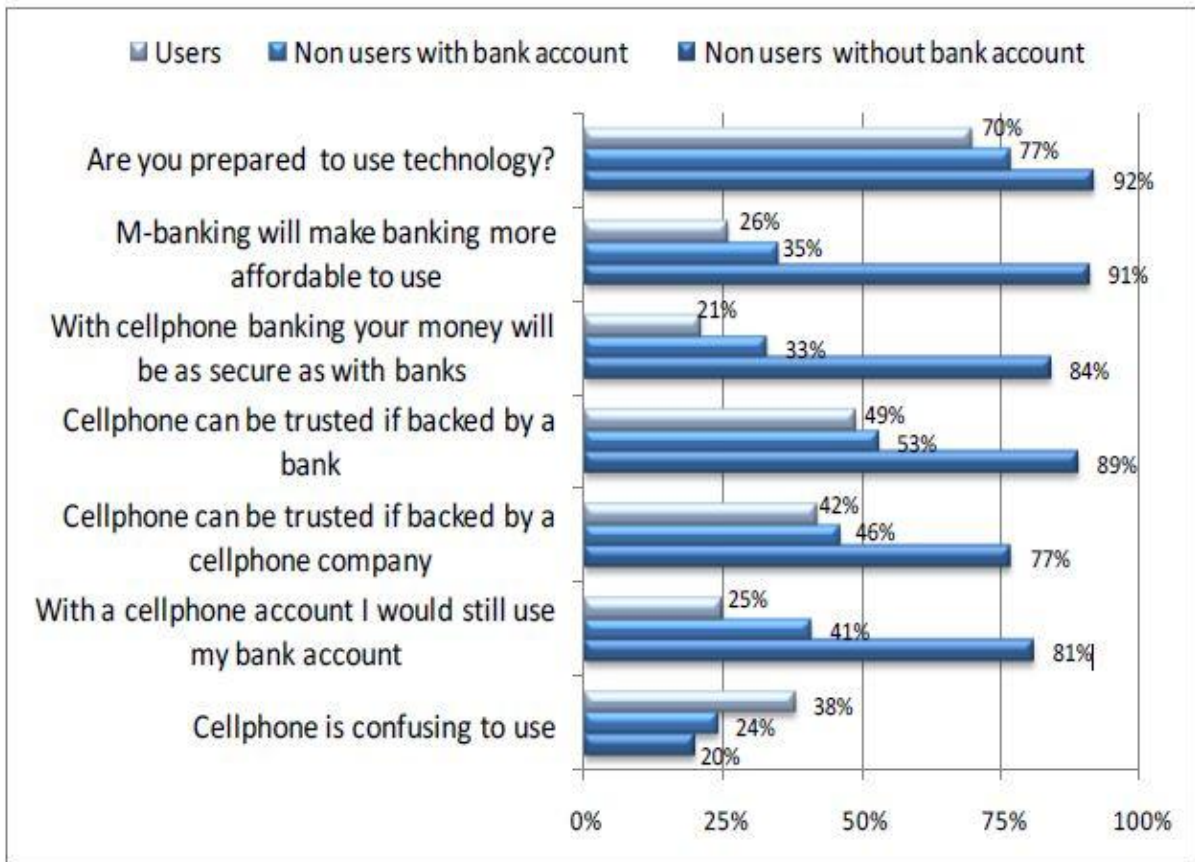

Fig 3 Attitudes towards M-banking in Ohafia

A higher number of the unbanked cohort than any other cohort of the three responded in the affirmative. This can be deciphered to mean that they have appositive attitude towards m banking and therefore can easily be tapped into utilizing the facility. Non- users of Mobile Banking but who have traditional bank accounts had moderately receptive attitudes towards Mobile Banking. This can be interpreted to mean that while they are comfortable with the financial services they receive from their banks inside banking halls and though ATM"s they might be willing to take advantage of Mobile Banking with a little convincing. Surprisingly, users of Mobile Banking were the most skeptical of m-banking services with majority answering in the negative. This can be attributed to the fact that most of them are still uncertain of whether the service is viable over the long-term due to its newness.

Organizations' Accessibility to Banking Services

All the urban based businesses in the sample have access to and employ both traditional banking, methods of using ATMs and banking through the banking hall, and mobile banking. On the other hand, shown in the next figure, only 45% of the rural businesses have access to traditional banking services. All of the rural businesses have access to and make use of mobile banking.
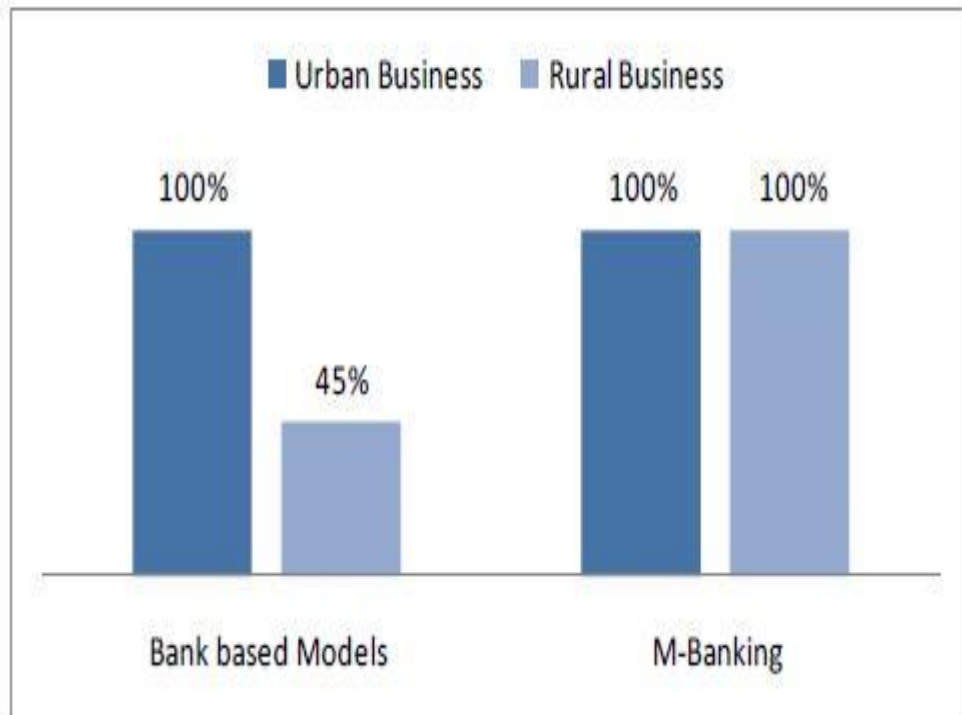

Fig 4 Bank Based Models and M-Banking in Ohafia

Effect of Implementing Mobile Bank Account Tracker on Payments, Transfers Deposits and Withdrawals

As highlighted on the comparative graph, the biggest effect in, terms of efficiency, in effecting financial obligations was felt when making withdrawals and peer to peer payments. This is when comparing before and after taking advantage of Mobile Banking. There was general improvement in the overall efficiency of conducting transactions. However, the study revealed that the Mobile Banking service had no effect on the small businesses" cross border transactions.
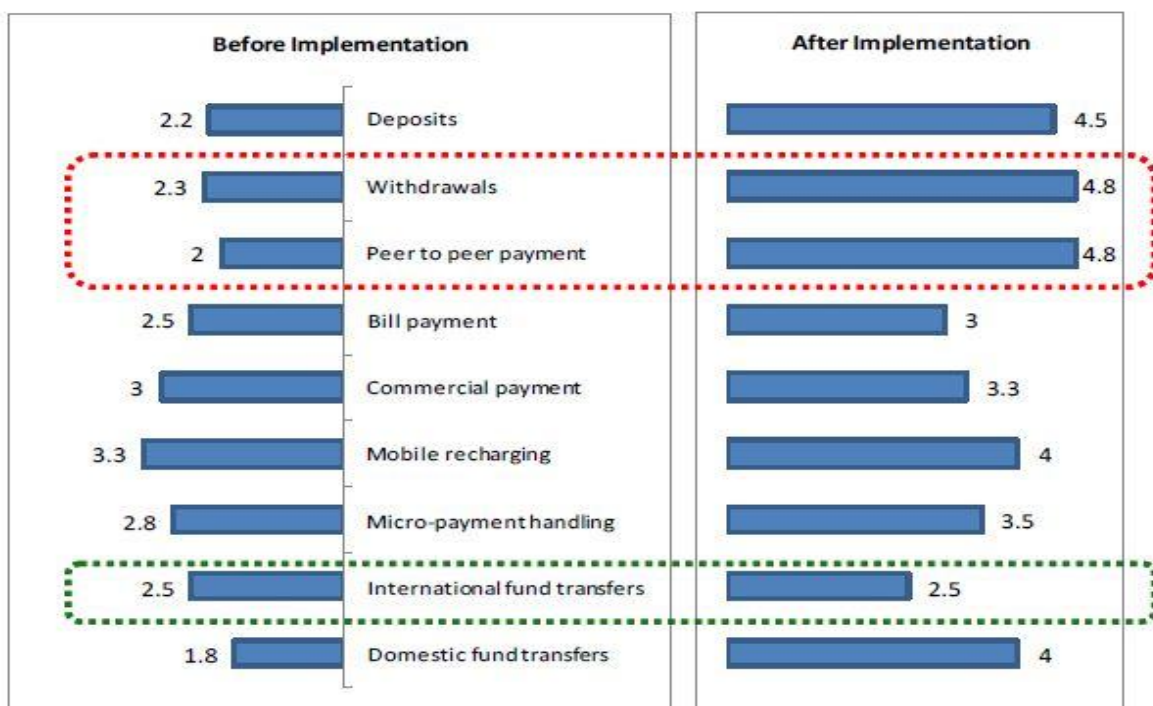
Fig 5 Before and After Proposed Implementation.

Concern about Aspects of Security

This study revealed that loss of an Android Mobile Handset and security passwords were the biggest security concerns both rural and urban businessmen had, regarding an M-banking service. The account owner also worries about encryption of data stored in his mobile phone. This is shown below in the figure below.
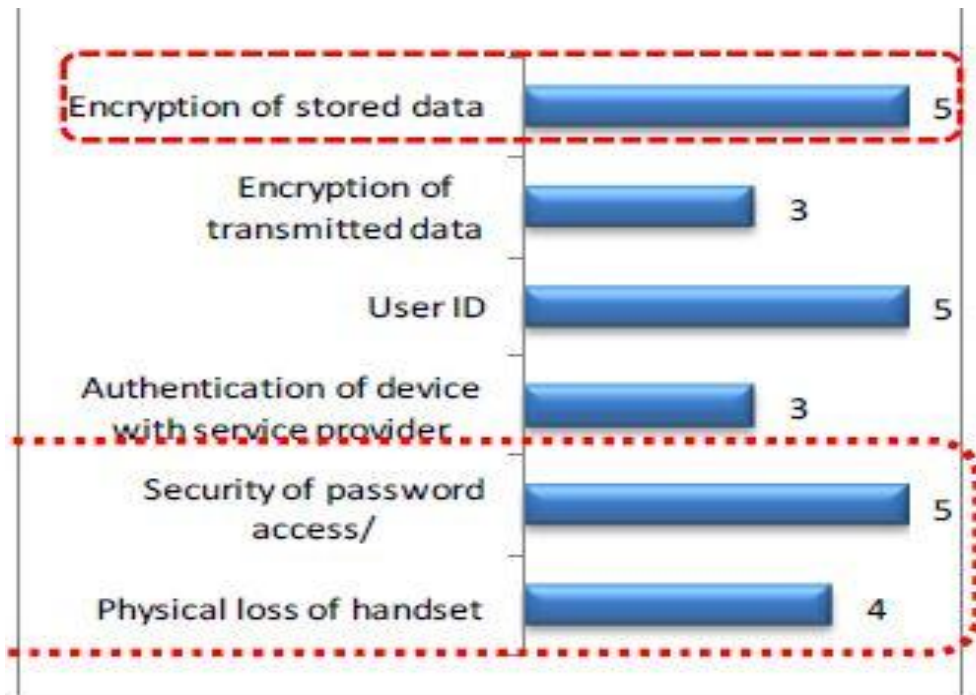

Fig 6 Concerns about Aspects of Security

IV.   CHSYSTEM DESIGN AND IMPLEMENTATION

Overview of System Design

The proposed system was designed in client only architecture. The client application runs as an Android app and was written in Java and doesn't require any server side for database storage i.e Data is stored locally.

Input Design

The input to the system is done in several activities in the app. Activities include "Search Activities", Adding and updating transactions, adding and updating User bank accounts. Input to the system. The Account addition/update page comprises of the following fields:

Account number field: This is where the account number of the user is filled in.

Customer number field: This is where the phone number of the customer is entered

Account Holders Field: This is where the account name is filled.

Bank name: This is the field to enter to the bank name. STANBIC IBTC is set by default.

Branch name: This is the field to enter to the bank's branch name where the account was opened.

Branch name: This is the field to enter to the bank's branch name where the account was opened.

Current Account balance: This is the field to enter to the current account balance of the account as at when this account was added to the account tracker.

Remarks: This is the field to enter to additional remarks of the account being entered.

The images below illustrates the input forms of the system

Fig 3 Account Input form

Fig 4 Account Update form

Fig 5 Transaction Search

Fig 6 Transaction addition/update

Process Design

The account setup/ update process involves getting the required values from the user in the forms, Inserting the details in the "Accounts" table if its new or updating existing records in cases where the records exists already.

The transaction process involves getting the transaction details, validating the details, deduction or addition to the current account balance depending if it's a deposit or withdrawal, inserting transaction records into the "Transactions" table and lastly updating the last transaction date field in the accounts table for the particular user.

Output Design

Output in the system includes "Recent Transaction List", "Account details" and "Transaction details". The output of these activities was designed with simple forms where the details are represented in textboxes. The following images depict outputs from the system.
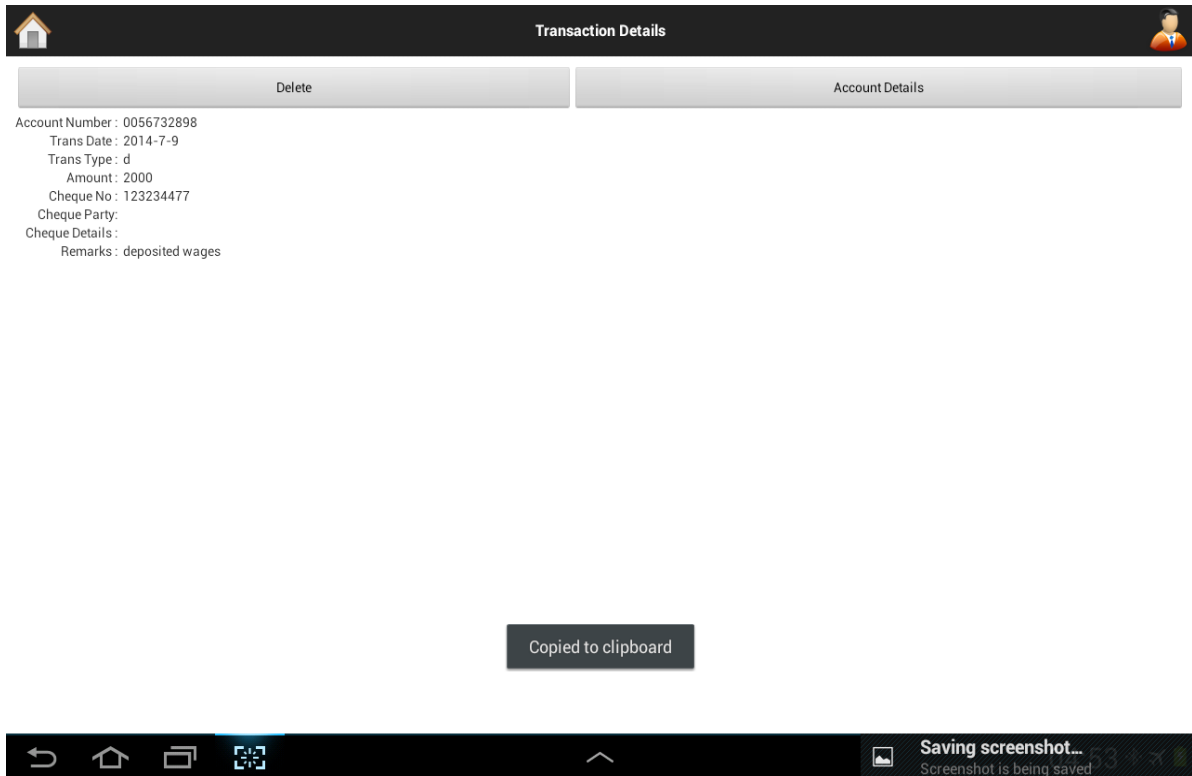

Fig 6 Recent Transactions

Fig 7 Transaction Details

Database Design

The SQLite database consists of 2 tables. The "Accounts" table and the "Transaction" table. The Accounts table holds records of the user bank accounts and the Transaction table holds records of user account transacttion. The following tables below shows the table definition of the tables.

Field Description	Field Name	Field Type	Field Width
Account No	Acno	VARCHAR	20
Branch Address	Address	VARCHAR	50
Account Balance	Balance	VARCHAR	20
Bank	Bank	VARCHAR	20
Branch	Branch	VARCHR	20
Customer NO	Cno	VARCHAR	20
Account ID	_id	INT	10
LAST TRANS DATE	l_trns_date	DATE	20
REMARKS	Rmks	VARCHAR	40

Table 2: definition of the "Accounts" table.

Field Description	Field Name	Field Type	Field Width
Trans Account ID	account_id	INT	20
Cheque Details	cheque_details	VARCHAR	40
Cheque NO	cheque_no	INT	10
Transaction ID	_id	INT	10
Transaction Remarks	Remarks	VARCHAR	40
Trans Amount	Amount	INT	10
TRANS DATE	Transdate	DATE	20
Trans Type	Transtype	INT	1

Table 2:definition of the "transactions" table.

Program Design

The client side of the program is a Android app was designed in Java and. It is made up of 5 major forms :
- AddAcount.java : which is responsible for displaying an the form used to add account to the system

- AddTransaction.java: which is responsible for displaying an the form used to add account transactions to the system
- HomeActivity.java: which is responsible for displaying the Dashboard menu
- TransactionDetails.java: which is responsible for displaying the transaction details of a transaction.
- UpdateAccount.java: which is responsible for displaying the form used for updating accounts.

Other utility classes include DBHelper.java for database routines and executing SQL scripts and statements, Database.java acts as a support class for DBHelper.java used in handling initial database setup routines which include tables creation and adding default data to the table. Another utitlty class is the utils.java which handles and optimzes user menu selections.

4.6 System Implementation

The client application is a Android app which needs a minimum OS requirement of Version 2.2. The minimum system requirement is minimum of 600mhz processor, 256 MB RAM and at least 60MB

Project Costing

Most of the cost is attached to deploying/distributing the app and purchase of mobile phone for both development and testing.

Software Costing

- $25 (roughly N4125) for Google play developer account to upload app to playstore

Hardware Cost

Cost of a mobile phone running android 2.3 upwards.

V.   RECOMMENDATIONS AND CONCLUSION

This project investigates the banking system of STANBIC IBTC Bank with the aid of existing account holders. Hence the normal Banking Hall/ A.T.M system was studied and thereafter a need for a mobile account tracker was discovered. The processes involved in the existing system where studied to enable the development of an adaptable/ compactable system.

Hence a Mobile bank Account Tracker running on the Android Operating System was developed having the features of the existing system but with more convenience and easier access. In Android, every application runs in its own process, which gives better performance in security, protected memory and other benefits.

RECOMMENDATIONS

Having identified the process of the existing bank transaction system and the advantages of the newly developed mobile system; the system in this project is therefore recommended for use by STANBIC IBTC Bank as well as several banks in Nigeria.

Due to the flexibility of the system design, the system could be deployed for several Nigerian banks with some customization to fits the individual bank demands. The system would enhance general improvement in the overall efficiency of conducting transactions. Hence we expect reduced A.T.M queues as well the banking halls queue in addition to quick, reliable, convenient and private transaction system.

VI.   CONCLUSION

In conclusion this project has studied the existing bank transaction system and provided a mobile system to enhance transaction efficiency. These solutions provide benefits to both the bank; STANBIC IBTC has the case study, as well as the account holders. The numerous advantages would also have a positive impact on the economic system of the country.

REFERENCES

[1]. Chima O. (2002). "Potential Uses of ICTs by Small and Micro Enterprises in Nigeria". UNU/INTECH (12)1123-1125
[2]. Crabbe H. (2012). "The Impact of Mobile Communication Technologies in Medium and Small Enterprises" Mark Willie Printers Asaba: 26-44
[3]. Donner and Tellez (2011). "Micro Entrepreneurs and Mobiles: An Exploration of the Uses of Mobile Phones by Small Business Owners in Eastern Nigeria" http://emmaflash.blogspot.com/article_23?all/pdf
[4]. Femi and Azeez (2011) "Networks, communities, and markets in West Africa: Implications for Firm Growth and Investment." Journal of African Economies, 10(1): 109-142.
[5]. Michael E (2001) "Android: Google's Power of touch" Europe Tech Radar, (31): 101-142.
[6]. Okorie C. (2009) "Mobile Phone Trends in Nigeria, the good and the bad". E-compass   Nationwide (29): 220-456.
[7]. Saheed B. (2013) "Training for Work in the Informal Sector: Fresh Evidence from Nigeria." Tech Matters, (22): 123-156.
[8]. Sunday M. (2009) "G.S.M Analysis in Abia" Afro Report, (11): 11-62.
[9]. Wale S. (2013) "Effects of E-commerce in growing Nigerian Economy" Blitz Weekly, (32):19-2