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EFFECTIVENESS OF MOBILE BANKING SERVICES IN SELECTED COMMERCIAL BANKS IN RWANDA

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Abstract

This study established the effectiveness of mobile banking services in selected commercial banks in Rwanda. Descriptive design involving both qualitative and quantitative approaches was employed. Sample size of 227 was computed from a total population of 524 employees from the selected banks and the selection of respondents was done through systematic random sampling. The instruments of data collection used in this study included both structured questionnaires and interview. In data analysis, quantitative data was analyzed through frequencies and percentages for respondents', mean values were used to determine the effectiveness of mobile banking services in the selected commercial banks. Difference in effectiveness of mobile banking services was determined through One-Way-ANOVA. Research findings reveal that mobile banking services in the selected commercial banks were generally effective. The most effective item under mobile banking services was noted in security measures and privacy, followed by time management and convenience and the least effective was on the financial risk measures. This study also found out that there were significant difference in the effectiveness in mobile banking services among selected commercial banks. The bank with most effective mobile money services was Banque Populaire du Rwanda, followed by the Kenya Commercial Bank, next was Bank of Kigali, Equity Bank, and finally, ECOBANK. The study concluded that the mobile banking services in the selected commercial banks are effective. It recommended that the bank management should ensure that they continue strengthening issues concerning security and privacy in mobile banking; put in place promotion and sensitization programs for mobile banking services, as well as to adopt new and modern technology that meets the demands of ever changing trends of mobile banking services.

Key words

Security Risk; Financial Risk; Commercial banks; Rwanda.

INTRODUCTION

The concept of business performance can be traced right from USA before 20th century (Wright, 2002). However, during 20th Century, the scholar indicated that many firms in USA and Europe took collecting data, both internal and external; discerning patterns and meaning in the data (analyzing) and responding to the resultant information as significant steps towards improving business performance. Nevertheless, the challenge was that businesses sometimes took the trouble to laboriously collect data from non-automated sources. As they lacked computing resources to properly analyze the data, they often made commercial decisions primarily on the basis of intuition.

Later on, the idea of employing automation to improve business performance becomes the main focus throughout the world (Bodenhorn, 2000). According to him, as businesses started automating more and more systems, more and more data became available. However, collection often remained a challenge due to a lack of infrastructure for data exchange or due to incompatibilities between systems. Reports on the data gathered sometimes took months to generate. Such reports allowed informed long-term strategic decision-making. However, short-term tactical business decision-making often continued to rely on intuition.

In 1989, Howard Dresner, a research analyst at Gartner popularized "business intelligence" (BI) as an umbrella term to describe a set of concepts and methods to improve business decision-making by using fact-based support systems (Cowen, 2000). The author stated that performance management builds on a foundation of BI, but marries it to the planning-and-control cycle of the enterprise with enterprise planning, consolidation and modeling capabilities. Increasing standards, automation, and technologies to boost business performance have led to vast amounts of data becoming available and this later on led to the advent of mobile banking as a way of offering better choices to clients and improving performance.

The first mobile banking and payment initiative was announced during 1999 (Polasik & Wisniewski, 2009). According to the scholars, the first major deployment was made by a company called Paybox (largely supported financially by Deutsche Bank). The company was founded by two young German's (Mathias Entemann and Eckart Ortwein) and successfully deployed the solution in Germany, Austria, Sweden, Spain and the United Kingdom (UK). In 2003, more than a million people were registered on Paybox and the company was rated by Gartner as the leader in the field. Unfortunately Deutsche Bank withdraws their financial support and the company had to reorganise quickly (Polasik & Wisniewski, 2009).

Another early starter and also identified as a leader in the field of mobile banking was a Spanish initiative (backed by BBVA and Telephonica), called Mobi Pago (Laukkanen & Lauronen, 2005). The authors indicated that the name was later changed to Mobi Pay and all banks and mobile operators in Spain were invited to

join. The product was launched in 2003 and many retailers were acquired to accept the special USD payment confirmation. Because of the complex shareholding and the constant political challenges of the different owners, the product never fulfilled the promise that it had. With no marketing support and no compelling reason for adoption, this initiative is floundering at the moment.

Initiatives in Norway, Sweden and France never got traction. France Telecom launched an ambitious product based on a special mobile phone with an integrated card reader (Koenig-Lewis et al, 2010). According to the authors, the solution worked well, but never became popular because of the unattractive, special phone that participants needed in order to perform these payments. Since 2004, mobile banking and payment industry has come of age. Successful deployments with positive business cases and big strategic impact have been seen recently.

Mobile banking is being adopted all over the world in different ways (Eriksson & Nilsson, 2007). The writers also noted that in developing countries, mobile banking solutions have been deployed as a means of extending financial services to the community previously known as the "unbanked" or "underbanked," which is estimated to be as much as 50% of the world's adult population, according to Financial Access' 2009 Report "Half the World is Unbanked" (Addison-Wesley et al, 2008). According to the authors, since these payment networks are often used for micropayments, the use of mobile banking in developing countries has attracted public and private funding by organizations such as the Bill and Melinda Gates Foundation, USAID and MercyCorps.

In Africa, the history of mobile banking is of recent. In April 2007, following a student software development project from Kenya, Safaricom launched a new mobile phone based payment and money transfer service, known as M-Pesa (Mas & Morawczynski, 2009). The service allows users to deposit money into an account stored on their cell phones, to send balances using SMS technology to other users (including sellers of goods and services), and to redeem deposits for regular money. Users are charged a small fee for sending and withdrawing money using the service. M-Pesa has spread quickly, and has become the most successful mobile phone based financial service in the developing world (Githahu, 2012). The author noted that by 2012, a stock of about 17 million M-Pesa accounts had been registered in Kenya.

Later on, mobile banking was launched in Tanzania by Vodacom in 2008 but its initial ability to attract customers fell short of expectations (Staff Writer, 2013). According to the writer, in 2010, the International Finance Corporation released a report which explored many of these issues in greater depth and analyzed the strategic changes that Vodacom has implemented to improve their market position, as a result, M-Pesa in Tanzania had five million subscribers by May, 2013. As the

stock of mobile banking has greatly risen, there seems to some evidence that this type of banking has affected the performance of commercial banks and this is the major subject of this study.

Mobile Banking refers to provision and availment of banking and financial services with the help of mobile telecommunication devices (Lassar et al, 2005). The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information. Similarly, Zhou et al, (2010) defines mobile banking as 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 personal digital assistant. In this regard, mobile banking differs from mobile payments, which involve the use of a mobile device to pay for goods or services at the point of sale or remotely, analogously to the use of a debit or credit card to effect an EFTPOS payment.

The Theory of Perceived Risk (TPR) proposed by Raymond A. Bauer in 1960 is the guiding principle guide for this study. This theory suggests that in the context of consumer behavior, benefits are often accompanied by risks (Bauer, 1960). Perceived risk (PR) in this theory is regarded as a barrier to the dissemination of new innovations (Ostlund, 1974). Lee's (2009) results confirmed that PR had a stronger affect on an individuals' decision to use Individual Behavior (IB) in comparison to the benefit factor. Six types of PR have been researched in the context of IB: security, privacy, financial, social, time/convenience, and performance risk.

Since mobile banking is as an element of innovation and the six characteristics of TPR such as security, privacy, financial, social, time/convenience, and performance risk are both directly and indirectly related to business of performance, this theory became relevant to this study.

In Rwanda, mobile banking was launched in 2010 by MTN Rwanda (Kantengwa, 2011). Two years after launch, the author stated that mobile banking had boasted 415,000 registered customers, and over 170,000 active customers. According to her, as per now, many banks such as Banque Populaire du Rwanda, Bank of Kigali, Equity Bank, Kenya Commercial Bank, ECOBANK, Fina Bank, Cogebanque and URWEGO Opportunity Bank have all established mobile banking services for their clients.

While the initial mobile banking offering focused on domestic money transfers, Murgatroyd et al, 2012) indicated that mobile banking is now expanding and it is imperative for stakeholders to understand the financial needs to its users. The authors also pointed out that mobile banking services in Rwanda continue to rollout cost-friendly products to provide better options for all. They further noted that the users of mobile money in Rwanda are assured of security for their money on their mobile phones even when they lose their phones, another move that is likely to help market Mobile banking products in the country. The system ensures that only the

owner of the account has access to the wallet by ensuring that the correct PIN (a 4 digit secret code known only by the account holder) is put into the menu.

Recent studies by National Institute of Statistics of Rwanda (2013) on the use of mobile banking in Rwanda showed that the country is still an early market for mobile banking. Although mobile banking services in Rwanda seem to attract mostly banked customers, its impact on the performance of many of the commercial banks in the country has not recently been subjected to investigation. It is within this background that this study examined the impact of mobile banking in selected commercial banks in Rwanda. These selected commercial banks included Banque Populaire du Rwanda, Bank of Kigali, Equity Bank, Kenya Commercial Bank and ECOBANK. These banks were selected for this study because they are among the first ones to that adopted mobile banking in Rwanda.

METHODOLOGY

In order to determine the effectiveness of mobile banking this study employed descriptive survey design. According to the pilot study carried out, the five commercial banks in Kigali City had a population of 524 and these were spread out in their various branches in the City. This target population comprised of the staff or employees and the managers of the banks. Bank employees and managers were targeted in this study because they are knowledgeable about issues regarding mobile banking in the last few years since mobile banking was introduced. The research sample size was 227 respondents and this was determined from the total population of 524 using the Slovene's formula. Both questionnaires and interviews guides were used in this study. The research used Statistical Package for Social Sciences (SPSS) software package version 16 to analyze data. Effectiveness of mobile banking services among the selected commercial banks was determined using mean values. Data on the effectiveness of mobile banking services was determined and interpreted as shown below.

Mean Range	*Response Mode*	*Interpretation*
3.26-4.00	Strongly Agree	Very effective
2.51-3.25	Agree	Effective
1.76-2.50	Disagree	Ineffective
1.00-1.75	Strongly disagree	Very Ineffective

As for the difference between effectiveness in mobile banking services among the selected commercial banks in Kigali City, mean differences, F-ratios and significant values at 0.05 were used. Qualitative analysis was based on the evidential reports obtained from the top managers of the selected commercial banks in Kigali City.

Qualitative data analysis began with data organization. After data organization, data was grouped in categories and this gave rise to creation of themes and patterns. Lastly, data was described, explained more deeply and exhaustively using logical process and conclusions as well as recommendations were also drawn.

RESULTS AND DISCUSSION

Effectiveness of mobile banking in the selected commercial banks in Kigali City was determined using mean ranges.

TABLE 1. EFFECTIVENESS OF MOBILE BANKING SERVICES IN SELECTED COMMERCIAL BANKS IN RWANDA

	Mean	Rank	Interpretation
MOBILE BANKING			
Security and Privacy Measures			
Proper ways of verification of account are made before withdrawal and deposits are made	2.98	1	Effective
The secret code or pin numbers are only known by the account holder	2.89	2	Effective
Client's money remains safe in case one loses his/her phone	2.80	3	Effective
Through mobile banking, cases of fraud and theft are reduced	2.77	4	Effective
Mean Average of Security and Privacy Measures	2.86		Effective
Financial Risk Measures			
With the help of mobile banking, customers do not need to carry huge sums of physical money	3.11	1	Effective
Cases of robbery have also been reduced through mobile banking services	2.80	2	Effective
Errors causing financial loses can be rectified through mobile banking services	2.64	3	Effective
Clients are also updated on financial risks involved in mobile banking	2.31	4	Ineffective
Mean Average of Financial Risk Measures	2.72		Effective
Time/Convenience			
Customers can also access banking services any where	2.91	1	Effective
Customers valuable time is save when accessing bank services through mobile banking	2.87	2	Effective
Customers can access banking services anytime	2.84	3	Effective
With mobile banking, there are no cases of customers queuing at bank	2.79	4	Effective
Clients can also access loan services if they have mobile money accounts	2.77	5	Effective
Mean Average of Time/Convenience	*2.84*		*Effective*
Overall Mean Average	*2.81*		*Effective*

Mean ranges from 1.00-1.75 indicate that the mobile banking services in the selected commercial banks in Kigali was generally very ineffective; mean ranges from 1.76-2.50 show that the mobile banking services in the selected commercial banks in Kigali City was generally ineffective, mean ranges from 2.51-3.25 indicate that the mobile banking services in selected commercial banks in Kigali City was generally effective, and lastly mean ranges from 3.26-4.00 portray that the mobile banking services in selected commercial banks in Kigali were generally very effective. The summary on this is established in Table 1.

Basing on the overall mean average of 2.81, it can be noted that the mobile banking services in selected commercial banks in Kigali City are relatively effective.

Mobile banking services were most effectively rated in security and privacy measures as its mean average values were the highest at 2.86 as compared to the rest of the items. Security and privacy measures were generally high in the selected commercial banks because proper ways of verification of account are made before withdrawal and deposits are made (rated t the mean of 2.98), the secret code or pin numbers are only known by the account holder (rated at the mean of 2.89); clients money remains safe in case one loses his/her phone (rated at the mean of 2.80), and lastly through mobile banking, cases of fraud and theft are reduced (rated at the mean of 2.77).

After security and privacy measures, mobile banking services were noted to be more effective in time management and convenience and this was evident in its mean average of 2.84. Time management and convenience were noted to be more effective in mobile banking services in the selected commercial banks in Kigali City because customers can access banking services anywhere (rated at the mean of 2.91), customers valuable time is saved when accessing bank services through mobile banking (rated at the mean of 2.87), customers can access banking services anytime (rated at the mean of 2.84), there are no cases of customers queuing at bank (rated at the mean of 2.79), and lastly, clients can access loan services if they have mobile money accounts (rated at the mean of 2.77).

Mobile banking services less effectively rated in financial risk measures as its' mean average stands 2.72 and one of its items was lowly rated. Respondents agreed that with the help of mobile banking, customers do not need to carry huge sums of physical money (rated at the mean of 3.11), they also agreed that cases of robbery have also been reduced through mobile banking services (rated at the mean of 2.80), they continued to agree that errors causing financial loses can be rectified through mobile banking services (rated at the mean of 2.64). However, respondents disagreed that clients are updated on financial risks involved in mobile banking (rated at the mean of 2.31).

Before interviewing key informants about the effectiveness of mobile banking in their banks, they were asked about when they established mobile banking services. According to the information obtained the first two commercial banks that established mobile banking were Banque Populaire du Rwanda (BPR) and Kenya Commercial Bank (KCB) in 2010. These were followed by the Bank of Kigali (BK) and Equity Bank in 2011, and the last bank to establish mobile banking was ECOBANK as it started such services in 2012.

On why the banks started such services, informants mentioned the following reasons and they arranged in their frequencies beginning with the most mentioned reason to the least.

(i) To cope up with the current trends with banking business being influenced by modern technology;
(ii) To tap clients who were who want to access banking services anywhere and anytime;
(iii) To reduce cases of related to theft and fraud;
(iv) To reduce over queuing at the banks;
(v) To be competitive in banking sectors; and
(vi) To respondent to clients demand to mobile banking.

Some of the common services mentioned by those interviewed include alerts for account balances, sent payments, direct deposits, and a myriad of account activity. In some of the banks such as Banque Populaire du Rwanda (BPR) and Kenya Commercial Bank, users are allowed to sign up for these alerts through their online banking service for free. In most of the banks, text messaging may be used to communicate with bank personnel in lieu of e-mail or sending a message through an online web site's contact center. Further still, by texting certain codes or instructions, bank customers may be able to send donations from their deposit accounts. These donations are sent to charitable organizations or causes with which the bank has an established partnership. Additionally, full account access is given from the site, allowing users to monitor activity, request account transfers and make payments. More typical services include account transfers, bill payments and activity monitoring.

As one of the informants was quoted saying, "I use my phone for everything, including banking. My phone is my lifeline for my business and family communications as well. I have a business and have an application on my phone where I can receive credit card payments from customers who have mobile banking accounts. This is much cheaper than the traditional way of receiving credit card payments."

On the benefits of mobile banking, respondents said; mobile banking utilizes the mobile connectivity of telecom operators and therefore does not require an internet connection; with mobile banking, users of mobile phones can perform several

financial functions conveniently and securely from their mobile; you can check your account balance, review recent transaction, transfer funds, pay bills, locate ATMs, deposit cheques, manage investments, etc.; mobile banking is available round the clock 24/7/365, it is easy and convenient and an ideal choice for accessing financial services for most mobile phone owners in the rural areas; mobile banking is said to be even more secure than online/internet banking.

Relating these findings with the ones with those of questionnaires, it can be seen that the research findings through interview are somewhat consistent with the ones indicated by those administered through questionnaires, thus mobile banking services in the selected commercial banks are relative effective.

Difference in the Level of Effectiveness Mobile Banking in Selected Commercial Banks in Kigali City

To establish whether there is significant difference in the effectiveness of mobile banking among selected commercial banks in Kigali. Significant differences in these items were determined by the use of both mean differences and F-test using One Way-ANOVA. This finding was also used to test the research hypothesis on the no significant difference in the effectiveness of mobile banking among selected commercial banks in Kigali;

TABLE 2. DIFFERENCE IN THE EFFECTIVENESS OF MOBILE BANKING IN THE SELECTED COMMERCIAL BANKS IN KIGALI

Variable	Category of banks	Mean	F	Sig.	Interpretation	Decision on HO
Effectiveness of Mobile Banking	Banque Populaire du Rwanda (BPR)	2.9641	1.762E	0.000	Significant difference	Rejected
	Kenya Commercial Bank (KCB)	2.5561				
	Bank of Kigali (BK)	2.2456				
	EQUITY BANK	1.1838				
	ECOBANK	1.0521				
	Average Mean	*2.06985*				

Table 2 indicates that there is significant difference in the effectiveness of mobile banking services among the selected commercial banks in Kigali City. This significant difference is indicated in the differences of mean values computed of 2.9641 for Bank Populaire Du Rwanda (BPR); 2.5561 for Kenya Commercial Bank (KCB); 2.2456 for Bank of Kigali; 1.1838 for Equity Bank; and finally, 1.0521 for ECOBANK and at the F ratio of 1.762E and significant value of 0.00. Thus, the commercial bank with the most effective mobile banking services in Kigali is Bank Populaire Du Rwanda (BPR) with the mean value of 2.9641 and the one with the

least effective mobile banking services is the ECOBANK with lowest mean value of 1.0521.

In this regarding, the findings therefore led to the rejection of null hypothesis 1(a) stating that there is no significant difference in the effectiveness of mobile banking services among the selected commercial banks in Kigali City.

According to majority of the key informants, there are indeed significant differences in the effectiveness of mobile banking services among different commercial banks. Number of mobile banking services offered by different banks explained the reason as to why there are differences in the effectiveness of mobile money services among banks. Though all the selected banks offer mobile banking services involving alerts for account balances, sent payments, direct deposits, and a myriad of account activity. Only users of Banque Populaire du Rwanda (BPR) and Kenya Commercial Bank could sign up for these alerts through their online banking service for free and four of that banks out of five could use text messaging to communicate with bank personnel in lieu of e-mail or sending a message through an online web site's contact center. Further still, only Bank of Kigali and Equity bank could use enable its clients to send donations from their deposit accounts through certain codes. Only Banque Populaire du Rwanda (BPR) allows users to monitor activity, request account transfers and make payments. However, all the banks were able to offer typical services including account transfers, bill payments and activity monitoring. These services offered by the banks suggest there are differences in effectiveness of services delivery.

CONCLUSIONS

Basing on the research findings established that the mobile banking services in selected commercial banks in Kigali are effective though some improvements are still needed in the service in some banks. The banks were generally most effective in ensuring security measures and privacy in the services; ensuring time management and convenience for their clients and putting in place financial risk measures. On the difference in the level of effectiveness in mobile banking services and business performance among the five selected commercial banks in Kigali, this study concludes that there are significant differences in the effectiveness in mobile banking services among selected commercial banks.

RECOMMENDATIONS

As this study proposes the following recommendations;

(i) The management of the banks should ensure that they continue strengthening issues security and privacy of clients with mobile banking accounts such that the number of clients accessing such services can increase and cases of frauds and theft of clients' money are minimized. This can be done through developing a private code or software that cannot easily be hijacked easily. If

this can be done, more clients will shift to mobile banking services and the banks will increase its profitability ratio, thus improving the business performance of clients.

(ii) The management of the selected commercial banks should also try to adapt to new and modern technology that meets the demands of ever changing trends of mobile banking services. This can be done by consultation and engaging in research. If this is done and customers are told about, the number of clients using mobile banking services is likely to increase and the banks will also be able to get more money for financial their investment programs or activities.

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