Effect of Information Communication Technology Products on Financial Performance: Empirical Analysis of Financial Institutions in Rwanda

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***Abstract*: Information communication technology has in particular brought a complete paradigm shift on the bank's financial performance in the banking industry. The changing dynamics of the banking sector is forcing the financial sectors to reengineer to meet the challenges associated with bank consolidation, rising operational costs, outsourcing, portfolio investment, payments and settlement systems. The purpose of the study was to analyze the effect of information communication technology products on financial performance. The study was anchored and guided on Innovation Diffusion Theory. The study adopted descriptive research design while the sample comprized 92 respondents. The results revealed that mobile banking and internet banking had a positive and significant effect on financial performance ($\beta = 0.954$, $p<0.05$; $\beta = 0.491$, $p<0.05$). Thus, the study concluded that mobile banking and internet banking positively and significantly affects financial performance. The study recommends that policy makers should consider mobile banking in their formulation of policies because of the technological developments and the expected switch from physical branch networks to technologically supported banking services. Commercial banks also need to emphasize the use of internet banking as this will enhance banks growth and customers saving on time.**

***Keywords*: Financial Performance, Information Communication Technology, Innovation and Diffusion Theory, Internet Banking and Mobile Banking**

I. INTRODUCTION

Due to technical advancements and the introduction of information and communication technology as a competitive advantage for every corporation, today's business environment is incredibly dynamic and intense. In the last few decades, application of information technology in business strategies has become at the very heart of the competitive process. As economy moves from lower to higher stages of development, business processes are shifting from simpler to modern and complex techniques of production. Commercial banks across the world have always embraced business process reengineering as a strategy to change on their business processes and procedures hence improve on their financial performance (Agbolade, 2011). The changing dynamics of the banking sector is forcing the financial sectors to reengineer to meet the challenges associated with bank consolidation, rising operational costs, outsourcing, portfolio investment, payments and settlement systems.Information and communication technology are the automation of processes, controls, and information production using computers, telecommunications, software and other gadgets that ensure smooth and efficient running of activities which in turn improves the performance (Agbolade, 2011). Information technology has played a great role in changing input-output relationship of production activities (Krishna, 2015).

Many studies have shown that world organizations have been inspired by the rapid and persistent upgrading of technology and scientific knowledge. Rapid changes in computer and communication technologies have altered the way organizations do business and decision-making process which is reflected on their operational effectiveness. Information technology is one of the most important tools along with innovations in organizations and it plays a critical role in development of new products and services (Yeboah *et al.*, 2014).Banks like other business organizations are deploying innovative products and services to ensure their future survival and meet the changing expectation of their customers. In this intense globally competitive market, banks should strive to satisfy the needs of their customers through providing quality customer service and improve their customer relation management. In this regard, information technology and the communication networking system have revolutionized the working of banks and financial entities all over the world (Del Gaudio *et al.,* 2021: Agrawal and Jain, 2013).

The role of information communication technology in the banking sector became of interest to this study due to the significant role it plays in the economy by stimulating economic growth through the intermediation of funds to economic agents that need them for productive activities (Aliyu *et al.,* 2012). This function is very vital for any economy that intends to experience meaningful growth because it makes arrangements that bring borrowers and lenders of financial resource together and more efficiently too than if they had to relate directly with one another (Ojo *et al.*, 2017). Indeed, there is no doubt that the majority of business organizations, particularly banks, consider computer technology as core competency measure to gain their competitive advantage.

Information Communication technology has in particular brought a complete paradigm shift on the bank's financial performance in the banking industry (Aliyu *et al.,* 2012). Nowadays, traditional banking towards relationship banking handled by face to face interaction either in a branch or head office, whereas, in contemporary banking, customers are demanding more flexible and accessible services everywhere and anytime (Ojo *et al.*, 2017). Technology has made a lot of impact on banking services owing to its role in gathering and analyzing information. The 21st century has witnessed a lot of technological innovation in banking sector (Yeboah *et al.*, 2014). The core issues faced by the banks today are on the fronts of customer's expectations, cutting operational costs, and managing competition (Simiyu, 2018). Harold and Jeff (1995) contend that financial service providers should modify their traditional operating practice to remain viable in the 1990's and the decade beyond. Thus, information communication technology has emerged as a catalyst in the various industries of the world in aiding the process and procedures required in the realization of various organisational performance.

Many organizations have invested their time and resources for the betterment of their services and products. Yeboah *et al.,* (2014) argued that banks have invested huge sums of money in information technology having their products and services mainly supported by technology. Identifying the information technology investment and its role in the banking industry is very crucial point for the success of the modern banks and Yeboah *et al.,* (2014) insisted that banks should properly understand the impact of information communication technology on their efficient service delivery, customer satisfaction and employees' productivity in order to maximize the return on its investment. Information technology has become inevitable and is seen as the only way for banks to survive in the increasingly competitive banking arena (Asefa, 2020). This therefor calls for banks incorporate information communication technology into their strategic plans for effective performance in payment and delivery systems.

However, among the extensive researches done on information communication technology and financial performance little focus has been placed within the context of financial institutions in Rwanda. Therefore, the study aimed to fill the gap by examining the effect of information communication technology products on financial performance of commercial banks in Rwandan context.

II. REVIEW OF RELATED LITERATURE

2.1 Theoretical Review

The study is anchored on Innovation Diffusion Theory (IDT) which explains how, why, and at what rate new ideas and technology spread. Innovation diffusion theory consists of major components: innovation characteristic, individual user characteristic, adopter distribution overtime, diffusion networks, innovations and adopter categories, and the individual adoption process (Taylor & Todd. 1995). Moore and Benbasat (1996) postulated that the definitions of Innovation Diffusion Theory are in fact, based on perceptions of the innovation itself, and not on the perceptions of actually using the system. Ajzen & Fishbein (1975) concur that attitudes towards an object and attitudes regarding a particular behavior relating to that object can frequently differ. The Innovation Diffusion Theory is of significance to the study in finding out the impact of ICT products on the financial performance of financial institutions. The theory states that adoption of information and communication technology demonstrates a strong theoretical support towards innovation. According to the theory, a perceived financial benefit has a strong significant relation to ICT products. It is this aspect that the study sets to find out. The supply of information is essential in producing faster technology diffusion.

The theory is helpful in guiding one to understand the essential components of adoption of ICT by organizations. This is particularly important to the current study that is set out to find the effect of ICT products on financial performance of financial institutions. Innovation diffusion theory consists of major components: innovation characteristic, individual user characteristic, adopter distribution overtime, diffusion networks, innovations and adopter categories, and the individual adoption process (Taylor & Todd, 1995). This component is supportive in understanding why the organizations would choose to adopt ICT in their operations and the perceived benefits which is financial performance. Therefore, this theory is relevant to the study due to the fact that business process reengineering is a response to changes in the operating environment through adoption of innovations.

2.2 Empirical Review

2.2.1 Mobile Banking and Financial Performance

Before the advent of mobile banking, the rate at which banks penetrated the unbanked market was very slow (Daniel 1999). Mobile banking is the provision or availability of banking services with the help of mobile devices. However, the ease with which accounts are opened by mobile technology and the accessibility this has brought to bank accounts has hastened the rate of market penetration as opposed the slow rate at which the traditional banking approaches the market. World Bank (2017) postulated that mobile banking allows customers to receive short messages (SMS) through their phone, wireless application protocol (WAP), and Java enables phone support other banking activities using GPRS (General Packet Radio Service) such as direct payments confirmation and funds transfer. Mobile payments technology is becoming increasingly significant, especially in the context of developing economies, where many low income households and microenterprises do not have ready access to financial services (Mutu, 2013). The move from traditional banking to agency banking and currently mobile banking has been beneficial to both the banks and customers as it reduces operating cost of the institution and its convenient and cheap as lesser fees are charged on mobile transaction. The banking sector has had to adopt technological change to remain

competitive and improve on their financial performance (Daniel 1999).

Several studies have been conducted on the effects of mobile banking and the performance of commercial banks. Bochaberi& Job (2021) conducted research on mobile banking and financial performance of selected commercial banks in Kenya. The findings revealed that mobile banking positively and significantly influences the financial performance of commercial banks in Kenya. Demirgüç-Kunt*et al.,* (2013) found that mobile banking positively and significantly influences the financial performance of commercial banks. Kigen (2011) studied the impact of mobile banking on transaction costs of microfinance institutions where he found out that by then, mobile banking had reduced transaction costs considerably though they were not directly felt by the banks because of the then small mobile banking customer base. Simpson (2002) suggests that mobile banking is driven largely by the prospects of operating costs minimization and operating revenues maximization. A comparison of online banking in developed and emerging markets reveal that in developed markets lower costs and higher revenues are more noticeable. Sullivan (2000) finds no systematic evidence of a benefit of mobile banking in US click and mortar banks. Jayawardhena & Foley (2000) show that internet banking results in cost and efficiency gains for banks yet very few banks are using it and only a little more than half a million customers are online in U.K. There is a need to conduct further studies on this area and therefore, the study hypothesized that;

H_1: *Mobile banking has significant effect on financial performance*

2.2.2 Internet banking and financial performance

Internet banking has become an important issue, not only to retain customers but also gaining a competitive advantage while maintain and growing overall effectiveness. In the present banking system, excellence in customer service is the most important tool for sustainable business growth. Allen (1988) defines internet banking as the process by which banks delivers information or services to its patrons, it encompasses the system which enables financial organization, patrons, individuals or business to access account, transact business or mine information on financial products and services via a public or private network. Gaffney, (2013) are of opinion that the use of internet in the banking institutions can give cost advantages by reducing financial transaction costs. In the face of intense competition in service industry such as banking, there is often a need to enhance efficiency and effectiveness in order to ensure organizational survival and competitiveness (Gitonga, 2010).

Several studies have been conducted on the effect of internet banking on the performance of commercial banks. According to Maiyo (2013) he examined the effect of internet banking on financial profitability of commercial banks in Kenya. The findings revealed that internet banking positively and significantly affects the financial performance of commercial banks in Kenya. Another study by Cheruiyot (2010) on impact of internet banking on financial performance of commercial banks in Kenya. The results revealed that internet banking positively and significantly affects the financial performance. A study by Malhotra & Singh (2009) on the impact of internet banking on bank profitability in the Indian banking sector. The statistical findings revealed that internet banking positively and significantly affects the financial performance. Ibekwe (2018) sought to assess the impact of internet banking on the Jordanian banks' profitability. The study was conducted in 15 Jordanian banks. The outcome indicated that internet banking had a negative but significant effect on banks' financial performance. The the study therefore hypothesized that;

H_2: *Internet banking has significant effect on financial performance*

III. METHODOLOGY

The research design is the conceptual step in conducting research. It serves as a guide for data collecting and measurement (Kothari, 2004). The research was conducted using a descriptive research approach. Descriptive research design was employed to study a population, by selecting samples to find and analyze occurrences at any given point in time. The total number of respondents in the study was 92 employees who have knowledge about the study variables. Multiple linear regression analysis was applied in the study to test the hypotheses formulated and is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where,

Y = Financial performance

X_1= Mobile banking

X_2= Internet Banking

β_0= Constant

β_1-β_2 = Coefficient of estimates

ε = Error tem

IV. FINDINGS

Results in Table 1 revealed that there was a positive and significant correlation between mobile banking and financial performance ($r = .791$, $p<0.01$). More so, the correlation between internet banking and financial performance had a positive and significant relationship at ($r = 0.654$, $p<0.01$). Therefore, it can be concluded that explanatory variables are positively correlated to financial performance at 1% level of significance.

The findings of the multiple linear regression model revealed that information communication technology products accounted for 58.9% of the variation in financial performance ($R^2 = 0.589$). The F ratio of 7.754 with a p-value less than 5% level of significance further demonstrated that the model was

fit to predict financial performance, as evidenced by the statistical findings.

The first hypothesis stated that there is a significant effect between mobile banking and financial performance. According to the findings of the study, mobile banking had a positive coefficient of estimate that was statistically significant ($\beta = 0.954$, $p<0.05$), indicating that it had a positive and significant effect on financial performance. This therefore implies that a unit change in mobile banking increases financial performance by 0.954 units. The findings concur with (Bochaberi & Job, 2021: Demirgüç-Kunt *et al.,* 2013: Kigen, 2011: Simpson, 2002) that mobile banking positively and significantly affects financial performance of commercial banks while in contrast to Sullivan (2000) who found no systematic evidence of mobile banking and financial performance in US click and mortar banks.

The second hypothesis stated that there is significant effect between internet banking and financial performance. Results showed that there was a positive and significant effect between internet banking and financial performance ($\beta = 0.491$, $p<0.05$). This implies that a unit change in internet banking increases financial performance by 0.491 units. The effect of internet banking was stated by the t-test value = 1.576 which implies that the standard error associated with the parameter is less than the effect of the parameter. The findings are in line with (Maiyo, 2013; Cheruiyot, 2010; Malhotra & Singh, 2009) that internet banking positively and significantly affects financial performance. However, the results are in contrast to Ibekwe (2018) who found that internet banking had a negative but significant effect on banks' financial performance.

Table 1 Inferential Results

	Unstandardized Coefficients		Standardized Coefficients			
	B	Std. Error	Beta	T	Sig.	Correlation
(Constant)	1.869	0.610		3.064	0.000	
Mobile banking	3.023	1.082	.954	2.793	0.006	0.791**
Internet Banking	2.947	1.871	.491	1.576	0.000	0.654**
Model Summary						
R	0.768					
R Square	0.589					
Adjusted R Square	0.557					
F	7.754					
Sig.	0.000					

* Significant at 0.5 level (2-tailed), ** Significant at 0.01 level (2-tailed)

V. CONCLUION AND RECOMENDATIONS

The study concludes that mobile banking influences the financial performance of the commercial banks in Rwanda. Therefore, commercial banks should adopt mobile banking as a way of increasing number of transactions, reducing cost of service delivery and hence improve on their profitability and revenue. The study also concludes that internet banking increases the likelihood of customer service attraction due to round the clock banking services which in turn improves financial performance.

The study recommends that policy makers should consider mobile banking in their formulation of policies because of the technological developments and the expected switch from physical branch networks to technologically supported banking services. The study also recommends that banks should enroll more service through internet banking as this will encourage more customers to adopt internet banking. Commercial banks also need to emphasize the use of internet banking as this will enhance banks growth and customers saving on much time which they could have wasted on queues to be attended the traditional way. The study suggested that further studies should be conducted on business process re-engineering on financial performance.

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