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Influence of Mobile Banking Technology Innovations on Profitability of Commercial Banks in Trans Nzoia County, Kenya

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ABSTRACT: The Financial services sector in Kenya has undergone transformation in the past years with several innovation driven improvements. Commercial banks in Kenya and the rest of the world have continued to use huge investments on ICT based innovations and training of manpower to handle the new technologies. The relationship between the growing investments in ICT based bank innovations and the banks performance in Kenya needs to be studied and establish whether ICT innovations strategies have contributed to the profitability of commercial banks in Kenya. The main objective of the study was to find out the influence of Mobile Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County. The specific objectives being; to examine whether Technology Innovations, Product Base Innovations, Market System Innovations and Process & Delivery Channel Innovations influence profitability of commercial Banks in Trans Nzoia County, Kenya. The study was anchored on the Diffusion of Innovation (DOI) Theory, Technology Acceptance Model/Theory (TAM) and Schumpeterian Theory of Creative Destruction. A descriptive census research design was adopted by the study. The development is intended to inform further research and enable organizations to develop pathways for Mobile based induced innovations. The target population of the study was the staff in the 15 licensed commercial banks, totaling to 255 personnel, in Trans Nzoia County that have been operational between the years 2014 and 2018. The study focused more on the top, middle and lower level management staff who directly deal with the day to day management and operations of the Banks. The researcher used census study due to the small number of respondents in the target population whose responses were important and indispensable in the study. Primary data was collected using a self-administered questionnaire while secondary data was obtained from annual reports of the Banks. The data was then coded to enable the responses to be grouped into various categories. The Data analysis techniques included; multiple regression, correlation and ANOVA. The SPSS software was used to analyze and process data where analyzed data was presented in form of bar charts, frequency tables and analysis tables.

KEYWORDS: Innovation, ICT, Mobile banking, Profitability, Performance

I. INTRODUCTION

(Bernerjee, 2016) support the hypothesis that ICTs act as innovation enablers, in particular product and marketing innovation. Unlike findings by other studies, these effects seem large both in manufacturing and services. No evidence however to justify that use of ICT increases the capability of a firm to cooperate with other firms and institutions, develop innovation in-house or introduce more “innovative” (new-to-the-market) products. These results suggest that ICTs enable firms adopt innovations developed elsewhere but they do not necessarily increase their “invention” capabilities, i.e. the capability to develop new processes and products. The available econometric evidence at firm level shows that a combination of investment in ICTs and changes in organizational and working practices contributes to firm productivity growth. Crespi, Criscuolo and Haskel (2017) used CIS data for the UK and find a positive effect on firm performance of the interaction between ICT and organizational innovation.

Mobile Banking Technology.

Mobile banking is the use of mobile phone to access banking services and facilities offered by financial institutions (Agboola, 2010). The said services and facilities include making deposits, payments, fund transfer and other related financial products. The use of mobile phone devices has increased tremendously due to the improved information Communication Technology (ICT) infrastructure. These have been transformed by the use of mobile devices such as

Smart phone and tablets. As e-commerce evolve and take center stage the move to mobile technology continues to offer a faster, more reliable and convenient methods of customer interaction with the service provider for financial service. Mobile banking has been accepted and adopted as a mainstream financial access transaction system by retail banks rather than the otherwise traditional banking (Agboola, 2010). For banks to fully realize their potential, it is important and inevitable to understand the customers' needs and preference as well as seek to overcome adoption resistance. For the full realization of this potential, the banks needs to be aware and understand customers taste and preference depending on customers features individually and overcome limitations to access and increase to market share adoption. Retail banks mostly need have advanced mobile money strategies through the need to consider age groups and income categories. The leading mobile banking in Kenya is M-Pesa model (Mbiti, 2011). Mobile banking has grown with high speed due to its security, convenience, reliability, and ease to use and affordability. Financial institutions have embraced the change due to its popularity as the mobile telephone infrastructure by communication companies including Safaricom, Airtel, Telkom Kenya (formerly Orange) have become the rivers of the financial services.

Banking Sector in Kenya

In Kenya, studies by Bikker and Bos (2018) concluded that innovation in Kenyan banking industry was driven by technological advancement, changing customer needs and intensified competition. The changing business environment can be explained by a number of factors; - Firstly, the customer productivity and profitability in the retail segment has gradually collapsed in many markets in Africa and around the world. Secondly, the self-aware attitude of the new customer towards the bank has led to a reverse power shift in the customer bank relation operations and management. Thirdly, tighter regulation demanded by government and institutions led to increasing costs for compliance hence the direct transfer on the cost to the consumer. This reverse power shift have dictated changes in the way customers and bankers conduct their business, making service innovation essential to achieve competitive advantage and profitability . Over the last few years, Kenyan banks have been pre-occupied with designing innovations in the services they offer and their service delivery modes. Such service innovations have become the value proposition.

The banking sector had its roots in Kenya long before independence; it started as a banking agent of National Bank of India set up at the British representative office through Imperial East African Company. The banking Act, the company Act and the Central Bank of Kenya Act are the official documents that presides over and govern the Kenyan banking industry. In 1995, the banking sector was liberalized and the exchange controls put in place. Central Bank of Kenya controls all the activities other banks and financial institutions partakes through formulation and implementation of monetary policy and Fiscal policy (CBK, 2016).

Kenya has 43 licensed banks, 35 microfinance banks, one mortgage finance company, 86 Forex bureaus and 8 foreign banks (BarclaysBank, 2013; Cytonn, 2016). Over the past two years, there has been revolution in banks where some banks are in receivership, mergers and acquisition. In the recent years, banking industry in Kenya has since moved from the traditional banking ways and mode of operation to adopting automation to cope with the increasing client base and ever changing customer needs and increasing competition and product dynamics (CBK, 2013). Banking industry in Kenya has been facing various challenges that include interest's margin decline, ever changing customer need and the new stringent rules and regulations especially in the new constitution. Commercial banks are the institutions where deposits are accepted, loans are offered and other related financial services are offered especially in the African region (Banking in Kenya, 2016).

Statement of the Problem

The global banking industry and financial sectors have experienced turbulent market conditions, market deregulation, stiff competition, technological advancements and reduced trade barriers thereby necessitating banking product diversification. As such, many commercial banks have resorted to diversifying their portfolios in order to stay afloat and maintain or enhance their profitability. Nonetheless, bank performance still remains to be an issue of concern since, lately, not all the banks have maintained or significantly improved their performances (Otieno, & Moronge, 2014). Whereas a number of studies have been conducted in developed economies on the influence of product diversification on bank performance, scanty empirical evidence exists on the developing economies like Kenya. However, there is evidence to the effect that the Banking sector in Kenya has experienced insignificant growth and unstable financial performance. For example, the aggregate financial performance of the banking sector in Kenya has been recorded below the industry estimates since in less than a year, some banks have registered poor performance, three banks have been put under receivership and others acquired.

However, listed commercial banks have recorded Earnings Per Share (EPS) growth in the financial year 2016 rated at 4.4% compared 6 to 2.8% in the previous financial year and a 5 year average of 13.9% still falling below the expected 14.6% growth rate. Besides, the banks gross loans and advances as well as deposits grew at slower rates compared to the expected five year average growth rate of 14.6% despite the attempts by the banking sector to resuscitate the banks' financial performance through portfolio diversification. As such, a knowledge gap still exists as to whether banking

product diversification really enhances the financial profitability of listed commercial banks in Kenya or not, hence the need for this study.

Objectives of the Study

General Objective

The general objective of the study was to establish the influence of M-Banking Technology Innovations on profitability of commercial Banks in Trans Nzoia County, Kenya.

Specific Objectives

- I. To examine the influence of M-Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County.
- II. To assess the influence of the product base Innovations on profitability of Commercial Banks in Trans Nzoia County.
- III. To analyze the influence of Market system Innovations on profitability of Commercial Banks in Trans Nzoia County.
- IV. To assess the influence of Process and delivery channel Innovations on profitability of Commercial Banks in Trans Nzoia County.

Research Questions

- I. How M-banking Technology Innovations influence Profitability of commercial banks in Trans Nzoia County?
- II. To what extent does Product base innovation influence Profitability of commercial banks in Trans Nzoia County?
- III. How does Market System innovation influence Profitability of commercial banks in Trans Nzoia County?
- IV. How does product process and delivery channel innovation influence Profitability of commercial banks in Trans Nzoia County?

II. LITERATURE REVIEW

Introduction

This chapter reviews studies that have been done in the area of M-Banking Technology and Innovations. It focused on the theoretical review that consists of Diffusion of Innovation (DOI) Theory, Technology Acceptance Model/Theory (TAM) and Schumpeterian Theory of Creative Destruction. These three theories give guidelines on the study with regards to M-Banking technology and innovation strategy for sustainable profitability through competitive advantage.

Theoretical Framework

Diffusion of Innovation (DOI) Theory

This theory was important in aiding the researcher in examining the user adoption of the technology innovations in the banking sector in Trans Nzoia County. This was because the Rogers' (1995) Diffusion of Innovation (DOI) theory is a popular model used in information systems research to explain user adoption of new technologies. Rogers defines diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social society." An innovation is an idea or object perceived to be new and unique (Business Dictionary, 2011).

According to DOI, the rate of diffusion is determined by an innovation's relative advantage, compatibility, complexity, trialability and observability. Rogers (1995) defines relative advantage as "the degree to which an innovation is seen as being superior to its predecessor". Complexity, which is comparable to TAM's perceived ease of use construct, is "the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand". Compatibility refers to "the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters". Trialability is "the degree to which an idea can be experimented with unlimited basis". Finally, observability is the "degree to which the results of an innovation are visible" (Rogers, 1995). The diffusion theory is relevant since it explains the reason why banks adopt technical innovations. One of the reasons why banks adopt technical innovations is relative advantage. This means that the banks that adopt technical innovations have relatively better in terms of financial advantage than those who do not.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a theoretical model that explains how users come to accept, adopt and use a technology or innovation. Original TAM was proposed by Davis in 1989. The model suggests that when a user is presented with a new technology, a number of factors influence their decision regarding how and when they will

use it. This includes its perceived usefulness (PU) and its perceived ease of use (PEOU). However, the TAM does not account for the influence and personal control factors on behavior. Other factors such as economic factors, outside influences from suppliers, customers and competitors are also not considered by the TAM (van Akkeren and Harker, 2013).

This model adopts well established causal chain of “beliefs, attitude, intention, actual behavior”, which was developed from the theory of reasoned action by social psychologists. In Davis’s study, two important constructs are identified; perceived usefulness and perceived ease of use (Davis, Foxall and Pallister, 2002). These perceptions predict attitudes toward the system adoption. Then the attitude develops the intentions to use and the intentions cause actual system usage and adoption. In many recent studies regarding technology, including this study, TAM is adopted extensively, TAM was adopted and it showed that it contributes to the prediction of individual usage of technology, (Fishbein and Ajzen, 2016). TAM assumes that perceived usefulness (the degree to which a person believes that using a particular system would enhance performance) and perceived ease of use (the degree to which a person believes that using a particular system would be easy and free of effort and struggle) with the influence of pre-existing external variables being the primary determinants for adoption of a new technology. Perceived ease of use has a direct effect on perceived usefulness. Both determine an individual’s attitude toward use, which leads to behavioral intention to use a system and actual use of the system (Davis, Foxall and Pallister, 2002). TAM is tailored to IS contexts, and was designed to predict information technology acceptance and usage on the job. TAM theory is relevant in that it explains the type of technology banks adopt. The bank will adopt a technology with perceived ease of use as it does away with traditional banking. This theory instigates the second research question: How do product innovations influence profitability of Commercial banks.

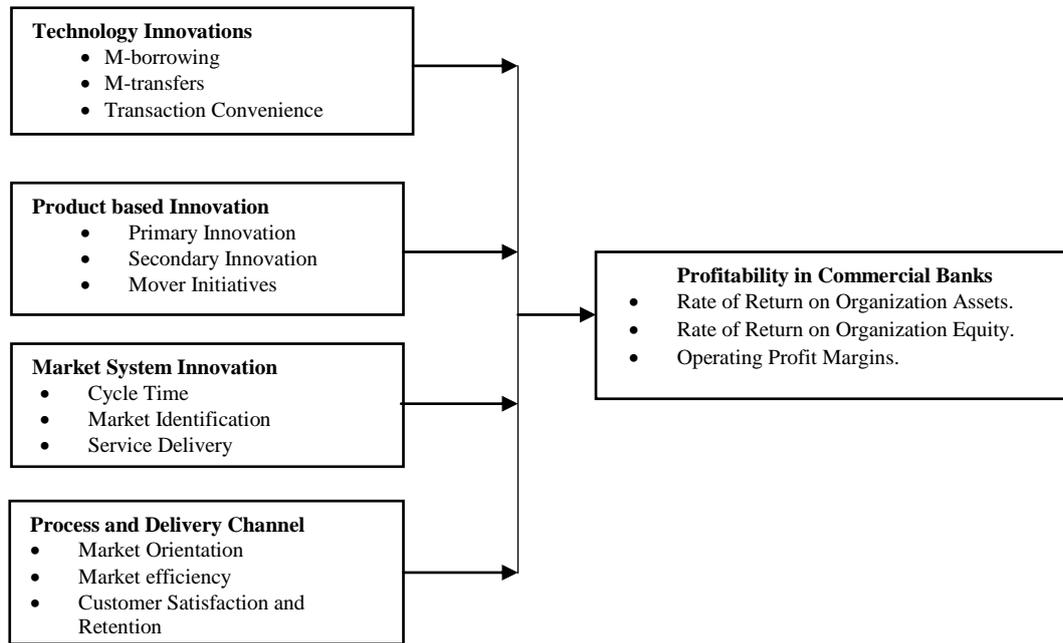
Schumpeterian Theory of Creative Destruction

Schumpeter (1939) who saw innovations as perpetual of creative destruction that were essential forces driving growth rates in a capitalist system. Schumpeter’s thinking evolved over his lifetime to the extent that some scholars have differentiated his early thinking where innovation was largely dependent on exceptional individuals willing to take on exceptional hazards as “an act of will”, i.e., entrepreneurs, from his later thinking that recognized the role of large corporations in organizing and supporting innovation. This resulted in his emphasis on the role of oligopolies in innovation and which later was falsely viewed as the main contribution of his work (Freeman, 1994). Schumpeter (1928) pointed to the discontinuous and disruptive nature of technological change in capitalism that brings the inseparable combination of short-term instability and long-term growth. He was not a technological determinist but recognized the social and organization forces that played key roles in his cyclical process of industrial change. Schumpeter argued that entrepreneurs, who could be independent inventors or R&D engineers in large corporations, created the opportunity for new profits with their innovations, and hence the adoption of this theory for this study on how commercial banks’ profitability is influenced by mobile–banking technology innovations. In turn, groups of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation. However, before the economy could equilibrate a new innovation or set of innovations, conceptualized by Schumpeter as Kondratiev cycles, would emerge to begin the business cycle over again.

For all this insight on the role of innovation, Schumpeter still did not really explain the source of innovation. He was able to point to its importance and role in timing economic cycles but did not address its source. This rather interestingly allowed Keynesian economics to argue that levels of investment were the cause of innovation. It was not until the 1960s that economists would begin again to search for the source of innovation. The importance of innovation was highlighted by researchers like Abramovitz (1956) and Solow (1957) who were able to demonstrate how little neoclassical economics was able to explain. Based on data on the United States economy from 1909-49, Solow showed that only 12.5 % of the increase of per capita output could be traced to increased use of capital. This left a surprisingly large 87.5% residual that Solow attributed to technical change. Romer (1994) echoes Solow’s observation and continued the call for innovation theorists to internalize the process of innovation within their models. To this end, the work on innovation that emerged from the base set by Schumpeter has been concentrated on the creation of innovation and its subsequent diffusion between firms, industries, and regions. The Schumpeterian Theory is relevant because new technology replaces old technology which it is better and adds value to the adopter.

Conceptual Framework

A conceptual framework is a research tool intended to help a researcher develop awareness and understanding of the situation under scrutiny and to communicate about the same (Ronoh, 2018). When clearly articulated, a conceptual framework has potential usefulness as a tool to assist a researcher to make meaning of subsequent findings. It forms part of the agenda for negotiation to be scrutinized, tested, reviewed and reformed as a result of investigation and it explains the possible connections between the variables (Smyth, 2014). A conceptual framework for the present study shows the influence of Mobile Banking Technology innovations on profitability of commercial banks.



Independent Variable

Dependent Variable Figure

Conceptual Framework

Review of Variables

Technological Innovations

Technological innovations such as the use of computer automation and electronic banking influences speed of bank service delivery, enhanced management decision making and saving time (Alu, 2014). Information and Communication Technology has provided self-service facilities from where prospective bank customers can operate their account direct from their mobile phone devices. It assists customers to send and receive money, check account balance and pay essential bills (Agboola, 2010). Laudon (2010) argues that Technological Innovation deals with the Physical devices and software that link various computer hardware components and transfer data from one physical location to another. Electronic Banking has tremendously improved the services of banks to their customers (Agboola, 2010). Kariuki (2015) argues that there exist positive impacts of M-banking on the turnover and profitability and to a lesser extent on employment, most notably when e-commerce is part of larger business strategies of the bank. Further, Kariuki (2015) provides evidence that the use of M-Banking can contribute to improved bank performance, in terms of increased market share, expanded product range, customized products and better response to client demand. According to the per transaction basis advantage, Mobile banking has revolutionized the way people within the developing countries transfer cash and currently it's poised to provide of refined banking services that may build a true distinction to people's lives. This kind of banking can give good type of services starting from account data that should do with alerting the customers on the updates and transactions on their account through their mobile phones. People receive short messages on their phones informing them of their immediate transactions in their bank accounts. In addition, they assist in payments (utility bills), deposits, withdrawals, transfers, purchase airtime, request bank statements and perform thirteen different crucial banking tasks, bushed real time over their mobile phones. Banks at the side of normal leased Bank (Uganda) have mostly enforced service delivery technology as the simplest way of augmenting the services historically provided by personnel (Howcraft and Bacett, 2016).

It is important to recognize that the structure, and not just the percentage consumers pay in fees to complete a transaction, may influence product demand and downstream welfare impact. While the cost of making small transfers is higher, there may be consumer protection benefits to using a slab pricing model, which is more intuitive than a percentage-based model, especially among individuals with low levels of numeracy.

In relation to channel expansion, Mobile usage has been expanding from a passive monetary channel to an active transaction channel, the primary reason consumers log on to the M-Banking is to either check balance, transfer money and the most recent on in the M-Banking is borrow mobile based loans

The M-Pesa has forced money transfer companies to lower prices; M-Pesa has also induced these firms and other financial firms to improve their products and services. In some cases, firms have partnered with M-Pesa to offer an integrated service (Njiraini and Anyanzwa, 2018). The study considered data on existing various mobile banking products and their improvement and availability which has influenced the financial performance of the sampled

commercial banks. Due to the per transaction service charge the more the transaction and frequency the more the high transaction scale and that translates to revenue. M-Banking brings the banking hall service to the customer's mobile device hence increased transaction convenience and frequency.

Wide range of banking transactions - 58% of US based Smartphone users have mobile banking app for primary checking of account and 50% of the users (including 68% of those under 35years and 31% of 55years and above) are active users of M-Banking. 75% of M-Banking users login weekly, primarily to check their account balances and or transaction history. Bank customers are charged transaction fee per every complete transaction done. The M-banking increases the contact time and interaction of the M-Banking financial system hence the tap and go payment experience.

In recent years, banks, payment system providers, and mobile operators have begun experimenting with branchless banking models which reduce costs by taking small value transactions out of banking halls into local retail shops, where agents such as airtime vendors, gas stations, and shopkeepers, register new accounts, accept client deposits, process transfers, and issue withdrawals using a client's mobile phone then communicate transaction information back to the telecommunication provider or bank. This enables clients to send and receive electronic money wherever they have cell coverage. They need to visit a retail agent only for transactions that involve depositing or withdrawing cash (Salzaman, Palen and Harper, 2011).

Product Base Innovation

Mabrouk and Mamoghli (2010), in their study on Dynamics of Financial Innovation and Performance of Banking Firms: Context of an Emerging Banking Industry, analyzed the effect of the adoption of two types of financial innovations namely; product innovation (M-Banking and SMS banking and so on) and process Automatic cash dispenser on the performance of banks. Their analysis included two adoption behaviors, first mover in adoption of the financial innovation and imitator of the first movers. They found out that first mover initiative in product innovation improves profitability while process initiative has a positive effect on profitability and efficiency. Bernerjee (2016) concluded that banks that imitate are less profitable and less efficient than first movers. Different terminologies have been used to categorize and describe product development. (Cooper, Scott, and Kleinschmidt, 2018) for example, embraces two distinct activities: old product development, which involves updating and improving existing products, and new product development, which involves a greater degree of innovational challenge. They similarly categorized product development into primary and secondary innovations. Primary innovations were broadly concerned with the development of new markets and relate to instances where there is a high degree of technical originality and a commensurate change in consumer behavior. Secondary innovations, on the other hand, are basically business or company focused and typically involve improvements to an existing market. Product portfolio decisions are the manifestation of a firm's innovation and marketing strategies.

The common approach to managing new product development is to develop and manage a portfolio of specific projects (Wheelwright and Clark 1992). Practically speaking, choosing the product portfolio determines the firm's strategy for the medium term future and is senior management responsibility (Storey and Easingwood, 1998; Cooper, Scott and Kleinschmidt, 2018). Operationally, portfolio decisions involve two strategic components: a development strategy regarding the number and rate of new product introductions (introduction intensity), and a market entry strategy regarding the relative speed to market (pioneering intensity). Past research suggest that better-managed firms structure their portfolios by striking a balance in the product innovation portfolio across these strategic components. However, past research has not systematically decomposed the components of portfolio strategy to examine how the components work together in relation to financial performance.

As regards long term business growth, according to Kaimenyi and Ndung'u (2009), majority of households in developing countries lack access to financial services, which impedes economic growth and development. M-pesa, a service provided by Safaricom Company in Kenya is the most celebrated success story of M-banking in developing world. M-pesa was introduced in March 2007 as a mobile money transfer service, today; it is a success story of financial services advancement with a technological base that makes it effective, efficient and cheap. Indeed, M-banking has opened opportunities for many Kenyans and others in developing countries. The mobile telephony sector in Kenya has witnessed a growth over the recent past. This sector has continued to grow, in terms of both subscription and invention of new and innovative products that aims at enhancing delivery of service and increasing customer value (CCK, 2013). The communication commission of Kenya through the implementation of the Communication Act has provided an enabling environment that has seen reforms in the telecommunication sector. This has enabled mobile telephony to grow exponentially thus providing a platform for successful mobile banking (M banking) technology.

As regards the provision of unique and superior value globally, financial establishments and in particular banks have developed innovative products and offered various services in an effort to take care of customer satisfaction and efficiency, which is their main objective. Essentially banking services are being offered through electronic delivery channel that provides services through mobile gadgets (Mari, 2006; Rashid, 2011) Recent development in M-Banking

has provided the opportunity for customers to access banking services without making a physical movement to visit bank branches. This technological dynamism has intensified in recent past and has led to the reduction of financial institutions costs. This system has enabled banks to increase pace of operations, remove rigidity of business transactions and reduce costs involved with having personnel serve customers physically (Ayo and Oni, 2010). The use of mobile phones has enabled the growth of markets, social business and public services in countries (Spence and Smith, 2010). Lin (2011) claims that rapid advances in mobile technology have made M-banking extremely important in the monetary services sector. Porteous, (2016) classified M-banking into two; firstly, transformational M-banking, which is the provision of banking services using a mobile phone to reach the unbanked population. The shift of most transactions from banks to transportable kiosks within the banking sector in our world nowadays, mobile cash transfer services may be a quick growing development. This has come back to enhance the extent of banking industry and may be delineating because the provision of banking or monetary services with the help of mobile telecommunication devices. M-banking has come back to remain, providing its customers with associate degree expedient means of banking.

For purposes of new product knowledge and introduction, for banks to grow their internal sales team organically requires a lot of time, resources and managerial attention. This is even more cumbersome if you're selling software to a niche, where you need to focus more attention on buyer personas. The time spent hiring and educating new internal staff on your solution is an unavoidably expensive and lengthy process.

In contrast, a channel partner program shaves off much of the costs associated with training new staff. You can simply identify channel partners who are successful in your industry and provide them with the core details needed about your product to sell it. In many cases, working with just a handful of resellers will easily allow you to triple or quadruple your sales arsenal, without exerting the time and resources spent internally.

Not only can channel partners enhance your sales processes, but they can also dramatically expand your marketing penetration. There are a variety of types of channel partners, like resellers and affiliates (more on them later) that can exponentially increase the amount of traffic visiting your digital properties. Whether your goal is to capture more leads or increase brand awareness, channel partners will help you get more eyes on your prize, giving your internal marketing team more time to focus on strategy and less time executing.

Regardless of what your type of product you sell, there are channel partners who will be both familiar and well-equipped to help you increase revenue in your industry. Partners' will likely have spent a long time building up their market knowledge in their respective industries. Taking advantage of both the relationships they've accumulated and their keen sense of the problems your buyers are hoping to solve, your customer acquisition process will ultimately accelerate additionally; partners will likely have valuable feedback on how you can improve your solutions to better fit the needs of the market.

Mobile Banking is a service that provides the customers anytime and anywhere banking with the assistance of mobile telecommunication services. This service is very easily available by each and every mobile internet user. It also saves a lot on time consumption. Mobile Banking is also safe and secure with the assistance of the mobile pin number (m-pin). The pin number, which is firstly distributed by the bank, secures every user of mobile banking but it is possible for the customer to change it as many times as per the needs of the customers. The customers can straightforwardly control all the transactions through mobile banking and all transactions will be safe in the account details (Aggarwal, 2014).

Market System Innovation

In the banking sector, Berger (2018) observed that the most visible process innovations in recent years have been those exploiting Mobile technologies to allow for rapid increase in Mobile banking transactions. Also, other process innovations have been observed: At the same time centralization of transactions processing and of such core operations as credit risks assessment and sanctioning has reduced the role of local branch and led to a raft of branch closures. Payment methods have been migrated from checks contactless payment systems, how consumers transact business being revolutionized. According to Bernard, Lima and Souza (2017), service delivery process innovation involves changes to the service delivery process or how the service is being provided with significant changes in the role of staff, strategic partners, and/ or customers, the most typical form of innovation including increased accessibility and changes in the degree of self service. Bernard, Lima and Souza (2017) found that automating financial processes such as account opening or closing, payment processing, personal loans borrowing and repayment, etc. has helped banks reduce cycle times, reduced high level staffing, improved visibility into the status of requests for front office and customers, standardization of processes and improved quality of services to customers. Banerjee (2016) found that most recent innovations in the banking sector focused on delivery of products or services, management of customer interactions and administration of back office functions. Centralized transaction process in core operations such as credit risk assessment and loan approval has reduced the role of the local branch. Payment processes have been revolutionized by the introduction of chip-and-pin and contactless payment systems. Bernard,

Lima and Souza (2017) suggest that process innovations have been very important in transforming back office functions, streamlining customer interactions and similar cost management strategies.

Better and potential market identification requires selecting the priority target market(s) where to focus. Selecting a target market helps operators communicate effectively with consumers and position the service based on their needs and preferences. There is little point in selecting a target market that is too small to support the mobile money business through its initial growth phase. There are two reasons why it is imperative to have a reasonably large initial target market in mobile money. First, mobile money services experience strong economies of scale at both the platform and the agent level, so it is essential to drive volumes as quickly as possible. Second, mobile money services focused on transfers benefit from strong network effects. As such, all else being equal, operators should select a target market that will allow it to scale up as quickly as possible. By size, however, we refer to volume of transactions rather than number of customers. Sometimes, operators choose to focus on smaller segments (small-scale traders, for example) because they have the potential to become heavy users.

Consider whether a potential target market is composed of early adopters. Operators which select a target market of early adopters are more likely to see rapid adoption of their service than others. Consider the addressability of a potential target market. When marketers refer to a segment as addressable, they mean that it is possible to reach those customers through marketing channels. In general, the more media that customers consume, the easier it is to address them.

Selecting a target market does not mean that the mobile money product will exclude all other customers. In fact, most operators design their mobile money platform with enough flexibility that the products and services offered can be used by anyone. Target market simply helps operators craft a marketing strategy that will be effective with the customers they most strongly want to serve.

Electronic markets are more effective forms of synchronization for certain classes of products transactions. Applying cheap coordinative transactions, organized networks and straightforwardly available databases, economic theory forecasts that a relative shift of economic activity from single-source sales channels to electronic markets is likely to transpire as: Lower organization costs are more favorable to electronic markets; low-cost calculation is more favorable to electronic markets by making the complex product descriptions simpler and minimizing asset specificity. They are also most likely to transpire as a progression from producer controlled value chains to electronic markets can be predicted and stakeholders will choose markets when amplified volume is larger than loss in income from electronic market effect. Segmentation is the process of identifying groups of consumers likely to use a mobile money service, understanding their requirements, and defining their profiles (Saleemi, 2018). It is only after segmenting the base of potential customers that those operators select a target market. Matters Financial services are more complex than mobile services because of the variety both of customers' needs and of the attributes that customers seek from products that meet those needs. Because different customers have different needs and preferences, it is impossible to market a mobile money service that addresses everyone's equally well. Segmentation helps the operator develop a marketing strategy that effectively drives customer activation.

Segmentation is never undertaken as an end to itself; it always has a practical application. In fact, the ability to apply the segmentation to mobile money service design and/or the development of marketing campaigns is the sign of good segmentation. For example, an advertisement targeting urban migrant workers who send money home would obviously look different and use a different marketing mix from an advertisement targeting rural parents who send money to their children in school. There are numerous ways to segment a market. The most common first step in segmentation is identifying the groups of customers who most need the product being offered. For mobile money transfer, this means identifying consumers who are already transferring money on a regular basis.

Process and Delivery Channel

Market orientation as a business culture leads to business performance improvement, as proved by numerous studies (Bertschek, Cerquera and Klein, 2011). It is precisely product innovation that is considered as a moderator of the link between market orientation and successful business operation (Bertschek, Cerquera and Klein, 2011). Innovations have a positive impact on business performance by leading to a market share increase and/or cost reduction and, in turn, a profit rise. Market oriented enterprises deliver superior quality products to their customers while complying with ecological, health and safety standards as well as with legal norms. Agboola (2010), in his study on Information and Communication Technology (ICT) in Banking operations in Nigeria using the nature and degree of adoption of innovative technologies; degree of utilization of the identified technologies; and the impact of the adoption of Mobile devices on banks, found out that technology was the main driving force of competition in the banking industry. During his study he witnessed increase in the adoption of M-Banking. He indicates that adoption of M-Banking improves the banks' image and leads to a wider, faster and more efficient market. He asserts that it is imperative for bank management to intensify investment in ICT products to facilitate speed, convenience, and accurate services, or otherwise lose out to their competitors.

Hernando and Nieto (2016), studied whether Mobile device delivery channels change bank's performance, they found out that adoption of mobile device as a delivery channel involved gradual reduction in overhead expenses (particularly, staff, marketing and IT) which translates to an improvement in banks' profitability. The study also indicates that Mobile banking is used as a complement to, rather than a substitute for, physical branches. The profitability gains associated with the adoption of a transactional Mobile Banking are mainly explained by a significant reduction in overhead expenses. This effect is gradual, becoming significant eighteen months after adoption and reaching a maximum generally two and a half years after adoption. Their study showed that multichannel banks present statistically significant evidence of efficiency gains that is reduction in general expenses per unit of output. Banks would further profit from cost reductions to the extent that the Mobile delivery channel functions as a substitute for traditional distribution channels. Their analysis shows that this effect varies over time and explains, in terms of cost and income structure, the main drivers of better performance.

According to Bertschek, Cerquera and Klein (2011), companies that build strong brands increase value just by adding their logo to a product. Nike can sell shoes at a much higher price than some of its competitors, even though their production costs may be similar. Value addition also promotes the growth of backward and forward linkages, and in the process creates the much-needed productive jobs for the youth, and equally, increases the purchasing power of citizens. Increased purchasing power means increased demand for locally made products and this in turn, will raise the local market share of products and services. As demand for locally made products increases, so does the demand for financial services and products to cater for the new market. Moreover, value addition provides additional foreign exchange earnings through export of product and services through forex exchange.

Business process management is designed to making daily workflow more productively. But when processes are inefficient or dysfunctional they can lead to a number of problems in the organization. They can affect the quality of service you provide to customers. They can lead to employees that are frustrated and unhappy. And costs can increase as resources are wasted.

Business process can easily become ineffective, wasting time and resources. And ineffective business processes can lead to disgruntled employees, higher costs, and missed opportunities for growth. If you want to see your organization continue to grow, operate efficiently, and have a greater source of impact on customers, it is important to continually evaluate and improve business processes. Business processes are fundamental to the ability of a company to successfully execute business strategies. Technology, the right employees, and supporting structures can all help make this happen. But having the right processes in place is the best way businesses can deliver value to its customers and continue to remain competitive. So the question becomes, how do companies develop high-performing business processes? Business process management examines and evaluates the processes that are present in an organization. It ensures that any processes in place are effective and cost-efficient. It identifies and improves existing processes so the entire organization can continue to find better ways to get things done. Every time you contact a client, develop a new product or deal with a customer complaint, you likely follow a certain set of steps. These steps are known as business processes and they not only save you time, they help your organization run more efficiently. As the market continues to evolve and expectations continue to shift, it is important to regularly improve business process management within an organization. Strive for continuous improvement, instead of perfection (Crespi, Criscuolo and Haskel 2017). Many business processes can become inefficient due to poorly monitored progress or manual effort. Improving business processes will increase efficiency and get rid of activities that waste time and resources.

According to Yusuf (2017), customer satisfaction is ensuring a customer's needs are met, his problems are handled, and he's satisfied with his experience with the company and the company's products or services. Yusuf (2017) also defines customer retention as getting a customer to return after her first purchase, and continue returning on a regular basis. These two activities go hand-in-hand. Ensuring customers are happy and pleased with their experience is the foundation for them coming back and spending more money with the business.

Companies spend millions of dollars every year to create new products, build solid brands, and market new products. Yet none of those activities matter if customers do not buy the product or service a company is marketing. Getting customers in the door to buy is an on-going challenge and a focus of every marketing department across the target market segment. So what happens after the customer buys once? That's when companies' customer satisfaction and retention activities shift into gear. Getting someone to try a company once is a challenge. Getting them to be a repeat customer is even more difficult. That is the fundamental connection between customer satisfaction and customer retention.

Profitability

There are various measures of organizational financial performance. However the most used is profitability (Wekesa, 2016). Profitability measures the extent to which a business generates a profit from the factors of production: labor, management and capital. Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business (Crespi, Criscuolo and Haskel, 2017).

Four useful measures of firm profitability are the: Rate of return on organization's assets (ROA), rate of return on organization's equity (ROE), operating profit margins and the net income. The ROA measures the return to all organizations assets and therefore often used as an overall index of profitability, the higher the value, the more profitable the business operations. The ROE measures the rate of return on the owner's equity employed in an organization's business. It is useful to consider the ROE in relation to ROA in order to determine if the firm is making a profitable return on their borrowed money. The operating profit margin measures the returns to capital per dollar of the gross firm revenue. The two ways a firm has of increasing profits is by increasing the profit per unit produced or by increasing the volume of production while maintaining per unit profit. Operating profit margin, focuses on the per unit produced component of earning profit and the asset turnover ratio focuses on the volume of production component of earning a profit (Crane, 2011). Net firm income comes directly off of the income statement. Net Income is calculated by matching firm revenues with the expenses incurred to create those revenues, in addition to the gain or loss on the sales of firm's capital assets. Net firm income represents the return to the owner for unpaid operator and family labor, management and owner's equity. Just like working capital, net firm income is an absolute dollar amount and not a ratio, thus comparisons to other firms is difficult since firm are different in size (Crespi, Criscuolo and Haskel, 2017). The indicators of profitability were then discussed as follows;

The ROA measures the return to all organizations assets and therefore often used as an overall index of profitability, the higher the value, the more profitable the business operations. It is an indicator of how profitable a business is relative to its total assets. It gives the managers, investors or analyst an idea as to how efficient the management is at using its assets to generate earnings during a period.

The ROE measures the rate of return on the owner's equity employed in an organization's business. It is useful to consider the ROE in relation to ROA in order to determine if the firm is making a profitable return on their borrowed money. The measure is used by investors to determine the level of return an organization is generating in proportion to the investment made. An organization that can generate a high return on equity is considered good investment, which drives up its share price. It measures profitability of business in relation to the equity, measures how well investment is used to generate earnings growth. The operating profit margin measures the returns to capital per dollar of the gross firm revenue. The two ways a firm has of increasing profits is by increasing the profit per unit produced or by increasing the volume of production while maintaining per unit profit. Operating profit margin, focuses on the per unit produced component of earning profit and the asset turnover ratio focuses on the volume of production component of earning a profit (Crane, 2011).

Net firm income comes directly off of the income statement. Net Income is calculated by matching firm revenues with the expenses incurred to create those revenues, in addition to the gain or loss on the sales of firm's capital assets. Net firm income represents the return to the owner for unpaid operator and family labor, management and owner's equity. Just like working capital, net firm income is an absolute dollar amount and not a ratio, thus comparisons to other firms is difficult since firm are different in size (Crespi, Criscuolo and Haskel, 2017).

III. RESEARCH METHODOLOGY

Introduction

This study sought to analyze the effect of M-Banking innovations on profitability of Commercial Banks. Specific areas under study:- research design, data collection procedures, sampling techniques and data analysis procedures. Research methodology shows various methods used by the researcher in collecting, analysis, presentation and discussion of the study findings. This is inclusive of research strategy details, the various respondent categories and the method used in data collection.

Research Design

This study used descriptive census research design. Orodho (2013) and Kothari (2013) describe a descriptive census design as a design that seeks to portray accurately the characteristics of a particular individual, situation or a group. According to Kothari (2013), in a descriptive study, researchers observe, count, delineate, and classify. They further describe descriptive research studies as studies that have, as their main objective, the accurate portrayal of the characteristics of persons, situations, or groups, and/or the frequency with which certain phenomena occur. (Mugenda and Mugenda, 2019) describes a descriptive survey research design as a systematic research method for collecting data from a representative sample of individuals using instruments composed of closed-ended and/or open-ended questions, observations, and interviews. It is one of the most widely used non-experimental research designs across disciplines to collect large amounts of survey data from a representative sample of individuals sampled from the targeted population.

Target Population

Population is a well-defined or set of people, services, elements, and events, group of things or households being investigated. Cooper and Schindler (2016) states that the target population must be defined clearly so that proper sources from which data are to be collected can be identified. Target population in statistics is the specific population about which information is desired. According to Ngechu (2014), Creswell (2013) acknowledges that a target population as one that the researcher wants to generalize the study results. The target population of this study is 255 staff working in the 15 Commercial Banks within Trans Nzoia County that have been operating between 2014 and 2018.

Table 3.1: Target Population

Staff level	Population	Percentage
Managers	15	5
Heads of operations	75	30
Customer care (Tellers)	90	30
Marketing (Direct sales Agents)	75	30
Total	255	100

Sample Size and Sampling Technique

The researcher will use census study due to the small number of respondents in the target population whose responses are important and indispensable in this study. The target population of the study is 255 staff working in the 15 licensed commercial banks in Trans Nzoia County and that have been in operation between 2014 and 2018. According to Kothari (2014), census study was ideal for the researcher to establish the impact and influence of M-Banking technology and innovation as more convenient strategy of sustainable profitability performance for commercial banks in Trans Nzoia County, a census study is more essential due to the small number of commercial banks in Trans Nzoia County.

Sampling Frame

According to Orodho and Kombo (2015), a sampling frame is a list of elements from which to select a probability sample. This study had a total of 255 respondents from the targeted 15 commercial banks in Trans Nzoia County that have been in operation between the years 2014 and 2018.

Data Collection Instruments and Procedure

In order to comprehensively study the effects of Mobile banking technology and Innovation as a strategy to profitability for commercial banks and draw a valid conclusion (Cooper and Schindler, 2010). With respect to effects of ICT innovations on profitability, the study will utilize a closed format questionnaire used in various previous research projects. The questionnaire designed in this study comprised of two sections. The first part was designed to determine fundamental issues including the demographic characteristics of the respondent, while the second part consisted of questions focusing on the four independent variables (Technology Innovations, Product base Innovations, Market System Innovations and Process & Delivery Channel Innovations) and the dependent variable (Profitability of commercial Banks Trans Nzoia County).

To enhance quality of data to be obtained, Likert-scale type questionnaire was adopted whereby respondents indicated the extent to which the variables are practiced on a five point Likert scale; (Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree). The structured questions were used in an effort to conserve time and money as well as to facilitate an easier analysis as they were in immediate usable form;

Type and Sources of Data

The study collected both primary and secondary data for the purpose of analyzing the effects of Mobile banking profitability performance of Commercial Bans. Primary data was collected using the questionnaires while secondary data was obtained from annual reports of the banks.

Data Collection Instruments and Procedure

Data collection involved self-administered questionnaires. The researcher dropped off the questionnaires physically at the respondents' place of work and picked them after the agreed period of 5 days. Each questionnaire was coded to enable the researcher identify which person responded. The coding technique was only used for the purpose of matching filled and returned questionnaires with those delivered to the respondents.



Pilot Test

According to Kothari (2014), a pilot test is necessary for testing the reliability and validity of the data collection instruments. Cooper and Schindler (2016) explain reliability of the research instrument as determining whether the instrument will truly measure that which it intends to measure or how truthful the research results will be. The clarity of the research instruments to the respondents was established so as to enhance the instrument’s validity and reliability. The pilot study, 10% of the 255 respondents targeted, facilitated familiarity with research and its administration procedure as well as identified items that required modification. The result helped correct inconsistencies that arose from the instrument, to ensure it measures what is intended. The researcher carried out the pilot test in Moi’s Bridge town, Soy Sub-County (in the neighboring Uasin Gishu County), being an area outside the scope of this study.

Validity of Research instruments

Validity is the degree by which the sample of test items represents the content the test is designed to measure (Cooper and Schindler, 2016). Content validity which was employed by this study is a measure of the degree to which data collected using the questionnaire represents a specific domain or content of a particular concept. Mugenda and Mugenda (2019) contend that the usual procedure in assessing the content validity of a measure is to use a professional or expert in a particular field. To establish the validity of the research instrument, the opinions of the supervisor and other experts in the field of study, especially ICT innovations, were obtained to facilitate the necessary improvement in the questionnaire to enhance validity.

Reliability of Research instruments

The reliability of an instrument refers to its ability to produce consistent and stable measurements (Cooper and Schindler, 2016). The reliability coefficient used by this study is the Cronbach alpha, which estimates internal consistency by determining how all items on a test relate to all other items and to the total test - internal coherence of data (Cooper and Schindler, 2016). The reliability is expressed as a coefficient between 0 and 1. The higher the coefficient, the more reliable is the test.

The findings of the pilot test indicated that Technology Innovations had a coefficient of 0.716; Product Base Innovations had a coefficient of 0.764, Market System Innovations had a coefficient of 0.757 and Process & Delivery Channel Innovations had a coefficient of 0.793. According to Ronoh (2018), a coefficient above 0.7 represents reliability. All constructs below indicated Cronbach Alpha coefficients above the suggested value of 0.7 implying that the study was reliable. Based on the reliability test, it was concluded that the scale used in this study was reliable to capture the constructs for the research as shown in the table below;

Table 3.2: Reliability Analysis

Variables	Number of items	Cronbach Alpha	Comment
Technology Innovations	5	0.716	Acceptable
Product Base Innovations	5	0.764	Acceptable
Market System Innovation	5	0.757	Acceptable
Process & Delivery Channel Innovation	5	0.793	Acceptable
Profitability	5	0.815	Acceptable
Average Cronbach Alpha		0.769	Acceptable

From the table above, the overall reliability statistics table was as shown below;

Table 3.3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.769	.774	5

Data Processing and Presentation

The multiple linear regression analysis will be used to analyze the respondents’ views about the influence of M-Banking Technology innovations on profitability of commercial banks. According to Francis (2017), using multiple linear regression analysis is advantageous in that it enables the determination of relative influence of one or more predictor variables to the criterion value and identifying anomalies for easier analysis. Francis proceeds by stating that multiple linear regression analysis helps explain the relationship between one continuous dependent variable and two or more independent variables. Descriptive statistics tool SPSS was used in data analysis and helped in describing the



data and determining the extent of the variables correlation. The multiple linear regression model took the form, at a significance level of 5%;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where;

- Y Profitability of Commercial Banks in Trans Nzoia County
- β_0 Constant/Intercept term
- X_1 Technology Innovations
- X_2 Product Innovations
- X_3 Market Innovations
- X_4 Process Innovations
- ε Error term

IV. RESEARCH FINDINGS AND DISCUSSION

Introduction

This chapter contains presentation and interpretation of the data collected in the study. The general objective of the study was to establish the influence of M-Banking Technology Innovations on profitability of commercial Banks in Trans Nzoia County, Kenya. The specific objectives of this study were:-to examine the influence of M-Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County, to assess the influence of the M-Banking Technology product base Innovations on profitability of Commercial Banks in Trans Nzoia County, to analyze the influence of M-Banking Technology Market system Innovations on profitability of Commercial Banks in Trans Nzoia County and to assess the influence of M-Banking Technology Process and delivery channel Innovations on profitability of Commercial Banks in Trans Nzoia County.

Response Rate

Out of the total 255 questionnaires that sent to the respondents, 190 of them were dully filled and returned by the respondents; yielding a response rate of 74.5%. This was considered a very reliable response rate for generalizations of study findings since according to Zikmund et al., (2010) a response rate of 70 percent and above is said to be a reliable response rate.

Pilot Study

Fraenkel and Wallen (2000) stated that items are considered reliable if they yield a reliability coefficient of 0.70 and above. The researcher conducted a pilot study on 26 respondents (2 commercial Banks) in Moi's bridge to test the data collection instruments validity. According to Connelly (2008) pilot study sample should be 10% of the projected sample for the larger study. . According to Ronoh (2018), a co-efficient above 0.7 represents reliability. To determine the reliability of the findings, Cronbach's alpha correlation coefficient was computed at 95% confidence interval for all the variables under study. Total Cronbach's alpha correlation coefficient was found to be 0.891. This indicated that the level of internal consistency for the items was 89.1 percent. Therefore, the study showed the existence of acceptable level of inter-item consistence.

Demographic Characteristics of the Respondents

Gender

The study established that majority of the respondents 57.4 percent were male while 42.6 percent of them were female. These study findings depicted a good representation of both gender at TSC.

Table 4.1 Gender of the respondent

Gender	Frequencies in Percentage
Male	57.4
Female	42.6
Total	100

Age

The respondent age in years indicated that 25.9 percent of the respondents were between age 21-30 years, 30.1 percent were between 31-40 years of age. 25.2 percent of the respondents were aged between age 41-50 years while 20.8 percent of the respondents were aged 51 and over years of age. Majority of the respondent were between age 31-40 years as shown in table 4.2 below.



Table 4. 2: Age of the respondent

Age	Percent
21-30 years	25.9
31-40 years	28.1
41-50years	25.2
51and over years	20.8
Total	100

Number of Years in Service

Distribution by number of years in service 25.3 percent of the respondents had worked for a period of below 0-3 Years in the organization. 38.6 percent of the respondents had worked for a period of 4- 7 Years . 40.3 percent of the respondents have worked in the organization between 8-11 years while 25.5 percent of the respondents had worked for a period over 12 years in the organization as shown in table 4.3 below.

Table 4.3: Number of Years in Service

No. of Years	Percent
0-3 Years	25.3
4- 7 Years	38.6
8 – 11 Years	40.3
Above 12 Years	29.5
Total	100.0

Presentation of Findings

Influence of M-Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County

Influence of M-Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County. Technological innovations such as the use of computer automation and electronic banking influences speed of bank service delivery, enhanced management decision making and saving time (Alu, 2014). (Agboola, 2010). Laudon (2010) argues that Technological Innovation deals with the Physical devices and software that link various computer hardware components and transfer data from one physical location to another. Electronic Banking has tremendously improved the services of banks to their customers (Agboola, 2010). Kariuki (2015) argues that there exist positive impacts of M-banking on the turnover and profitability and to a lesser extent on employment, most notably when e-commerce is part of larger business strategies of the bank. Further, Kariuki (2015) provides evidence that the use of M-Banking can contribute to improved bank performance, in terms of increased market share, expanded product range, customized products and better response to client demand.

From table 4.1 below, Mobile banking innovation has improved the bank’s profitability due to improved the bank’s rate of return on assets (RAO), better rate of return on bank’s equity (RAE), expanded the operating profit margins and increased net income.

Table 4.1: Influence of M-Banking Technology Innovations on profitability of Commercial Banks in Trans

Statements		SA	A	N	D	SD	T
The mobile banking innovation has improved the bank’s profitability	%	8.3	47.2	29.2	10.9	4.5	100
The mobile banking innovation has improved the bank’s rate of return on assets (RAO).	%	30.7	30.9	4.7	22.7	10.9	100
Mobile banking innovation has bettered the rate of return on bank’s equity (RAE)	%	11.3	47.3	25.1	5.5	10.9	100
Mobile banking innovation has expanded the operating profit margins.	%	6.3	24.6	40.0	18.3	10.8	100
Mobile banking innovation has increased the effect of net income	%	13.6	18.2	40.0	22.7	5.5	100



Nzoia County

Influence of the M-Banking Technology product base Innovations on profitability of Commercial Banks in Trans Nzoia County

Mabrouk and Mamoghli (2010), in their study on Dynamics of Financial Innovation and Performance of Banking Firms: Context of an Emerging Banking Industry, analyzed the effect of the adoption of two types of financial innovations namely; product innovation (M-Banking and SMS banking and so on) and process Automatic cash dispenser on the performance of banks. Their analysis included two adoption behaviors, first mover in adoption of the financial innovation and imitator of the first movers. Bernerjee (2016) concluded that banks that imitate are less profitable and less efficient than first movers.

Table 4.6 mobile banking process innovations have increased the bank long term business growth as a result of provision of unique and superior value, new better product and knowledge base and safeguarded and improved product quality.

Table 4.6: Influence of product base Innovations on profitability of Commercial Banks in Trans Nzoia County

Statements		SA	A	N	D	SD	T
Mobile banking process has increased product base innovations	%	30.0	41.8	22.7	5.5	0	100
Mobile banking process innovations have increased the bank long term business growth	%	9.1	16.4	30.0	27.3	17.3	100
Mobile banking process innovations have increased the provision of unique and superior value	%	18.2	29.1	19.1	28.2	5.5	100
Mobile banking process innovations has improved new product and knowledge base	%	23.6	34.5	13.6	0	28.2	100
Mobile banking process innovations have safeguarded and improved product quality	%	36.4	40.0	22.7	0.9	0	100

Influence of M-Banking Technology Market system Innovations on profitability of Commercial Banks in Trans Nzoia County

Berger (2018) observed that the most visible process innovations in recent years have been those exploiting Mobile technologies to allow for rapid increase in Mobile banking transactions. Bernard, Lima and Souza (2017), service delivery process innovation involves changes to the service delivery process or how the service is being provided with significant changes in the role of staff, strategic partners, and/ or customers, the most typical form of innovation including increased accessibility and changes in the degree of self service. Banerjee (2016) found that most recent innovations in the banking sector focused on delivery of products or services, management of customer interactions and administration of back office functions. The study sought to analyze the influence of M-Banking Technology Market system Innovations on profitability of Commercial Banks in Trans Nzoia County.

From table 4.3 below, mobile banking has had a positive influence on market system innovation due to better and potential market identification, improved target market mix, better market service provision. And better and skillful market segmentation.

Table 4.7: influence of Market system Innovations on profitability of Commercial Banks in Trans Nzoia County

Statements		SA	A	N	D	SD	T
Mobile banking has had a positive influence on market system innovations.	%	5.5	35.5	30.9	11.8	16.4	100
Mobile banking market system innovations have led to better and potential market identification.	%	6.4	36.4	19.1	27.3	10.9	100
Mobile banking market system innovations have improved target market mix.	%	12.7	41.8	17.3	22.7	5.5	100
Mobile banking market system innovation has increased better market service provision.	%	0.9	52.7	18.2	6.4	21.8	100
Mobile banking market system innovations have improved skillful market segmentation.	%	28.2	36.4	17.3	12.7	5.5	100



Influence of Process and delivery channel Innovations on profitability of Commercial Banks in Trans Nzoia County

Market orientation as a business culture leads to business performance improvement, as proved by numerous studies (Bertschek, Cerquera and Klein, 2011). It is precisely product innovation that is considered as a moderator of the link between market orientation and successful business operation (Bertschek, Cerquera and Klein, 2011). Market oriented enterprises deliver superior quality products to their customers while complying with ecological, health and safety standards as well as with legal norms. Agboola (2010), The study sought to assess the influence of M-Banking Technology Process and delivery channel Innovations on profitability of Commercial Banks in Trans Nzoia County.

Table 4.8: influence Process and delivery channel Innovations on profitability of Commercial Banks in Trans Nzoia County

statements		SA	A	N	D	SD	T
Mobile banking process and delivery channel has positively influenced process and delivery channel innovations	%	31.0	35.4	19.4	10.8	5.5	100
Mobile banking process and delivery channels innovations have had a positive effect on value addition	%	30.9	16.4	30.9	16.4	5.5	100
Mobile banking process innovations have influenced positively business process efficiency	%	19.1	41.8	32.7	6.4	0	100
Mobile banking process and delivery channel innovations have positively influenced time management	%	8.2	51.8	28.2	5.5	6.4	100
Mobile banking process and delivery channel innovations have positive influence on customer satisfaction and retention	%	27.3	50.9	21.8	0	0	100

The influence of mobile banking technology innovations have on profitability of commercial Banks in Trans Nzoia County

There are various measures of organizational financial performance. However the most used is profitability (Wekesa, 2016). Profitability measures the extent to which a business generates a profit from the factors of production: labor, management and capital. Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business (Crespi, Criscuolo and Haskel, 2017). Four useful measures of firm profitability are the: Rate of return on organization’s assets (ROA), rate of return on organization’s equity (ROE), operating profit margins and the net income. The ROA measures the return to all organizations assets and therefore often used as an overall index of profitability, the higher the value, the more profitable the business operations. The ROE measures the rate of return on the owner’s equity employed in an organization’s business. It is useful to consider the ROE in relation to ROA in order to determine if the firm is making a profitable return on their borrowed money. The operating profit margin measures the returns to capital per dollar of the gross firm revenue. Lastly, the study sought to analyze the influence mobile banking technology innovations have on profitability of commercial Banks in Trans Nzoia County.

From table 4.5 Mobile banking technology innovation increased profitability of commercial banks majority of the respondents agreed that mobile banking technology innovation increased profitability of commercial banks as in influence per transaction basis advantage. Channel of expansion is too increasing with mobile banking. Mobile banking market innovation too has led to benefits of upward scale effect and Increased range of banking transactions

Table 4.5: Influence mobile banking technology innovations have on profitability of commercial Banks in Trans Nzoia County

Statements		SA	A	N	D	SD	T
Mobile banking technology innovation increased profitability of commercial banks.	%	58.2	30.0	10.9	0.9	0	100
Mobile banking technology innovation has per transaction basis advantage.	%	54.5	38.2	6.4	0.9	0	100
Mobile banking technology innovation has influenced the channel of expansion.	%	45.5	47.3	5.5	0.9	0.9	100



Mobile banking market innovation has led to benefits of scale effect.	%	58.2	30.9	10.9	0	0	100
Mobile banking technology innovation has increase range of banking transactions.	%	52.7	34.5	12.7	0	0	100

Inferential Statistics

Pearson Correlation

The study sought to establish the strength of the relationship between independent and dependent variables of the study. Pearson correlation coefficient was computed at 95 percent confidence interval (error margin of 0.05). Table 4.6 illustrates the findings of the study.

Table 4.6: Correlation Matrix

		Profitability of commercial Banks
M-Banking Technology Innovations	Pearson Correlation	.607**
	Sig. (2-tailed)	.000
	N	190
M-Banking Technology product base Innovations	Pearson Correlation	.921**
	Sig. (2-tailed)	.000
	N	190
M-Banking Technology Market system Innovations	Pearson Correlation	.836**
	Sig. (2-tailed)	.000
	N	190
M-Banking Technology Process and delivery channel Innovations	Pearson Correlation	.823**
	Sig. (2-tailed)	.000
	N	190

Table 4.6 above, the p-value for M-Banking Technology Innovations was found to be 0.000 which is less than the significant level of 0.05, (p<0.05). The result indicated that Pearson Correlation coefficient (r-value) of 0.607, which represented an average, positive relationship between M-Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County.

Table 4.6 above, the p-value for M-Banking Technology product base Innovations was found to be 0.000 which is less than the significant level of 0.05, (p<0.05). The result indicated that Pearson Correlation coefficient (r-value) of 0.921, which represented a strong, positive relationship between M-Banking Technology product base Innovations on profitability of Commercial Banks in Trans Nzoia County..

Table 4.6 above, the p-value for M-Banking Technology Market system Innovations was found to be 0.000 which is less than the significant level of 0.05, (p<0.05). The result indicated that Pearson Correlation coefficient (r-value) of 0.836, which represented a strong, positive relationship between M-Banking Technology Market system Innovations on profitability of Commercial Banks in Trans Nzoia County.

Table 4.6 above, the p-value for M-Banking Technology Process and delivery channel Innovations was found to be 0.000 which is less than the significant level of 0.05, (p<0.05). The result indicated that Pearson Correlation coefficient (r-value) of 0.823, which represented a strong, positive relationship between M-Banking Technology Process and delivery channel Innovations on profitability of Commercial Banks in Trans Nzoia County.

Multiple Linear Regression

Multiple linear regressions were computed at 95 percent confidence interval (0.05 margin error) to show the multiple linear relationships between the independent and dependent variables of the study.

Coefficient of Determination (R²)

Table 4.6 shows that the coefficient of correlation (R) is positive 0.527. There is a positive correlation between influences of M-Banking Technology Innovations on profitability of commercial Banks in Trans Nzoia County, Kenya. The coefficient of determination (R Square) indicates that 25.9% of profitability of commercial Banks in Trans Nzoia County, Kenya is influenced by M-Banking Technology Innovations. The adjusted R² however, indicates that 31.2% of profitability of commercial Banks in Trans Nzoia County, Kenya is influenced by M-Banking Technology Innovations leaving 68.8% to be influenced by other factors that were not captured in this study.



Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.527 ^a	.259	.312	7.12218

a. Predictors: (Constant), M-Banking Technology Innovations, M-Banking Technology product base Innovations, M-Banking Technology Market system Innovations, M-Banking Technology Process and delivery channel Innovations

Analysis of Variance

Table 4.8 shows the Analysis of Variance (ANOVA). The p-value is 0.000 which is < 0.05 indicates that the model is statistically significant in predicting how M-Banking Technology Innovations influence the profitability of commercial Banks in Trans Nzoia County, Kenya. The results also indicate that the independent variables are predictors of the dependent variable.

Table 4.8: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	925.798	4	613.608	56.109	.000 ^b
	Residual	2432.302	166	16.733		
	Total	3258.090	190			

Regression Coefficients

From the Coefficients table (Table 4.9) the regression model can be derived as follows:

$$Y = 44.562 + 0.954X_1 + 0.492X_2 + 0.487X_3 + 2.032X_4$$

The results in table 4.9 indicate that all the independent variables have a significant positive effect on profitability of commercial Banks in Trans Nzoia County, Kenya. The most influential variable is M-Banking Technology Process and delivery channel Innovations, with a regression coefficient of 2.032 (p-value = 0.000), followed by M-Banking Technology Innovations with a coefficient of 0.954 (p-value = 0.000) then M-Banking Technology product base Innovations with a coefficient of 0.492 (p-value = 0.000) and lastly M-Banking Technology Market system Innovations with a coefficient of 0.487 (p-value = 0.018). According to this model when all the independent variables values are zero, profitability of commercial Banks in Trans Nzoia County, Kenya will have a score of 43.561.

Table 4.9: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	44.562	2.803		15.209	.000
M-Banking Technology Innovations,	.954	.123	.703	3.674	.000
M-Banking Technology product base Innovations,	.492	.146	.431	2.476	.000
M-Banking Technology Market system Innovations, ,	.487	.157	.422	2.002	.000
M-Banking Technology Process and delivery channel Innovations,	2.032	.173	.644	5.309	.000

V. SUMMARY CONCLUSION AND RECOMMENDATION

Introduction

This chapter presents discussion of findings, conclusion as well as recommendations based on the objectives of the study.

Summary of Findings

Influence of M-Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County

The study sought to establish the influence of M-Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County. The findings implied that the mobile banking innovation has improved the bank's

profitability and that the mobile banking innovation has improved the bank's rate of return on assets (RAO). These findings also implied that mobile banking innovation has bettered the rate of return on bank's equity (RAE) and that mobile banking innovation has expanded the operating profit margins. On the statement of whether mobile banking innovation has increased the effect of net income, majority agreed.

Influence of the product base Innovations on profitability of Commercial Banks in Trans Nzoia County

The findings implied that mobile banking process has increased product base innovations and that majority of the respondents disagreed that mobile banking process innovations have increased the bank long term business growth. These findings implied that mobile banking process innovations have increased the provision of unique and superior value and that mobile banking process innovations has improved new product and knowledge base. Finally, majority of the respondents indicated that mobile banking process innovations have safeguarded and improved product quality.

Influence of Market system Innovations on profitability of Commercial Banks in Trans Nzoia County

The findings indicated that mobile banking has had a positive influence on market system innovations and that mobile banking market system innovations have led to better and potential market identification. The findings revealed that mobile banking market system innovations have improved target market mix, mobile banking market system innovation has increased better market service provision. The finding also showed positively that mobile banking market system innovations have improved skillful market segmentation.

Influence of Process and delivery channel Innovations on profitability of Commercial Banks in Trans Nzoia County

The findings implied that mobile banking process has positively influenced process and delivery channel innovations and mobile banking process innovations have had a positive effect on value addition. The findings also implied mobile banking process innovations have influenced positively business process efficiency and that mobile banking process innovations have positively influenced time management. Banking process innovations have positive influence on customer satisfaction and retention.

Conclusion

In conclusions the study found that M-Banking Technology Innovations was found to be p-value 0.000 which is less than the significant level of 0.05, ($p < 0.05$). The result indicated that Pearson Correlation coefficient (r-value) of 0.607, which represented an average, positive relationship between M-Banking Technology Innovations on profitability of Commercial Banks in Trans Nzoia County.

M-Banking Technology product base Innovations was found to be p-value 0.000 which is less than the significant level of 0.05, ($p < 0.05$). The result indicated that Pearson Correlation coefficient (r-value) of 0.921, which represented a strong, positive relationship between M-Banking Technology product base Innovations on profitability of Commercial Banks in Trans Nzoia County.

M-Banking Technology Market system Innovations was found to be p-value 0.000 which is less than the significant level of 0.05, ($p < 0.05$). The result indicated that Pearson Correlation coefficient (r-value) of 0.836, which represented a strong, positive relationship between M-Banking Technology Market system Innovations on profitability of Commercial Banks in Trans Nzoia County.

M-Banking Technology Process and delivery channel Innovations was found to be p-value 0.000 which is less than the significant level of 0.05, ($p < 0.05$). The result indicated that Pearson Correlation coefficient (r-value) of 0.823, which represented a strong, positive relationship between M-Banking Technology Process and delivery channel Innovations on profitability of Commercial Banks in Trans Nzoia County.

Recommendations

The Commercial Banks in Trans Nzoia County should embrace creativity and innovation to realize the profits and the bank's rate of return on assets (RAO), ensure that mobile banking process innovations are safeguarded to improve product quality, target market mix, increased better market service provision and skillful market segmentation.

Areas for Further Research

This study focused on establishing the influence of M-Banking Technology Innovations on profitability of commercial Banks in Trans Nzoia County, Kenya. This study recommends that further study be done to argument findings of this study; the study should be on the influence of M-Banking Technology Innovations on profitability of commercial Banks in other Counties, Kenya.

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BIOGRAPHY



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Born in the slopes of Cherangany hills Trans Nzoia County, Rift Valley Region, Kenya. As a second born child and eldest daughter to a single mother household. Passionate about education and community transformation She has had to beat all the odds accustomed by the cultural beliefs and traditions to go through education despite the harsh economic status and long distance to the far off scattered and inefficiently equipped education institutions. Having attained Diploma in Information Technology from Eldoret National polytechnic and a Bachelor's degree in Business Information Technology she is currently publishing for her Msc. in Information Communication Technology from Jomo Kenyatta University of Agriculture & Technology and wish to do more Transformative scholarly technology journals.

Education and Technology has proved to be the countries global grid enabler and as such all young people should endeavor to be as much as they can be academically so as to always put our countries in a global grid and move and move with the ever changing global Technology dynamics and demands. Lucy looks forward to be participate and being part of Kenya's icon on Technology policies, systems and security advancement. With special focus on systems Design, analysis and Implementation.



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