

**DIGITALIZATION OF FINANCIAL SERVICES AND FINANCIAL
PERFORMANCE OF BANKS
CASE STUDY OF BANK OF KIGALI PLC: PERIOD 2019-2022**

BY:

Nice MUMARARUNGU

**Thesis Submitted in Partial Fulfillment of the Requirements for the Master's
degree in Finance**

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DECLARATION

I, Nice MUMARARUNGU, hereby declare that this submission is my own work towards the Master's degree of Finance and that, to the best to my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

Date.....|.....|.....

Student's Signature

Nice MUMARARUNGU

APPROVAL

This research project entitled “Digital financial system and financial performance in financial institutions.” written and submitted by Nice MUMARARUNGU, in partial fulfillment of the requirements for the degree of Master’s Degree in Finance is hereby accepted for defense.

Dr. GASHEMA Bruce

Supervisor

Date

DEDICATION

To my beloved parents

To my beloved brothers and sisters

To my friends and colleagues

ACKNOWLEDGEMENTS

First and foremost, I would like to may glory and honour be to the Almighty Lord through whom all things are possible for giving me the determination, patience and courage to pursue this master's degree programme.

It is a fruit of the energy of different people who friendly cooperated to bring this dissertation into a reality. It is a big pleasure that I wish to acknowledge the following people for their enormous effort in producing this project work. I thank the staff and lecturer of the ULK for all they have done for me. I am extremely grateful to my supervisor Dr. GASHEMA Bruce for her.

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LIST OF ABBREVIATIONS AND ACRONYMS

ATM	- Automatic teller machine
AUCA	- Adventist University of Central Africa
BNR	- <i>Banque Nationale du Rwanda</i>
DFS	- Digital Financial Services
EU	-European Union
ICT	- Information and Communication Technology
NPM	- Net Profit Margin
ROA	- Return on Assets
ROE	- Return on Equity
SERVQUAL	- Service Quality
SPSS	- Statistical Package for Social Science
TAM	- Technology Acceptance Model
ULK	- Université Libre de Kigali
USA	- United States of America

ABSTRACT

The main objective of this research was to assess the effect of digital financial system on financial performance in financial institutions. Financial institutions in Rwanda including Bank of Kigali still receive complainants from their customers that they continue to recognize the long queues are still using different branches of banks at a vast rate comparing to the previous one before the implementation of digital financial services. Different concepts, theories and available related literatures published on the variables made this study were used. In this study the researcher adopted descriptive and correlation research design to enable the researcher accomplishes the objectives of the study. The research conducted in Bank of Kigali Rwanda, headquarter. The questionnaires were distributed to the respondents as an instrument for data collection, and data collected was analyzed using SPSS version 22. The findings revealed that the respondents strongly confirmed that digital financial system affect financial performance in financial institutions through ATM services as shown with the overall mean of 3.61 (Table 6), analysis done on mobile banking with the overall mean of 3.70 (Table, 7), and analysis done on online banking with the overall mean of 4.52 (Table, 8). The findings also showed that Bank of Kigali's ROA in 2019 is 3.66%. Bank of Kigali's ROA in 2020 is 2.95%. In 2021 and 2022, the return on asset ratio is 3.26% and 3.22% respectively means that the BK is investing a low amount of capital into its production while simultaneously receiving high income. BK's ROE is 16.9% in 2019. This means that every Rwf of common shareholder's equity earned about Rwf 16.9 in 2019. In other words, shareholders saw a 16.9 percent return on their investment. Table 10 also shows that from 2020 and 2022 the ratio are the following 14.8%, 18.2%, and 18.7% respectively indicates that BK 's return on equity is in positive way; it means its shareholders are winning and gaining value. The net profit margin of bank of Kigali fluctuated from 2019 to

2021. Notice that in terms of Rwf amount, net sales is higher in next year. Nonetheless, in 2019 represents only 39.6% of sales; while in 2020, it represents 34.1%; but in 2021, it represents 38.1%, and 43.3% in 2022. For every 1 Rwf of sales, bank of Kigali made Rwf 0.39 in 2019, Rwf 0.34 in 2020, Rwf 0.38 in 2021, and Rwf 0.43 in 2022. Using the Pearson correlation, the researcher concluded that digital banking system have very high correlation to financial performance in financial institutions due to the fact that equal $r = .884^{**}$ which is very high correlation and the p-value is .006 which is less than 0.05. However, researcher recommends that BK should therefore continue to adopt new technologies which will improve their margins and hence their profitability in order to attract more investors.

Key Words: digital, banking, system, financial, and performance.

CHAPTER 1: INTRODUCTION TO THE STUDY

This chapter presents background of the study, problem statement, research objective research question, hypothesis of the study, scope of the study, significance of the study, and definition of key terms.

1.1 Background to the study

According to Taylor (2014), some international monetary institutions implement digital banking services to their customers. Such firms include commercial banks, financial cooperatives, and firms offering microfinance services, among others. The digital financial service is meant to provide adequate customer delivery channels. It is collectively approved that a safe and well-organized digital financial system use as an international technology system is crucial for secure banking institutions in different locations such as Europe, America, Asia, and Africa (Mulee, 2011). The benefits derived from the information technology system, as well as electronic banking, are practical among users. Today's business environment is extremely dynamic and experience rapid changes as a result of technological improvement, increased awareness and demands that banks serve their customers electronically. Banks have traditionally been in the forefront of harnessing technology to improve their products and services. (Salehi & Zhila, 2015).

The European Union (EU) has been involved in the usage and adoption of digital money since 2000, as well; for example, in France, England, and German implemented electronic banking much longer than many other countries of the same regions (McAndrews & Strahan, 2012). The management of the financial institutions has embarked on promoting digital financial services through the use of ATM (Quick Cash) and mobile banking and other digital products to attract its customers on its usage; it is convenient, reliable, fast and safe. The Barclays Bank in the UK had

commercial electronic or digital where clients in any region of the country can send and receive money with the use of their mobile phones. The money is transferred electronically with their mobile phones. The service is also offered by the organization internationally or cross-borders (Barclays Bank, 2013).

Many sectors in the economy in Kenya, inclusive of the financial industry, cannot avert technological advances. Banking over the internet is one of the technological advancement which has gained competition. The evolution of ATMs, e-banking, and mobile banking has increased competition among banks in Kenya. New markets and distribution channels have also been created due to the penetration of the internet into other areas. Kigen (2019) explain digital banking as giving financial services over the internet. In modern times, banks have started adopting various channels in delivery of services through using hybrid platforms where some branches offer both traditional and electronic banking services.

In this modern era, the advancement in Technology has played an important role in improving service delivery standards in the Banking industry in Rwanda. In its simplest form, Automated Teller Machines (ATMs) and deposit machines now allow consumers to carry out banking transactions beyond banking hours (Nath & Shrick, 2015). This was popularized in Rwanda first by Bank of Kigali; customers can also recharge their mobile phones via SMS. E-Banking has made banking transactions easier around the World and it is fast gaining acceptance in Rwanda. Therefore, the researcher intends to carry out a study on the effect of digital financial system on financial performance in financial institutions with Bank of Kigali as case study.

1.2 Statement of the Problem

According to the BNR (2020), information technology was expected to minimize time, distance, and space and expense thus expanding access to affordable financial services. It was found that, electronic banking is allowing banks to change from the traditional channels associated with human assistance to digital channels that operate on self-service basis reducing operational cost and improving efficiency and financial performance. However, through the analysis of Bank's financial data, it is observed that the BK's return on assets has fluctuated from 2019-2021, for instance, the BK has 3.66% in 2019 decreased to 2.95% in 2020 and then increased to 3.26 in 2021. BK's net profit margin in 2019 was 39.6 in 2020 was decreased to 34.1%. BK also its return on equity has fluctuated from 2019-2021, for instance, the BK has 16.9% in 2019 decreased to 14.9% in 2020 and then increased to 18.2 in 2021 because the loan provisions bring a decrease on the bank's performance. This is why this study investigates the effect of digital financial system on financial performance in financial institutions in Rwanda.

1.3 Research objectives

Objectives of this study are both general and specific objectives:

1.3.1 General objectives

The main objective of this research was to assess the effect of digital financial system on financial performance in financial institutions.

1.3.2. Specific objectives

The following are specific objectives

1. To analyze the use of digital financial system tools in Bank of Kigali.
2. To evaluate the level of financial performance of Bank of Kigali.

3. To assess the relationship between digital financial system and financial performance in financial institutions in Rwanda.

1.4 Research Questions

1. How does digital financial system tools applied in Bank of Kigali?
2. What is the level of financial performance of Bank of Kigali?
3. Is there any relationship between digital financial system and financial performance in financial institutions in Rwanda?

1.5 Hypothesis

Baron (2019), hypothesis is logically conjectured relationship between two or among more variables and lends itself to being tested through statistical analysis of the data collected for the purpose. This study has the following hypotheses:

H₀: There is no significant relationship between digital financial system and financial performance in financial institutions in Rwanda.

H₁: There is a significant relationship between digital financial system and financial performance in financial institutions in Rwanda.

1.6 Scope of the study

The scope of the study covered time, geographic and content scope.

1.6.1. In time scope

This study covered the period of three years, from 2019 to 2022 and this period was important to reach digital financial system and financial performance in financial institutions.

1.6.2. In Geographical scope

This research carried out in Bank of Kigali, located in Kigali city, Nyarugenge district because it is easy to get data here.

1.6.3. In content

The study focused on effect of digital financial system on financial performance in financial institutions.

1.7 Significance of the study

The main aim of the study was helpful fill significant gaps in knowledge about digital financial system and perceptions of customers on financial performance in financial institutions. In addition to this, the study findings are expected to be of great use to:

1.7.1. Personal interest

This study will help the researcher to get equipped with knowledge; skills and experience gains during the research, especially for the digital financial system and perceptions of customers on financial performance in financial institutions. Also the study enables her to fulfill his academic duty as it is required at the end of postgraduate studies.

1.7.2. Social interest

This study will help the Rwandan population to understand the effect of digital financial system on financial performance in financial institutions and the management improving their activities to accomplish a society purpose.

1.7.3. Scientific interest

The other researchers who will reach at the period of doing his/her research. These researchers will be able to find some data through this study actually for those who will have a related research will benefit more.

1.7.4. Academic interest

This research is the part of academic requirements for acquisition of Master's degree in Finance. It will be the chance for the researcher to use skills acquired from University to analyze the relationship between digital financial system and perceptions of customers on financial performance in financial institutions.

1.8. Structure of the thesis

The first chapter is introducing the study, background of the study, problem statement, objectives of the study, research questions, hypothesis, scope of the study, significance of the study, definition of key terms, and then structure of the thesis. The second chapter talked about the introduction to literature review, conceptual and theoretical Perspectives, related case studies and conceptual framework. The third chapter addresses; the research design, population, sampling, sample size, data collection methods, validity and reliability tests, data processing, methods of data analysis and then ethical consideration. The fourth chapter presents research findings, the fifth chapter deal summary, conclusion and recommendation.

CHAPTER 2: LITERATURE REVIEW

This chapter tries to make together related literature on the topic. Also this chapter broadly aims to review the existing literature to arrive at conceptual understandings. It expands on the concept and theories according to different authors and these relate to the variables under study on effect of digital financial system on financial performance in financial institutions.

2.1 Definitions of key concepts

Digital financial system is an internet portal, by which customers can use different kinds of banking services ranging from bill payment to making investments.

Automated teller machines (ATMs): is a machine where cash withdrawal can be made over the machine without going in to the banking hall.

Mobile banking involves the use of mobile phone for settlement of financial transactions. Mobile banking is meant for low value transactions where speed of completing the transaction is a key.

Financial performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues.

Return on Assets (ROA) refers to the profitability of a firm. It measures the ability of the firm management to generate income by utilizing company assets at their disposal.

Return on Equity (ROE) is a financial ratio that refers to how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet.

2.2 Digital financial system

Digital financial system are financial services (e.g., payments, remittances, and credit) accessed and delivered through digital channels, including via mobile devices. These encompass established instruments (e.g., debit and net profit margin) offered primarily by banks, as well as

new solutions built on cloud computing, digital platforms, and distributed ledger technologies (DLT), spanning mobile payments, crypto-assets and peer-to-peer (P2P) applications. Digital financial services are the sustainable provision of affordable, accessible and secure financial services. An inclusive system that provides opportunities for accessing and moving funds, growing capital and reducing risk for our clients (Bruwer, 2019).

Greenacre (2020), digital financial is the broad range of financial services accessed and delivered through digital channels, including payments, credit, savings, remittances and insurance. The digital financial system (DFS) concept includes mobile financial services (MFS). In this context, the term “digital channels” refers to the internet, mobile phones (both smartphones and digital feature phones), ATMs, POS terminals, chips, electronically enabled cards, biometric devices, tablets, and any other digital system. DFS models usually employ agents and the networks of other third-party intermediaries to improve accessibility and lower the overall service delivery cost.

Digital financial services (DFS) are a relatively new, low-cost means of digital access to transactional financial services. Often termed ‘mobile money’ or ‘mobile financial services’. DFS is one of the core solutions used in developing countries to catalyze financial inclusion and provide much-needed low-cost access to financial services (Gutierrez & Singh, 2013). Using digital technology to access financial services is becoming an everyday occurrence for millions of us, and is set to be a growing trend in how we spend, send and save money. People can now pay bills, transfer money and access their bank statements easily using their computer or mobile phone. In higher income countries, this gives greater choice and convenience. In developing countries, the growth in digital financial services has given millions of consumers (who

previously had little or no access to a bank account) access to financial services for the first time. But with technology developing so fast, it can be hard to keep up (Bangura, 2016).

2.2.1 Automated Teller Machine (ATM)

Automated Teller Machine (ATM) is a product of technological development developed to enhance quick service delivery as well as diversified financial services such as cash speeds, withdrawals, funds transfer, transactions such as payment for utilities credit card bills, cheque book requests and other financial enquiries. All financial institutions are using this method/system, aggressively encouraging all their customers to take advantage of these services on the grounds of ease process but an unannounced financial generation to the bank (Ling, 2014).

Automated Teller Machine (ATM) is the first well-known machines to provide electronic access to customers. With the advent of ATM, banks are able to serve customers outside the banking hall. ATM is designed to perform the most important function of banks such as withdrawal of cash, speeds, printing of mini statements, settlements of bills. It does all through an access to personal identification number (PIN), and a plastic that contains magnetic chip which the customer is identified through (Abdullah & Andrew, 2010).

In the years back, banking operation and or transaction was an ease process of walk-in to speed or withdraw with less congestion or time consuming process via pass-book or cheque book. In recent time, the complexity of human demand and or business transaction informed the influx of customers in and out of banking halls, which in one hand requires either the need for additional hands or stretching the services of the available staff on the other hand. Automated teller machine(ATM) is an electronic banking outlet, which allows customers to complete basic transactions without the aid of a branch representative or teller. Automated Teller Machine

(ATM) can be defined also as a machine where cash withdrawal can be made over the machine without going in to the banking hall. It also sells recharge cards and transfer funds; it can be accessed 24 hours/7 days with account balance enquiry (Milligan, 2017).

Singh (2019) described ATM as 'Avoid Travelling with Money' or 'Any Time Money' but certainly it implies both. He asserts that Slim ATM cards are fast replacing compounding withdrawal form as a convenient way of getting your money from banks. A smart person no longer needs to carry a wallet-full of paper money on his person. All he needs to do is fish-out an ATM card inserts it in the slot, punch in a few details and go home with hard cash. The ATM card can also be regarded as plastic money; it is not only safe but convenient. The ease of settlement of bills has made it acceptable and important throughout the country.

Anyone with a credit card or debit card can access most ATMs. There are two primary types of ATMs. Basic units allow customers to withdraw cash and receive reports of their account balances only. The more complex machines accept speeds, facilitate line of credit payments and report account information. To access the advanced features of the complex units, a user must be an account holder at the bank that operates the machine. Today banks are switching to multi-channel distribution of financial service in hybrid platforms, where the traditional services of banks are provided through. Such may include speed-taking, lending, account management, the provision of financial advice, electronic bill payment and the provision of other electronic payments products and services such as electronic money (Singh, 2019).

Electronic banking has long been recognized to play an important role in economic development on the basis of their ability to create liquidity in the economy through financial intermediation between savers and borrowers. It also offers financial services and products that accelerate

settlement of transactions and in the process reduce cash intensity in the financial system, encourage banking culture, and catalyses economic growth (Al-Gahtani, 2011).

According to Al-Gahtani (2011), for the effective functioning of the financial system, the payment systems must be safe and efficient; otherwise they can be a channel for the transmission of disturbances from one part of the economy or financial system to others. This is why central banks have been active in promoting sound and efficient payments system and in seeking the means to reduce risks associated with the system. Apart from the poorly developed systems and structures, the developing countries may benefit from the technologies offered by today's world while building up their financial intermediation infrastructure. These technologies are provided through electronic banking.

Many banks want to invest in ATMs to reduce branch cost since customers prefer to use them instead of a branch to transact business. The financial impact of ATMs is a marginal increase in fee income substantially offset by the cost of significant increases in the number of customer transactions. The value proposition however, is a significant increase in the intangible item "customer satisfaction". The increase translates into improved customer loyalty that in result in higher customer retention and growing organization value. ATM is a lower-cost delivery channel and a way to increase sales. For many consumers, electronic banking means 24-hours access to cash through an automated teller machine (ATM) or Direct Speed of paychecks into checking or responsive accounts. But electronic banking involves many different types of transactions (Adeoti, 2012).

ATMs are electronic terminals that let you bank almost any time. To withdraw cash, make speeds, or transfer funds between accounts, you generally insert an ATM card and enter your PIN. Some financial institutions and ATM owners charge a fee, particularly if you don't have

accounts with them or if you engage in transactions at remote locations. Generally, ATMs must tell you they charge a fee and its amount on or at the terminal screen before you complete the transaction. Check the requirements with your institution and at ATMs you use for more information about these fees (Lin & Wang, 2011).

Electronic Check Conversion converts a paper check into an electronic payment or when a company receives your check in the mail when you give your check to a cashier, the check is run through an electronic system that captures your banking information and the amount of the check. You're asked to sign a receipt and you get a copy for your records. When your check is handed back to you, it should be voided or marked by the merchant so that it can't be used again. The merchant electronically sends information from the check (but not the check itself) to your bank or other financial institution, and the funds are transferred into the merchant's account. When you mail-in a check for payment to a merchant or other company, they may electronically send information from your check (but not the check itself) through the system, and the funds are transferred from your account into their account (Singh, 2019).

2.2.2 Mobile Banking

Mobile banking refers to the use of a mobile device to carry out financial transactions. The service is provided by some financial institutions, especially banks. Mobile banking enables clients and users to carry out various transactions, which may vary depending on the institution (Aladwani, 2012).

Mobile banking is the most famous of all digital banking solutions. It brings the bank to your smartphone. You can carry out more than 200 banking transactions from the comfort of your home, office, or anywhere in the world, anytime. Mobile phones are the most commonly used technical device in every individual's daily life. Mobile Banking is emerging as an alternate

avenue for providing banking services. India is the second-largest telecom market in the world that enables a high potential for expanding mobile banking services across the country (Farnood, 2018).

Mobile banking can allow customers to access more than 200 different banking services with a single click. However, the single most advantage of mobile banking is accessibility. It allows customers to access their bank on their smartphones at their fingertips (Laukkanen & Pasanen, 2011).

Ease of access: Mobile banking allows you instant access to your bank account with a few clicks. Whether you are accessing mobile banking on an app or on your mobile browser, the user interface is designed in simple terms that are easy for all age groups to understand and execute. Most of the user interfaces are interactive and allow customers to carry out transactions with ease. This is particularly helpful for aged customers who are novices at using smartphones. Another most important benefit of using mobile banking is that it is free of cost. You do not need to pay any charges or fees to use mobile banking (Popa, Christopher, & Martin, 2017).

A single destination: Mobile banking allows users to integrate all their relationships with a particular bank under a single login. This includes their bank accounts, credit cards, Demat account, Insurance policies, UPIs, and investments under a single umbrella. This enables better management of your relationships with the bank.

Fund transfers: Sending and receiving money has already seen advancements beyond a layman's imagination. Mobile banking has only furthered this feature by leaps & bounds. Fund transfers are now done in real-time with RTGS or without any bank account details using IMPS. There are no more hassles of writing cheques or depositing them physically in the branch. This

has saved enormous costs by reducing paper usage and thus saving a large number of trees (Purnima & Preeti, 2011).

Bill Payments: The boon of paying bills through mobile banking is highly underrated. There is still huge apprehension among the public in using mobile phones to pay bills of any kind. They still rely on physical bill payments that ensure that their account is rightly credited. This misconception is slowly lifting encouraging more and more people to utilize mobile banking bill payment systems to their benefit. Banks have also upgraded their systems to make bill payments hassle-free so that consumers can realize that this facility allows quick, real time bill payment on most utilities, mobile connections, DTH connections, broadband connections and investment services like insurance and mutual funds (Skinner & Alavi, 2010).

Service Requests: Submitting account-related service requests has always been a hassle with the traditional branch banking system. Customers were made to run from counter to counter to get the right form or fill in the right details and submit it to the right officer. In spite of all the hassle, the form may end up on the wrong table to be ignored, thus the customer's service request never fulfilled. That has changed now with mobile banking. Starting from checkbook requests to email updates on your account, it is all available on your mobile banking platform. With constant SMS alerts, you can also keep track of your requests. This has made banking officials more accountable for fulfilling these requests and has served well for the customers in getting their job done (Taghavi & Torabi, 2018).

2.2.3. Online banking

Online banking refers to banking services where depositors can manage more aspects of their accounts over the internet, rather than visiting a branch or using the telephone. Online banking typically is comprised of a secure connection to banking information through the depositor's

home computer or another device. Online banking offers several main benefits to depositors. It provides a real-time view of finances and eliminates the need for numerous visits to a bank teller. It can also take the place of balancing a checkbook and other tedious tasks common to paper-based banking. Depositors can monitor each transaction in an accessible user interface to understand how credits, ATMs, deductions and payments affect their account's balance (Sikdar, Kumar, & Makkad, 2015).

According to Essinger (2014), online banking is to give customers access to their bank accounts via a web site and to enable them to enact certain transactions on their account, given compliance with stringent customer trust checks". Essinger (2014), also described online banking as the provision of traditional (banking) services over the internet". Online banking provides convenient and flexible services to customers. It enables customers to transact almost all their banking transactions online. One could check accounts, query the bank and also transfer funds to other people on different accounts, it is the most financially savvy innovative method for yielding higher profitability. Another feature of internet banking is that, it gives a 24/7 access to customers.

Online banking is used widely by masses and has numerous benefits to offer. Nowadays, all banks provide online banking facility to their customers as an added advantage (Sharma, 2013). Gone are the days, when one had to transact with a bank which was only in his local limits. Online banking has opened the doors for all customers, to operate beyond boundaries. Nowadays, people are so busy in their work lives, that they don't even have time to go to the bank for conducting their banking transactions. Online banking enables people to carry out most of their banking transactions using a safe website, which is operated by their respective banks. It provides many features and functions to their customers and enables them to view their account

balance, transfer money from their account to another account (be it in their respective bank or any other bank) view their accounts summary, etc (Gerson, 2014).

2.3 Financial performance

Kohlar (2017), argues that financial performance is the act of performing financial activity. In broader sense, financial performance refers to the degree to which financial objectives being or has been accomplished. It is the process of measuring the results of a firm's policies and operations in monetary terms. It is used to measure firm's overall financial health over a given period of time and can also be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. Getting on top of financial measures of performance is an important part of running a growing business, especially in the current economic climate. Many businesses fail because of poor financial management or planning. The business success can depend on developing and implementing sound financial and management systems. Updating the original business plan is a good place to start. A review of the financial performance can help in reassess of the business goals and plan effectively for improving the business (Sumrall, 2015)

Financial performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. The level of performance of a business over a specified period of time, expressed in terms of overall profits and losses during that time. Evaluating the financial performance of a business allows decision-makers to judge the results of business strategies and activities in objective monetary terms (Berezin, 2015).

Getting on top of financial measures of performance is an important part of running a growing business, especially in the current economic climate. Many businesses fail because of poor

financial management or planning. The business success can depend on developing and implementing sound financial and management systems. Updating the original business plan is a good place to start (Mukhopadhyay, 2018).

The financial performance of any institution cannot be found without analyzing its financial statements as the financial analysts in United States, United Kingdom, and New Zealand have consistently given the corporate annual financial report the highest ranking as the most important source of information include financial statements (Statement of Financial Position and Statement of Comprehensive Income) obviously play a major role in a fundamental approach to security analysis (Al-Khour, 2015).

2.3.1 Return on assets (ROA)

Return on assets (ROA) is a financial ratio that shows the percentage of profit a company earns in relation to its overall resources. It is commonly defined as net income divided by total assets. Net income is derived from the income statement of the company and is the profit after taxes. The assets are read from the balance sheet and include cash and cash-equivalent items such as receivables, inventories, land, capital equipment as depreciated, and the value of intellectual property such as patents. Companies that have been acquired may also have a category called "good will" representing the extra money paid for the company over and above its actual book value at the time of acquisition. Because assets will tend to have swings over time, an average of assets over the period to be measured should be used. Thus the ROA for a quarter should be based on net income for the quarter divided by average assets in that quarter. ROA is a ratio but usually presented as a percentage (Albrecht, James, Earl, & Swain, 2015).

ROA is used internally by companies to track asset-use over time, to monitor the company's performance in light of industry performance, and to look at different operations or divisions by comparing them one to the other. For this to be accomplished effectively, however, accounting systems must be in place to allocate assets accurately to different operations. ROA can signal both effective use of assets as well as under-capitalization. If the ROA begins to grow in relation to the industries as a whole, and management cannot pinpoint the unique efficiencies that produce the profitability, the favorable signal may be negative: investment in new equipment may be overdue (Baker, Benrud, & Powell, 2015).

Another common internal use for ROA involves evaluating the benefits of investing in a new system versus expanding a current operation. The best choice will ideally increase productivity and income as well as reduce asset costs, resulting in an improved ROA ratio. For example, say that a small manufacturing company with a current sales volume of Frw 50,000, average assets of Frw30,000, and a net profit of Frw 6,000 (giving it an ROA of $\text{Frw } 6,000 / \text{Frw}30,000$ or 20 percent) must decide whether to improve its current inventory management system or install a new one. Expanding the current system would allow an increase in sales volume to Frw65,000 and in net profit to Frw7,800, but would also increase average assets to Frw39,000. Although sales would increase, the ROA of this option would be the same-; 20 percent. On the other hand, installing a new system would increase sales to Frw70,000 and net profit to Frw12,250. Because the new system would allow the company to manage its inventory more efficiently, the average assets would increase only to Frw35,000. As a result, the ROA for this option would increase to 35 percent, meaning that the company should choose to install the new system (Baker, Benrud, & Powell, 2015).

The formula to calculate return on assets is:

$$\text{ROA} = \frac{\text{Annual Net Income}}{\text{Average Total Assets}}$$

A company's *return on assets (ROA)* is calculated as the ratio of its net income in a given period to the total value of its assets. For instance, if a company has Frw10,000 in total assets and generates Frw2,000 in net income, its ROA would be $\text{Frw}2,000 / \text{Frw}10,000 = 0.2$ or 20%.

2.3.2. Return on equity

Return on equity (ROE) is the amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested (Christopher, 2014).

According to Garcia (2008), Return on Equity (ROE) is one of the most important indices for assessing a company's performance. It describes how effectively the company uses owner or shareholder equity to generate income. This equity may be invested directly into the company by a partner, or it may be invested through stock purchases. ROE is calculated using this and equity along with income, both of which may be found in a company's balance sheet.

ROE is expressed as a percentage and calculated as:

$$\text{Return on Equity} = \text{Net Income} / \text{Shareholder's Equity}$$

Net income is the after tax income whereas average shareholders' equity is calculated by dividing the sum of shareholders' equity at the beginning and at the end of the year by 2. The net income

figure is obtained from income statement and the shareholders' equity is found on balance sheet. You will need year ending balance sheets of two consecutive financial years to find average shareholders' equity (Loth, 2016).

Return on equity is an important measure of the profitability of a company. Higher values are generally favorable meaning that the company is efficient in generating income on new investment. Investors should compare the ROE of different companies and also check the trend in ROE over time. However, relying solely on ROE for investment decisions is not safe. It can be artificially influenced by the management, for example, when debt financing is used to reduce share capital there will be an increase in ROE even if income remains constant (Jan, 2012).

2.3.3 Net profit margin

Net profit margin is the percentage of revenue remaining after all operating expenses, interest, taxes and preferred stock dividends (but not common stock dividends) have been deducted from a company's total revenue. The net profit margin is equal to how much net income or profit is generated as a percentage of revenue. Net profit margin is the ratio of net profits to revenues for a company or business segment. Net profit margin is typically expressed as a percentage but can also be represented in decimal form. The net profit margin illustrates how much of each dollar in revenue collected by a company translates into profit (Chris, 2019).

Net profit margin is one of the most important indicators of a company's financial health. By tracking increases and decreases in its net profit margin, a company can assess whether current practices are working and forecast profits based on revenues. Because companies express net profit margin as a percentage rather than a dollar amount, it is possible to compare the profitability of two or more businesses regardless of size (Carlson, 2019).

Investors can assess if a company's management is generating enough profit from its sales and whether operating costs and overhead costs are being contained. For example, a company can have growing revenue, but if its operating costs are increasing at a faster rate than revenue, its net profit margin will shrink. Ideally, investors want to see a track record of expanding margins meaning that net profit margin is rising over time. Most publicly traded companies report their net profit margins both quarterly during earnings releases and in their annual reports. Companies that can expand their net margins over time are generally rewarded with share price growth, as share price growth is typically highly correlated earnings growth (Murphy, 2019).

$(\text{Net profits} \div \text{Net sales}) \times 100 = \text{Net profit margin}$

This measurement is typically made for a standard reporting period, such as a month, quarter, or year, and is included in the income statement of the reporting entity. The net profit margin is intended to be a measure of the overall success of a business. A high net profit margin indicates that a business is pricing its products correctly and is exercising good cost control. It is useful for comparing the results of businesses within the same industry, since they are all subject to the same business environment and customer base, and may have approximately the same cost structures (Bragg, 2019).

Generally, a net profit margin in excess of 10% is considered excellent, though it depends on the industry and the structure of the business. When used in concert with the gross profit margin, you can analyze the amount of total expenses associated with selling, general, and administrative expenses (which are located on the income statement between the gross margin and the net profit line items) (Downes & Goodman, 2015).

2.3.4 Return on investment

Return on Investment (ROI) is a performance measure used to evaluate the returns of an investment or to compare the relative efficiency of different investments. ROI measures the return of an investment relative to the cost of the investment. Return on Investment is a very popular financial metric due to the fact that it is a simple formula that can be used to assess the profitability of an investment. ROI is easy to calculate and can be applied to all kinds of investments (Mansa, 2018).

ROI, or return on investment, is a common business term used to identify past and potential financial returns. Managers and executives look to the ROI of a project or endeavor because this measure indicates how successful a venture will be. Often expressed as a percentage or a ratio, this value describes anything from a financial return to increased efficiencies. Any expense a company has can be calculated in terms of ROI. While some expenses or activities – such as buying staples or repairing an employee bathroom – may not have a direct or financial ROI, each expense contributes to an overarching investment. For example, hiring a graphic designer to create ads, paying a photographer to take pictures of the company, and overhauling the company’s website can be considered a return on investment (Sroufe, 2018).

In many instances, ROI is used to calculate how much of a value an investment is. For example, an angel investor would want to know the potential ROI of an investment before committing any funds to a company. Calculating a company’s potential or actual financial ROI typically involves dividing the company’s annual income or profit by the amount of the original or current investment (Pearce, 2016).

ROI is also used to describe “opportunity cost,” or a return the investor gave up to invest in the company. If a business owner were to invest their money in the stock market, they could expect to receive an annual return of at least 5%. By investing that same money in a company, an owner would expect to see a similar, if not higher, ROI for their money. Companies even use ROI to measure the success of a specific project. If a business owner were to invest money in an advertising campaign, they’d analyze the sales generated by the ad and use that information to determine the ROI. If the money generated exceeded the amount spent, then a business could consider it an acceptable ROI (Gaudet, 2019). When calculating your annualized ROI, you’re looking for the average yearly return on investment earned during the investment period. This shows you how profitable the venture is, which is helpful, because ROI doesn’t include the holding period of an investment within its formula. Annualized ROI can help you analyze and compare the performance of your investment during specific time periods. ROI is calculated as the net profit during a certain time divided by the cost of investment, which is then multiplied by 100 to express the ratio as a percentage (Farris, Bendle, Pfeifer, & Reibstein, 2010). The equation looks like this:

$$\text{ROI} = (\text{Net Profit} / \text{Investment}) \times 100$$

What’s considered a good ROI depends on the investment. When a company is spending money on a piece of equipment, for example, the ROI is in productivity. Marketing spend, on the other hand, requires an ROI in sales.

2.3.5 Interest and fees earned on loans

The interest and fees earned ratio is defined as the ratio of a company’s operating income (or EBIT—earnings before interest or taxes) to its interest expense. The ratio measures a company’s ability to meet the interest expense on its debt with its operating income. A higher ratio indicates

that a company has a better capacity to cover its interest expense. The interest coverage ratio is a debt and profitability ratio used to determine how easily a company can pay interest on its outstanding debt. The interest coverage ratio is calculated by dividing a company's earnings before interest and taxes (EBIT) by its interest expense during a given period (Abdullah & Andrew, 2010).

The "coverage" in the interest coverage ratio stands for the length of time—typically the number of quarters or fiscal years—for which interest payments can be made with the company's currently available earnings. In simpler terms, it represents how many times the company can pay its obligations using its earnings.

The formula used is:

Interest fees earned on loans Ratio = EBIT/Interest Expense

Where:

EBIT=Earnings before interest and taxes

The lower the ratio, the more the company is burdened by debt expenses and the less capital it has to use in other ways. When a company's interest coverage ratio is only 1.5 or lower, its ability to meet interest expenses may be questionable. Companies need to have more than enough earnings to cover interest payments in order to survive future and perhaps unforeseeable financial hardships that may arise. A company's ability to meet its interest obligations is an aspect of its solvency and is thus an important factor in the return for shareholders (Akbaba, 2016).

6. Loans to assets

The loan-to-total-assets ratio analyzes a company's balance sheet. The calculation includes long-term and short-term debt (borrowings maturing within one year) of the company. It also encompasses all assets—both tangible and intangible. It indicates how much debt is used to carry a firm's assets, and how those assets might be used to service debt. It, therefore, measures a firm's degree of leverage. Loan servicing payments must be made under all circumstances, otherwise, the company would breach its debt covenants and run the risk of being forced into bankruptcy by creditors. While other liabilities such as accounts payable and long-term leases can be negotiated to some extent, there is very little “wobble room” with debt covenants (Akroush & Khatib, 2009).

Loan to assets Ratio: This formula tells us how much of its assets a company would have to sell to pay off all of its debts. The debt ratio is calculated as follows:

Loan to assets Ratio = total liabilities/ total assets

2.4 Theoretical review

There are several theories that explain why financial institutions would select particular digital financial system to ensure financial performance. Three theories: theory of reasoned action, innovation diffusion theory, and technology acceptance model have been emphasized.

2.4.1 Innovation Diffusion Theory

This theory postulated by Rogers (Rogers, 2006) (2006) explains individuals' intention to adopt a technology as a modality to perform a traditional activity. The critical factors that determine the adoption of an innovation at the general level are the following: relative advantage, compatibility, complexity, trialability and observability. Many banks have found it advantageous

to adopt ICT in their operation in order to improve their efficiency. This is achieved through development of websites and mobile applications that suit the customer needs. Customers are therefore able to access their accounts anywhere as long as they are connected to the internet. This theory is concerned with the manner in which a new technological idea, artefact or technique, or a new use of an old one, migrates from creation to use.

Technological innovation is communicated through particular channels, over time, among the members of a social system. The stages through which a technological innovation passes are: knowledge (exposure to its existence, and understanding of its functions); persuasion (forming of favorable attitude); decision (commitment to its adoption); implementation (putting it to use); and confirmation (reinforcement based on positive outcomes from it) (Aduda & Kingoo, 2012).

In the same way internet banking has been enhanced due to cyber threats and fraud. Early users generally are more highly educated, have higher social status, are more open to both mass media and interpersonal channels of communication, and have more contact with change agents. Mass media channels are relatively more important at the knowledge stage, whereas interpersonal channels are relatively more important at the persuasion stage (Barnes & Corbitt, 2013).

Innovation decisions may be optional (where the person or organization has a real opportunity to adopt or reject the idea), collective (where a decision is reached by consensus among the members of a system), or authority-based (where a decision is imposed by another person or organization which possesses requisite power, status or technical expertise). (Barnes & Corbitt, 2013) Barnes and Corbitt (2013) advises that managers need to understand the capabilities of any particular technology and the benefits that ensue from its use in considering what technology to use with their operations, as well as understand associated costs and limitations of operating that technology. He advises the general issues to consider as the volume and variety of output that the

technology can achieve, the fit with existing technology used with the organisation and the level of maturity of the technology. Internet banking heavily relies on ICT since it is carried out on the internet. Customers are able to access their accounts remotely without having to physically visit the bank (Dass & Pal, 2011).

2.4.3 Technology Acceptance Model

To understand, predict and explain why people accept or reject information systems; researchers have developed and used various models to understand the acceptance of users of the information systems. The technology acceptance model (TAM) that was introduced by Davis, Bagozzi, and Warshaw (1989) is one of the most cited models that researchers used to study underlying factors that motivate users to accept and adopt a new information system (Al-Shibly, 2011).

The primary goal of TAM is to provide an explanation of factors affecting computer applications' acceptance in general. In addition, this model helps researchers and practitioners to identify why a particular system is unacceptable (Davis, 2009). Davis suggested that using an information system is directly determined by the behavioral intention to use it, which is in turn influenced by the users' attitudes toward using the system and the perceived usefulness of the system. Attitude and perceived usefulness are also affected by the perceived ease of use. Technology Acceptance theory is a key theory that underpins the current study on how digital financial system affects the banks financial performance.

2.5 Empirical Review

Pooja (2009) examine the impact of Internet banking on banks' performance and risk and reveal that the profitability and offering of Internet banking does not have any significant association, on the other hand, Internet banking has a significant and negative association with risk profile of

the banks. Sana (2011) electronic banking has increased the profitability of banks; it has enabled the banks to meet their costs and earn profits even in the short span of time. The illiteracy of customers is not regarded as a major impediment in the provision of their products and services. For banks, the main motive to adopt electronic banking is to increase their clientele and to retain their customers. The profitability of banks has augmented in transitioning to electronic banking medium.

Al-Smadi (2011) examines the impact of electronic banking on the Jordanian banks' performance. Empirical analysis has been conducted on a panel data of 15 Jordanian banks for the period 2000-2010. The results indicate that electronic banking has a significant negative impact on banks' performance. Tunaya (2015), investigated the interaction between internet banking and bank's performance. ROA and ROE ratios were used as measures of bank's performance. Results show that a strong relationship through internet banking to the bank performance in the Euro Area countries and other than the Euro Area countries are also not determined causation significantly in both directions. On the other hand, there is also a significant relationship between internet banking and the performance of the bank when all banks are considered.

Sathye (2015) studied the impact of the introduction of transactional Internet banking on performance and risk profile of major credit unions in Australia. The results show that transactional Internet banking didn't have a significant impact on any of these. Thus Internet banking hasn't proved to be a performance-enhancing tool in the context of major credit unions in Australia. It neither reduces nor enhances risk profile.

Mateka (2016) examined the effect of internet banking on the financial performance of listed commercial banks in Kenya. The key finding of the study revealed that internet banking has positive influence on bank's incomes, operating costs, and loan book and customer deposits. Halili (2014) studied the challenges that are derived from adoption of online banking. The empirical analysis would employ data obtained from 22 commercial banks from five countries viz., United Kingdom, Germany, Czech Republic, Latvia, and Poland. The study concludes that adoption of Online Banking is negatively related with the performance of three banks out of 22 banks considered under study. Indicators as: Return on Equity (ROE), Return on Asset (ROA) and Margin (Mrg) as the main fault to global financial crisis.

Kathuo (2015) analysed the effect of mobile banking on the financial performance of commercial banks in Kenya. The findings revealed and concluded that the financial performance of the banks that provide these mobile banking products has improved because they ensure efficiency of the banking services. The study also concluded that due to technological advancements in the area of telecommunications and information technology the banking industry has continued to revolutionize.

Nieto (2017) study the impact of the Internet on banks' financial performance by identifying and estimating the impact of the adoption of a transactional website on financial performance. The adoption of the internet as a delivery channel has a positive impact on banks' profitability (ROA and ROE) after one and a half years, mainly explained by the lower overhead expenses and, in particular, staff and IT costs after the same period.

Bosire and Ndungu (2020) carried out study to evaluate the determinant of financial performance of commercial banks listed at Nairobi Securities Exchange (NSE) in Kenya. They applied descriptive study design to arrive at census approach targeting eleven commercial banks listed in Kenya. The study utilized secondary data available on the comprehensive audited financial statement of eleven commercial banks listed to Nairobi Securities Exchange, correlation between the research variables was created from the data obtained from audited financial statements. The data was analyzed using SPSS and the outcome obtained and presented in tables using statistical aspects. The study findings explained that government securities had strong positive correlation with financial performance of commercial banks listed in Nairobi Security Exchange, real estate, loans and stocks had weak positive correlation with financial performance of commercial banks listed in the Nairobi Security Exchange in Kenya. Finding for the study indicated that the following variables determines the financial performance of commercial banks listed in the Nairobi Security Exchange in Kenya if other factors are held constant; government securities, real estate, stocks and loans.

The work of Oluwagbemi, Abah and Achimugu (2011) studied how information technology has impacted the Nigerian banking industry. The result indicates that deployment of information technology facilities have fundamentally transformed the content and quality of banking business in Nigeria. Addai (2015), used purposive sampling method to select a sample of 150 bank customers from 3 banks in Ghana. The study was designed to determine the link between electronic banking and customer satisfaction. The study produced strong evidence of empirical support of positive impact of availability, reliable and, convenience of electronic banking on customer satisfaction.

Dogarawa (2015), used a sample of 180 bank (current account holders) drawn from branches of three deposit money banks (DMBs) in three major Nigerian cities of Lagos, Port Harcourt and Kaduna to examine the impact of electronic banking on customer satisfaction. Sample selection was based on judgmental sampling technique while analysis was based on chi-square technique. The study shows low quality and inefficient service delivery, an indication of low level of or no satisfaction from electronic banking services.

Ogunlowore and Oladele (2014), examined the relationship between technology-based financial services and customers' perception of the financial performance. A sample of 499 respondents drawn from five DMBs was used for the study. Sample size was determined using Freud and William's formula. Dimensions of service quality captured in the study are usefulness, ease of use and security. The result indicates strong positive impact of electronic banking on financial performance.

The work of Agboola (2013), researched on the influence of digital technology on financial performance of commercial banks in Abuja Nigeria. The researcher used descriptive design while primary data was used to collect data using questionnaires. The findings of the study showed that digital technology has strong positive impact on financial performance of commercial banks in Nigeria. The study proposed policy to embrace innovation in order to improve on efficiency in operations that meets customer demand and expectation Ariff, Zakuan, and Yun (2013) studied on effect of technological innovation on the financial performance of commercial banks in Tanzania. The researcher applied descriptive survey design while questionnaire was used to collect primary data from commercial banks representatives. The research findings explained that adoption of technological innovations by majority of

commercial banks in Tanzania contributed positively on financial performance of commercial banks and an improvement in service delivery during business operation was witnessed.

Amaoko (2012), in his research found that, ICT has contributed positively to the provision of banking services and growth of the Ghanaian banking industry. It was also reported that, e-banking is not yet developed in Ghana. The study recommended that banks should develop user friendly systems and applications for general population. Government and banks should play a key in enhancing ICT infrastructure, put in place incentives like tax reduction, and make PC available and affordable for every Ghanaian. Financial institutions should offer programs to reassure customer's responsive with regards to ICT through sensitization.

As analyzed by Santouridis (2009) empirically investigate the digital banking in Greece by examining the digital banking services and the quality services. The researchers have used digital banking services to measure the SERVQUAL model. From the results, they observed that the dimensions of ATMs, m-banking and online banking have a significant and positive impact on quality service provision level. In line with this, it is important that e-banking services are designed in such a way that both literate and illiterate customers can use them without one being assisted to use them.

Ankit (2011) determined the factors of electronic banking which have an impact on quality service in India. The sample size of 250 respondents has been selected for the study, and the data has been collected through questionnaires. The results of the study showed that the banking needs which include convenience, privacy, risk, and problem resolution are found to be the most important determinants which have a positive impact on assurance services. Ali and Akter (2010) argued that a transitional period in the banking sector of Bangladesh has been passing through

since shifting from the traditional banking system to the online banking system. These comments indicate that gradually electronic banking is gaining its importance in Bangladesh. Customers' liking is necessary for the banking sector to elevate responsive, business expansion and accomplishment. At the same time the banking process is becoming faster and easier. In order to survive in the competitive field of the banking sector commercial banks are looking for better service opportunities to provide their customer. The paper has been undertaken mainly to find out whether e-banking can improve quality services to the customers or not.

Addai, Ameyaw, Ashalley and Quaye (2015) investigated the impact of digital financial services delivered for customers in Ghana, "Banking gives customers the opportunity to access banking services from the comfort of their homes and offices and also be able to do most of the transactions which would have been done in the banking halls. With the use of personal computer (PC) or even mobile phone with an internet connection, customers are able to carry out transactions such as cash withdrawals, payments of utility bills, transfers from one account to the other, viewing and printing of statements as well as a request for checkbooks on their traditional accounts". The study relied on primary and secondary data sources from three banks in Ghana (Trust Bank Ghana Limited, Ecobank Ghana Limited, and Barclays Bank Ghana Limited), up to 150-sample size. The SPSS analysis showed a strong positive correlation between customer satisfaction and E-banking availability, convenience, and reliable.

Ali, Saeid, Reza and Hamed (2016) conducted a study on effects of E-banking on services quality (Case Study: Agricultural Bank of Khuzestan Province. Therefore, the present study attempts to cast light upon the effects of e-banking on service quality in Agricultural Bank of Khuzestan Province (Iran). The statistical population is all of the customers of Agricultural Bank of Khuzestan among which 385 of them were selected for the sample study. The research period

is from March-April until May-June 2015. The library and field methods were used for the data collection. This study is of applied and causal-descriptive research and is specifically based on Structural Equation Modeling (SEM). At first, by using the descriptive statistics, the demographic conditions of respondents were determined. Afterwards, by the statistical inference, the hypotheses of the study were investigated. The results show that the quality of e-banking services has direct and positive effects on financial performance.

Ingabire and Niyonsenga (2017) evaluated the impacts of ATM service quality dimensions on customer satisfaction among the banks in Kigali, Rwanda. The study reviewed existing literatures on service quality and customer satisfaction. It was found that a significant relationship exists between service quality dimensions and customer satisfaction. The study concluded that service quality promotes customer satisfaction. The results indicated that assurance and empathy were the highest predictors of the variations in service quality while tangibility was the weakest predictor.

Belay and Kindie (2017) conducted a study among the commercial banks on the effect of ATM service quality on customer satisfaction in Ethiopian commercial Banks, using proportional stratified and simple random sampling technique and cross-sectional data collected from 190 customers of Ethiopian commercial banks, in Debre Markos town. The data collected were analyzed using Statistical tools such as mean, standard deviation, correlation, and multiple regression model. The results indicated that except assurance, tangibility, reliability, responsiveness and empathy have positive and significant effect on customer satisfaction and the customers were mostly satisfied with the responsiveness dimensions of ATM service quality. Furthermore, the tangibility, reliability, responsiveness and empathy significantly explained

79.2% of the variations on customer's satisfaction level, It was suggested to the management of the bank to pay attention for training and developing staffs' skill in using ATM System in addition to installing the ATM in appropriate and accessible places.

Naeem et al. (2016) carried out an investigation to identify the measurements of A.T.M service quality that effect customer satisfaction in the banking institutions. Data was collected using questionnaire with five point likert scale and sample size 100 by using convenience sampling technique. SPSS 20 was used as statistical test for the analysis of correlation and regression. Regression analysis found positive and significant relationship between price, reliability, responsiveness, convenience, security, service quality on customer satisfaction. The study recommended that the management of MCB bank should work on price, reliability, service quality of A.T.M.

A study by Yared (2016) investigated the effect of ATM (automated teller machine) service quality on customer satisfaction of ATM users of CBE customers. Five ATM service quality dimensions namely reliability, convenience, user-friendliness, security, and responsiveness have been established based on the literature review. For this investigation primary data was collected from a convenience sample of 203 customers of CBE located in Hawassa City using ATM service through structured questionnaire. The Collected data was analyzed using mean, standard deviation, correlation, and regression analysis. Regression results indicate that reliability, convenience, user-friendliness, security, and responsiveness are dimensions of ATM service quality that positively and significantly contributes toward customer satisfaction.

Dondolo and Nkosivile (2016) examined the influence of ease of use, security concerns and attitudes on South African consumers' satisfaction with ATM banking services. Participants of the study were solicited through electronic mailing list of ATM users in South Africa. These

participants were provided with a website link that directed them to an online survey hosted by Qualtrics. A total of 224 participants from the various provinces of South Africa responded. This study confirms that customer satisfaction is linked to security concerns, attitudes and ease of use. Overall, the results indicated that the respondents were satisfied with ATM banking services.

Ifeanyichukwu and Emenike (2016) conducted a study the impact ATM on the banking performance in Nigeria using descriptive and regression analyses. The results of descriptive statistics showed that private sector saving deposits and private sector demand deposit series are normally distributed but the private sector time deposits and the value of ATM transaction were not normally distributed. The results of the ADF unit root tests showed that the levels of the variables contain unit roots whereas their first differences did not contain unit roots. The regression results indicated that ATM transactions positively and significantly impacted private sector demand deposits in Nigeria but not private sector savings deposits and private sector time deposits. It recommended that the monetary authorities and commercial bank enlighten the depositors on the usage of ATM machine through mass media such as, television, bill board and radio as well as paste directive posters at every ATM centres across the country.

Oduşina (2014) conducted a study on ATM Usage and customers' satisfaction in Nigeria. It was discovered that despite the increasing number of ATM installations in Nigeria. Customers' needs were not satisfactorily met as customers were always seen on queue in large numbers at various ATM designated centers as well as poor service delivery of some of these machine. The research engaged in comparative analysis of three banks in Ogun State, Metropolis of Nigeria viz-a-viz First Bank, Guaranty Trust Bank and Skye Bank. However, questionnaires were distributed to the respondents. A total of 200 respondents answered the questionnaire cutting across the three

banks, the chi-square statistical tool was used to analyze the data and the results showed a positive and significant relationship between ATM usage and customers' satisfaction.

Okoro (2014) examine the impact of automated teller machine (ATM), point of sales (PoS), Mobile and Internet service values on the intermediation efficiency of the Nigerian economy using multiple regression technique on time series data of 2006 — 2011. The study reports the following findings: that there is significant relationship between ATM, PoS, Internet service values and the intermediation efficiency of the Nigerian economy. However, the study also reveals that there is no significant relationship between Mobile service value and intermediation efficiency of the Nigerian economy within the period under study. He concludes that the ATM, PoS and Internet services are the major instruments used by the customers of the deposit money banks in Nigeria, and recommends that the banks should put more effort in advertising these products in Nigeria.

Ogbuji (2012) studied the 'Analysis of the Negative Effects of the ATM as a channel for delivering banking services in Nigeria'. The authors sampled 600 respondents from Anambra and Lagos states in Nigeria. The reason according to the authors was because the two states constitute different people from different parts of Nigeria. Chi-square was used to test the hypothesis, and result showed that ATM should not be installed indiscriminately everywhere and that ATM has increased the rate of crime in Nigeria. Muhammed (2010) empirically studied ATM Service Quality and Customer Satisfaction in Pakistani Banks using data from 500 customers of multinational and national banks. He used regression analysis to test his six hypotheses. The most captivating hypothesis in his study was the sixth hypothesis, he found that 'ATM Service Quality has positive and significant relationship with customer satisfaction. Singh (2009), studied the 'Impact of ATM on Customers' Satisfaction' comparatively studying three

banks in India conducted his research using 360 respondents from the three banks, he used the F-ratio statistics to test the difference in the customers satisfaction of the three banks, He concluded that Material satisfaction level is the highest in State Bank of India, followed by ICICI and then to HDFC bank.

Kaura, Prasad, and Sharma (2015) examined the extent to which service quality, perceived price fairness and service convenience (antecedents of customer satisfaction) influence customer satisfaction for Indian retail banking sector. The study identified the dimensions of service quality are human behavior, tangibility and information technology. Dimensions of service convenience are decision convenience, access convenience, transaction convenience, benefit convenience and post-benefit convenience. A convenience sample of 445 retail banking customers. The findings show that with the exception of tangibility, all the other dimensions of service quality had a significant effect on customer satisfaction.

Gachuru and Mwangi (2017) investigated the effect of agency banking satisfaction in relation to customers' growth in the banking sector in Kiambu District in three banks; Equity Kenya Commercial Bank and Cooperative Bank. The study used stratified random sampling techniques to select 28 agents. The results showed an average of 600,000 transactions in agency banks on a daily basis. Further, 80.3% were satisfied with agent banking services.

Ndungu and Njeru (2014) carried out a literature review to show that agency banking in Kenya has led to extended banking hours with some agents reportedly opening as early as 06.00hrs and others closing as late as 01.00hrs. This shows how agency banking improves convenience. The study assessed the factors behind the adoption of agency banking in Kenya. The study investigated the relationship between convenience and customer service affected performance. The independent variables were the total commissions earned by agents for 6 months. The results

show that there is high level of system availability, hence service convenience. The study shows that the high level of convenience is associated with the high level of adoption of agency banking. Further, the convenience is also associated with the delivery of extended hours of banking.

Mongi and Mokaya (2018) noted the mushrooming of the agency banking services to supplement the incapacitated areas of banking services. However, the link between agency banking and customer satisfaction remained undocumented. The study focused on investigating the effect of agency banking services on customer satisfaction among National Microfinance Bank customers in Arusha Municipality. The study used a stratified random sample of 60 respondents and collected data using questionnaires. Using regression analysis, the study found out that the convenience and service reliability of agency banking services positively influence customer satisfaction.

According to Mwenda and Ngahu (2016) agency banking platforms facilitate bill payments without the customer necessarily going to make the payment at the bank or to the service provider to make the payment. The service is however provided at a commission but eventually saves the customer the travel and the inconvenience of waiting in the queues. The bank takes up the risk of operating through the agents as a strategy of ensuring reliability and availability of service at non conventional banking hours. Monitoring measures are put in place to safeguard the interest of the customer and the bank. The bank must ensure that the service at the agent location matches the service at the bank. This is achieved through proper recruitment and training of the agents. The agents are trained to the level of the bank employee and must understand and comply with the confidentiality code in order to ensure that information is confidential. The banks must ensure that the agents understand the interests of their customers and in order for them to meet

the same. The banks must ensure constant touch with the agents to ensure that the agents remain focused on the banks' interests. Their operations must be determined and monitored by the banks' management. Among the bills that can be paid at the agent location include water, electricity and credit card payments. Further, since customers always prefer services closer to them, agents must be situated close to customers and operate longer hours.

Addai, Ameyaw, Ashalley and Quaye (2015) investigated the impact of digital financial services delivered for customers in Ghana, "Banking gives customers the opportunity to access banking services from the comfort of their homes and offices and also be able to do most of the transactions which would have been done in the banking halls. With the use of personal computer (PC) or even mobile phone with an internet connection, customers are able to carry out transactions such as cash withdrawals, payments of utility bills, transfers from one account to the other, viewing and printing of statements as well as a request for checkbooks on their traditional accounts". The study relied on primary and secondary data sources from three banks in Ghana (Trust Bank Ghana Limited, Ecobank Ghana Limited, and Barclays Bank Ghana Limited), up to 150-sample size. The SPSS analysis showed a strong positive correlation between customer satisfaction and E-banking availability, convenience, and reliable.

Kariuki (2015), in his research paper titled, "Six Puzzles in Electronic Money and Banking", showed the positive impacts of ICT on their banking performance using bank turnover and profits as measure of performance. He established that banks with high profit growth are more likely to be using greater numbers of advanced ICTs. He concluded that e-banking leads to higher profits though in long-term but not in short-term due to high ICT investment cost. Further he provides evidence that the use of e-banking can contribute to improved bank performance, in terms of increased market share, expanded product range, customized products and better

response to client demand. Kariuki (2012), in his research on the effect of product development on the Financial performance of commercial banks in Kenya concluded that new product development impacted positively on financial performance of banks in Kenya, however the same was not statistically significant.

Yegon (2012) in his study on the impact of ICT investments on organisational performance at the Kenya Commercial Bank group limited concluded that the relationship was not very strong. According to the study by Rothare (2021), on impact of information technology on the performance of Tunisian banks it was found that, information technology led to reduced costs and improved performance of commercial banks. According to the study by Rono (2019), on determinants of electronic banking and performance of commercial banks in Kenya it was discovered that, most of the commercial banks in Kenya have invested on e-banking applications with a positive impact of improved efficiency and performance. He discovered that e-banking has improved the financial performance in the banking industry and customers convenience by allowing customers to carry out banking transactions anytime and anywhere.

In their research Kadzo and Wafula (2019), analyzed on the effect of internet banking on financial performance of commercial banks in Kenya and came up with the following findings: internet reduce transaction costs and attracts customers to the bank: cheaper transaction costs can lead to extend client base because many potential customers seek value of their money: e-banking enhances customer royalty and sense of security as opposed to over the counter banking because customers are able to access banks' services round the clock which creates a strategic advantage against competitors: Internet banking saves time leading to increased efficiency.

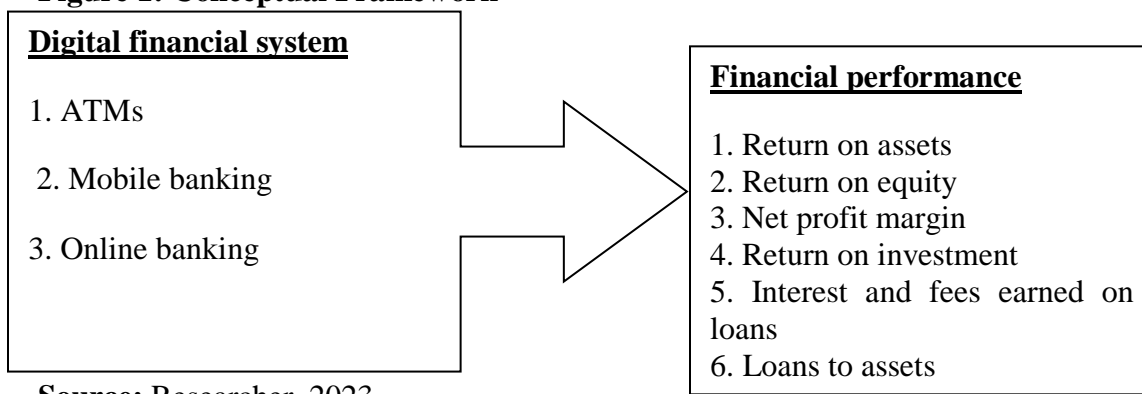
According to the study by Njogu (2021), it was discovered that there is a strong positive relationship between electronic banking and the financial performance of commercial banks in Kenya. Electronic banking minimized operation costs of the commercial banks, improved their speed in service provision, enhanced accessibility to a wider market and is convenient to customers. In the findings of the study, commercial banks were encouraged to adopt to e-banking as this would influence their financial performance.

According to Diergaardt (2020) study on effect of e-banking on commercial banking sector performance a case study of Namibia, some challenges were identified that need to be overcome by the developing countries in order to achieve the advantages of e-banking. For the developing countries to adopt global technology for their local requirements, they first need to develop an adequate level of infrastructure and human capacity building, the ability to strengthen public support for finance, ability to create necessary level of regulatory and institutional framework due to lack of security, trust and privacy and develop the ability to mainstream small and medium scale enterprises towards e-banking.

2.6. Conceptual Framework

The conceptual framework expresses the rationale behind the study. The figure 1 indicates framework of determinants of both the independent and dependent variables. In this case, Independent variable is” digital financial system while dependent variable is perceptions of customers on financial performance in financial institutions. This framework is helpful discussions that was made in second chapter by referring to different authors.

Figure 1: Conceptual Framework



Source: Researcher, 2023

From the figure above model shows that, digital financial system (ATM, and mobile banking, online banking) is the independent variable that affect the outcome of financial performance that is dependent variable. Dependent variable is financial performance measured in terms of return on assets, return on equity, and net profit margin.

CHAPTER 3: RESEARCH METHODOLOGY

The chapter explains the methodology that used in the study. The chapter thus, outlines into research design, population of the study, sample size and sampling techniques, data collection techniques and tools, validity and reliable, methods of data analysis, ethical considerations, and limitation of the study.

3.1 Research design

Research design is the assumption that the researcher brings to the study; procedures of or strategies and specific methods of data collection, analysis, and interpretation. The selection of a research design is also based on the nature of the research problem being addressed, the researchers' personal experiences, and the audiences for the research (Creswell, 2015). This particular research study was a descriptive and correlation research design. It is descriptive because it describes the perceptions of the respondents on digital financial system and perceptions of customers on financial performance in financial institutions by using mean and standard deviations. It is correlational research because it measures the relationship between digital financial system and financial performance in financial institutions by using Pearson correlation.

3.2 The population of the study

Cooper and Schindler (2014), define population as the entire set of individuals of interest to research. Although the entire population usually does not participate in a research study, the results from the study are generalized to the entire population. Target population of the study was the employees of bank of Kigali, headquarter. So the population targeted was bank of Kigali, headquarter staffs comprising 52 employees from departments of IT, operations, risk management, internal audit and control, and finance and accounting.

3. 1. Population

Name of working departments	No of employees in each working Department
IT	6
Finance and accounting	24
Risk management	6
Internal Audit and control	7
Operations	9
Total	52

Source: Bank of Kigali, 2023

3.2.1. Sample size

Sample size is a count of the individual samples or observations in any statistical setting, such as a scientific experiment or a public opinion survey. Though a relatively straightforward concept, choice of sample size is a critical determination for a research project. Too small a sample yields unreliable results, while an overly large sample demands a good deal of time and resources. Since the total target population size was small, the researcher considered the whole target population as her sample size. Therefore, it was no need of determining sample size in order to achieve accuracy and for the research data collection; the researcher distributed the questionnaire to all 34 employees.

3.3 Sampling

Sampling techniques is the process of using a small number of items or parts of a large population to make conclusions about the whole population (McCabe, 2016). Sampling is that by

selecting some of the elements in a population, we may draw conclusions about the entire population. In this work, the universal sampling used for determining a representative population. The study considered a sample which is universal by using the whole population to fulfil the questionnaire.

3.4 Data Collection Techniques and Tools

Data collection tools are the instruments which are used to collect the necessary information needed to serve or prove facts (Mugenda and Mugenda, 2018). The study used both primary and secondary data in order to achieve the objective.

3.4.1 Questionnaire

This study utilized a questionnaire to gather essential information. Questionnaires are important for studies since they gather data that is not straightforwardly discernible as they ask about sentiments, inspirations, mentalities, achievements and also encounters of people (Mugenda & Mugenda, 2018). The questionnaire involved both open and close-finished inquiries. The study used Likert scale to generate the questions in the questionnaire. The questionnaire is structured questions. The close-ended questions give more organized reactions to encourage substantial suggestions.

A questionnaire is a formalized framework consisting of a set of questions and scales designed to generate primary data. Questionnaire construction involves taking established sets of scale measurements and formatting them into an instrument for collecting raw data from respondents (William, 2017).

The questionnaire designed in English. It has three sections: the first section is used to capture the demographic information of respondents: age, sex, education background, and operating experience.

The second section was about dimensions; relating to evaluation of digital financial system (independent variable). The third section was about dimensions; relating to evaluation of financial performance in financial institution (dependent variable). The questionnaire used a Likert five point scale, since it is simple and easy to understand. A Likert scale is easy to construct and administer. The scaling composed of the following:

1. Strongly disagree (SD), 2. Disagree (D), 3. Neutral (N), 4. Agree (A), 5. Strongly Agree (SA)

Table 1. Interpretation of scale

Weight scale	Likert scale
1	Strongly Disagree (S D)
2	Disagree (D)
3	Neutral
4	Agree (A)
5	Strongly Agree (SA)

Source: (Saunders, Philip, & Adrian, 2016)

Secondary data is quite beneficial especially when it comes to quantitative information as it can cover large databases. Hence, this kind of evidence gathering is much more economical regarding time, effort, and cost. Secondary data was collected from the financial statements of Bank of Kigali for analyzing the performance level.

3.5 Validity and reliability tests

The study conducted a pilot study of 10% of respondents (10 respondents) from the sample population of 96 customers. Mugenda and Mugenda (2018), observe that the purpose of pilot study is to assess the clarity of the instruments and the validity and reliability of each item in the instrument.

3.5.1 Validity of questionnaire

Validity and reliability are the major instruments to measure the instruments quality and adequacy. Validity refers to the extent to which a measurement instrument actually measures what it is meant to measure (Shanghverzy, 2017). To ensure the validity of the research instrument, the researcher will design the questionnaire by reviewing relevant literature and studies in the area of interest. The questionnaire was validly by supervisor.

3.5.1 Reliability of questionnaire

Reliability is the degree of similarity of the results obtained when the measurement is repeated on the same subject or the same group (Shanghverzy, 2017). The questionnaire guide pretested by administering the questionnaire to the study participants Adjustments made accordingly, in case required, with the guidance of the lecturer. The reliability dimension used for this study is Alpha Cronbach. When the Alpha is greater than 0.70 that shows there is high reliability, if Alpha is less than 0.70 the instrument is not reliable.

Table 1. Reliability table

Cronbach's Alpha	N of Items
.709	10

Source: Primary data (SPSS data, 2023)

From table 1 above it is evident that the obtained Cronbach alpha value of 0.709 is above the acceptable standard value of 0.7 hence indicative that the data collection instrument was likely to yield reliable and valid results.

3.6 Data processing

Data processing is the conversion of data into usable and desired form. This conversion or “processing” is carried out using a predefined sequence of operations either manually or automatically. Most of the data processing is done by using computers and thus done automatically. The output or “processed” data can be obtained in different forms like image, graph, table, charts or any other desired format depending on the software or method of data processing used.

Data Editing: This involves checking all questions in order to discover errors and remove unnecessary information. Here effort was made by the researcher to reduce errors that could come out during the course of research process, hence creates better ground for coding and tabulation (Hair, Robert, & David, 2016). Data editing will be performed with a computer.

Data coding: Coding was used to summarize data by classifying different responses in categories that can be easily understandable. Developing coding frames was made from asked questions and answers to particular questions were noted leading to coding patterns from which coding frames and frequency counts facilitated tabulation.

Tabulation: After the process of coding, all information were put into statistical tables showing the number of occurrences of respondents in particular question. The research was presented in calculated percentages, after tabulation data was analyzed and summarized in accordance with the objective of study.

3.7 Methods of data analysis

The data obtained through the questionnaires which was administered to the respondents and examined by using the Statistical Package of Social Sciences (SPSS) 22 version and the results

obtain presented in the form of tables in chapter four. The data was analyzed using the frequencies, descriptive, Microsoft excel and Pearson correlation tools in SPSS. The researcher used Microsoft excel in this research in analysis of financial reports. The use of Microsoft excel for a data analysis is recommended particularly if the data is complex or multiple analyses are performed or if you have large number of figures.

3.7.1 Mean (\bar{X})

The best known and frequently used measure of the center of a distribution of a quantitative variable is well known as the mean. The mean refers to the average or arithmetic mean of the values; adding up the data points and dividing by how they are.

And the formula is:

$$\bar{X} = \frac{1}{n} \sum_{i=1}^n x_i n_i$$

Where, \bar{X} = mean; n = number of total respondents, x_i = scale value of the respondents.

Table 2. Evaluation of the Mean

Mean	Evaluation
1.00-1.99	Weak
2.00-2.99	Tend to weak
3.00- 3.99	Tend to strong
4.00- 5.00	Strong

Source: (Aggesti & Franklin, 2009).

3.7.2 Standard Deviation (SD)

The standard deviation is a value which indicates the degree of variability of data. It indicates how close the data is to the mean. It shows the spread of data; SD is typical distance from the mean, larger values of the SD represent greater spread, if SD=0 mean that all observations take the same value. The formula of standard deviation is:

$$SD = \sqrt{S^2}$$

Where, $S^2 = \frac{1}{n-1} \sum_{i=1}^n (xi - \bar{x})^2$

Table 3. Evaluation of Standard Deviation

Standard Deviation	Level of Spreading
SD<0.5	Homogeneity
SD≥0.5	Heterogeneity

Source: Primary data (2023)

The homogeneity consists of things or individuals who have similar characteristics or all of the same type and heterogeneity consists of things or individuals who have few or no similar characteristics.

3.7.3 Correlation

In correlation analysis, we estimate a sample correlation coefficient, more specifically the Pearson Product Moment correlation coefficient. The sample correlation coefficient, denoted r, ranges between -1 and +1 and quantifies the direction and strength of the linear association between the two variables. The correlation between two variables can be positive (i.e., higher levels of one variable are associated with higher levels of the other) or negative (i.e.,

higher levels of one variable are associated with lower levels of the other) (Székely, 2017). Correlation analysis, the purpose was to measure the strength and closeness of relationship between each independent variable to dependent.

Table 4. Evaluation of positive coefficient of correlation

Correlation coefficient/positive or negative	Label/ positive or negative
$0 < r < 0.30$	Poor correlation
$0.30 \leq r < 0.60$	Moderate positive correlation
$0.60 \leq r < 0.80$	High positive correlation
$0.80 \leq r < 1.00$	Very high correlation

Source: (Sander, 2014).

3.8 Ethical Considerations

In research study perspective, ethics refers as the responsibility of researchers to be honest and respectful to all individuals who may be affected by their research studies or their reports of studies' results (Bryman & Bell, 2017). Researchers are usually governed by a set of ethical guidelines that assist them to make proper decisions and choose proper action. Consequently this study work will conduct without any person harmed or having to face any consequences from the research activities. The data collected from field and only used for academic purpose. In the process of data processing and analysis, there was no tendency of data manipulation or falsification, and interpretation was objective in order to reflect the authenticity. The conclusion was taken was from research findings, thus there was no subjectivity use in interpretation, and taking the conclusion of the study.

3.9 Limitation of the study

Various problems and constraints accounted during the time of data collection, such as refusal to release some of the information by some of respondents, regarding it confidential. Others would say that time might be not enough to carry on the necessary research, lack of published enough literature, on availability of some respondents.

CHAPTER 4: RESEARCH FINDINGS

This chapter focuses on the analysis of the data gathered and interpretation of findings. The data is presented in tables and then analyzed. The chapter is chronologically engaged to give statistical answers to the research questions addressed in chapter one of this research work. The statistical analysis was done using the statistical package for Social Sciences (SPSS) Package version 22. In this chapter, the researcher has grouped chapter four into 4 parts namely respondents' demographic profile and perception of respondents of digital financial system, perceptions of the respondents on financial performance in financial institutions and testing hypotheses.

4.1 Demographic Profile of the Respondents

The following part reveals the ranked gender, age group, academic qualification, and the years of experience in the bank.

Table 5. Description of respondents by demographic variables

Variables		Frequency	Percent
Distribution by Gender	Male	22	42.3
	Female	30	57.7
Distribution by age group	Below 30 years	6	11.5
	31-35	15	28.8
	36-40 41 years old and above	20 11	38.5 21.2
Academic qualification	Secondary	4	7.7
	Bachelor's degree	29	55.8
	Masters' degree and above	19	36.5
Marital status	Single	16	30.8
	Married	30	57.7
	Others	6	11.5
Experience	Less than 2 years	9	17.3
	between 2- 5 years	18	34.6
	6 years & above	25	48.1
Total		52	100.0

Source: Primary data (2023)

The table 5 is summarizing the description of respondents by demographic variables. Five variables were considered and findings are as follows:

Table 5 indicates that 42.3 % of respondents were male and 57.7% were female. This indicates that most of the respondents are female and the smallest numbers of the respondents are male.

Concerning the age group of the respondents, the results indicated that 11.5% of respondents were aged between below 30 years, 28.8% of respondents were aged between 31 to 35 years, 38.5% of respondents were aged between 36 to 40 years. While 21.2% of remaining respondents represent who were the aged 41 years old and above. This implies that the majority of the respondents are aged between 36 and 40 years old and this means that they are mature enough to generate the information to this study.

About academic qualification of the respondents, 7.7% represent those who has secondary, 55.8% of respondents represents those who held Bachelors' degree, while 36.5% of respondents represent the holder of masters' degree and above. This implies that the majority of respondents are those who hold bachelor degree and implying that the respondents are able enough to read, understand and interpret questionnaires by providing reliable and relevant information to this study.

For ascertaining the working experience, the findings show that 17.3% of the respondents have worked for Bank of Kigali for a period of less than 2 years, while 34.6% of respondents have worked for a period between 2 to 5 years, and 48.1% of respondents have worked in Bank of Kigali in period of 6 years & above. The findings indicate that participate had extensive experience and hence were adequately appropriate to take part in this study.

4.2. To analyze the use of digital financial system tools in Bank of Kigali

Investigation to analyze the effect of digital financial system in financial performance enlisted the following study findings. Researcher assesses the perceptions of respondents on the digital financial system through of ATMs, mobile banking, and online banking.

4.2.1 Perceptions of the respondents on ATMs

In this study, the respondents were asked to give their opinion on ATMs as determinants of digital banking system.

Table 6. Perceptions of Respondents on ATMs

Statements	Mean	Comments	SD	Comments
ATMs improve the reputation of the bank.	4.57	Strong	.41	Homogeneous
Machine does not run out of cash.	2.11	Tend to weak	.74	Heterogeneous
ATMs go to the extent of given accounts balances and bill payments.	4.55	Strong	.46	Homogeneous
ATMs accomplish higher efficiency per duration of time than human tellers.	4.23	Strong	.34	Homogeneous
Overall	3.86	Tend to strong		

Source: primary data (2023)

Table 6 shows the perceptions of respondents on ATM. In assessing this variable, three items were considered and the findings are as follows: the statement asking whether ATMs improve the reputation of the bank and it was perceived with the mean of 4.57 (strong) and standard deviation of 0.41 (homogeneous). This means that most of respondents agreed that ATMs improve the reputation of the bank and they share similar understanding on this statement.

The item which was to see if machine does not run out of cash was perceived by the mean of 2.11 (tend to weak) and the standard deviation of 0.74 (heterogeneous). This means that respondents disagreed that machine does not run out of cash and they have dissimilar understanding as it is indicated by the standard deviation. The next item assessed indicates that respondents strongly agreed with the same understandings that ATMs go to the extent of given accounts balances and bill payments. Based on the results, which have the mean of 4.55 (strong) and standard deviation of 0.46 (homogeneous).

Lastly, respondents strongly agreed with the same understandings that ATMs accomplish higher efficiency per duration of time than human tellers and based on the results, which have the mean of 4.23 (strong) and standard deviation of 0.34 (homogeneous). In general, all statements assessed on automated teller machine have scored with the aggregate mean of 3.86 (tend to strong) which means that respondents agreed that automated teller machine improve the financial performance of Bank of Kigali. The study is in line with Ifeanyichukwu and Emenike (2016) conducted a study the impact ATM on the banking performance in Nigeria using descriptive and regression analyses. The regression results indicated that ATM transactions positively and significantly impacted private sector demand deposits in Nigeria but not private sector savings deposits and private sector time deposits.

4.2.2 Perceptions of Respondent on Mobile Banking

The researcher needs to gain more understanding from respondents on how mobile banking improve financial performance of bank of Kigali.

Table 7. Perception of Respondent on Mobile Banking

Statements	Mean	Comments	SD	Comments
Through use mobile banking, our customers perform banking transaction quickly without needing help from staff.	4.40	Strong	.61	Heterogeneous
Sending marketing programs for the bank through the mobile increases the competitive advantage of the bank.	4.15	Strong	.78	Heterogeneous
Bank of Kigali use short text messaging to inform customers any changes in their account.	4.51	Strong	.49	Homogeneous
Overall Mean	4.35	Strong		

Source: primary data (2023)

The first statement was intended to know if through use mobile banking, our customers perform banking transaction quickly without needing help from staff. This was perceived with the mean of 4.40 (strong) and standard deviation of 0.61 (heterogeneous). This means that respondents strongly agreed that through use mobile banking, our customers perform banking transaction

quickly without needing help from staff and the respondents have different perceptions on this statement.

The following statement was to know whether sending marketing programs for the bank through the mobile increases the competitive advantage of the bank and it was perceived by the mean of 4.15 (strong) and the standard deviation of 0.78 (heterogeneous). This means that respondents strongly agreed that sending marketing programs for the bank through the mobile increases the competitive advantage of the bank and they have different understanding as it was indicated by the standard deviation of 0.78.

The next item assessed was to know whether Bank of Kigali use short text messaging to inform customers any changes in their account and the respondents strongly agreed that Bank of Kigali use short text messaging to inform customers any changes in their account. This is presented with a mean of 4.51 (strong) and standard deviation of 0.49 (homogeneous). This homogeneity in standard deviation indicated that all respondents have similar understanding in answering this question. In general, all statements assessed on mobile banking was scored with the aggregate mean of 4.35, this implies that the respondents appreciate the use of mobile banking at Bank of Kigali. Study agreed with Ariff, Zakuan, and Yun (2013) studied on effect of technological innovation on the financial performance of commercial banks in Tanzania. The research findings explained that adoption of technological innovations by majority of commercial banks in Tanzania contributed positively on financial performance of commercial banks and an improvement in service delivery during business operation was witnessed.

4.2.3 Perception of respondent on online banking

In this part, respondents were asked to give their opinion relating to online banking.

Table 8. Perceptions of Respondents on online banking services

Statements	Mean	Comments	SD	Comments
Online banking makes the quickly performance of the banking transactions.	4.19	Strong	.44	Homogeneous
Through online banking, BK manages the customer account anywhere and anytime.	4.67	Strong	.30	Homogeneous
Providing banking services not too many steps in processing transaction.	3.11	Tend to strong	.54	Heterogeneous
Overall	3.99	Tend to strong		

Source: Primary data (2023)

Table 8 revealed the perception of respondents on online banking services. In assessing this variable, the following items were considered and the findings are represented and interoperated as follows: The respondents strongly agreed that online banking makes the quickly performance of the banking transactions and was scored with the mean of 4.19 and standard deviation of 0.44 which means that the most of respondents have the same understanding on their response.

The other item assessed was to know whether through online banking, BK manages the customer account anywhere and anytime. It was perceived by the mean of 4.67 and the standard deviation of 0.30. This means that respondents strongly agreed with the same perceptions that through online banking, BK manages the customer account anywhere and anytime.

Lastly, respondents tend to strongly agreed that providing banking services not too many steps in processing transaction and it was scored with the mean of 3.11 and standard deviation of 0.54 which means that the most of respondents have different understanding on their response. Generally, all items assessed on online banking showed the overall mean of 3.99. This is to say that respondents agreed that BK provides bank services to its customers through online. The study concurred by Rothare (2021), on impact of information technology on the performance of Tunisian banks it was found that, information technology led to reduced costs and improved performance of commercial banks.

4.3. To evaluate the level of financial performance in Bank of Kigali

This section presents the level of financial performance of BK. This section indicates the analysis of financial statements of bank of Kigali by computing the ratios on ROA, ROE, and net profit margin.

4.3.1. Evaluation of Return on Assets Ratio

The formula to calculate return on assets is:

$$\text{ROA} = \frac{\text{Annual Net Income}}{\text{Total Assets}}$$

Table 9. Evaluation of Return on Assets Ratio of BK

Years	Annual net income (Frw '000')	Total assets (Frw '000')	Evolution in %
2019	37,308,336	1,019,075,587	3.66
2020	38,433,289	1,304,004,486	2.95
2021	51,894,970	1,590,372,983	3.26
2022	59,724,310	1,853,994,433	3.22

Source: BK's statement of financial position and income statement from 2019 to 2022

Bank of Kigali's ROA in 2019 is 3.66%. This means that every Rwf of Bank of Kigali invested in assets during the year produced at 3.66 of the net income. This indicates that Bank of Kigali was receiving high income. Bank of Kigali's ROA in 2020 is 2.95%. This means that every Rwf of Bank of Kigali invested in assets during the year produced at 2.95 of the net income. This indicates that Bank of Kigali was receiving high income.

In 2021 and 2022, the return on asset ratio is 3.26% and 3.22% respectively means that the BK is investing a low amount of capital into its production while simultaneously receiving high income. This indicates that ROA of BK was fluctuated during this four years. So adaptation of digital financial system has positive effect to the financial performance of BK by creating potential to quickly improve the return and bring in high profits.

4.3.2 Evaluation of Return on Equity Ratio

Return on equity (ROE) is the amount of net income returned as a percentage of shareholders equity.

ROE is expressed as a percentage and calculated as:

$$\text{Return on Equity} = \text{Net Income} / \text{Shareholder's Equity}$$

Table 10. Evaluation of Return on Equity Ratio of BK

Years	Annual net income (Frw '000')	Shareholder's Equity(Frw '000')	Evolution in %
2019	37,308,336	220,810,886	16.9
2020	38,433,289	259,344,020	14.8
2021	51,894,970	285,700,114	18.2
2022	59,724,310	319,076,356	18.7

Source: BK's income statement and statement of financial position from 2019 to 2022

The result implies that after preferred dividends are removed from net income BK's ROE is 16.9% in 2019. This means that every Rwf of common shareholder's equity earned about Rwf 16.9 in 2019. In other words, shareholders saw a 16.9 percent return on their investment. Table 10 also shows that from 2020 and 2022 the ratio are the following 14.8%, 18.2%, and 18.7% respectively indicates that BK 's return on equity is in positive way; it means its shareholders are winning and gaining value. This is usually a very good sign for investors and management of BK by using electronic banking services as better way of improving financial performance. Most investors avoid placing their money in a company that fails to consistently deliver positive returns, but investors may overlook a negative return for a single tough year if they believe the company is well-positioned for long-term growth.

4.3.3 Evaluation of Net profit margin

$$\text{NPM} = (\text{Net profit} / \text{Net Sales}) \times 100$$

Table 11. Evaluation of Net Profit Margin Ratio

Years	Net profit(Frw '000')	Net Sales (Frw '000')	Evolution
2019	37,308,336	94,260,387	39.6
2020	38,433,289	112,793,315	34.1
2021	51,894,970	136,271,358	38.1
2022	59,724,310	137,775,776	43.3

Source: bank of Kigali's statement of comprehensive income from 2019 to 2022

The net profit margin of bank of Kigali fluctuated from 2019 to 2021. Notice that in terms of Rwf amount, net sales is higher in next year. Nonetheless, in 2019 represents only 39.6% of sales; while in 2020, it represents 34.1%; but in 2021, it represents 38.1%, and 43.3% in 2022. For every 1 Rwf of sales, bank of Kigali made Rwf 0.39 in 2019, Rwf 0.34 in 2020, Rwf 0.38 in 2021, and Rwf 0.43 in 2022. Hence in terms of managing costs and expenses, BK did better in 2022. The higher the net profit margin (or return on sales), the better. A high percentage means that the company did well in managing its expenses. It is also useful to compare it to a benchmark, such as industry average or past performance, to determine the company's standing.

Table 12. Evaluation of Return on investment Ratio of BK

Years	Net profit(Frw '000')	Investment (Frw '000')	Evolution in %
2019	37,308,336	124,797,114	29.9
2020	38,433,289	155,404,946	24.7
2021	51,894,970	184,633,713	28.1
2022	59,724,310	241,573,713	24.7

Source: BK's income statement and statement of financial position from 2019 to 2022

The return on investment of bank of Kigali fluctuated from 2019 to 2022. Notice that in terms of Rwf amount, money generated exceeded the amount spent. BK's ROI is 29.9% in 2019. This means that every Rwf BK spent in investment earned about Rwf 29.9 in 2019. Results also shows that from 2020 and 2022 the ratio are the following 24.7%, 28.7 and 24.7% respectively indicates that BK 's return on investment is in positive way; it means that BK generated exceeded

money than the amount spent. This is usually a very good sign for investors and management of BK by using electronic banking services as better way of improving financial performance.

Table 13. Evaluation of Interest and fees earned on loans Ratio of BK

Years	EBIT (Frw '000')	Interest Expense (Frw '000')	Evolution in %
2019	52,092,606	26,197,201	1.99
2020	57,066,286	45,173,553	1.26
2021	76,880,669	63,217,418	1.22
2022	88,454,776	85,793,924	1.03

Source: BK's income statement from 2019 to 2022

Based on interest and fees earned on loans Ratio, the bank of Kigali fluctuated from 2019 to 2022. BK is burdened by debt expenses and the less capital it has to use in other ways. Because BK interest and fees earned on loans ratio is 2019, 2020, 2021, 2022, are 1.99, 1.26, 1.22, and 1.03, implied that BK has ability to meet interest expenses may be questionable. Companies need to have more than enough earnings to cover interest payments in order to survive future and perhaps unforeseeable financial hardships that may arise. A company's ability to meet its interest obligations is an aspect of its solvency.

Loan to assets Ratio= Total liabilities/ Total Assets

Table 14. Evaluation of loans to assets Ratio of BK

Years	T/Liabilities (Frw '000')	Total assets (Frw '000')	Evolution in %
2019	798,264,700	1,019,075,587	78.33
2020	1,044,660,466	1,304,004,486	80.11
2021	1,304,672,869	1,590,372,983	82.04
2022	1,534,918,077	1,853,994,433	82.79

Source: BK's income statement from 2019 to 2022

78.33%, 80.11%, 82.04%, and 82.79%, this ratio shows BK in 2019, 2020, 2021, and 2022 has higher the leverage and is the financial risk on account of heavy debt obligation on the part of the business. BK has higher the leverage and is the financial risk on account of heavy debt obligation on the part of the business. Generally, all banks bank has more assets than debt.

4.4 To assess the relationship between digital financial system and financial performance in financial institutions

Taking reference from chapter one of this research, the researcher had two hypotheses. The null hypothesis (H₀) stating that; there is no significant relationship between digital financial system (independent variable) and financial performance in financial institutions (dependent variable), and (H₁) stating that there is significant relationship between digital financial system and financial performance in financial institutions.

Table 15. Evaluation of Pearson correlation coefficient

		Digital financial system	Financial performance
Digital financial system	Pearson Correlation	1	.884 ^{**}
	Sig. (2-tailed)		.006
	N	52	4
Financial performance	Pearson Correlation	.884 ^{**}	1
	Sig. (2-tailed)	.006	
	N	4	4
**. Correlation is significant at the 0.01 level (2-tailed).			

The correlation between digital financial system and financial performance in financial institutions, from Table 12 the statistical evidence depict that there is a significant effect of digital financial system on financial performance in financial institutions. The Pearson correlation between digital financial system and financial performance in financial institutions is very high correlation (.884) and the sig. (2-tailed) is 0.006 which is less than level of significance of 0.05. Therefore the null hypothesis (H_0) was rejected and concluded that there is significant effect of digital financial system on financial performance in financial institutions selected in bank of Kigali, headquarter.

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of researcher's interpretation and conclusions from data analyzed, a summary of the results connected to the research problem and purpose of the research project and conclusion and recommendations were also suggested in this chapter.

5.1 Summary of Major Findings

The general objective of this study is to analyze the effect of digital financial system on financial performance in financial institutions. The research used descriptive survey research design and multiple linear regression analysis by SPSS 22 version was used to analyze the data collected throughout a questionnaire. The research conducted in bank of Kigali headquarter, located in Kigali city. The target population of the study is the customers of bank of Kigali headquarter. The researcher used convenience sampling techniques and give questionnaire to 52 respondents. All respondents answered questions which formed the base of analysis and then the analysis and interpretation were focused on the data collected from the targeted respondents through questionnaire.

For the first objective: To analyze the use of digital financial system tools in Bank of Kigali, the results revealed that the respondents strongly confirmed that digital financial system affect financial performance in financial institutions through ATMs as shown with the overall mean of 3.86 (Table 6), analysis done on mobile banking with the overall mean of 4.35 (Table, 7), and analysis done on online banking with the overall mean of 3.99 (Table, 8).

For the second objective: to evaluate the level of financial performance in Bank of Kigali, the findings showed that financial performance in financial institutions. Bank of Kigali's ROA in 2019 is 3.66%. Bank of Kigali's ROA in 2020 is 2.95%. In 2021 and 2022, the return on asset ratio is 3.26% and 3.22% respectively means that the BK is investing a low amount of capital

into its production while simultaneously receiving high income. BK's ROE is 16.9% in 2019. This means that every Rwf of common shareholder's equity earned about Rwf 16.9 in 2019. In other words, shareholders saw a 16.9 percent return on their investment. Table 10 also shows that from 2020 and 2022 the ratio are the following 14.8%, 18.2%, and 18.7% respectively indicates that BK 's return on equity is in positive way; it means its shareholders are winning and gaining value. The net profit margin of bank of Kigali fluctuated from 2019 to 2021. Notice that in terms of Rwf amount, net sales is higher in next year. Nonetheless, in 2019 represents only 39.6% of sales; while in 2020, it represents 34.1%; but in 2021, it represents 38.1%, and 43.3% in 2022. For every 1 Rwf of sales, bank of Kigali made Rwf 0.39 in 2019, Rwf 0.34 in 2020, Rwf 0.38 in 2021, and Rwf 0.43 in 2022.

For the third objective: To assess the relationship between digital financial system and financial performance in financial institutions, the results indicate that independent variable has very high correlation to dependent variable which are equal to $.884^{**}$ and the p-value is .006 which is less than 0.05. When p-value is less than significant level, thereafter we conclude that variables are significantly correlated.

5.2 Conclusion

From the research findings, the researcher therefore makes a conclusion that digital financial system is very important in the financial performance in financial institutions. Digital financial services (ATM, mobile banking, and online banking) have a positive and significant effect on the financial performance in financial institutions. This means that ATM, mobile banking, online banking are important for financial performance in financial institutions through return on assets, return on equity, and net profit margin.

The findings also lead us to conclude that, withdrawal, money transfer, deposits can be made anywhere at any time and using any bank ATM machine, mobile banking and online banking, customer cannot make a withdrawal or save more than some certain amount to allowed other customers have access to cash and money, can be transfer from one place to another through electronic means. In general conclusion the digital financial system has made banking transaction to be easier by bringing services closer to its customers hence improving banking financial performance.

Using the Pearson correlation, the researcher concluded that digital banking system have very high correlation to financial performance in financial institutions due to the fact that equal $r = .884^{**}$ which is very high correlation and the p-value is .006 which is less than 0.05.

5.3 Recommendations

The following recommendation are worth forwarding in this study:

1. ATM should be put in different locations easily accessible by customers, so that quick service and convenience is maintained hence improving bank operations.
2. BK should therefore continue to adopt new technologies which will improve their margins and hence their profitability in order to attract more investors.
3. The BK should propose increasing ATMs, mobile banking, online and fund transfer services because the findings indicate that they positively influence financial performance of bank of Kigali. When they are increased, financial performance increases.
4. The bank should keep on upgrading their e banking technology in order to have an up to date system for effective service delivery.

5.4 Suggestion for further research

The study focused on the digital financial system and financial performance in financial institutions, a case of bank of Kigali headquarter. There is need for a similar study to be conducted in the microfinance institutions so as to establish the effect of digital financial system on financial performance in microfinance institutions. The study also recommends that a study should be done on the challenges facing the adoption of digital financial services by commercial banks in Rwanda. Further research also should be carried out with increased sample size to generalize the results of the study.

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APPENDICES

Questionnaire

I'm Nice MUMARARUNGU: I'm in a student at Kigali Independent University (ULK). I am conducting my research concerning about "*Effect of digital financial system on financial performance in financial institutions*". I kindly solicit your assistance in the study by providing answers to the questions given below. Certainly your participation will be very much appreciated. Please do this on your own and answer honestly, just by indicating whatever you think is right to you on each question by ticking [√] the appropriate case for section A and cycling the appropriate number for section B

All the information and answers you give will be treated confidentially. Please do not write your name on the questionnaire. You will not be identified or mentioned in any report.

SECTION A: PERSONAL IDENTIFICATION

SECTION A: Demographic Profile of Respondents

Instruction: Please provide the information about you by ticking or writing as appropriate:

1) Please specify your gender

a) Male

b) Female

2) Indicates your age

a) Below 30 years

b) 30-35 years

c) 36-40 years

d) 41 years and above

3) Academic qualification

a) Secondary

b) Bachelor's degree

c) Masters' degree and above

4) Working experience

a) Less than 2 years

b) between 2- 5 years

d) 6 years & above

SECTION B: Respondents views on the digital financial system

Instructions:

Please answer all of the following questions, by indicating whatever you think is right to you on each question. Simply circle the number that best describes your knowledge about the following scale:

1. Strongly disagree (SD) 2. Disagree (D) 3. Neutral 4. Agree (A) 5. Strongly Agree (SA).

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	ATMs	SD	D	N	A	SA
5	ATMs improve the reputation of the bank.	1	2	3	4	5
6	Machine does not run out of cash.	1	2	3	4	5
7	ATMs go to the extent of given accounts balances and bill payments.	1	2	3	4	5
8	ATMs accomplish higher efficiency per duration of time than human tellers.	1	2	3	4	5
	Mobile banking	SD	D	N	A	SA
9	Through use mobile banking, our customers perform banking transaction quickly without needing help from staff.	1	2	3	4	5
10	Sending marketing programs for the bank through the mobile increases the competitive advantage of the bank.	1	2	3	4	5
11	Bank of Kigali use short text messaging to inform customers any changes in their account.	1	2	3	4	5
	Online banking	SD	D	N	A	SA
12	Online banking makes the quickly performance of the	1	2	3	4	5

	banking transactions.					
13	Through online banking, BK manages the customer account anywhere and anytime.	1	2	3	4	5
14	Providing banking services not too many steps in processing transaction.	1	2	3	4	5