UNIVERSITY of RWANDA

College of Science and Technology

Research and Postgraduate Studies (RPGS) Unit

RESEARCH THESIS TITLE: ASSESSMENT OF MOBILE PAYMENTS: CHALLENGES FROM USER PERSPECTIVE IN KIGALI

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN INFORMATION SYSTEM.
OPTION: E-GOVERNMENT,
SCHOOL OF ICT, COLLAGE OF SCIENCE AND TECHNOLOGY

KIGALI, RWANDA,

February 2022

DECLARATION

I, William KARENZI (Ref No: 220000003) declare that this research; "Mobile Payment: Benefits and Challenges from User Perspective in Rwanda", done for the award of the degree of Masters of Science in Information Systems (e-government Option) is validated to all sources as used and quoted, have been acknowledged as complete references and have never been presented or submitted for any academic award in any university or institution.

Signed by:  …… Date……19/02/2022.....

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FINAL MASTERS THESIS SUBMISSION FORM

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Research Title	ASSESSMENT OF MOBILE PAYMENTS: CHALLENGES FROM USER PERSPECTIVE IN KIGALI		
Programme	Masters of Science in Information Systems (e-government Option)		
Degree (Master)	**MSC.I N IS OPT: EGOVERNMEMT**		

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ACKNOWLEDGEMENTS

This research project is a result of a collective effort of wonderful people, to whom I would like to express my gratitude.

Firstly, it is a great honor on this occasion to express my sincere and deep thanks to Almighty GOD for the love, kindness, and grace and from whom all knowledge, wisdom and understanding rightly come, for all that He has so graciously allowed us to achieve.

I would like to express my sincere thanks to all my supervisors Dr Pierre BAKUNZIBAKE, Dr Damien HANYURWIMFURA and Dr Rehema BAGUMA for their kind, valuable guidance, support, wise advice, suggestions and corrections that made my research project a success.

I would also like to express my sincere gratitude to my relatives and friends that stood with me. Fellow student, for the time we spent together and the teamwork we built during class activities, I am really grateful to my colleagues.

I also, acknowledge UR-CST and the School of ICT which gives us this opportunity to gain knowledge from.

God bless you.

Abstract

Due to its wide range of use and increasing market penetration of mobile phones, mobile payments have become a popular payment method in Rwanda as well the number of registered mobile money accounts has increased significantly. Yet we have a little understanding of user challenges associated with the payment mode.

This study aims at identifying the most significant challenges affecting the use of mobile money in Kigali in order to recommend a way forward to be used to address the associated challenges. In this research we focused on MTN mobile money payments as one of most commonly used mobile payment mode in Rwanda. The target population was mobile money users in Kigali where the service is mostly used and UR students in Kigali campuses were our case study.

The quantitative research methodology was used where cluster sampling technique and survey questionnaire were used as data Collection techniques with a sample of **99** UR students. We used SPSS as a data analysis tool in analyzing the data collected from questionnaire.

The research results identified that Network, Limited cash and e-float by agents, Fraud, Transaction limits, Limited number of agents, High transaction cost and Interoperability mobile money use challenges. It has also figured out that among the challenges only four of them- digital skills, Limited cash and e-float by agents, Limited number of agents and High transaction cost are the most significant challenges. Conclusion we recommended a way forward to addressing the associated challenges. This contributes by providing information to the service users, service providers, and Government's financial regulator and to future researchers in the same field.

Key words: Mobile payments, assessment, challenges, user perspective, Kigali

LIST OF ABBREVIATIONS AND ACRONYMS

ATM: Automated Teller Machine
B2P: Business To Person
E-Commerce: Electronic Commerce
E-quality service: Electronic Quality Service
E-Service: Electronic Service
GCash: Is Mobile Money Or "E-Money" That Allows You To Pay Bills, Send Or Receive Money.
ICT: Information Communication Technology.
ID: Identity Document.
MMSs: Multimedia Messaging Service.
MMT: Mobile Money Transfer.
MoMo: Mobili Money.
MPesa: (M For Mobile, Pesa Is Swahili For Money) Is A Mobile Phone-Based Money Transfer Service
M-S-QUAL: Mobile Service Quality Measurement.
MTN: Mobile Telephone Networks.
P2P: Person-To-Person Payment.
PIN: Personal Identification Number.
SACCO: Savings and Credit Cooperative Organization.
SMS: Short Message Service.
SSL: Secure Sockets Layer.
TLS: Transport Layer Security.
UNCTAD: United Nations Conference On Trade And Development.
UR-CST: University Of Rwanda College Of Science And Technology.

LIST OF SYMBOLS

Yamane's equation $\boldsymbol{n = \frac{N}{1+N(e)2}}$

n – The sample size.

N - The population size.

e - The acceptable sampling error.

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

The multiple fields of application and the high market penetration of mobile phones suggests that mobile payment may become a very popular means of payment[1]. The popularity of mobile payments reached Rwanda with the introduction of mobile financial services in 2009, several mobile banking products came into play, providing different services such as cash-in, cash-out from an account, cash-out at an ATM person-to-person payment (P2P), business to person (B2P) payment, payment to merchant, bill payment, airtime top-up, taxes payment; cross border mobile transfers/ remittances and payment of water bills, fuel purchase at petrol stations, school fees and saving schemes[2].

Mobile money is one of the mobile payments modes and its services were introduced by private telecommunication providers in several countries around the world especially in Latin America, Asia, and Africa [3].MTN is the private telecommunication provider of MTN Mobile Money which is a secure electronic wallet service that's available to smartphone users and those with basic feature phones on the MTN network in Rwanda. Money can be stored in the user's MTN Mobile Money wallet and used to buy products and services in-store and online, pay bills and school fees, top-up mobile airtime, send money to other MTN mobile users as well as users on other networks, and much more[4].

Despite enjoying the gamification, ease-of-use, and support for routine purchases with mobile payments, users experience challenges related to pre-purchase anxiety and trust issues[5]. It is in that regard that the knowledge about challenges should be enhanced so as to help users to overcome the issues and so more literature about this is needed.

In this research, we collected data from UR students who use mobile money in payments for various services. We chose the University students because they are the ones who are able to answer both questions of ordinary users and questions of educated ones including technology-based. Also, students are the ones feasible for self-administered questionnaires that have been used in this research. And the type of questionnaire was chosen considering unpredicted change of the pandemic guidelines where physical contacts were prohibited during the time of data collection.

1.2 Background and Motivation

1.2.1 Mobile money

Mobile money is a type of technology that enables people to obtain, store, and spend money using their phones. It is also known as a 'mobile wallet,' or by the name of a particular service like mPesa, EcoCash, GCash, Tigo cash, Airtel money and others[6]. Mobile money is increasingly dominating in Africa. With the rapid proliferation of mobile money transfer- MMT in Sub-Saharan African -SSA has seen mobile banking expanding at 16% of the market [7]. Even if Rwanda was one of the last countries in the East African Community (EAC) to adopt mobile money, but its progress has been remarkable[8]. Although mobile payment has gained popularity in many regions due to its convenience, it also faces many threats and security challenges[9].

1.2.2 Mobile money in Rwanda

In Rwanda, MTN was first to mobile money market in 2010, followed by Tigo in 2011 and Airtel in 2013. And among the 3 main mobile money providers, MTN is known to have the largest subscriber base [10]. There is a national encouragement to all Rwandans to adapt the use of electronic payments by the Rwanda National Payment System (RNPS) Strategy 2018–2024 reaffirms the National Bank of Rwanda's (BNR) and Ministry of Finance and Economic Planning's (MINECOFIN) in order to achieve a cashless society for it is important in support of economic growth[11]. And the encouragement aligns with the increased number of mobile money registered accounts which were close to 16 million as of 2019[12]. This caught my attention to where users understand use challenges associated with the payment mode that will help the users in making the decision to adopt the service. Like recently, Rwanda Investigation Bureau (RIB) has issued a warning to Rwandans about the growing danger of fraudulent schemes targeting mobile money and mobile banking users[13]. This was a group of six male youth whose target was to cheat mobile money agents and they have been successful until arrested. If this is possible to mobile money agents who are better trained and have relatively advanced knowledge about the service, you can imagine what happens to peasant service users. The need for knowledge about challenges like a fraud that affect users' convenience. Like in Rwanda very few mobile money users know what happens to someone's Phone money in case of an untimely death or inability to use the mobile money account**.** Rutagengwa from MTN Rwanda explained, "It is forbidden for any second individual to obtain or possess one's passcode because it can lead to cybercrime and MoMo theft". As a result of the service provider's stance, certain families of deceased users have been denied access to any funds remaining on their accounts[14]. Unclaimed funds owned by telecoms have accumulated due to a lack of awareness and the time-consuming method of claiming funds on mobile money platforms by next of kin[15]. Hence, a deep understanding of challenges for this fast-growing payment mode is important to inform the users so they get equipped as they are shifting from traditional payments mode.

1.3 Problem Statement

Mobile money as one of the mobile payments is praised for offering safe storage, deposit, withdrawal, and transfer of funds at a lower cost and more convenience than banks and facilitates domestic remittances at much low cost[16]. But on other hand, it is clear that mobile money has a number of use challenges for instance; *Network, Awareness & Literacy, Limited cash and e-float by agents, Fraud, Transaction limits, Limited number of agents, High transaction cost and Interoperability.*

Mobile payment users and service providers must both take security measures to ensure data security and avoid data breaches to lessen mobile payment risks[9]. Mobile money-related fraud is becoming more prevalent, as mobile payments take off in many markets and new products are launched, the need to fix fraud definitively is increasing[8]. So knowledge of users about security measures is critical in mitigating the risks.

Also according to the research findings by[17], there is little awareness about mobile money where some elements of mobile money services were unpopular, not just in rural areas but also in urban areas which clearly demonstrated a lack of understanding of the broad variety of services provided by mobile money services. We consider these challenges to may contribute to hesitation or reluctance in use of mobile money services due to users' lack of knowledge about challenges and how to address the risks like increased cases of fraud. We believe that when the users are deeply aware of the service issues, they will work with the service provider in taking in addressing the challenges. There are evidences which predict that some of the service challenges are facilitated by a lack of users' understanding of mobile money services like most people share PINs with their friends and families because they don't know that it may contribute to increased account security risks.

In the Rwandan context, News articles and formulated reports show that mobile money payment in Rwanda is growing rapidly with increasing challenges like fraud cases as time and use volume increase. But there is no enough literature that studied the challenges. Mostly, you find the concepts challenges are written in newspapers and few formulated reports but not scientifically documented. For Example, awareness campaigns are commonly used to share knowledge with the public are via adverts on Tv and radios by mobile money service providers and Rwanda Investigation Bureau (RIB) about the challenges mostly fraud actions related to mobile money use. But still, pieces of evidence show that a need to widen knowledge about mitigating the use challenges of the service in Rwanda is needed. In that regard, a deep assessment of mobile money challenges is needed to equip the public with knowledge to explore the advantages and mitigate challenges. So recommended the way forward to dressing the challenges associated with using mobile money in Kigali-Rwanda was designed.

1.3.1 Research questions

So two research questions that were used to investigate are:

1. What are the most significant challenges affecting use of mobile money Payment in Kigali?

2. How can the Challenges associated with use of mobile money be mitigated?

1.4 Study Objectives

1 .4.1 General Objectives of the research

This research aims at studying the most significant Challenges in mobile money Payment in Kigali to recommend the way forward. The research focused on MTN mobile money payment as one that is commonly used mobile payment in the country.

1 .4.2 Specific Objectives of the research

i) To identify the most significant Challenges associated with the use of mobile money Payment in Kigali.

ii) To assess which mobile money use challenges that affect service quality the most.

iii) To recommend the way forward to addressing the associated Challenges.

1.5 Hypotheses

Use challenges of mobile money service negatively affect its service quality. So we will be testing if there is a sufficient statistical evidences proving the existence of the most significant mobile money challenges and if they affect the service quality.

Null hypothesis **$H0_1$:** There is no one of (*Network, Awareness, digital skills, Limited cash and e-float by agents, Fraud, Transaction limits, Limited number of agents, High transaction cost and Interoperability)* are mobile money use challenges in Kigali.

Null hypothesis **$H0_2$:** There is no one of *Limited cash and e-float by agents, Transaction limits, Limited number of agents and Interoperability* are most significant mobile money use challenges that affect convenience as mobile money service quality.

Null hypothesis **$H0_3$:** There is no one of *Network, Awareness, digital skills, transaction cost and fraud* are most significant mobile money use challenges that affect satisfaction as mobile money service quality.

1.6 Limitation of the study

Since the study was conducted using self-administered survey questionnaire, was an issue when the respondents needed clarity on some questions the researcher later decided to share his email address to all respondents via students' representatives so he can interact with respondents when needed.

Another quandary turned into the respondents` unwillingness to offer all data requested. The researcher countered this with the aid of using explaining to the respondents via their representatives that this was not an investigation, however a studies for educational purposes.

1.7 Study Scope

This research was framed in context of mobile payments and the study aims to assess the most significant use challenges of mobile money in Kigali. It focused on MTN mobile money users in Kigali specifically University of Rwanda students in campuses located in Kigali. Researcher has selected MTN Rwanda from among Rwanda's existing mobile money service providers. This is because MTN Rwanda has the widest network coverage in the country and the largest number of mobile subscribers in the country and it has been in Rwanda before others. Since students are in Kigali for studies, they as well residents in villages in their families. We conducted a survey in the city of Kigali and assumed that the results obtained would be the same as those obtained if the survey included other parts of the country. This work reveals key use challenges of mobile money services and proposes solutions.

1.8 Significance of the Study

This study sought to assess the most significant use challenges of mobile money, the research has identified challenges and the strategies which will help the service providers of mobile payment in Rwanda to improve on services quality. Therefore, this work will be of great help to mobile money users, researchers, mobile money service providers, other researchers, and governments. Since the research has distinguished two types of the service use challenges (system based challenges and user based challenges), this research helps the users and service providers to understand the types of interventions required to address the challenges. This will help government's payment regulator to develop guidelines to help limit the growing risks in the mobile money payments.

1.9 Organization of the Study

The first chapter is an introduction which consists of, background and motivation, problem statement, study objectives, general objective, specific objectives, hypotheses, study scope, significance of the study and organization of the study. Chapter two is the literature review, which mostly to explain the existing literature, identification of the gaps in the literature and propose a way forward which is going to address these gaps. Chapter three is the research methodology which describes the methodology used, research design, target population, sample size, sampling technique, data collection instrument and data analysis methods. Chapter four is the results and discussions it consists of research results and discussions that include presentation, analysis, and interpretation of the results found. Chapter 5 includes the thesis executive summary consists of an executive summary, conclusions, and recommendations, including the findings of the thesis and conclusions and recommendations that are consistent with the research objectives of the thesis. It also contains suggestions for further research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Literature Review

This chapter offers a summary of literature pertaining to the research goals that have been forwarded by other scholars. It addresses a knowledge gap in the field of mobile money payment.

2.2 General overview of cashless in general context.

Mobile money is one among many cashless payment modes that contribute to a cashless economy. A cashless economy is one where all transactions are completed through the use of cards or digital technology. In a cashless economy, the movement of physical money is reduced which leads to minimized costs and risks associated with carrying huge amounts of cash[18].

Cash is commonly used in illicit activities, such as illegal gambling or drug trafficking since there is no record of the transaction and the money is easier to launder[19]. On other hand, it is a challenge since mobile payment users are required to raise security awareness to avoid malware, SSL/TLS vulnerabilities and data breaches on mobile devices[9].

Also, the disparity between the rich and the poor where only the wealthy have access to the internet and network infrastructure makes it a challenge since it is difficult for those with a poor financial history to participate in cashless transactions[18]. This is disadvantageous since paying in cashless mode requires some platform or link to the internet necessitates. The internet links banks so that payments can be made. When buying goods online (E-Commerce), the internet is almost always needed. We can use those applications to make purchases even though we don't have access to the internet[20]. Privacy Issues Users' privacy can be jeopardized if they use cashless transaction methods because password credentials may be lost[18].

2.3 Awareness of challenges of mobile money in Asian context.

In Asia the knowledge about the challenges of using mobile money payments seem to be advanced, In India, the main goal of this type of payment service is to recruit low-income individuals to enter a nationalized banking system. People can use this service to move money, check their account balance, and inquire about their banking statements[20]. where as in Southeast Asian markets e-commerce providers highlighted some of the challenges of cash-on-delivery payments, minimal logistical infrastructure, and a lack of consumer trust but after the partnership with mobile money providers, mobile money helped e-commerce companies by providing solutions to these problems, allowing them to profit from this rapidly expanding industry. For mobile money providers have the ability to address the needs of a significant and increasing segment of the population who do not have access to appropriate payment services In Southeast Asia[21].

2.4 General overview of mobile money in Africa context.

The knowledge concerning challenges and benefits of using mobile money in Africa still need to be emphasized in literature to examine the awareness in the context of each country.

In Kenya, research was conducted in-home bay region studying challenges facing the use and adoption of mobile phone Money Services, and the study found out that lack of information was among the challenges where the majority of the population were unaware that cell phone money could also be used to purchase products with the use of till numbers and to pay utility bills as long as a business number was given[3].Since benefits and challenges of using mobile money are significant influence in adoption of mobile Since the benefits and challenges of using mobile money are a significant influence in the adoption of mobile money services by SMEs(small and medium enterprises) the knowledge about the challenges and how to address them, need to be populated. In Zimbabwe, a study about the adoption of mobile money services and the performance of small and medium enterprises was conducted and its findings leave that the greater the perceived advantages of mobile money services, the more small and medium enterprises are likely to adopt them[22]. Having revealed the curial benefit of mobile money services the researcher recommends the government of Zimbabwe to put in place support systems and create an enabling climate for mobile money services to thrive.

The benefits of using mobile money payment can go beyond benefiting individuals to programs and governments, in Uganda, research was conducted on the Effectiveness and Challenges of using Mobile Money Service in the Implementation of the Social Assistance Grants for Empowerment-SAGE programme in kiboga district, the study found that According to Kiboga district chairperson, the service provider(MTN mobile money) have reduced risks associated with money transfers, particularly within local government, Reduced management bureaucracies and associated problems, cash-handling leakages were reduced to a minimum, assured the government and MTN openness and accountability in regard to SAGE programme[7].Mobile money is a mechanism that allows people to conduct financial transactions using their cell phones. The perceived benefits associated with the adoption of mobile money services are positively linked to the degree of adoption, and consumers adopt mobile money because they believe they can receive financial benefits[22]. Generally, mobile money at some point is praised to be**;**

i) Convenient: The terms mobile money and mobile payments refer collectively to a set of applications that enable people to use their mobile telephones to manipulate their bank accounts, store value in an account linked to their handsets, transfer funds or even access credit or insurance products[23]. In other words, mobile money has made it simple and possible to make various payments, deposits and withdrew anywhere anytime. By use of a mobile phone handset, mobile money has created a modern branchless, convenient and real-time financial services platform accessible to anyone.

ii) Financial inclusions: Poverty is described as more than a lack of financial resources. It entails a lack of access to the tools and resources that would enable the poor to better their situation. Exclusion from the formal financial system is becoming more widely recognized as one of the obstacles to a world free of poverty[24]. Mobile money systems have been commonly recognized as a convenient way to make emergency payments and electronic money transfers to resolve

domestic financial matters in countries where traditional banking is not widely used[25]. For example in Uganda Smartphone technology has made mobile money services (MMS) more available, and efficient MMS implementation has benefited the unbanked population in both rural and urban areas[26].

As UNCTAD Secretary-General Supachai Panitchpakdi pointed out, mobile money services have the potential to help the private sector in a big way. These services have the ability to significantly boost financial inclusion if they are controlled properly. [27].

In Rwanda, the government sees an equitable and interoperable payments system as a key strategy for achieving financial inclusion goals as part of the Vision 2020 development plan. Banks and mobile money providers have worked together to form bilateral agreements to make it easier to move money between mobile money and bank accounts[28].

In that sense, mobile money's ability to link bank account with phone sets encouraged people to use financial products of which fight against poverty.

iii) Poverty Reduction: Mobile money can increase access to financial services. Microfinance institutions, in particular, can benefit from the use of mobile money. According to Britni and Kathleen, (2010) mobile money will help to alleviate poverty by raising savings rates, creating employment, and expanding access to microfinance institutions' financial products[29]. It has been suggested that m-money can help the economy by affecting financial and food security, jobs, and the accumulation of financial, human, and social resources[30].

iV)Secured: Advances in information technology have encouraged innovation in electronic payment, which allows goods and services to be exchanged without the use of physical cash; cashless payments reduce robbery and other cash-related crimes[17]. It is safer to be paid in electronic mode like mobile money when they are common cases of robbery. In Kenya when tax drivers are charged electronically, they can work more comfortably without having to hold large sums of cash[31].

V) Cheaper and more accessible: Mobile money has a lot of potential benefits, particularly for low-income people and people who live in rural areas. It provides secure storage, deposit, withdrawal, and transfer of funds at a lower cost and with greater convenience than banks, and it facilitates low-cost domestic remittances[16]. Mobile Money would create a more affordable and open electronic payment ecosystem, allowing the financial sector to expand and deepen[24].

Vi)Time saving: Instead of going to a faraway office with a fistful of cash and standing in line, consumers can pay their electricity bills with a few button presses; consumers can even buy cell phone credit ("airtime") without moving[31].

To summarise the benefits, we found more to be economic-related, it improves trade, allows for microfinance, makes remittances easier, provides protection that cash does not, and can even act as a substitute for debit and credit cards. It will provide unbanked people banking services[32].

On other hand despite its numerous advantages, widespread adoption and acceptance of mobile money have been slow in Uganda due to challenges like security concerns and device challenges as revealed by findings of a study about the evaluation of key security issues associated with mobile Money Systems in Uganda which found that "the key security issues are identity theft, authentication attack, phishing attack, vishing attack, SMiShing attack, personal identification number (PIN sharing, and agent-driven fraud"[26]**.** If that is the case mobile money has challenges that need to be assessed and addressed;

2.5.0 Mobile service quality and associate Challenges in mobile money Payments

2.5.1 Mobile service quality

In order to study use challenges of mobile money **Mobile Service quality model-** M-S-QUAL is hereby adopted. Before we talk about mobile service quality we will first explore service quality, e-service quality and then mobile service quality.

i) **Service quality:** Service quality can be complicated to comprehend and quantify, but the SERVQUAL model is one approach[33]. SERVQUAL is a well-known model that represents ten service quality dimensions for quality assessment which are: *responsiveness, competence, access, courtesy, communicating, creditability, security, understanding/ knowing the customer, and tangible* and the model was simplified into five key dimensions: *tangibles, reliability, responsiveness, assurance and empathy*[34]. These dimensions are used to identify any possible gaps between perceived and expected service quality.[33]. SERVQUAL was, however, not developed for Internet-based customer interactions. To adapt it more to measure e-service quality the model was further developed[33]. Also [35] conducted a study whose goal is to determine whether or not the ServQual dimension can be used to assess the quality of mobile-based services.

ii) **E-Service quality:** According to [36], in the online store perspective, the extent to which an online store facilitates efficient and effective shopping, purchasing, and delivery is referred to as e-service quality.

Maintaining the quality of e-service is becoming most important for providing satisfactory services to the users. For measuring quality different researchers proposed a variety of dimensions in diverse domains and contexts of applications[34]. A survey was conducted by using the e-Sq approach to study the e-service quality of UK banks to evaluate the perceived service quality basing on seven dimensions; *convenience/accuracy, accessibility/reliability, good queue management, personalization, friendly\responsiveness, customer service, and targeted customer service*[34]. Later, the E-S-QUAL model was developed and the model's purpose is to measures customers' perceived e-service quality and this includes questions that cover four dimensions which are *efficiency, fulfillment, system availability and privacy*[33].

iii) **Mobile Service quality:** The onset of the mobile commerce era motivates mobile service providers to develop methods that help them suitably evaluate the perceived mobile service quality of customers in order to attain higher customer satisfaction and to raise the value of services in the extremely competitive environment of mobile services[37]. Given the many types of mobile services available, [38]ascertained the essential characteristics of such services by conceptualizing, constructing, refining, and testing a multiple-item scale, M-S-QUAL, designed to measure service quality in the mobile environment the M-S-QUAL construction concluded with five factors (*contact, responsiveness, fulfillment, privacy and efficiency*)

It's in that regard in this study we do relate service quality e-service quality and m-service quality with linked aspects of mobile payment challenges.

2.5.2 Use Challenges in mobile money Payments

The number of people using mobile money is growing, as is the value of transactions. The rise in both services and transactions indicate that mobile money systems store a great deal of sensitive financial information about customers, which must be carefully guarded against data breaches and misuse by various players in the mobile money ecosystem[25]. Despite its numerous advantages, widespread adoption and acceptance of mobile money have been slow due to security concerns and device challenges [26]. According to[28], the gap between access to mobile phones and the adoption of mobile money services may be linked to a slew of challenges faced by mobile money users.

2.5.3 System based Challenges of mobile money Payment

2.5.3.1 Network connectivity issue

Poor network connectivity was mentioned in the research [28] as a major factor limiting people's use of mobile money, especially in Rusizi. According to some respondents, losing touch during a transaction will leave consumers wondering where their money has gone, as it might have been transferred out of the bank account but has not yet reached the intended recipient.

According to [39]definition of reliability encompasses proper technical operation (accessibility and availability) as well as the accuracy of service promises, where availability represents the likelihood that a service is available. And [28]argues that for mobile money users to have reliable services more work is needed to enhance reliability of the network in the rural areas. Hence in the context of this study, the reliability of service is linked with network connectivity and service availability.

2.5.3.2 Limited amount of cash and e-float by agents

Another common limitation was that agents frequently ran out of cash to make withdrawals which is the most common transaction[28]. When you want to deposit money in your phone, you find most of these agents don't have "float" and that they don't have cash when you want to withdraw money. Business days are the only days that they have enough revenue and "float" to serve more customers[3]. Efficiency refers to the design of the interface, with which customers can easily find

what they need[35]. In the context of this study, the limited amount of cash and e-float by agents can hider users of service to find what they need (deposit or withdrawal) hence convenience is as service quality dimension is affected.

2.5.3.3 Interoperability

Interoperability refers to the basic ability of computerized systems to connect and communicate with one another readily, even if they were developed by widely different manufacturers in different industries[40]. Mobile Money Interoperability is an option that enables money to be transferred directly and seamlessly from one mobile money wallet to another across networks[41].To the current in Rwanda, mobile money Interoperability is not possible. But the parliament has asked the Rwanda Utilities Regulatory Authority (RURA) to implement MTN Rwanda's and Airtel/ Tigo's scheme interoperability to make transactions easier[42]. On April 10, 2018, mobile money operators (Safaricom, Airtel, and Telkom Kenya) created a way for their subscribers to send money over the networks and before it was possible using SMS which would get expired so this was inconvenient and expensive to senders and receivers in different networks[43]. Hence in the context of this study, convenience as a quality dimension is linked with interoperability as an aspect of the mobile money challenge.

2.5.3.4 Transaction limits

This is done to reduce the possibility of money laundering and terrorist funding, the risk-based approach to know your customer (KYC) allows entry-level accounts to have lower transaction and balance limits[44]. In e-service quality Fulfillment refers to activities that ensure customers receive what they ordered, including the time of delivery, order accuracy, and delivery condition[45]. For transaction limit may not allow mobile money users to receive what they want in terms of money transfer it is referred to as not convenience.

2.5.3.5 High Transaction cost

There appears to be limited literature highlighting customer perspectives on transaction fees charged by mobile money service providers and how they affect their use of the service[46]. But, in a study by [28], the respondents working as tea farmers or pickers mentioned the **high cost** of transaction fees when using mobile money as the primary limiting factor. Also, 83% and 53% of respondents in Uganda and Ghana, respectively, said that their mobile money provider's high transaction fees prevent them from using their accounts to make payments. If that is the case, high transaction fees can efficiency the use of mobile money.

2.5.3.6 USSD Technology Vulnerabilities

The use of Unstructured Supplementary Service Data (USSD) technology in MMSs raises several security concerns. Because the PIN transmitted via USSD technology to the server is in plain text, attackers using network sniffer applications such as Wire-shark can intercept it[47]. The service provider can also read the PIN that was sent.

2.5.4 Users based Challenges of mobile money Payment.

2.5.4.1 Customer Awareness and digital literacy

In Kenya, research was conducted in-home bay region studying challenges facing the use and adoption of mobile phone Money Services, and the study found out that lack of information was among the challenges where The majority of the interviewees were unaware that cell phone money could also be used to purchase products with the use of till numbers and to pay utility bills as long as a business number was given[3].

Regarding awareness, mobile money subscribers seem to be aware but in the actual sense, many know less according to the expected. Like very few know what happens to someone's Phone money in case of an untimely death or inability to use the mobile money account**.**

Rutagengwa from MTN Rwanda explained, "It is forbidden for any second individual to obtain or possess one's passcode because it can lead to cybercrime and MoMo theft". As a result of the service provider's stance, certain families of deceased users have been denied access to any funds remaining on their accounts[14].

Unclaimed funds owned by telecoms have accumulated due to a lack of awareness and the time-consuming method of claiming funds on mobile money platforms by next of kin[15]. Research by [28] found that lack of digital literacy experienced by mobile money subscribers was one of the factors affecting the use and adoption of mobile money services others include weak network coverage, high transaction costs and familiarity with financial technology.

2.5.4.2 Fraud

Fraud is a deliberate fraud intended to harm another person for personal gain. It is both a criminal and a civil law violation[8]. Various forms of fraud, including consumer-facing fraud from agents and third parties, as well as a fraud perpetrated against agents, have been recorded in key MFS markets[48].

i. **SMiShing attack:** A smishing attack occurs when fraudsters use an emotionally charged delusional SMS to trick users into disclosing their mobile money PIN. When this method is used, an attacker can send SMS to the user(s) to "confirm" a payment even if no money has been transferred[26].
ii. **Identity theft:** It has been observed by [26]that mobile money agents frequently combine mobile money businesses with other services. Most well-established mobile money offices have a large number of staff members who specialize in various services. If a dishonest employee knows the PIN of a colleague in the office, he or she can carry out unauthorized transactions at the colleague's expense.
iii. **Authentication Attack:** Attackers can gain access to a user's account in a variety of ways. They take advantage of ineffective reset procedures for personal identification numbers (PINs).Most people share their PIN with their friends and family, which has increased security risks[26]. Since the PIN used is just four or five digits long and is unmasked, the

intruder on mobile money users can also gain access to the user's PIN by shoulder surfing. After gaining access to the PIN, the attacker may carry out a fraudulent transaction[49].

Security/privacy as a common dimension of SERVQAUL, E-S-QAUL and M-S-QAUL was defined by [39] as primarily protecting users from the risk of fraud and financial loss through the use of their credit card or other financial information, but also ensuring that the entire transaction is carried out as it should. Hence in the context of this study, Security/privacy as a quality dimension is linked with fraud as an aspect of the mobile money challenge. According to [39]turning to the ponder of e-government benefit quality, we note that in spite of the fact that a few of the quality assessment criteria will be bland in nature (i.e., may be appropriate for either e-commerce or e-government locales), others may apply as it were to e-commerce and a few may apply as it were to e-government. In that regard, we are going to use some dimensions of the scale suitable to assess mobile money as an e-service.

According to[34] Keeping up the quality of e-service is getting to be central for giving satisfactory services to the users. In this regard, the author investigated the quality dimension for measuring e-quality service so as to provide quality service to the users and therefore proposed six dimensions which are: *Reliability, Responsiveness, ease of use/usability, website design\content and Security/ privacy*.

Also, the E-S-QUAL model was developed and the model's purpose is to measures customers' perceived e-service quality and this includes questions that cover four dimensions which are: *efficiency, fulfillment, system availability and privacy*[33]. Furthermore, given the many types of mobile services available, [38]ascertained the essential characteristics of such services by conceptualizing, constructing, refining, and testing a multiple-item scale, M-S-QUAL, designed to measure service quality in the mobile environment the M-S-QUAL construction concluded with five factors (*contact, responsiveness, fulfillment, privacy and efficiency*).

Table 2: 1: Table for Concepts of mobile money challenges and related articles

Research articles	**Concept**									**Country**
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	
	Network issue	*Customer Awareness & Literacy*	*Limited cash and e-float by agents*	*Fraud* security	*Authentication Attack*	*Transaction limits*	*Limited number of agents*	*High transaction cost*	*Interoperability*	
Exploring the Use of Mobile Money Services among Tea SACCOs in Rwanda	✓	✓	✓	×	×	×	✓	✓	×	**Rwanda**
Adoption of mobile money services and the Performance of SMEs in Zimbabwe	✓	✓	×	✓	×	×	×	×	×	**Zimbabwe**
Mobile Payment Security, Threats, and	✓	×	×	✓	✓	×	×	×	×	**No specific county**

Challenges										
Challenges Facing the Use and Adoption of Mobile Phone Money Services	✓	✓	✓	×	×	×	✓	×	×	**Kenya**
Effect Of Cashless Payment Methods: A Case Study Perspective Analysis	✓	×	×	×	×	×	×	✓	×	**India**
Effectiveness and Challenges of using Mobile Money Service in the implementation of the Social Assistance Grants for Empowerment Program	✓	×	×	✓	×	×	×	✓	×	**Uganda**

me in Uganda										
Evaluation of Key Security Issues Associated with Mobile Money Systems in Uganda	✓	×	×	✓	✓	×	×	✓	×	**Uganda**
Mobile Banking And Fraud In Rwanda A Case Study Of Mtn Mobile Money	✓	✓	×	✓	×	×	×	✓	×	**Rwanda**
Mobile Money: Implications for Emerging Markets	×	×	×	✓	×	×	×	✓	✓	**Uganda**
Mobile Money Users' Challenges. Evidence From Developi	✓	✓	✓	✓	×	×	✓	✓	×	**Zimbabwe**

ng Countries										
Mobile money: Cell Phone Banking In Developing Countries	×	×	×	×	×	×	✓	✓	✓	**Developing Countries**
Two-Factor Authentication Scheme for Mobile Money: A Review of Threat Models and Countermeasures	×	×	×	×	✓	×	×	×	×	**sub-Saharan Africa**

2. 6 Literature review gap spotting

In other countries, there are works of literature that talk about the challenges of using mobile money and most of the literature talk about only one aspect separate. Like in Zimbabwe research by[22] emphasised on the factors of adoption of mobile money services following the performance of SMEs, where the study found that challenges and benefits of mobile money influenced firm adoption of mobile money services. This study is in line with the study by[26] which evaluated key security issues associated with the use of mobile money systems in Uganda and its findings show that despite a number of benefits the acceptance and usage of mobile money were low due to challenges like security issues regarding the use of the system. A Close similar conclusion was brown by a study[3] in research to examine challenges facing mobile money services use and adaption in Kenya and they found that a number of challenges hindered the use and adaption of the service include mostly lack of ID cars by users, language barrier, few agents of mobile money, a limited amount of e-floats and cash by agents and lack of awareness. In addition to that in

Zimbabwe, a study by[23] was conducted to investigate current difficulties faced by EcoCash users and the research leaves that the difficulties include lack of local dialects on the application, intermittent service interruptions, inhibitive costs and relatively low levels of ICT literacy due to lack of appropriate usage training by the service provider. In another hand a study was conducted in Ghana by[50] which investigated the Challenges of mobile payment systems to Its Adoption In Ghana and What Can Be Done To Make It Catch On and the main challenges found to security in general, technological and data traffic jams.

But in the Rwandan context, there are generally few works of literature talking about the mobile money challenges concepts only one represent, is a report[28] was conducted aimed at exploring the Use of Mobile Money Services among Tea SACCOs in Rwanda which found that the main hindrance to using mobile money services is lack of enough cash and e-float by agent, few mobile money agents in an area, poor network, security concern and digital literacy. Another research was conducted by[8] which aimed at investigating mobile banking and fraud in Rwanda using MTNmobile money as a case study, but the study's focus was fraud, not all related challenges and so there is a gap of knowledge about the challenges of using mobile money and the challenges can be addressed in the Rwandan context. Even if there are kinds of literature talking about this in other countries it is not enough according to[3] there is a lack of worldwide giving out of service with a hug potential and are not being replicated in other parties of the world and therefore success lessons are not leant.

As there are pieces of evidence that although the challenges were assessed in other parts of the world, that does not mean to have a direct effect in the context of Rwanda and having spotted little understanding of the service challenges in the context of Rwanda, this research studies the most significant user challenges of mobile money in the context of Rwanda to recommend a way forward to be used to address the associated problems.

2.7 Research Model

The study employed a descriptive research design and our target population was 99 UR students as mobile money registered users. Cluster sampling technique and self-administered questionnaire was used to Collection data from a sample of UR students. The figure 1 represents the research framework that was used.

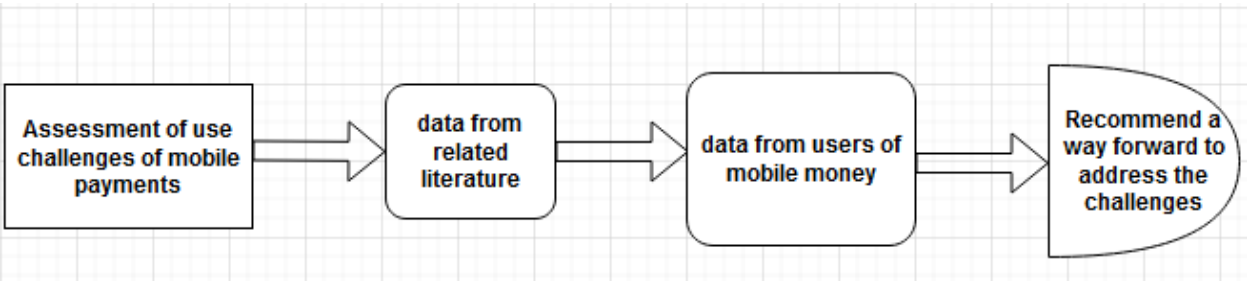

Figure 2: 1 Research framework

To investigate the most significant mobile money use challenges and how the challenges hinder the users from getting quality service we adopted E-Serv-QUAL and mobile service quality model M-Q-Serv for M-S-QUALis considered more suitable in our study. It is in that regard we have six quality dimensions linked with aspects of mobile money challenges.

The Dimensions help us in assessing the mobile money use challenges in relation to the developed model. In this regard, we will use mapped challenges from literature review that relate to quality dimension as when the challenge is addressed would yield a quality dimension of e-service and M-S-QUAL in our case and these are:

1. Reliability
2. Efficiency
3. Ease of use/usability
4. Security/ privacy
5. Fulfillment
6. Convenience

2.8 M-S-QUAL dimensions with associated mobile money challenges

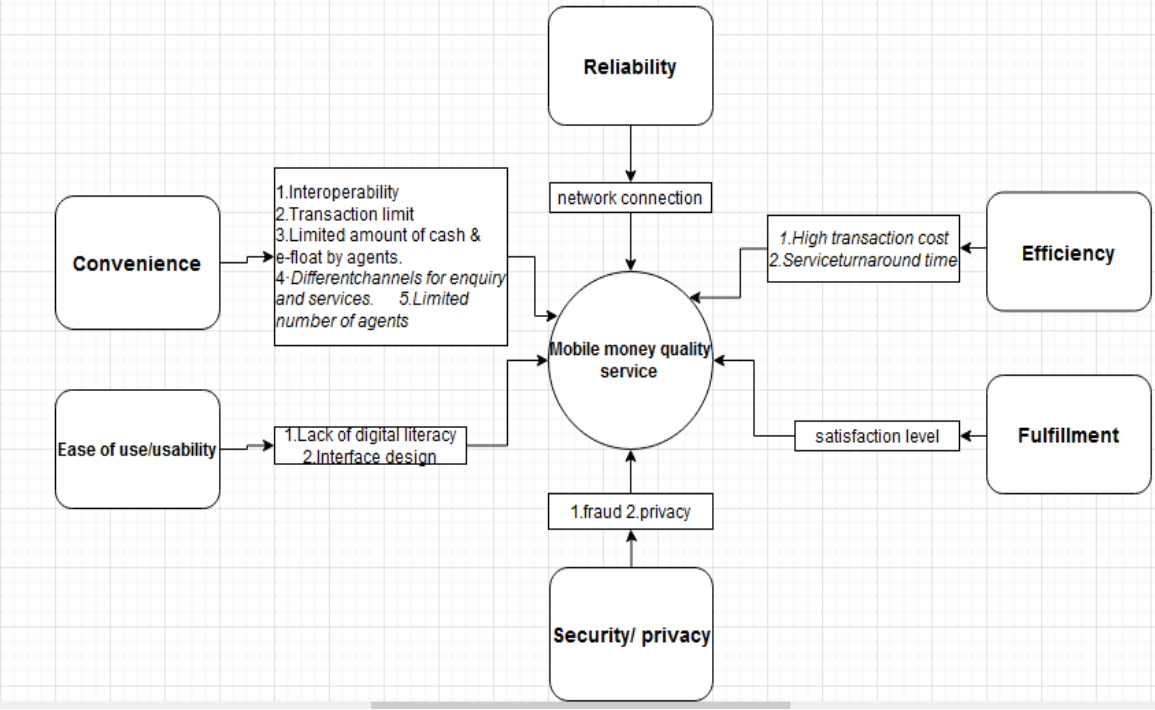

Figure 2: 2 M-S-QUAL model

In this model, as presented in figure 2, the 6 most common and related to e-service and M-S-QAUL quality dimensions are going to be used in assessing the challenges of mobile money payment. And concepts of mobile money challenges to be studied are the ones linked with the six most common and related to e-service and M-S-QAUL quality dimensions in order to have the challenges addressed so to have mobile money as quality service.

Having linked mobile money challenges with e-service and Mobile service quality dimensions from the literature that yields;

1. Reliability linked with network connectivity challenge.

2. Efficiency linked with high cost of transaction and Service turnaround time.

3. Ease of use/usability link with interface design, lack of Customer Awareness and digital literacy.

4. Security/ privacy linked with Fraud and privacy.

5. Fulfillment link with satisfaction level.

6. Convenience linked with interoperability, Transaction limits,limited munber of agents, Limited amount of cash and e-float on agents side Different channels for enquiry and services.

According to [39] 1. Reliability is defined as the citizen's confidence towards the e-government site concerning correct and on-time delivery of the service. Here mobile money will be assessed under challenges associated with reliability service quality measures. And the linked concepts from the literature is Connectivity /network challenge,

We will assess whether Network connection is problematic to the reliability of correctness and on-time delivery of the mobile money service.

2. Ease of use/usability represents having a friendly interface or environment between customers/citizens and government by owning a website that is user-friendly and accessible by anyone from anywhere.

Here mobile money as an e-service will be assessed under challenges associated with Ease of use/usability service quality measures. And the related concepts would be; lack of Customer Awareness and digital literacy.

We will assess whether Customer Awareness and digital literacy are the aspects that hinder Ease of use environment between users and the service.

3. Efficiency in an E-government website ensures that the services are up-to-date, efficient and satisfies the requirements of both customers/citizen and the government. Here mobile money will be assessed under challenges associated with efficient service quality measures. And the related concepts would be; high cost of transaction and Service turnaround time,

We will assess high cost of transaction and Service turnaround time limits the Efficiency of mobile money service from satisfying users' timely requirements**.**

4. Security/ privacy represents a trust which assures that the information of citizens/customers is safe, secure and safe from infringement in e-government websites. Here mobile money will be

assessed under challenges associated with Security/ privacy service quality measures. And the related concepts would be; Fraud, identity theft, Authentication attack, USSD technology vulnerabilities. We will assess whether Fraud and privacy are considered as a factor to why users of mobile money feel not secure and safe from money infringement.

5. Fulfillment: Fulfillment refers to activities that ensure customers receive what they ordered, including the time of delivery, order accuracy, and delivery condition[51]. Here mobile money will be assessed under challenges associated with fulfillment service quality measures. And the related concepts would be; satisfaction level. We will assess whether satisfaction level is the aspect that hinder Fulfillment of mobile money service from giving customers receive what they ordered.

6. Convenience: one of the convenience benefits of the mobile payment method is flexibility. This is because clients can send their money seven days a week and beneficiaries do not need to have a bank account to pay as long as they are registered in the system[52]. Here mobile money will be assessed under challenges associated with convenience service quality measures. And the related concepts would be; interoperability, Transaction limits,limited munber of agents, Limited amount of cash and e-float on agents side Different channels for enquiry and services.

We will assess whether interoperability, Transaction limits,limited munber of agents, Limited amount of cash and e-float on agents side Different channels for enquiry and services are considered as a hinder to the Convenience of mobile money users to send and receive money frequently. These will be used to study measures that can be put in place to lessen the challenges associated with the use of mobile money in Rwanda and how can knowledge of mobile money users be improved in Rwanda. Basing on that and information from literature we developed our Research conceptual framework bellow.

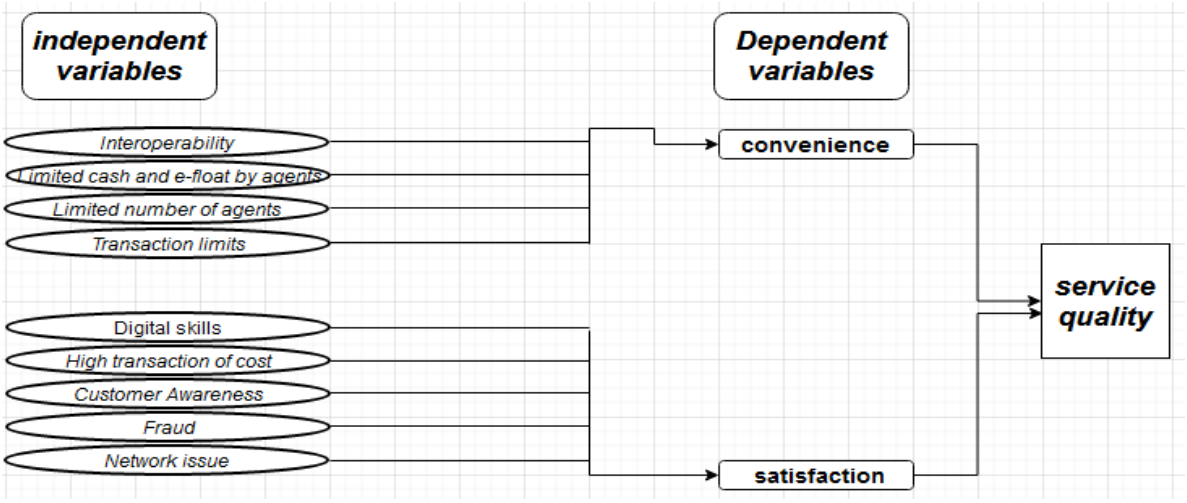

Figure 2: 3 Research conceptual framework

CHAPTER THREE: RESEARCH METHODOLOGY

3. 0 Research Methodology

In the chapter, we drew around the data collection and analysis processes and techniques that we used. The methodology we used to achieve our goal of the study, which is to explain the use Challenges in mobile money Payment in Kigali-Rwanda, is going to be described in the chapter. The chapter demonstrates the methods employed in study design, target population, sampling technique, and data analysis and data collection.

Since this research assesses the most significant challenges of using mobile money payment in Kigali-Rwanda, we used a quantitative research methodological approach. We used a quantitative methodology aimed at clarifying the importance of a better understanding of the phenomenon. The application of quantitative methods is very clear and important as it enables effective communication in an interdisciplinary research environment (Johnson, 2001). Quantitative research is characterized as a systematic analysis of phenomena through the collection of quantifiable data and the application of statistical, mathematical, or computational methods. Quantitative research gathers information from current and potential customers through sampling methods and the distribution of online surveys, polls, questionnaires, and other forms of online research, the results of which can be represented in the form of numerical[53].

3.1 Data collection

In this research, a questionnaire was used as a data collection instrument. Since we have two research questions, we designed the data collection instrument to collect data that would answer the questions '*1. What are the most significant challenges affecting use of mobile money Payment in Kigali? And how can the Challenges associated with use of mobile money be mitigated?' buy* the use of SPSS for data analysis. Data was collected with the target population UR students from Kigali campuses Nyarugenge, Remera and Gikondo.

3.1.1 Survey Questionnaire

During the process of collecting data, a self-administered questionnaire technique was adapted. A self-administered questionnaire (also known as a mailed questionnaire) is a data collection tool in which respondents are presented with written questions that must be answered in writing. In contrast to an interview report, the respondent will be able to devote more total time to it. This convenience will assist him or her in providing more accurate responses. This also allows him or her to devote more time to dealing with tough questions[54].

In that regard, I distributed questionnaire to a sample of **99** UR students who have been using mobile money on several occasions and they are the ones that can be flexible with the method. During the selection of who to engage in the survey, the criteria were constrained on educated ones for they are most probably adopted the technology earlier. Hence UR students are flexible with the method easy accessibly since we have limited physical contacts due to the current pandemic. So questionnaire of about 9 to 15 minutes was used and the aim of questions in the questionnaire was

used to investigate the most significant user's challenges associated with mobile money Payment mode. We also used news articles and published research papers talking about the mobile money payment mode. The questionnaire is designed to investigate the main challenges associated with the use of mobile money in Rwanda. The survey questionnaire was designed to investigate mobile money use challenges that hinder the users from getting quality service. The questionnaire was designed in three parts. 1. Population's Demography 2. Characteristic of service usage by the population 3. Users' perceptions on the mobile money challenges. To investigate most significant mobile money use challenges and how challenges hinder the users from getting quality service we adopted mobile service quality model M-Q-Serv. The six quality dimensions were linked with aspects of mobile money challenges. Basing on that and information from literature and our Research conceptual framework we developed earlier.

3.3 Sample size

Using Yamane's equation and published tables calculated our sample size of the population.

Yamane's equation $\boldsymbol{n = \frac{N}{1+N(e)2}}$

n – The sample size, **N** - The population size, **E** - The acceptable sampling error, Table 3: 1: Yamane's published tables

Size of population	Sample size (n) for Precision (e) of:			
	±3%	±5%	±7%	±10%
500	A	222	145	83
600	A	240	152	86
700	A	255	158	88
800	A	267	163	89
900	A	277	166	90
1,000	A	286	169	91
2,000	714	333	185	95
3,000	811	353	191	97
4,000	870	364	194	98
5,000	909	370	196	98
6,000	938	375	197	98
7,000	959	378	198	99
8,000	976	381	199	99
9,000	989	383	200	99
10,000	1,000	385	200	99
15,000	1,034	390	201	99
20,000	1,053	392	204	100
25,000	1,064	394	204	100
50,000	1,087	397	204	100
100,000	1,099	398	204	100
>100,000	1,111	400	204	100

A=Assumption of normal population is poor (Yamane, 1967). The enter population should be sampled.

According to UR facts and figures[55] and the numbers got from UR campus in Kigali, the Total registered number of students in Nyarugenge campus 6052, Remera campus 2008 and Gikond campus 1568 population is 9628 which ranges between 7,000 and 15,000 on Yamane's table, Using a confidence level of e = 10% we will get **99** students as sample size.

3.2 Sampling technique

There are 6 independent, self-governing colleges at The University of Rwanda[56] listed;

1. College of Arts and Social Sciences (CASS)

2. College of Agriculture, Animal Sciences and Veterinary Medicine (CAVM).

3. College of Business and Economics (CBE).

4. College of Medicine and Health Sciences (CMHS)

5. College of Education (CE)

6. College of Science and Technology (CST)

But students are distributed by campus where one campus can have students from different colleges. And the UR campuses are as follows;

Since our study scope is in Kigali, UR students in Kigali campus was the focus. So students from three campuses in Kigali were our population and these are;

- Nyarugenge Remera Gikondo

Using cluster sampling technique was used. Cluster sampling is a probability sampling approach that divides the population into different groups (clusters) for research purposes. For data collection and analysis, researchers use a basic random or systematic random sampling methodology to pick random groups[57]. In that regard, UR campuses in Kigali was considered as small groups using systematic sampling. The Cluster sampling technique is considered for its practical and appropriate for a large population where the researcher cannot get a complete list of population members.

3.4 Data analysis

Quantitative data analysis was conducted on the data collected via questionnaire and will be analyzed by use of SPSS software tool. Quantitative research gathers data from current and prospective customers by using sampling techniques and sending out online surveys, interviews, questionnaires, and other forms of data collection, the results of which can be represented numerically[53]. Different statistical methods will be used to present, interpret analyze and the data.

CHAPTER FOUR: RESULTS ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter presents, analysis, and interprets data generated through a quantitative approach to identify and address the most significant use challenges of mobile money services in Kigali. This study was also enhanced by a comprehensive review of relevant literature that provides an understanding the mobile money services and the associated challenges. Quantitative methods were used in this study to discuss findings from the data. Self–administered Survey questionnaire was distributed from 1st September to 09th November 2021.The questionnaire was designed in likert scale ranging from 1 to 7, 1 indicates that the aspect is not a challenge to use of mobile money and 3 shows that aspect is a challenge to some extent where 7 indicates that aspect is mainly a challenge. Since we two types of mobile money use challenges User based challenges and system based challenges.

For system based challenges, range from 1 to 3 would indicates that the aspect is not a challenge to use of mobile money and 4 to 7 indicates that aspect is mainly a challenge to users of mobile money. While users based challenges is reverse, range from 1 to 3 would indicates that the aspect is a challenge to users of mobile money and 4 to 7 indicates that aspect is the aspect is not a challenge to use of mobile money. To check if there is most related aspects co linearity used and multiple linear regression models was used to test the most significant challenge aspects between dependent and independent variables at p-value of 0.05 basing on our hypothesis.

4.1 Results from data collected from the population

4.1.1 Demography and Background characteristic of the respondents on mobile money service use.

This section we are to provide information about the background characteristics of the respondents on mobile money service use for we are much interested in how the population interacts with the service in order to determine whether they are fit for the survey. The purpose of this study was to identify the main user of the service among the people surveyed on. The questions about number transitions per month and how long they have been using the service, if their Momo accounts are linked with bank account and which Momo services they use most, were considered important because people who have using the service for so long or use it frequently have different preferences from those who are new to it or use it rare.

4.1.2 Demography of the respondents

According to UR facts and figures, female students present 36% and 64% stands for male student of total enrolment for last seven years. In the table below, having 60.6% male and 39.4% show that there was good distribution of gender.

Table 4: 1 : **Gender Distribution**

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	60	60.6	60.6	60.6
	Female	39	39.4	39.4	100.0
	Total	99	100.0	100.0	

The table bellows show distribution on educational level of respondents

Table 4: 2: Educational level of the respondents

Educational level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Postgraduate	25	25.3	25.3	25.3
	Undergraduate	74	74.7	74.7	100.0
	Total	99	100.0	100.0	

We also considered age ranges of the respondents for some challenges defer in significance indifferent age group. The Figure 5 represents Age distribution for respondents.

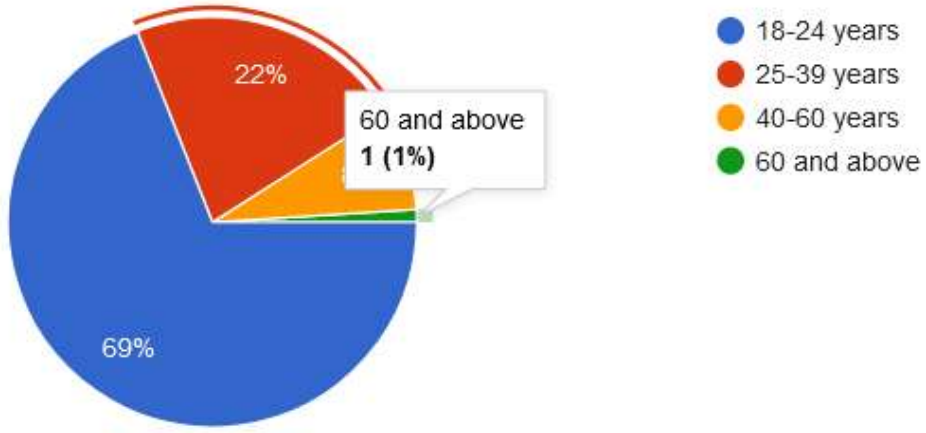

Figure 4: 1 Age distribution for respondents

4.1.3 Background characteristic of the respondents on mobile money service use.

This section we are to provide information about the background characteristics of the respondents on mobile money service use. The questions about number transitions per month and how long they have been using the service, if their Momo accounts are linked with bank account and which Momo services they use most, were considered important because people who have using the service for so long or use it frequently have different preferences from those who are new to it or use it rare.

The table below show how the respondents interacts with their bank account using mobile money account and the interesting parts is that big number 85.9% of the respondents use the service which gives confidence that the population would be fit for the survey.

Table 4: 3: Bank & mobile money account

Is your bank account linked to your mobile money account?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	14	14.1	14.1	14.1
	Yes	85	85.9	85.9	100.0
	Total	99	100.0	100.0	

The figure below shows how many transactions a respondent makes per month to see if the respondents have been using the service frequently because they are preferred from those who are use it rare. And the figure shows that the big numbers are those who use it frequently at least 20 transactions and above.

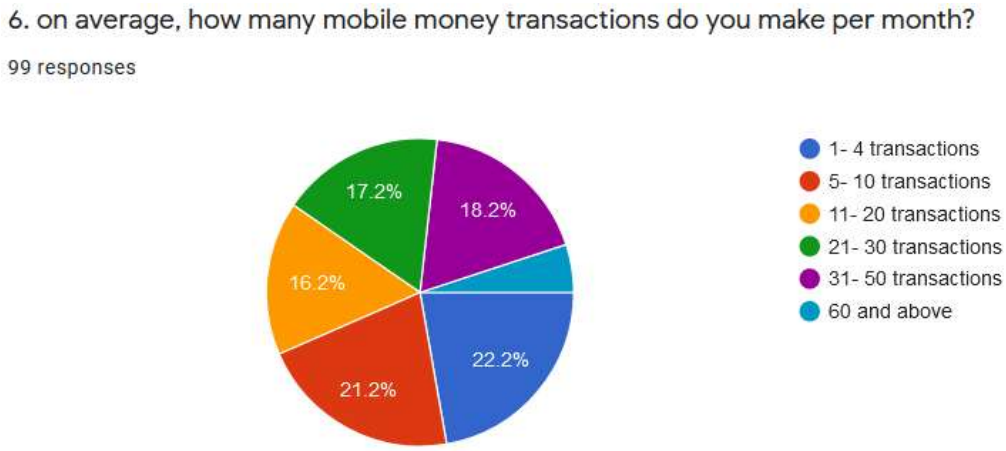

Figure 4: 2 Transactions per month

The tables below shows how long a respondent has been using the service to see if the respondents are new or have been using the service for so long because people who have using the service for so long they are preferred from those who are new to it. And the table shows that the big numbers

are those who are new to it only 2% while other have been using mobile money at least a year and above.

Table 4: 4: Service use period

How long have you been using mobile money?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Months	2	2.0	2.0	2.0
	1 to 3 years	41	41.4	41.4	43.4
	4 years and more	56	56.6	56.6	100.0
	Total	99	100.0	100.0	

The results shows that the big number of the population has been using the service and many basic services are known by the respondents.

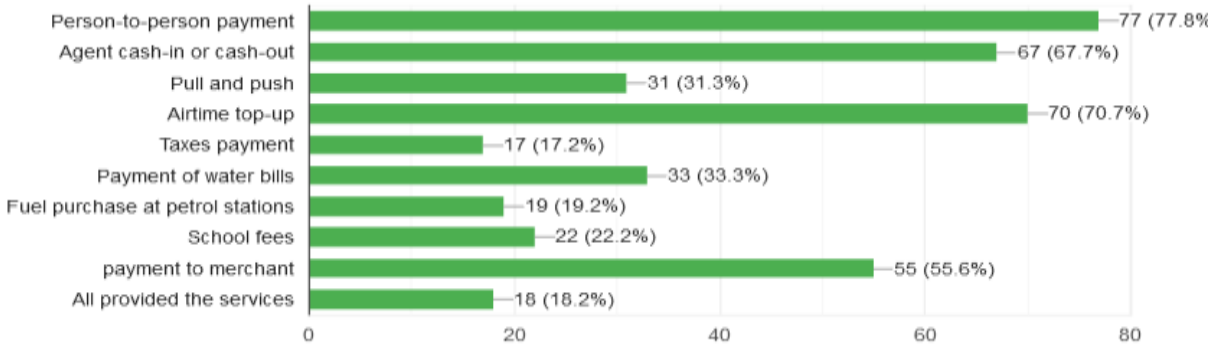

Figure 4: 3 Mobile money services awareness

4.1.4 Finding on use challenges of mobile money

In order to avoid use of redundant information in regression analysis, we first have to check if there is issue of multicolinearity using linear regression model to remove variable which cause co-related then reformulated our framework, then after we tested the most significant challenge aspects. For satisfaction and convenience are more related to service quality we identified which of mobile money challenges are most significant using multiple linear regression model. The test were run on to two; satisfaction and convenience

4.1.4.1 Co linearity tests of among independent variables

We will first check co linearity of all independent variables that is; Independent variables for satisfaction: network, Digital skills, awareness, transactions cost and fraud.

Table 4: 5 : Co linearity tests of among independent variables on Satisfaction

Coefficient Correlations[a]

Model			Fraud	Transaction cost	Network	Awareness	Digital skills
1	Correlations	Fraud	1.000	-.099	-.093	.058	.291
		Transaction cost	-.099	1.000	-.181	.257	-.005
		Network	-.093	-.181	1.000	.116	.368
		Awareness	.058	.257	.116	1.000	-.282
		Digital skills	.291	-.005	.368	-.282	1.000
	Covariances	Fraud	.003	.000	.000	.000	.001
		Transaction cost	.000	.005	-.001	.001	-2.993E-5
		Network	.000	-.001	.004	.000	.002
		Awareness	.000	.001	.000	.003	-.001
		Digital skills	.001	-2.993E-5	.002	-.001	.006

a. Dependent Variable: Satisfaction

Since there are no coefficient greater than 0.8, that means no correlation among the independent variables. Independent variables for convenience: Transaction limit, few agents, interoperability and limited cash and e-float.

Table 4: 6: Co linearity tests among independent variables on Convenience

Coefficient Correlations[a]

Model			Limited cash E-float	Interoperability	Transaction limits	Few agents
1	Correlations	Limited cash E-float	1.000	-.093	-.199	-.231
		Interoperability	-.093	1.000	-.034	-.213
		Transaction limits	-.199	-.034	1.000	-.201
		Few agents	-.231	-.213	-.201	1.000
	Covariances	Limited cash E-float	.008	-.001	-.001	-.002
		Interoperability	-.001	.009	.000	-.002
		Transaction limits	-.001	.000	.005	-.001
		Few agents	-.002	-.002	-.001	.007

a. Dependent Variable: Convenience

Since there are no coefficient greater than 0.8, that means no correlation among the independent variables.

4.1.4.2 Multicolinearity test results on satisfaction

When correlation among independent variables is high;

- Tolerance value is < 0.1
  VIF is > 5

Table 4: 7: Multicolinearity test results on satisfaction

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Network	.667	1.498
	Digital skills	.589	1.698
	Awareness	.706	1.417
	Transaction cost	.807	1.239
	Fraud	.778	1.286

a. Dependent Variable: Satisfaction

There is no Multicolinearity issue since tolerance is not < 0.1 and VIF is not >5 for all variables.

4.1.4.3 Multicolinearity test results on convenience

Table 4: 8: Multicolinearity test results on convenience

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	8.835	.639		13.828	.000		
	Transaction limits	-.139	.074	-.164	-1.885	.063	.882	1.133
	Interoperability	-.178	.097	-.156	-1.832	.070	.919	1.088
	Few agents	-.229	.082	-.253	-2.807	.006	.821	1.217
	Limited cash E-float	-.349	.092	-.334	-3.784	.000	.857	1.167

a. Dependent Variable: Convenience

For this case there is no multicollinearity issue since tolerance is not < 0.1 and VIF is not >5 for all variables.

4.2: Hypothesis Testing

Null hypothesis **$H0_1$:** There is no one of (*Network, Awareness, digital skills, Limited cash and e-float by agents, Fraud, Transaction limits, Limited number of agents, High transaction cost and Interoperability)* are mobile money use challenges in Kigali.

4.2.1 Finding on system based challenges of mobile money.

Table 4: 9: Means of responses on each aspect of system based use challenges

Statistics

		Network	Transaction cost	Fraud	Transaction limits	Interoperability	Few agents	Limited cash_efloat
N	Valid	99	99	99	99	99	98	99
	Missing	0	0	0	0	0	1	0
Mean		4.01	5.51	4.06	4.04	5.78	4.18	4.03
Median		3.00	6.00	4.00	4.00	7.00	4.00	4.00
Minimum		2	1	1	1	1	1	1

The means of responses on each aspect of system based use challenges. For system based challenges, a range from 1 to 3 would indicates that the aspect is not a challenge to use of mobile money and 4 to 7 indicates that aspect is mainly a challenge to users of mobile money. Therefore since all aspects system based challenges have mean of above 4 that shows that they are mainly challenge to users of mobile money. Hence we take alternative hypothesis that *Network, Limited cash and e-float by agents, Fraud, Transaction limits, Limited number of agents, High transaction cost and Interoperability* are considered as use challenges of mobile money service.

4.2.2 Finding on users based challenges of mobile money.

Table 4: 10: Statistics of users based challenges of mobile money

Statistics

		Digital_skills	Awareness
N	Valid	99	99
	Missing	0	0
Mean		5.55	3.98
Median		6.00	5.00
Minimum		1	1

The table shows means of responses on each aspect of users based use challenges. Since users based challenges, a range from 1 to 3 would indicates that the aspect is a challenge to users of mobile money and 4 to 7 indicates that aspect is the aspect is not a challenge to use of mobile money. The results show that only aspect of *awareness* is considered as a user's based challenge of mobile money and *digital skills* to use mobile money is not considered as a user's based challenge of mobile money.

Our questionnaire was designed in Likert scale ranging from 1 to 7, For system based challenges aspects (*Network, Limited cash and e-float by agents, Fraud, Transaction limits, Limited number of agents, High transaction cost and Interoperability*), from 1 to 3 would indicates that the aspect is not a challenge to use of mobile money and 4 to 7 indicates that aspect is mainly a challenge to users of mobile money. While to users based challenges (*Awareness, digital skills*) is reverse, a range from 1 to 3 would indicates that the aspect is a challenge to users of mobile money and 4 to 7 indicates that aspect is the aspect is not a challenge to use of mobile money.

To find out the most significant mobile money use challenges that affect mobile money service quality, we run a regression analysis to find the aspects with higher coefficients to be considered as the most significant mobile money use challenges in that regard multiple regression analysis engaging ANOVA was run at 0.05 p-value, R square and beta.

Null hypothesis **$H0_2$:** There is no one of *Limited cash and e-float by agents, Transaction limits, Limited number of agents and Interoperability* are most significant mobile money use challenges that affect convenience as mobile money service quality.

4.2.3 Multiple Regression Model for service convenience

Table 4: 11: Multiple Regression Model for service convenience

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616[a]	.379	.352	1.508

a. Predictors: (Constant), limited_cash_efloat, Interoperability, Transaction_limits, Few_agents

Table 4: 12: Multiple Regression Model for service convenience with ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	129.078	4	32.270	14.193	.000[b]
	Residual	211.452	93	2.274		
	Total	340.531	97			

a. Dependent Variable: Convenience

b. Predictors: (Constant), limited_cash_efloat, Interoperability, Transaction_limits, Few_agents

Since the multiple regression model above, the p-value is 0.0001, which is less than the significance level of 0.05. This means that the multiple regression model is significant and fits the data well.

Table 4: 13: Coefficients of Multiple Regression Model for service convenience

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	8.835	.639		13.828	.000		
	Transaction_limits	-.139	.074	-.164	-1.885	.063	.882	1.133
	Interoperability	-.178	.097	-.156	-1.832	.070	.919	1.088
	Few_agents	-.229	.082	-.253	-2.807	.006	.821	1.217
	limited_cash_efloat	-.349	.092	-.334	-3.784	.000	.857	1.167

a. Dependent Variable: Convenience

Since the sig values for transaction cost and interoperability are not < 0.05 that means the variables are not significant predictor of dependent variable. If that is the case only limited cash and e-float and few agents are the most significant use challenges of mobile money.

4.2.4 Multiple Regression Model for service convenience satisfaction.

Null hypothesis **$H0_3$:** There are no sufficient statistical evidences to prove that *Network, Awareness, digital skills, transaction cost and fraud* are most significant mobile money use challenges that affect satisfaction as mobile money service quality.

Table 4: 14: Multiple Regression Model for service satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.866[a]	.750	.737	.979	.750	55.870	5	93	.000

a. Predictors: (Constant), Fraud, Transaction_cost, Network, Awareness, Digital_skilles

Table 4: 15: Multiple Regression Model for service satisfaction with ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	267.492	5	53.498	55.870	.000[b]
	Residual	89.053	93	.958		
	Total	356.545	98			

a. Dependent Variable: Satisfaction

b. Predictors: (Constant), Fraud, Transaction_cost, Network, Awareness, Digital_skilles

Since the multiple regression model above, the p-value is 0.0001, which is less than the significance level of 0.05. This means that the multiple regression model is significant and fits the data well.

Table 4: 16: Coefficients of Multiple Regression Model for service satisfaction

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.934	.761		1.228	.223	-.576	2.445
	Network	.076	.060	.080	1.266	.209	-.043	.195
	Digital_skilles	.889	.078	.766	11.347	.000	.734	1.045
	Awareness	.049	.054	.056	.905	.368	-.058	.156
	Transaction_cost	-.227	.070	-.187	-3.250	.002	-.366	-.088
	Fraud	-.081	.055	-.086	-1.471	.145	-.190	.028

a. Dependent Variable: Satisfaction

Since the sig values for network awareness and fraud are not < 0.05 that means the variables are not significant predictor of dependent variable. If that is the case only Digital skills and transaction cost are the most significant use challenges of mobile money that affect mobile money service quality.

In general results show that the mean of all aspects (*digital skills, Limited cash and e-float by agents, Limited number of agents and High transaction cost*) indicates they are the most significant use challenges of mobile money that affect mobile money service quality. In that regard our conceptual framework changes as the figure below.

4.2.5 Conceptual framework

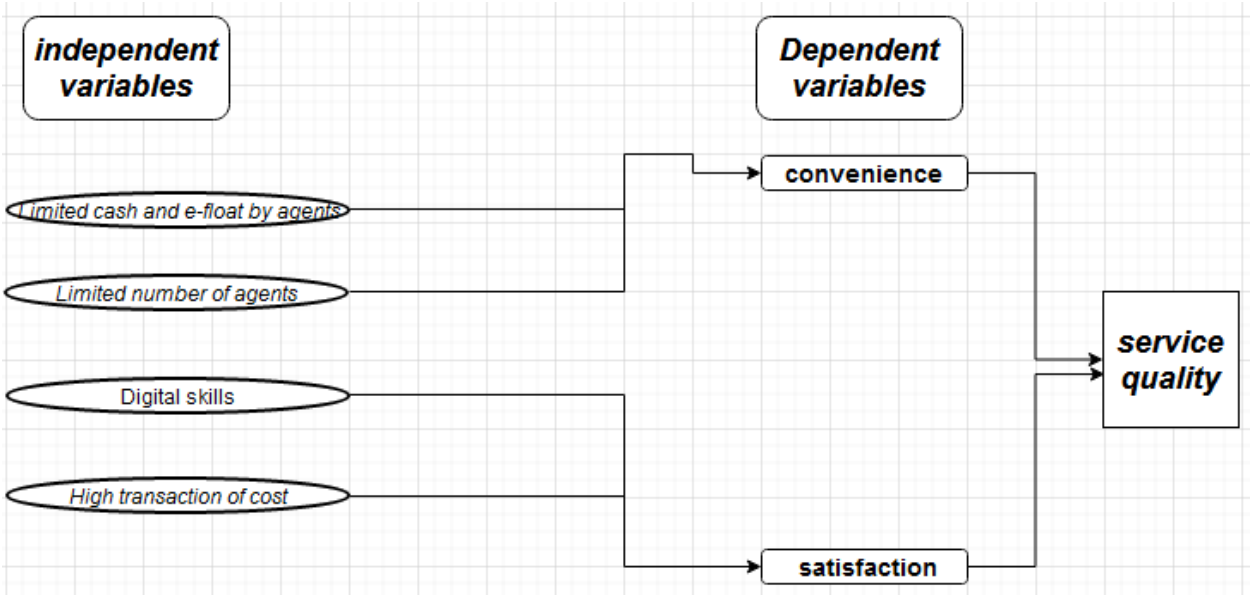

Figure 4: 4 Conceptual Framework

As illustrated in the figure above our conceptual framework as changed instead of having nine aspects of mobile money challenges we have remained with only four aspects as dictated by the study findings.

4.3 Discussion of the results

The results show that; *digital skills, Limited cash and e-float by agents, Limited number of agents and High transaction cost)* are the most significant hinders of mobile money quality service as earlier suggested by other studies.

But also issue of network connectivity was revealed to be the among use challenges and as hinder of mobile money service reliability. According to [39] , Reliability is defined as the citizen's confidence towards the e-government site concerning correct and on-time delivery of the service.

The results show that lack of digital literacy and customer awareness are aspects of mobile money use challenges which affect Ease of use/usability quality measure. Ease of use/usability represents having a friendly interface or environment between customers/citizens and government by owning a website that is user-friendly and accessible by anyone from anywhere.

Also the findings of the study show that, high cost of transaction and service turnaround time are mobile money use challenges that negatively affect service Efficiency. Efficiency in an E-government website ensures that the services are up-to-date, efficient and satisfies the requirements of both customers/citizen and the government.

Furthermore, on results, it's noted that, Fraud and privacy are considered as a factors to why users of mobile money feel not secure and safe from money infringement.And as a result this compromises Security/ privacy of mobile money service. Security/ privacy represents a trust which assures that the information of citizens/customers is safe, secure and safe from infringement in e-government websites. Here mobile money was assessed under challenges associated with Security/ privacy service quality measures. And concepts of fraud, identity theft, Authentication attack, USSD technology vulnerabilities would contribute more to the insurity.

On assessing whether the users are satisfied with the service we found low level of satisfaction which affects Fulfillment of mobile money user which also eans that the service is not giving customers what they ordered.Fulfillment refers to activities that ensure customers receive what they ordered, including the time of delivery, order accuracy, and delivery condition[51].

Interoperability, Transaction limits,limited munber of agents, Limited amount of cash and e-float on agents side were found to be significant a spects of mobile money use challengs.This implise that Convenience as mobile qualty dimesion is neagitvel affected. Convenience one of the convenience benefits of the mobile payment method is flexibility. This is because clients can send their money seven days a week and beneficiaries do not need to have a bank account to pay as long as they are registered in the system[52]. The above were used to study measures that can be put in place to lessen the challenges associated with the use of mobile money in Rwanda and improved mobile money service quality.

4.4 Suggested Solutions

Having revealed the challenging aspects of mobile money use challenges, the study suggests solutions to the challenges.

4.4.1 Awareness & Digital skills:

Mobile money service providers need to put in place customer awareness campaign to improve their education and protection. MMNO should consider offering digital financial training and literacy training to increase their knowledge and confidence in using the mobile money service. It also eliminates the major obstacles to security concerns that prevent the use of mobile financial services [28].

4.4.2 Network connectivity improvement:

MNOs need to work to improve connectivity (currently inadequate) and reduce network coverage inconsistencies. It is also important that MNOs and other stakeholders consider investing in improving remote network infrastructure by expanding their network through adding number of masks / boosters.

4.4.3 Polices to allow sufficient cash and e-float to agents

Mobile money service providers need to revise polices to allow mobile money agents to have enough cash or e-float to serve clients who withdraw or transfer huge amounts of money. Most probably, they will serve many people and can make more money in return.

4.4.4 Strict measures against Fraud

Mobile money service providers need to implement a better surveillance system to combat fraud. Due to criminal and bribery-related issues, appropriate measures must be taken at the mobile money agent stand where physical transactions take place. Also Mobile users should report all security incidents / scams to regulatory agencies and Security organization. Even if the transaction could be processed cashlessly, the customer still had to provide cash for those who withdrew cash from received from relatives or friends. So the mobile money agent stand should be established relatively near government security formations[49].

4.4.5 Transaction limits

Mobile payments service provides should talk to the Rwanda National Bank BNR Payments Regulator to better understand the unintended consequences of some policies including the Transaction limits. This rule denies the users the convenience to transfer the amount of their choice and frequently. The removal of such barriers should be considered but the associated would be managed by strong KYC controls and high value transaction examining by the service providers[26].

4.4.6 Establishment of agents per number of beneficiaries

Mobile money providers to conduct a study that would help to identify number of momo agents needed in relation to clients (number of clients per agent) this will reduce the travel time for clients

or inconveniences caused by long queue. And then the stakeholders need to consider strategies to increase the number of business People who can provide mobile payment services[28].

4.4.7 Renegotiate transaction cost

Mobile money service providers and financial regulatory organization would try to renegotiate the cost of transaction to make it more affordable to users.

4.4.8 Remove Interoperability limitations

Government of Rwanda through it financial institutions regulator should encourage partnerships and interconnections between financial institutions and mobile money providers to engage in Interoperability initiative that will ease transactions and ensure cost-effectiveness with increasingly transaction volume and expanding the range of financial products via mobile phones. This leads to Government's goal of cashless economy.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study aims at assessing the most significant use challenges of mobile money payment in Kigali where UR students in Kigali campuses are the target population. The study uses SPSS to run multiple linear regression model after determine the significance and relevance of the model to the data. In conclusion, the study found out that mobile money has numerous use challenges that hinder its quality service, but *digital skills, Limited cash and e-float by agents, Limited number of agents and High transaction cost* are the most significant challenging aspects faced by the mobile money users. Other Challenges include *Network, Limited cash and e-float by agents, Fraud, Transaction limits, Limited number of agents, High transaction cost and Interoperability*.

5.2 Recommendations

In connection with the results of this study, this study recommends the following:

- Both MNOs and government institutions concerned should also consider providing mobile money awareness campaign and literacy training to improve knowledge regarding the use of mobile money service[28].
- We recommend more robust fraud prevention practices and guidelines to ensure that all elements of fraud are captured when mobile money service is adopted.
- To mitigate the issue of insufficient cash and e-float, MNOs should only hire agents who always show the ability to have cash on hand to reduce incidents when agents do not meet customer cash requirements.
- Providers need to set up a portal where victims can share incidents Anonymous to make users be aware of new fraud strategy[26].
- To give a broad training to mobile money agents so that they can keep awakening awareness of the users since they are in touch with users most of the time. In addition, service providers should develop comprehensive legal documents on the operation of mobile money services, to be shared to users via agents and social media plate forms.
- Mobile Network Operators and other stakeholders need to consider strategies to increase the number of business People who can provide mobile payment services and promote their use in all areas and communities in the country[28].

5.3 Areas for Further Research

We are proposing to do similar research on all mobile money operators in the country. This will allow a health comparison of the results to provide recommendations that apply to all players in Rwanda's mobile payment industry. We also suggest conducting a similar investigation in rural areas of the country to discover other challenges in relation with specific geographical area. To investigate the mobile money challenges in relation with specific mobile payment operator in specific geographical area.

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Appendices

Appendix 1: Questionnaire

Dear participant,
I am Karenzi William, a student from the University of Rwanda studying Masters in Information systems option of e-Government, current I am writing my MSc research dissertation entitled: Assessment of mobile Payments: Challenges from User Perspective in Kigali" I, therefore, request you to participate in the research, by responding to the enclosed questionnaire which was designed to collect information related to mobile money use Challenges. This study aims at assessing the mobile money Payments use challenges in Rwanda (Kigali) to recommend a framework to be used to address the associated challenges.
Your participation in this research project is completely voluntary and your responses will be anonymised no one will know your individual answers. Data from this research will be kept confidentially and reported only as a combined total of responses.

Thank you for your contribution.

Population's Demography

1. Do you use mobile money services?

a) Yes

b) No

2. **Gender?**

a) Male ( )
b) Female ( )

3. Age

a) 18-24 years ( )
b) 25-39 years ( )
c) 40-60 years ( )
d) 60 and above ( )

4. Education level

a) Postgraduate ( )
b) Undergraduate ( )

5. **Does your bank account linked to your mobile money account?**

a) Yes ( )
b) No ( )

Characteristic of service use by the Population

6. on average, how many mobile money transactions do you make per month?

a) 1- 4 transactions ( )
b) 5- 10 transactions ( )
c) 11- 20 transactions ( )
d) 21- 30 transactions ( )
e) 31- 50 transactions ( )
f) 60 and above ( )

7. How long have you been using mobile money?

a) Months ( )
b) 1 t o 3 years ( )
c) 4 years and more ( )

8. Which of the following mobile money services are you aware of? (tick all the appropriate).

a) Person-to-person payment ( )
b) Agent cash-in or cash-out ( )
c) Pull and push ( )
d) Airtime top-up ( )
e) Taxes payment ( )
f) Payment of water bills ( )
g) Fuel purchase at petrol stations ( )
h) School fees ( )
i) payment to merchant ( )
j) All provided the services ( )

Assessment of users' perceptions on mobile money challenges.

9. To what extent is mobile money payment reliable?

1 – Totally unreliable, 2 – Unreliable, 3 – Slightly unreliable

4 – Neutral, 5 – Slightly reliable, 6 – Reliable, 7 – Perfectly Reliable

10. How often you do face network issues while making mobile money transactions?

1 – Never, 2 – Rarely, in less than 10% of the times, 3 – Occasionally, in about 30% of the times,
4 – Sometimes, in about 50% of the times, 5 – Frequently, in about 70% of the times,
6 – Usually, in about 90% of the times, 7 – Every times

11. To what extent is the mobile money system easy to use/usability?

1 – Totally unusable, 2 – Unusable, 3 – Slightly unusable

4 – Neutral, 5 – Slightly usable, 6 – Usable, 7 – Perfectly Usable

12. To what extent are you skilled to use mobile money?

1 – Totally unskilled, 2 – Unskilled, 3 – Slightly unskilled

4 – Neutral, 5 – Slightly skilled, 6 – skilled, 7 – Perfectly skilled

13. To what extent are you aware of the mobile money service, its benefits, challenges, and channels of enquiry and services?

1 – Totally unaware, 2 – Unaware, 3 – Slightly unaware

4 – Neutral, 5 – Slightly aware, 6 – Aware, 7 – Perfectly Aware

14. While using the mobile money service to make a transaction, you get a text on your phone screen (USSD menu display). Are these users friendly?

1 – Very untrue, 2 – Untrue, 3 – Somewhat untrue

4 – Neutral, 5 – Somewhat true, 6 – True, 7 – Very true

15. To what extent is mobile money payment Efficient?

1 – Totally inefficient, 2 – Inefficient, 3 – Slightly inefficient

4 – Neutral, 5 – Slightly efficient, 6 – Efficient, 7 – Perfectly Efficient

16. Is total service time in using mobile money problematic?

1 – Very untrue, 2 – Untrue, 3 – Somewhat untrue

4 – Neutral, 5 – Somewhat true, 6 – True, 7 – Very true

17. Is the transaction cost of mobile money payment high?

1 – Very untrue, 2 – Untrue, 3 – Somewhat untrue

4 – Neutral, 5 – Somewhat true, 6 – True, 7 – Very true

18. To what extent is mobile money payment Secure?

1 – Totally insecure, 2 – insecure, 3 – Slightly insecure,

4 – Neutral, 5 – Slightly secure, 6 – Secure, 7 – Perfectly Secure**.**

19. To what extent do you think your personal details related to use of mobile money services are protected?

1 – Totally not protected, 2 – not protected, 3 – Slightly not protected,

4 – Neutral, 5 – Slightly protected, 6 – protected, 7 – Perfectly protected**.**

20. How often have you been facing cases of fraud from the time you started using mobile money service? (Minor fraud: for example receiving malicious calls or calls of thieves; major fraud: stealing your money)?

1 – Never, 2 – Rarely, in less than 10% of the times, 3 – Occasionally, in about 30% of the times,
4 – Sometimes, in about 50% of the times, 5 – Frequently, in about 70% of the times,
6 – Usually, in about 90% of the times, 7 – Every time

21. To what extent does the mobile money payment service fulfill your expectations?

1 – Totally not fulfilling, 2 – Not fulfilling, 3 – Slightly not fulfilling,

4 – Neutral, 5 – Slightly fulfilling, 6 – fulfilling, 7 – Perfectly fulfilling**.**

22. To what extent are you satisfied with the mobile money service?

1 – Totally not satisfied, 2 – Not satisfied, 3 – Slightly not satisfied,

4 – Neutral, 5 – Slightly satisfied, 6 – satisfied, 7 – Perfectly satisfied**.**

23. To what extent is mobile money payment convenient?

1 – Totally Inconvenient, 2 – Inconvenient, 3 – Slightly Inconvenient,

4 – Neutral, 5 – Slightly convenient, 6 – Convenient, 7 – Perfectly Convenient**.**

24. Sometimes, you may need to send a little or big amount of money and other times you may need to send money many times in a day. How frequently do you encounter transaction limits while making mobile money payments?

1 – Never, 2 – Rarely, in less than 10% of the times, 3 – Occasionally, in about 30% of the times,
4 – Sometimes, in about 50% of the times, 5 – Frequently, in about 70% of the times,
6 – Usually, in about 90% of the times, 7 – Every time

25. Sometimes you may need to transfer money from MTNmobile money to Airtel/Tigo Cash or want to get money from banks that do not use the mobile money and you face an issue of lack of interoperability between mobile money and other money services. To what extent do you think this is a very big issue?

1 – Very untrue, 2 – Untrue, 3 – Somewhat untrue

4 – Neutral, 5 – Somewhat true, 6 – True, 7 – Very true

26. Is the Limited number of mobile money agents problematic to the service users?

1 – Very untrue, 2 – Untrue, 3 – Somewhat untrue

4 – Neutral, 5 – Somewhat true, 6 – True, 7 – Very true

27. Do Mobile money service offer different channels for enquiry and service as needed?

1 – Very untrue, 2 – Untrue, 3 – Somewhat untrue

4 – Neutral, 5 – Somewhat true, 6 – True, 7 – Very true

28. Do you face the challenge of mobile money agents having limited cash or e-float/money?

1 – Never, 2 – Rarely, in less than 10% of the times, 3 – Occasionally, in about 30% of the times,
4 – Sometimes, in about 50% of the times, 5 – Frequently, in about 70% of the times,
6 – Usually, in about 90% of the times, 7 – Every time