



UNIVERSITY OF NAIROBI
COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCES
SCHOOL OF COMPUTING AND INFORMATICS

RESEARCH PROPOSAL

**EVALUATING END USER SATISFACTION WITH MOBILE BANKING
APPLICATIONS. CASE OF NAIROBI COUNTY.**


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**PROPOSAL PRESENTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR AWARD OF THE DEGREE OF MASTER OF SCIENCE IN INFORMATION
TECHNOLOGY MANAGEMENT OF THE UNIVERSITY OF NAIROBI**

DECLARATION

This project is my own original work and to the best of my knowledge, this research work has not been submitted for any other award in any University.

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This project report has been submitted in partial fulfilment of the requirements for the Master of Science Degree in Information Technology Management of the University of Nairobi with my approval as the University Supervisor.

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DEDICATION

I dedicate this work to my family; My father posthumously-you always believed in me, My mother-for all your sacrifice, prayers and support, My sister and niece-for your encouragement, My dear wife and son-my greatest source of inspiration.

ACKNOWLEDGEMENT

I give special thanks to the Almighty God for the gift of life, grace and wisdom to be able to carry out this research.

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I would also like to appreciate my family, my dear wife Ann and son Kristian for their encouragement, moral support and their understanding as I sacrificed family time to ensure completion of this research project.

Contents

DECLARATION	2
DEDICATION	3
ACKNOWLEDGEMENT	4
LIST OF FIGURES	8
LIST OF TABLES	8
LIST OF ABBREVIATIONS	9
ABSTRACT	10
CHAPTER 1: INTRODUCTION	12
1.1 Background of the Study	12
1.2 Mobile Banking in Kenya	13
1.3 Problem Statement	14
1.4 Research Objectives	15
1.5 Significance of the Study	15
CHAPTER 2: LITERATURE REVIEW	17
2.1 Introduction	17
2.2 Mobile banking Application.....	17
2.3 M-Banking in Kenya.....	18
2.4 Theoretical Frameworks and Models of Satisfaction.....	18
2.4.1 Diffusion of Innovations Theory	18
2.4.2 Assimilation Theory	19
2.4.3 Satisfaction Formation Process Model	19
2.4.4 The Doll and Torkzadeh model	20
2.4.5 Integrated Research Model.....	21
2.4.6 Information System Continuance Model.....	22
2.4.7 Attribute Model of Overall User Satisfaction.....	22
2.5 Empirical Review	24
2.6 End User Satisfaction	26
2.7 Determinants of End-User Satisfaction.....	27
2.7.1 Information Quality Attributes	27
2.7.2. System Quality Attributes	27
2.7.3 Service Quality Attributes	27
2.8 Conceptual Model	28
2.8 Study Constructs	29
CHAPTER 3: RESEARCH METHODOLOGY	31
3.1 Introduction	31
3.2 Research Design.....	31

3.3 Research Hypotheses.....	31
3.4 Population.....	31
3.4 Sample Design.....	32
3.5 Data Collection.....	32
3.6 Data Analysis	33
3.7 Operationalization of Research Variables.....	33
3.8 Ethical Considerations.....	34
CHAPTER 4: RESULTS AND DISCUSSION.....	35
4.0 Introduction	35
4.1 Reliability Test.....	35
4.2 Descriptive Statistics	35
4.2.1 End-Users Gender.....	35
4.2.2 End-Users Age.....	36
4.2.3 End-Users Education Level	36
4.2.4 End-Users IT Skills	37
4.2.5 End-Users Employment Sector	37
4.3 Understanding of Mobile-Banking Applications	38
4.3.1 End-Users Access to a Commercial Bank Account	38
4.3.2 End-Users Awareness of Their Bank Offering M-banking.....	39
4.3.3 End-Users Registration and Preferred Mode of M-banking Application.....	39
4.3.4 M-banking Application Services Period of Use	40
4.3.4 Factors M-Banking Application End-Users Consider Important	41
4.3.5 End-User Satisfaction with M-Banking Information Attributes	41
4.3.6 End-User Satisfaction with M-Banking System Attributes.....	42
4.3.7 End-User Satisfaction with M-Banking Support Service Attributes.....	43
4.4 Hypothesis Testing.....	44
4.5 Regression Analysis	45
4.4 Discussion	51
CHAPTER 5: CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE RESEARCH	55
5.0 Introduction	55
5.1 Summary of Findings	55
5.1.1 M-Banking App Information Attributes Impact on Overall End-User Satisfaction	55
5.1.2 M-Banking App System Attributes Impact on Overall End-User Satisfaction.....	56
5.1.3 M-Banking App Support Services Attributes Impact on Overall End-User Satisfaction	56
5.2 Conclusion.....	57
5.3 Recommendations	58

5.4 Further Research Work	58
5.5 Limitations of the study.....	59
REFERENCES	60

LIST OF FIGURES

Figure 1: Trends in mobile subscriptions and penetration levels. Source (CA)	12
Figure 2: Diffusion Innovation Theory	19
Figure 3: Spreng et al. (1996) Satisfaction Formation Process	20
Figure 4: The end-user satisfaction model of IS (Doll and Torkzadeh, 1988)	21
Figure 5: Wixom and Todd (2005) Integrated Research Model	21
Figure 6: (Bhattacharjee 2001) IS Continuance Model	22
Figure 7: Attribute Model of Overall User Satisfaction (Vaezi 2013)	23
Figure 8: Conceptual model	29
Figure 9: Respondents age	36
Figure 10: Respondents registration to m-banking	39
Figure 11: Respondents preferred mode of m-banking	40
Figure 12: Normal P-P Plot	47
Figure 13: Means plot (overall end-user satisfaction and end-user continued use)	50
Figure 14: Means plot (overall end-user satisfaction and end-user recommendation)	50

LIST OF TABLES

Table 1: Summary of Previous Studies and Knowledge Gaps	25
Table 2: Hypotheses	31
Table 3: Operationalization of Variables	33
Table 4: Reliability Test	35
Table 5: Respondents Gender	36
Table 6: Respondents Education Level	37
Table 7: Respondents IT Skills	37
Table 8: Respondents Employment Sector	38
Table 9: Respondents Access to a Commercial Bank Account	38
Table 10: Respondents Awareness of Their Bank Offering M-banking	39
Table 11: M-Banking Application Services vs Frequency of Use	40
Table 12: M-Banking Application Factors and Rate of Importance	41
Table 13: Rank of Importance of Factors of M-Banking Applications	41
Table 14: End-User Satisfaction with M-Banking Information Attributes	42
Table 15: End-User Satisfaction with M-Banking System Attributes	43
Table 16: End-Users Satisfaction with M-Banking Support Service Attributes	43
Table 17: One-Sample T-Test Test	44
Table 18: Results of Hypotheses Test	45
Table 19: Results of Multicollinearity Test	46
Table 20: Residual Statistics	47
Table 21: Summary of Regression Analysis	48
Table 22: M-Banking Attributes Satisfaction Impact on Overall End-User Satisfaction	48
Table 23: ANOVA	49
Table 24: Coefficients	49

LIST OF ABBREVIATIONS

ACSI	American Consumer Satisfaction Index
CA	Communications Authority of Kenya
CBK	Central Bank of Kenya
FNB	First National Bank Namibia
IT	Information technology
IoT	Internet of Things
IS	Information System
ICT	Information Communication Technology
KCB	Kenya Commercial Bank
MNO	Mobile Network Operator
MIS	Management Information System
SACCOS	Savings and Credit Cooperatives
SMS	Short Messaging Service
USSD	Unstructured Supplementary Service Data
WAP	Wireless Application Protocol

ABSTRACT

Introduction: Information technology (IT) has played a vital role in the number of innovations seen in the banking sector, key being mobile technologies. According to the Communications Authority of Kenya (CA) (First Quarter Sector Statistics Report For The Financial Year 2018/2019), mobile phone penetration is at 100%. The banking sector has noted this and in the past decade, have sought to take advantage by developing products to tap this potential through offering banking services via mobile phones commonly referred to as m-banking.

With users continued adoption and uptake of m-banking applications, there has been limited discourse as to the evaluation of these applications on end-user's satisfaction of the systems. Studying user satisfaction with Information Systems (IS) has been a key subject of research in Management Information Systems (MIS) for a long time.

Methodology: This research aimed at evaluating the end-user satisfaction of m-banking applications by examining the systems attributes namely; information, system and support service attributes. The study adopted a quantitative and descriptive research approach. Purposive sampling method was used to select 384 respondents from Nairobi County. Data analysis was conducted using SPSS 21, tests done include; reliability test, one *t*-test sample, ANOVA and regression analysis.

Results: 346 responses were received from a possible 384, a 90% response rate is considered adequate for data analysis and interpretation. The study focused on respondents with a bank account with any of the commercial banks in Nairobi (331 respondents 95.7%) and out of this 279 (84%) had registered and utilised the services of m-banking apps. Findings from one *t*-test sample analysis returned *p* values of <0.001 for the information, system and support service attribute satisfaction implying the results are statistically significant. In order of contribution to the dependent variable, the multiple regression returned R square of 0.816 revealing independent variables explained 81.6% of the variance. The results show that m-banking end-users satisfied with the information, system and support service attributes were in overall satisfied with the system and were more likely to continue using and recommending the system to others.

Conclusion: The research recommends commercial banks and their IT team to improve the systems security features, presentation interface, handling of system errors and consistency in support services. This will greatly improve the end-user's satisfaction of m-banking applications.

Key words: Information technology, commercial banks, m-banking application, end-user satisfaction, m-banking system attributes.

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

The role of Information technology (IT) in the number of innovations seen in the banking sector has been a significant one, key being mobile technologies. Within today's society, mobile phones have emerged and played a key role in the achievement of user convenience. With their ability to offer uninterrupted access to information with user's geographical location and time withstanding, mobile technologies have proved to be a fundamental and functional component in today's modern organizations (Michael 2015).

According to the Communications Authority of Kenya (CA) (First Quarter Sector Statistics Report For The Financial Year 2018/2019), mobile phone penetration is at 100%.

This rapid growth can be attributed to the major advancements seen within cloud computing, mobile payments, artificial intelligence, Internet of Things (IoT) and mobile applications markets. The increased network expansion in the country has also played a role of this growth. The mobile sub-sector is expected to be kept driven by these highlighted factors in the coming quarters as new and emerging services receive continued embracement by Kenyans.

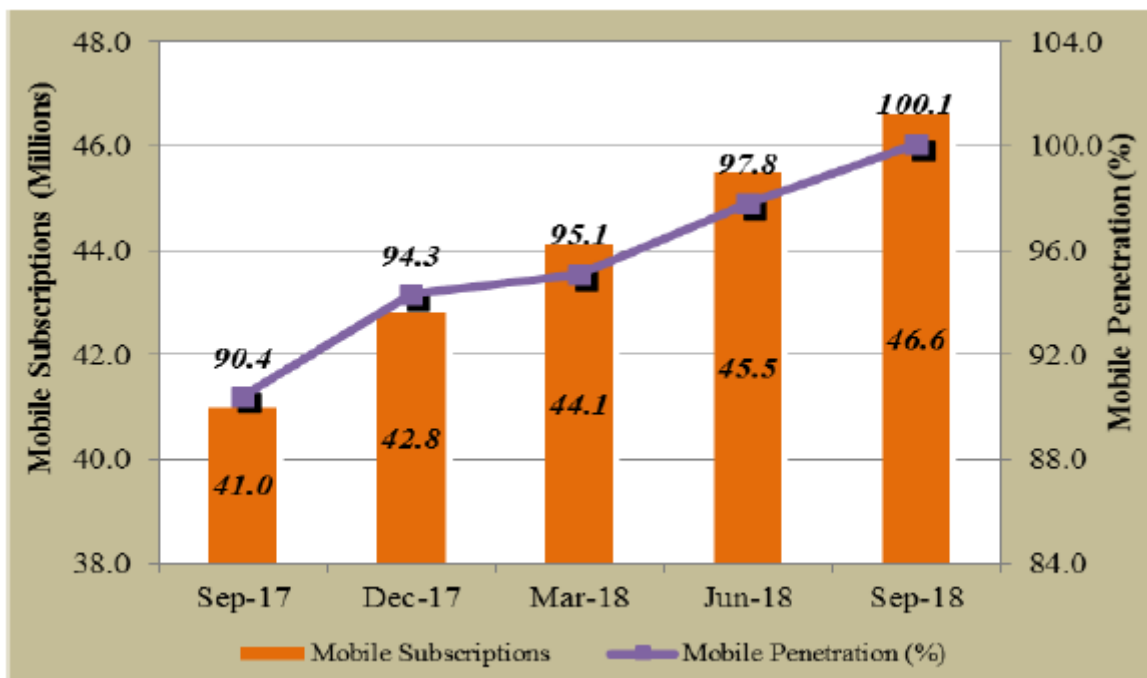


Figure 1: Trends in mobile subscriptions and penetration levels. Source (CA)

The current development and modernization of banking trends has been brought about by the necessity for more suitable means of accessing financial and banking resources away from the conventional norms. Research has revealed that commercial bank customers are

progressively embracing accessing financial and banking services through their portable wireless devices (Odera 2013).

Through digital modernization commercial banks have been given another chance to further strengthen and affirm its customer level of satisfaction and loyalty. Furthermore, it's enabled banks not only have the potential to meet its customer expectations but also establish strong associations and profitability using the method (Ogonji 2015).

1.2 Mobile Banking in Kenya

(Sharma, 2012) Defines Mobile banking as the process of availing traditional banking amenities to customers through their mobile devices. In his research, (Njenga 2010) posits that the continuing development and innovation within the banking industry has risen about as clients require their banks to offer them different means of accessing financial transactions beyond the traditional ways of obtaining banking services.

To achieve growth, banks must understand their customer's perceptions and satisfaction of m-banking applications and determine its impact on consumer's usage rate of the applications. Financial services banks offer to their clients through mobile banking include; Ability to check ones' bank balance and statement, clients can transfer funds between accounts and to other banks, facilitate payments of bills and purchasing phone credit (Odera 2013).

Four primary players are required to facilitate the provision of mobile banking services to bank's customers. These players include; the bank client, the bank, the mobile network provider and the mobile banking technology merchant (Finmark Trust 2007).

M-banking is also availed as a value added services by the available mobile phone service providers. Service providers embed it among its service menu. Currently the mobile banking services are accessible to clients across the various telecommunication service providers including Safaricom "Mpesa", Airtel "Airtel money" and Telkom Kenya "T-Kash"

(Report 2017) By December 2017, there were 42 commercial banks and the Kenya Central Bank (CBK) that made up the banking sector. CBK is the authority that regulates the commercial in Kenya.

According to the 2017 Global index report, more than 80% of Kenyans have access to bank account and/or an account at other financial entities. The other financial entities might be cooperative Sacco's, credit unions or microfinance companies. The report also indicates that in the past year, the clients have used mobile banking to transfer funds or pay utility bills (FSD-Annual Report 2017).

In Kenya, m-banking is offered through the following mediums; m-banking over Short Messaging Service (SMS) also known as SMS banking. This where the bank offers banking services over SMS. Customers are required to sign up for the service by registering their mobile number. They can then send SMS to the bank to request a service and the bank replies with an SMS that contains the information requested by the customer. Secondly there is m-banking over Unstructured Supplementary Service Data (USSD). This service is commonly used to offer banking services to customers who do not own a smartphone or with limited access to internet. They can use the USSD codes provided by the banks to request for services. Lastly m-banking over Wireless Application Protocol (WAP). With the increased customer use of smartphones, banks have developed in house mobile apps which users can download and install in their smart devices and get access to the availed services provided by the bank.

Some of the popular m-banking applications in the country include; Kenya Commercial Bank (KCB) offers KCB mobi bank, Cooperative Bank has MCo-op Cash, Equity Bank offers Eazzy m-banking, Family Bank has PesaPap, NIC Bank offers NIC now.

For a long time, the focus of many research studies carried out within the Information Communication Technology (ICT) sector focuses on Information Systems (IS). The study of satisfaction uses two main approaches. Examining the processes that are involved with satisfaction formation is the first approach. It also seeks to evaluate the essential dynamics that results to users being satisfied or dissatisfied. On the other hand, the other method is not really bothered with the processes that results in users of an IS being satisfied or dissatisfied but rather it evaluates satisfaction as the summary effects as a consequence of user interaction with an IS (Vaezi et al. 2016).

1.3 Problem Statement

With mobile phone penetration at 100% in Kenya and at the same time commercial banks have availed ways in which their customers can access banking services via use of mobile phone applications, evaluation of these applications on customers satisfaction is limited especially in developing countries.(Donner and Tellez 2008)

Empirical studies done locally have not addressed this gap in knowledge. (Achieng and Ouma 2016) carried out a case study to find out to what magnitude are customers of Barclays Bank satisfied with its mobile banking application called 'Hello Money'. They found out that despite the extensive acceptance of m-banking, the users found it difficult to

access the financial services being offered through this innovation as the system availability wasn't up to standard. This research was however limited to one banking institution.

In his research on mobile banking, (Njenga 2010) looked at usage experiences in Kenya. He found out that execution of mobile banking is determined by availability of a reliable network coverage. He posits that the better the network quality the lower are operational cost and in turn potential clients can afford the service.

(Odera 2013) did a research study to find out factors affecting m-banking adoption within the banking sector in Kenya. The study focused on the employees of the main commercial banks in Kenya, including KCB, Barclays Bank, Standard Chartered Bank, Co-operative Bank and Equity Bank in Kenya. The research found out convenience was rated as the top factor in mobile banking adoption. This study was also limited to only employees of the stated banks.

In an effort to evaluate how customer perceptions influence the adoption of m-banking, (Okombo 2015) carried out a research of a Kenyan bank; the Commercial Bank of Africa (CBA). The findings revealed that adoption of m-banking services was significantly influenced by the customers perceived usefulness of the application. The study further recommended research in factors that add value in order to increase adoption and customer satisfaction of the service.

These studies have not assessed end-user satisfaction with m-banking applications within Kenya, thus our research proposes to address the gap in literature by assessing end-user satisfaction with m-banking applications provided by commercial banks in Nairobi County, Kenya.

This research study was unique from the studies mentioned above as it focused on evaluating the end-user satisfaction of mobile banking. This research sought to address the subsequent investigation question; to what degree are mobile banking end-users in Nairobi satisfied by the service.

1.4 Research Objectives

The research overall objective was to:

Evaluate the end-user satisfaction with m-banking applications in Nairobi County, Kenya using the comprehensive model of attribute user satisfaction with IS

The specific objectives of the research included:

1. Examine how attributes of m-banking information outputs contribute to end-user information satisfaction.

2. Examine how attributes of m-banking technical system contribute to end-user system satisfaction.
3. Examine how attributes of m-banking support service contributes to end-user service satisfaction

1.5 Significance of the Study

The research recommendation will be important to researchers as it will provide basis for further research into other aspects of m-banking satisfaction evaluation, thus this paper will contribute to the existing knowledge on m-banking applications and shall provide reference material to scholars.

Decisions makers within the banking industry will find this study valuable in their decision making regarding the implementation of m-banking applications for service delivery and even future applications in different areas.

M-banking applications solutions providers and developers through information on the systems performance in terms of satisfaction and experiences of the systems users.

The end-users as the findings will enable the banks improve some of the areas in m-banking the customers deem need improvement.

1.6 Limitation of the Study

With a focus of commercial banks customers within Nairobi County only elicits the study delimitation. Thus results of this research should be applied cautiously in other counties.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter will look at literature that focuses on consumer satisfaction with m-banking applications. The importance of customer satisfaction as well as mobile banking applications will be emphasized. The chapter will discuss the most recent update on Kenya's mobile phone coverage. Theoretical theories and models relevant to end-user satisfaction will be discussed in order to provide research analysis and comprehension of the study goals.

2.2 Mobile banking Application

Mobile banking is the process where commercial banks and other financial entities provide their customers with financial services or transactions over mobile technologies. Their clients access these services via their mobile devices remotely. Mobile banking provided by banks and financial institutions uses a software application “app” different from the related internet banking. (Shrestha 2017).

Mobile banking is seen as one of the cutting-edge way of availing banking services to banks and financial institutions clients through ICTs. This has been achieved because of the wide coverage and spread of mobile phones adoption in low income countries. Mobile banking allows users to utilise their mobile devices to carry out financial transactions which is linked to the client’s bank account.

Mobile banking enables commercial banks avail their services to their customers on a 24-hour basis. Restrictions are sometimes placed by commercial banks or financial institutions on the limit of transactions amounts allowed or which bank accounts can be accessed through mobile banking. Availability of a data or internet connection to a mobile device is a determinant of mobile banking service.

The set of applications that enable bank or financial institutions customers be able to use their mobile devices to access and operate their bank accounts like check bank balance, access credit products or transfer funds is referred collectively as mobile banking, mobile finance or mobile payments (Szczepanik & Józwiak, 2018).

2.3 M-Banking in Kenya

In Kenya m-banking is a fast growing sector in the banking industry. Majority of commercial banks and financial institutions in the quest to provide their client's with fast and efficient services remotely are leveraging on mobile devices technologies.

Banks in Kenya are in the process of trying to leverage on the usage of mobile banking in order to avail financial services to their clients as owning mobile phones has become prevalent (Kenya Information and Communication Policy, 2011).

Quite a number of commercial banks have adopted m-banking including Co-operative bank of Kenya offering Mcoop, National Bank offering NatMobile app, Kenya Commercial Bank offering Mobi-bank and the Equity bank with M-Kesho. These banks provide services to its customers such as checking balances remotely, transferring payments, reviewing statements, and paying subscriptions via mobile phones. They also cooperate with telecom companies to deliver services such as credit card topping up and utility bill payment (Kenya Information and Communication Policy, 2011).

2.4 Theoretical Frameworks and Models of Satisfaction

(Ives, Olson, and Baroudi 1983) posits that researches have given considerable attention to user satisfaction as an imperative surrogate to the process of measuring success of information systems since the 1980s.

There exists a number of models developed geared towards the measuring end-user satisfaction. These include the General User Satisfaction Scale from (Ives, Olson, and Baroudi 1983) and the 12-item End User Computing Satisfaction (EUCS) instrument from (Doll and Torkzadeh 1988).

2.4.1 Diffusion of Innovations Theory

An innovation can be referred to as a practice, an idea or objects perceived to be new by individuals or other units of adoption. An innovation rate of adoption is determined by its characteristics as perceived by the members of a social system (Gomachab 2018).

The theory of diffusion of innovation focuses on change. It deals with processing new innovations. The innovation can be an idea, product or service which are being evaluated for acceptance so to bring good in their societies. This theory seeks for ways where the new innovations are changed in order to satisfy the needs of the people its intended for but isn't concerned with persuading users to welcome the innovations.

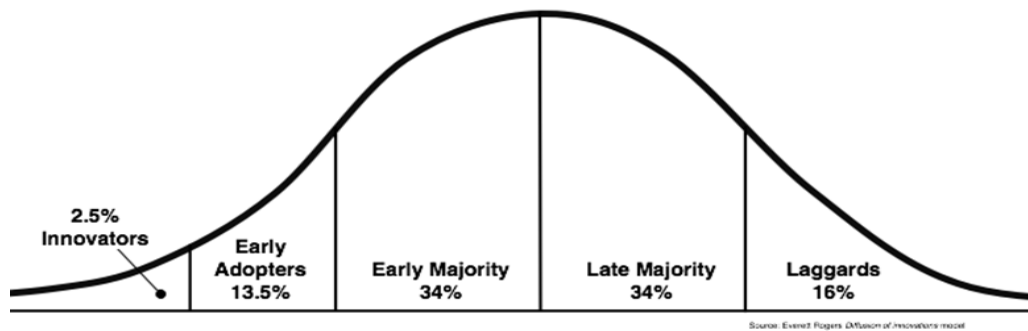


Figure 2: Diffusion Innovation Theory

Innovators-The adoption process starts with some visionary and imaginative innovators. They usually prefer to enjoy good time, energy and creativity when developing new ideas and equipment. **Early adopters**-As soon as the benefits begin to show, Pioneer users will start to join. These people are constantly looking for opportunities to strategically advance their activities in life and business. They are usually able to establish a connection between innovation and personal needs. **Early majority**-Once the idea, product, or behaviour exceeds the initial expectations, you can reach the majority of the audience. The first majority are rationalists; they rarely act on ideas or innovations without conclusive evidence, even if they are generally satisfied with the idea of moderate progress. They are followers who are influenced by mainstream fashion. They are often influenced and become followers, but at the same time, they are also vigilant about temporary fashion. **Late majority**- They are risk-averse and are usually dissatisfied with new ideas because they are conservative pragmatists. What drives them is their inner fear of not adapting; this leads them to follow traditional ideals and mainstream fashion. The perceptions and fears of the laggards often affect them. **Laggards**-At the same time, laggards are those who persist to the end. These people generally believe that adopting a particular product or behaviour is high risk (Robinson 2009).

2.4.2 Assimilation Theory

This theory proposes that customers of a company make cognitive comparisons between their expectations of the product or service and the perceived performance of the product or service. Festinger's 1962 dissonance theory inspired this worldview.

(Anderson 1973) states that as customers strive to bring a product or service more in line with their expectations, they tend to seek dissonance avoidance by adjusting perceptions of the product.

Customers might adjust their expectations to align with perceived product performance to alleviate stress caused by an incongruity between expectations and product performance. This can also be accomplished by reducing the relative importance of the disconfirmation by increasing satisfaction levels.

The theory's flaw is that it implies there is a relationship between anticipation and satisfaction rather than articulating how disconfirmation of an expectation leads to happiness or discontent.

2.4.3 Satisfaction Formation Process Model

Consumer satisfaction is established, according to the concept, when their assessment of performance is compared to both their expectations and wishes. Contentment with qualities and satisfaction with information are used to calculate overall satisfaction. This model has an advantage over prior customer satisfaction models in that perceived performance does not directly affect satisfaction.

The drawback is that, while the researchers evaluated their model by assessing customer satisfaction for a product, they believe their model would produce significant results when measuring customer satisfaction for services.

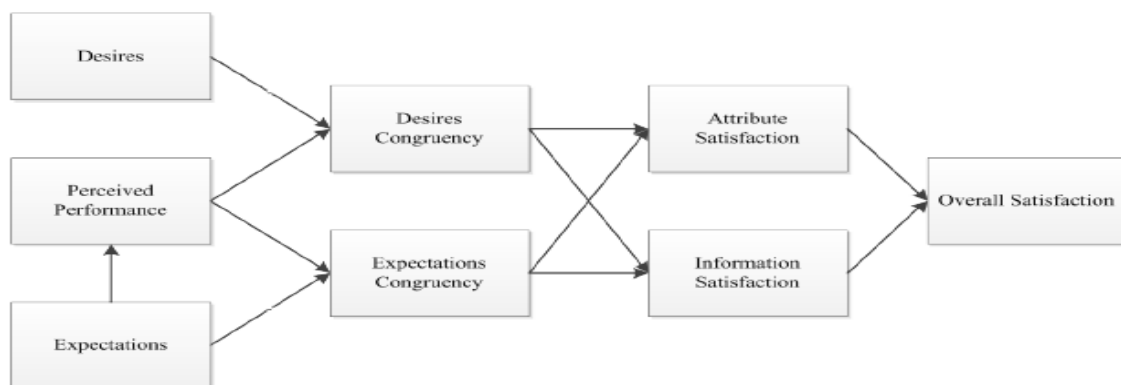


Figure 3: Spreng et al. (1996) Satisfaction Formation Process

2.4.4 The Doll and Torkzadeh model

In their study, (Doll and Torkzadeh 1988) established an instrument that evaluates the satisfaction of IS users that interact directly with the IS for a specific application by combining ease of use and information product components. They compared and contrasted traditional computer settings with end-user computing environments. The following are the requirements that the instrument designed to measure end-user satisfaction meets:

- a. It assesses user satisfaction with the information offered by a certain IS.
- b. It comprises items to assess an IS's ease of usage.
- c. Instead of using a semantic differential scale, it uses a Likert scale.
- d. It is concise, user-friendly, and appropriate for both academic and practical research.
- e. It is trustworthy and legitimate, and it may be used to a variety of systems.
- f. It investigates the link between end-user happiness and other independent variables.

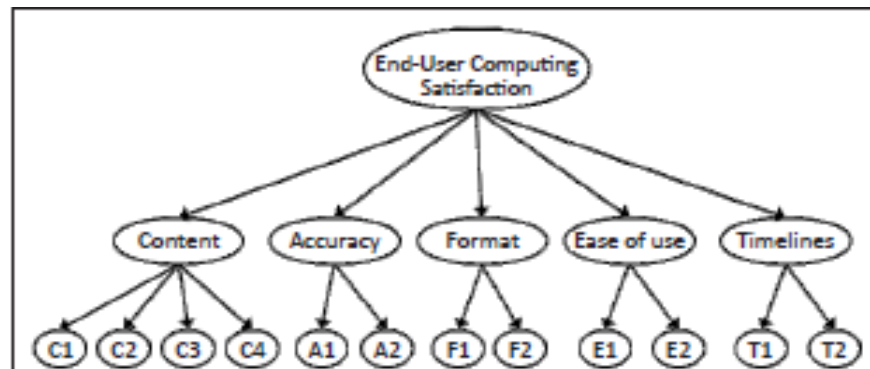


Figure 4: The end-user satisfaction model of IS (Doll and Torkzadeh, 1988)

2.4.5 Integrated Research Model

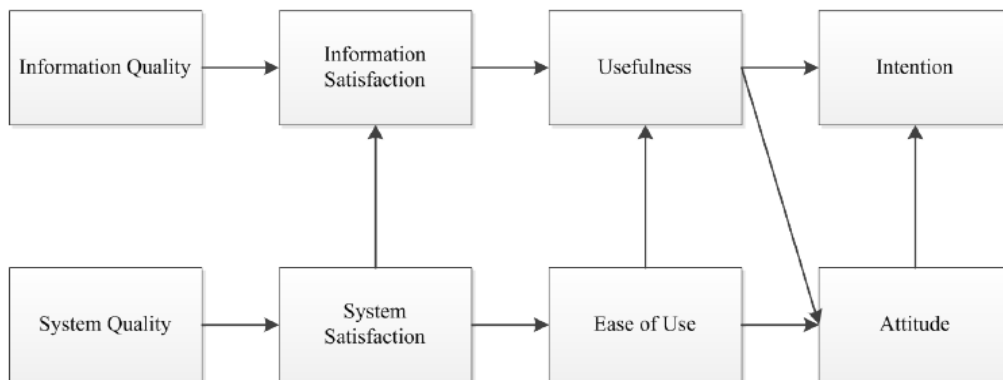


Figure 5: Wixom and Todd (2005) Integrated Research Model

Scholars (Wixom and Todd 2005) created a satisfaction with Information System paradigm by combining two lines of major IS research. The user satisfaction and technical acceptability principles were merged into one model by combining the two streams. They were able to distinguish between system and information quality as a consequence of this research.

The outcomes of the integration projects supported their efforts, demonstrating that these two research schools of thought can successfully be merged. They acknowledged that service quality influences user satisfaction, but they excluded it from the model since

included it would have made their study too system specific, and their goal was to measure features of Information Systems that are rather general and prevalent across many systems.

2.4.6 Information System Continuance Model

An assessment further into fundamental factors of online brokerage users' inclinations to keep and continue using the online platforms (Bhattacharjee 2001). According to the findings, user satisfaction with the introductory customer interaction, perceived utility of utilization, and the relationship between perceived utility and loyalty incentives are all important drivers of users' intentions to continue using the service. Users' pleasure with the service and their perception of its usefulness are both affected by confirmation of expectations. Users' happiness with online banking systems is determined by confirmation of expectation from prior IS use and perceived usefulness, according to this model.

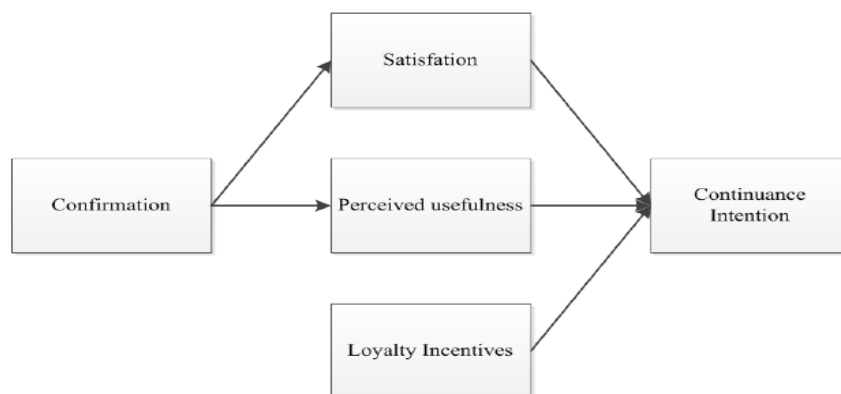


Figure 6: (Bhattacharjee 2001) IS Continuance Model

2.4.7 Attribute Model of Overall User Satisfaction

According to the (Vaezi 2013) model, user happiness with qualities of information output, technical system, and support services leads to positive outcomes with each element, which results in overall user satisfaction.

According to the study, the model does not explain how satisfaction is formed from an evaluative standpoint; rather, it investigates the cumulative contribution of attribute-level satisfaction to satisfaction with key aspects of an IS (i.e. information, system, and service) and, as a result, overall user satisfaction

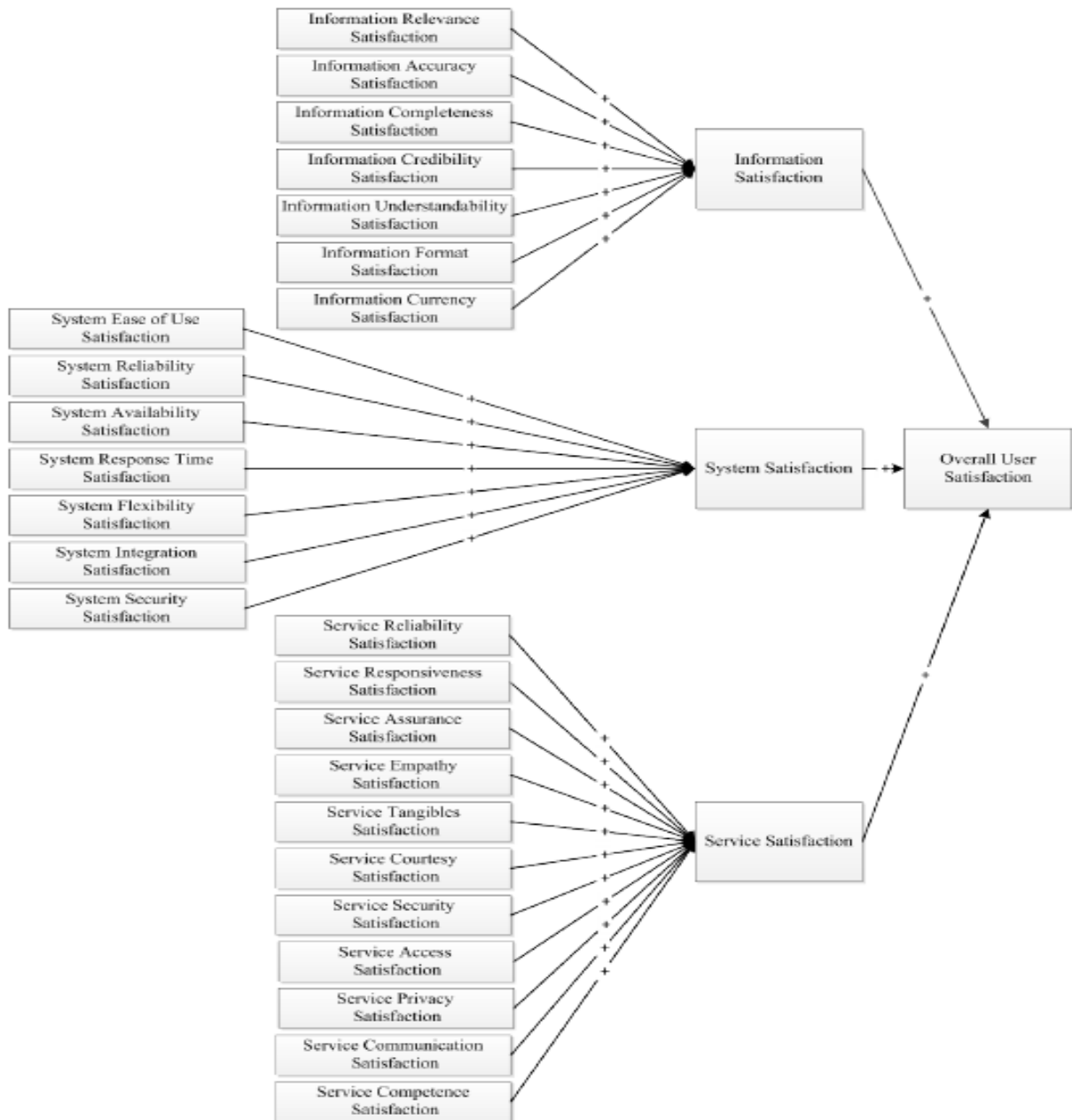


Figure 7: Attribute Model of Overall User Satisfaction (Vaezi 2013)

2.5 Empirical Review

(Achieng and Ouma 2016) in their study sort to evaluate the degree of end users satisfaction with mobile banking; a case study of Hello Money offered by Barclays Bank of Kenya's, they found out that while there was wide acceptance of this mode of self-service technology, the system availability was poor thus customers were not able to transact at their convenience rather when the system was available.

In a study by (Gomachab 2018), the researchers investigated the impact of mobile banking on customer satisfaction of four commercial banks in Keetmanshoop, Namibia (Nedbank Namibia, Standard Bank, First National Bank Namibia (FNB) and Bank Windhoek. commercial banks of Namibia. The study found out that the factors of mobile banking that influence customer satisfaction the most, as well as least contributing to 75% of the overall satisfaction of consumers include reliability, convenience, cost effectiveness, available on different mobile networks and security among others.

(Odera 2013) studied how the banking industry has adopted m-banking with a focus on the employees of the top five commercial banks in Kenya ; Barclays Bank, Standard Chartered Bank, Kenya Commercial Bank (KCB), Equity Bank and Co-operative Bank. The researcher found out that convenience, knowledge of services, navigation of the app were key factors in determining adoption decisions by users. The researcher recommended that these banks should evaluate the mobile banking services that they would prefer to access via their banks m-banking applications. In so doing, the management of these banks would have to re-evaluate the services they offer via m-banking and come up with a myriad of solutions that will not only be enticing to their customers but also encourage them to sign up for the service.

In their study on factors influencing customer satisfaction of mobile banking services; A study on Second-Generation banks (Jannat and Ahmed 2015). They successfully identified the most influential factors on customer satisfaction of m-banking to be transaction speed, security & trust, ease of use, accuracy of transaction, system availability, responsiveness, convenience and cost effectiveness are the most influential factors for customer satisfaction.

(Okombo 2015) did a case study of commercial bank of Africa in Nairobi County. The findings were that there was a significant relationship between perceived usefulness and adoption of m-banking services with recommendation of further research in factors that add value in order to increase adoption and customer satisfaction of the service.

Table 1: Summary of Previous Studies and Knowledge Gaps

Studies	Focus	Findings	Gaps in knowledge	How gaps were addressed
Achieng and Ouma 2016	extent of customer satisfaction with mobile banking; a case study of Barclays Bank of Kenya's Hello Money	Wide acceptance of this mode of self-service technology, the system availability was poor thus customers were not able to transact at their convenience rather when the system was available	The study didn't focus on attribute level satisfaction of an IS	This study will use attribute level satisfaction to determine its impact on overall end-user satisfaction with the IS
Odera 2013	M-banking adoption with a focus on the employees of the top five commercial banks in Kenya. (Kenya Commercial Bank (KCB), Barclays Bank, Standard Chartered Bank, Co-operative Bank and Equity Bank)	Convenience, knowledge of services, navigation of the app were key factors in determining adoption decisions by users	The study focused on assessing factors affecting adoption of m-banking applications not user satisfaction	This study will focus on end-user satisfaction with m-banking applications
Jannat and Ahmed 2015	Factors influencing customer satisfaction of mobile banking services; A study on Second-Generation banks	Influential factors on customer satisfaction of m-banking to be transaction speed, security & trust, ease of use, accuracy of transaction, system availability, responsiveness, convenience and cost effectiveness	Limited to factors affecting satisfaction not how the attributes of these factors affect overall end-user satisfaction	This study will use attribute level satisfaction to determine its impact on overall end-user satisfaction with the IS
Okombo 2015	Influence of customer perceptions on the adoption of mobile banking	There was significant relationship between	Didn't focus on m-banking system satisfaction but	This study will evaluate end-users satisfaction of

	service; case study of commercial bank of Africa in Nairobi county	perceived usefulness and adoption of m-banking services	gave recommendation of further research in factors that add value in order to increase adoption and customer satisfaction of the service	m-banking applications
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2.6 End User Satisfaction

(Kotler & Keller 2012) defines satisfaction as the feelings of pleasure or disappointment felt by a person derived from the comparison of perceived products' performance or outcome relating to their expectations. They go on to say that a consumer can be disappointed if the performance fails to meet their expectations, pleased if the performance meets their expectations, and elated or extremely satisfied if the performance exceeds their expectations.

In relation to IS end users, (Doll and Torkzadeh 1988) defines end user satisfaction as a person's emotional response to a computer application after interacting with it directly.

End-user satisfaction can be thought of as a quality concept. The factors influenced by psychological interactions established during an exchange transaction shape the end user's perception of the service obtained.

Satisfaction is the degree to which organizational services or products meets or goes beyond the client's expectations. Satisfaction by the end users is achieved when expectations the consumer have of the mobile banking service is met. End user satisfaction will be high (meaning more consumers will engage into mobile banking) when the expectations of the service is met , and if not, it will be low (meaning more consumers will not engage in using mobile banking services) (Gomachab 2018).

(Kassim et al. 2012) According to their report, assessing satisfaction and its determinants is a critical step in determining the value and effectiveness of an information system's investment.

“End-user IS satisfaction” (EUISS) is one of the most often utilized measures of IS effectiveness among the many types of assessments available (Au, Ngai, and Cheng 2002).

A critical theme since the inception of Information System (IS) field is determining whether an IS implementation is successful. Scholars in various research undertakings have proposed several indicators of IS success including user satisfaction, IS performance, IS

effectiveness and system use among others. (Vaezi et al. 2016) states that most researches have turned to user satisfaction as a measure or key indicator of IS success.

2.7 Determinants of End-User Satisfaction

2.7.1 Information Quality Attributes

Information quality refer to the outputs of an IS. (Laumer et al. 2017) states that from looking at the IS success model, it is argued that the quality of information as an IS output is one of the major components explaining user satisfaction. It is defined as “a measure of the quality of (the IS) outputs: namely, the quality of the information the system produces in reports and on-screen”. (Gürkut and Nat 2018) state that information quality has a significant direct effect on satisfaction.

Reliability, relevancy, correctness, precision, timeliness, currency, format, availability, completeness, sufficiency, volume, objectivity, personalisation, consistency, and understandability are some of the characteristics of good information (Fein 2020).

2.7.2. System Quality Attributes

In their research (Cheng 2019) found out that users expect that an organization’s IS should be of high quality. Attributes for a high quality IS includes easy accessibility, fast system responses, and flexibility to users’ needs.

System reliability, flexibility, learnability, integration, navigation, response time, user interface, software adequacy, security, privacy, documentation, portability, ease of use, error delectability, error recoverability, appearance and layout, functionality, and accessibility are examples of system quality attributes. (Murugiah and Akgam 2015) in their study of customer satisfaction in the Libyan banking sector, which was based on the assessment of service quality by customers. They discovered that there was a clear link between service quality and customer loyalty and customer contentment.

(Gürkut and Nat 2018) According to this theory, a rise in system quality leads to an increase in satisfaction. Their research found that system quality has a direct impact on satisfaction.

(Au, Ngai, and Cheng 2002) posits that system usage is another measure of IS success and is relatively easier to put into operation. They state this method shows the user’s degree of confidence on the effectiveness of a particular IS.

2.7.3 Service Quality Attributes

This refers to the level of service that the system user receives in terms of speed of response and technical expertise (Petter, Delone, and Mclean 2008). By considering service quality as a long-term overall evaluation of a service and satisfaction as a transaction specific evaluation, (Parasuraman et al. 1988) claimed that positive evaluation of service satisfaction over time will lead to perceptions of service quality.

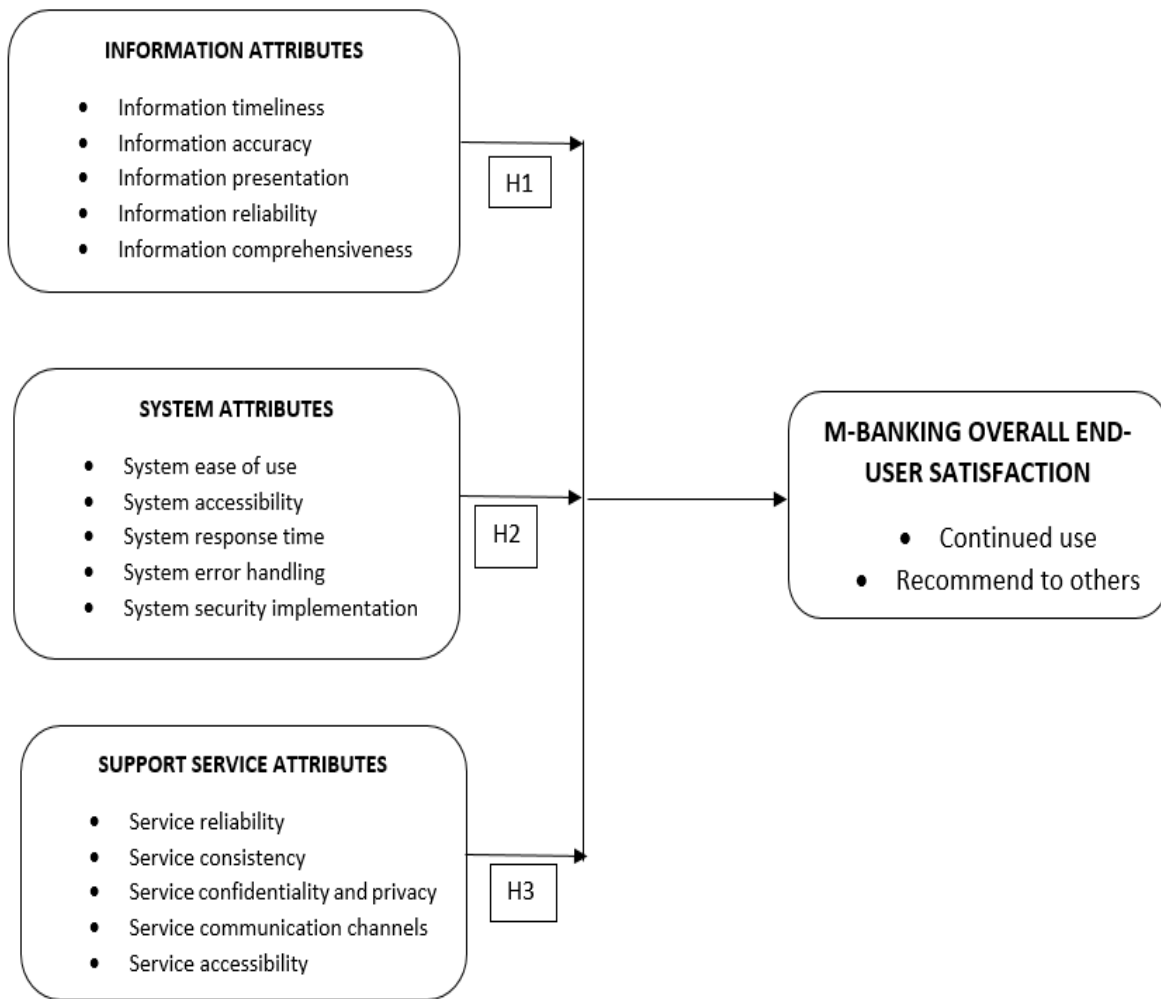
It's difficult to measure service quality objectively the same way we analyze product quality because there aren't any concrete indications. As a result, measuring consumers' opinions of service quality is one technique to assess service quality. (Vaezi 2013).

(Nelima, Mbugua, and Kilwake 2016) state that an individual's judgments of an informing technology's usefulness are based on their belief that employing a certain technology leads to higher task performance. According to (Fein 2020), the dimensions of perceived usefulness aspects include impact on productivity, job performance, effectiveness & efficiency, ability of the system to meet users expectations and needs.

2.8 Conceptual Model

To investigate overall user satisfaction with an m-banking applications, this study proposes the use of an attribute-level model of overall user satisfaction by (Vaezi 2013). The research will be guided by the model, which states that overall user satisfaction is the sum of three characteristics of user satisfaction. The information, technical system, and supporting services properties associated with a given Information System are these aspects. IS user happiness with each of these elements is a result of user satisfaction with specific attributes associated to each aspect, according to the model.

This approach of researching attribute level satisfaction and aspect level satisfaction is expected to deliver a more diagnostically impactful model of user satisfaction, avoiding the theoretical controversies associated with the majority of process-oriented models of satisfaction, such as those based on quality evaluations and expectation disconfirmation



Independent variables

Dependent variable

Figure 8: Conceptual model

2.8 Study Constructs

This research reviewed end user satisfaction literature with IS to decide which relevant IS attributes to include in the conceptual model. For the adopted model, three key facets information, system and service attribute satisfaction for the model’s independent variables and overall end-user satisfaction with m-banking applications forms the dependent variable for our study.

M-banking overall end-user satisfaction is the summary affective state that is an outcome of the overall experience received by the users as they interact with the IS.

Information attributes: Literature was reviewed to identify attributes pertaining to information satisfaction. Information accuracy, timeliness, presentation, reliability and comprehensiveness were identified to be important factors affecting satisfaction of an IS

(Fein 2020) (Jannat and Ahmed 2015). These information attributes will be studied against the independent variable to establish their impact on overall end-user satisfaction of the IS.

System attributes: From the literature reviewed, the key attributes pertaining to system satisfaction include; system ease of use, response time, accessibility, error handling capabilities and security implementation (Murugiah and Akgam 2015) (Kahandawa and Wijayanayake 2014). These will be evaluated to determine how satisfaction with system attributes impact overall end user satisfaction of m-banking applications.

Support service attributes: service consistency, reliability, accessibility, confidentiality and communication channels are identified from literature as key attributes relating to support service satisfaction of m-banking applications (Shrestha 2017). These will be measured to determine how overall end user satisfaction of m-banking applications is impacted by satisfaction of its support services.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The research design, target population, sample size and sampling technique, research instruments, testing of study instruments, validity and reliability of study instruments, as well as data collecting and data collection procedures are all covered in this chapter.

3.2 Research Design

Descriptive research design and quantitative methodology was followed in conducting this research project.

The descriptive survey was thus applicable in this study as the objectives were to establish how m-banking attributes contribute to end-user satisfaction.

The study under the quantitative research methodology, utilized survey method as the research technique to collect primary data using a structured questionnaire.

Multiple choice questions were used to collect the demographic data in the questionnaire. Likert scale questions were utilized in the survey to collect the basic information.

3.3 Research Hypotheses

The table below shows the different hypotheses that were tested during the research.

Table 2: Hypotheses

Number	Hypotheses
H1	m-banking Information attributes satisfaction has a significant impact on overall end-user satisfaction of the system
H2	m-banking System attributes satisfaction has a significant impact on overall end-user satisfaction of the system
H3	m-banking Service attributes satisfaction has a significant impact on overall end-user satisfaction of the system

3.4 Population

The population of a study refers to the total number of persons in the form of a comprehensive headcount of all elements that the study's conclusions are intended to represent (Sekaran 2013).

A well-defined population ensures that the findings and outcomes are applicable to the correct group of societal elements.

The target population for this study constituted end-users of m-banking applications from commercial banks within Nairobi County.

Nairobi's population was at 4,397,073 persons in the last census report in 2019 (KNBS 2019) with 2,598,171 (KNBS 2019) person being over 18 years of age. On the other hand, statistics for mobile uptake is at 100% in the country according to the Communication Authority of Kenya. With reference to these statistics, the target population was 2,598,171 persons.

3.4 Sample Design

Due to time, money, and access constraints, you will not be able to collect or analyse all of the data accessible to you. By focusing on a selection of cases or elements rather than all of them, sampling techniques offer a number of ways for decreasing the amount of data you need to collect.

Sampling techniques offer a variety of strategies for reducing the quantity of data you need to collect by focusing on a subset of cases or elements rather than all of them.

When time, money, and energy are limited, sampling is used to acquire a representative group that allows the researcher to obtain information about the total population.

The study employed purposive random sampling in getting the sample size. The characteristics considered in the survey included; respondents must be 18 years and above and owns a bank account with a commercial bank.

The study was guided by Krejcie and Morgan's sample size table to determine the sample size for consideration. With a 95% confidence level, a 5% margin of error, and a population size of 2,598,171 people, the sample size was at least 384 respondents (appendix 1).

3.5 Data Collection

A well-structured questionnaire was used to obtain primary data for the study. The questionnaires were provided via personal interviews, which allowed the researcher to schedule appointments and conduct personal follow-ups on the distributed questionnaires.

The questionnaires were divided into two portions and consisted of closed-ended questions. The demographic data of the respondents was collected in the first section (A). The study's second portion (B) gathered information about the end-satisfaction. user's Section B used a 5-point Likert scale to allow respondents to indicate their satisfaction with the features of m-

banking applications provided by their banks on both a negative and positive scale. According to (Kothari, 2004) the use of Likert scales is good as they demonstrate the strength of respondent's perception to the survey; as well as easy of data collection, simple to evaluate and expansive.

A pilot test of the study instrument was carried out among a select number of respondents to obtain suggestions on the tool.

3.6 Data Analysis

The collected data was subjected to statistical analysis in this study. To make data interpretation easier, the Statistical Package for the Social Sciences (SPSS) was employed. Tables, charts, and graphs were used to represent quantitative data. Frequencies, percentage charts, and graphs were utilized to depict descriptive analysis using sets of categories created from the data.

(Kothari, 2004) The task of interpreting (drawing inferences and conclusions) is carried out primarily on the grounds of inferential assessment. Inferential statistics were used to draw conclusions from the data collected to determine which validity data may imply a conclusion. From a 5-point Likert scale, three significant ranges were used; negative (1-2), neutral (3) and positive (4-5). To test the significance of the positive scores using a test value of $\mu = 4$, One-sample *t*-test will be used. (Creswell 2009) states that studies should use *t*-tests for studies with categorical information on the independent variables.

Analysis of Variance (ANOVA), T-tests and regression analysis was carried out on the collected data.

The significance level ($0 > 05$) was used to make the statistical analysis and meet the study's objectives, while the confidence level (0.95) was utilized to explain the test results.

3.7 Operationalization of Research Variables

Table 3: Operationalization of Variables

Variable	Type of variable	Measure	Indicators
End-user satisfaction	Dependent	Nominal	EUS-1 Continued m-banking app use EUS-2 Recommend to others
M-banking Information attributes	Independent	Scale	IAS-1 Information is provided timely IAS-2 Information is accurate IAS-3 Information interface is well presented IAS-4 Information is reliable

			IAS-5 Information is comprehensive
M-banking System attributes	Independent	Scale	SAS-1 System is easy to use SAS-2 System is accessible SAS-3 System is prompt with requests SAS-4 System handle errors efficiently SAS-5 System is secure
M-banking Support Service attributes	Independent	Scale	SSAS-1 Support service is reliable SSAS-2 Support service is consistent SSAS-3 Support service is private and confidential SSAS-4 Support service have proper communication channels SSAS-5 Support service is accessible

3.8 Ethical Considerations

The study observed confidentiality, privacy and integrity towards respondents and the data they provide. The study is guided by voluntary participation and none of the respondents will be coerced to provide data.

CHAPTER 4: RESULTS AND DISCUSSION

4.0 Introduction

This section provides the analysis of collected data which are guided by the objectives of the research and the proposed conceptual framework. As stated in the previous chapter, the sample size targeted is 384. Out of the questionnaires distributed, 346 respondents provided constructive feedback for the study, this represent a 90% response rate which is acceptable. The characteristics of the sample size are discussed in this section. The measure of assessing the model involves hypothesis testing of the data collected.

4.1 Reliability Test

The table below shows the reliability coefficient of 0.904. This is acceptable as the accepted value is 0.7 and above coefficient (Zhang and Xiang 2019). According to (Gliem 2003) The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale

Table 4: Reliability Test

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.904	.904	33

4.2 Descriptive Statistics

This section provides the background and demographic details of the respondents. These include the end-users' gender, age, level of education, employment sector, and information technology skills. This information is necessary because it allows the researcher to determine the viability of target audience to respond to questions on their satisfaction with mobile banking applications.

4.2.1 End-Users Gender

The gender of Mobile banking application end-users is represented in table 5 below. According to the findings, 43.1% are female while 56.9% are male. This indicates that majority of m-banking application end-users are male.

Table 5: Respondents Gender

		Sex			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	149	43.1	43.1	43.1
	Male	197	56.9	56.9	100.0
	Total	346	100.0	100.0	

4.2.2 End-Users Age

Respondents were provided age brackets and requested to select the bracket they belonged to. The results are as shown in Figure 9 below:

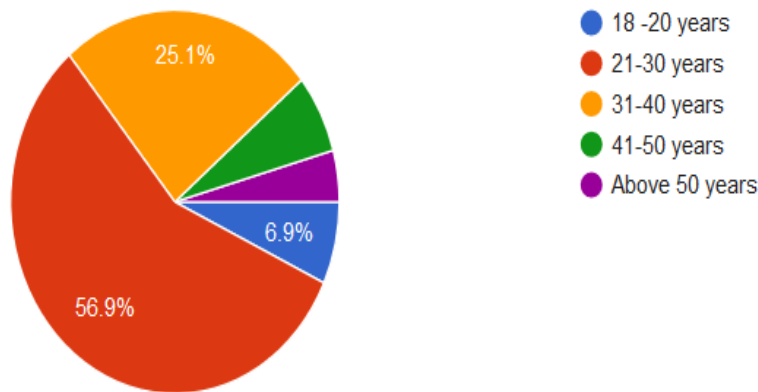


Figure 9: Respondents age

From figure 9, majority of the respondents are between age-group of 21-30 at 56.9%, followed by respondents between the age-group of 31-40 at 25.1%. Respondents between age-group 18-20 made up 6.9%, between the age-group of 41-50 made up 6.6% and lastly respondents between the age-group 50+ made up 4.3%. This means that people between age-group of 21-30 use m-banking applications more.

4.2.3 End-Users Education Level

The study sought to establish the level of education of mobile banking end-users and the results are shown in table 6 below.

Table 6: Respondents Education Level

3. education	Freq.	Percent	Cum.
Certificate	29	8.38	8.38
Diploma	62	17.92	26.30
No Certified Schooling	4	1.16	27.46
Post Graduate	70	20.23	47.69
Primary School	3	0.87	48.55
Undergraduate	178	51.45	100.00
Total	346	100.00	

The statistics suggest that undergraduate qualifications account for the majority of respondents (51.5%), followed by postgraduate qualifications (20.2%), and diploma qualifications (1.5%). (17.9 %). Respondents without a high school diploma, a primary school diploma, or a high school diploma all scored below 10%, indicating that they were knowledgeable enough to provide accurate and legitimate responses.

4.2.4 End-Users IT Skills

The IT knowledge of the respondents was important to the study as mobile banking is a technological innovation and skills in IT would influence adoption and use.

Table 7: Respondents IT Skills

IT_Skills				
	Frequency	Percent	Valid Percent	Cumulative Percent
No	80	23.1	23.1	23.1
Valid Yes	266	76.9	76.9	100.0
Total	346	100.0	100.0	

Table 7 shows that majority of the respondents had IT skills with 76.9% versus the ones without at 23%. This means the respondents will be able to understand the technical attributes of m-banking applications as asked in the survey.

4.2.5 End-Users Employment Sector

According to the findings, the majority of respondents (25.7 %) work in private practice, with at least 15% unemployed.

Table 8: Respondents Employment Sector

employment					
	Frequency	Percent	Valid Percent	Cumulative Percent	
	Non- Governmental Organization(NGO)	67	19.4	19.4	19.4
	Private Sector	89	25.7	25.7	45.1
Valid	Public Sector	58	16.8	16.8	61.8
	Self Employed	77	22.3	22.3	84.1
	Unemployed	55	15.9	15.9	100.0
	Total	346	100.0	100.0	

4.3 Understanding of Mobile-Banking Applications

The understanding of m-banking applications from commercial banks was evaluated by a number of factors. These include; having a bank account with any of the commercial banks, access and registration on m-banking, duration of use of m-banking applications, respondents' most preferred mode of m-banking, usage frequency of m-banking applications and which m-banking services they use.

4.3.1 End-Users Access to a Commercial Bank Account

Respondents were asked if they had a bank account with any of the commercial banks in Nairobi. This was necessary as clients' accounts are linked to their phones to enable m-banking. Their response is shown in table 9 below;

Table 9: Respondents Access to a Commercial Bank Account

bank_account					
	Frequency	Percent	Valid Percent	Cumulative Percent	
	No	15	4.3	4.3	4.3
Valid	Yes	331	95.7	95.7	100.0
	Total	346	100.0	100.0	

The findings indicate that 95.7% had a bank account with a commercial bank while 4.3% of the respondents did not, indicating majority of the study respondents had access to a commercial bank account which is significant for this survey.

4.3.2 End-Users Awareness of Their Bank Offering M-banking

For respondents to answer questions on m-banking, the researcher wanted to know their knowledge in understanding m-banking. The respondents were asked if they knew their bank offered m-banking. The results are shown in table 10 below;

94.3% of the respondents were aware their bank offered m-banking, 2% reported that their bank didn't offer m-banking and 4.9% didn't know whether their bank offered m-banking services. 10 respondents (2.9%) preferred not to answer the question.

Table 10: Respondents Awareness of Their Bank Offering M-banking

		m_banking			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	2	.6	.6	.6
	Yes	317	91.6	94.3	94.9
	Don't Know	17	4.9	5.1	100.0
	Total	336	97.1	100.0	
Missing	System	10	2.9		
Total		346	100.0		

4.3.3 End-Users Registration and Preferred Mode of M-banking Application

The study sought to find out how many respondents had registered for m-banking with their banks and their preferred mode of m-banking application. The results are presented in figure 10 and 11 below;

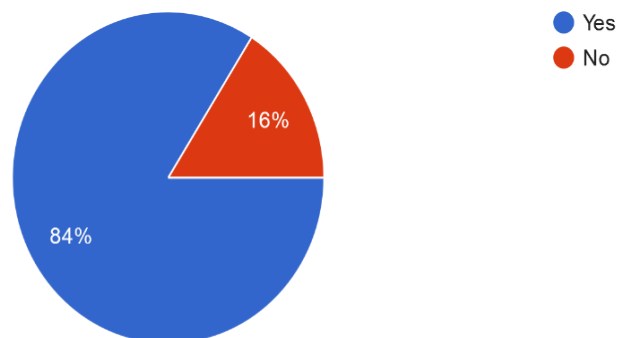


Figure 10: Respondents registration to m-banking

The findings indicate that 279 (84%) respondents had registered for m-banking with their commercial bank while 52 (16%) had not. The study proceeded to analyse and interpret data findings from this group of respondents who had a bank account and had registered for m-banking application.

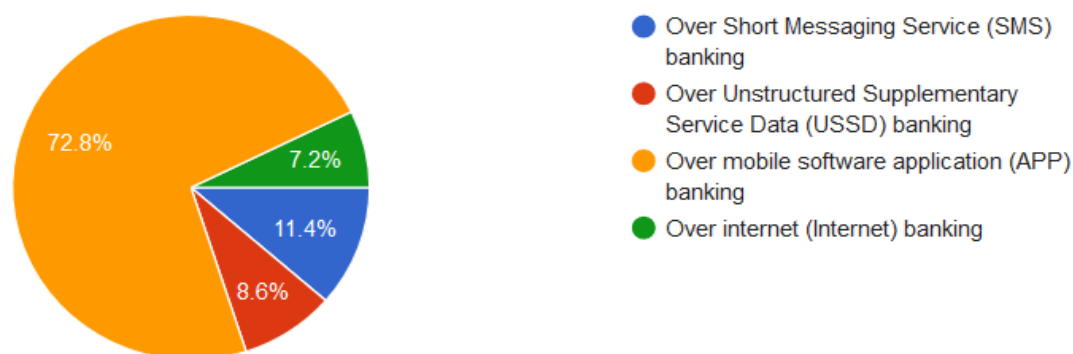


Figure 11: Respondents preferred mode of m-banking

Results in figure 11 above show that majority of the respondents preferred m-banking via an 'App' (72.8%) compared to SMS Banking (11.4%), Internet banking (7.2%) and USSD banking (8.6%).

4.3.4 M-banking Application Services Period of Use

The study sort to find out how long end-users had utilised m-banking application. Majority of the respondents had used the app between 1-3 years (44.4%), 24% had used the app for 1 full year, 20.8% of respondents had used the app for more than 3 years and 10.8% of the respondents had used the app for less than 1 year.

Table 11: M-Banking Application Services vs Frequency of Use

period_mbanking				
	Frequency	Percent	Valid Percent	Cumulative Percent
1 year	67	24.0	24.0	24.0
1-3 years	124	44.4	44.4	68.5
Valid Less than 1 year	30	10.8	10.8	79.2
More than 3 years	58	20.8	20.8	100.0
Total	279	100.0	100.0	

4.3.4 Factors M-Banking Application End-Users Consider Important

The study respondents were asked to rank the factors they consider most about the m-banking applications provided by their banks. The factor the respondents deemed very important was security (73.1%) and the least factor was cost (43%)

The results of the respondents rating are shown in table 12 below.

Table 12: M-Banking Application Factors and Rate of Importance

	Factor	Not important	Of little importance	Moderately important	Important	Very important
F1	Cost	1.1%	2.5%	12.2%	41.2%	43%
F2	Security	-	1.1%	2.5%	23.3%	73.1%
F3	Convenience	0.4%	0.4%	4.7%	44.1%	50.5%
F4	Interface	-	1.4%	12.2%	49.5%	36.9%
F5	Reliability	-	1.1%	3.6%	43.7%	51.6%

The responses were analyzed and ranked as represented in table 13 to determine the importance that end-users place on the various factors of m-banking applications.

Table 13: Rank of Importance of Factors of M-Banking Applications

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
cost	279	1	5	4.23	.837
security	279	2	5	4.68	.576
convenience	279	1	5	4.44	.637
interface	279	2	5	4.22	.709
reliability	279	2	5	4.46	.621
Valid N (listwise)	279				

The results show that end-users attach more importance to security (mean of 4.68), reliability (4.46), convenience (4.44), cost (4.23) and least importance to m-banking application interface (mean of 4.22).

4.3.5 End-User Satisfaction with M-Banking Information Attributes

The study attempted to determine the end-user's satisfaction with m-banking information attributes. The results indicate that a total of 85.4% end-users were satisfied with how fast the system provided information outputs compared to 10.3% who were not while 4.3% were neutral. A total of 89.9% were satisfied with information accuracy while 6.2% were not with

3.9% being neutral. A total of 70.6% were satisfied with how well the m-banking information was presented on the interface while 16.4% were not satisfied with 13.3% being neutral. We also see that a total of 76% were satisfied with how reliable the information attribute was compared to 14% who were not satisfied with 10% of the respondents being neutral. A total of respondents 70.3% were satisfied with comprehensiveness of the m-banking information output while 15% were not satisfied with 14.7% being neutral. Findings shown in table 14.

Table 14: End-User Satisfaction with M-Banking Information Attributes

	Attribute	Very dissatisfied	Dissatisfied	Neither	Satisfied	Very satisfied
IA1	Information is timely	1.4%	8.9%	4.3%	74.6%	10.8%
IA2	Information is accurate	1.6%	4.6%	3.9%	77.4%	12.5%
IA3	Information is well presented	2.1%	14.3%	13.3%	58.1%	12.2%
IA4	Information is reliable	2.5%	11.5%	10%	67.4%	8.6%
IA5	Information is comprehensive	1.4%	13.6%	14.7%	59.9%	10.4%

4.3.6 End-User Satisfaction with M-Banking System Attributes

The study sort to find out m-banking end-user’s satisfaction with the systems. The results indicate that a total of 92.5% end-users found the application easy to use while 6.1% did not while 1.4% were neutral. Most respondents were satisfied with m-banking application system accessibility 71.7% while 19.3% were not satisfied with 9% being neutral. Respondents were satisfied with how m-banking application system handled their requests for services 71.3% while 14.7% were not satisfied with 14% being neutral. In terms of system handling errors, majority of the respondents were satisfied 68.1% while 18.3% were not. The findings reveal that most respondents were satisfied 78.5% with the security features of m-banking application while 12.5% were not and 9% being neutral. Findings shown in table 15

Table 15: End-User Satisfaction with M-Banking System Attributes

	Attribute	Very dissatisfied	Dissatisfied	Neither	Satisfied	Very satisfied
SA1	System is easy to use	0.4%	5.7%	1.4%	74.6%	17.9%
SA2	System is accessible	2.2%	17.1%	9%	60.6%	11.1%
SA3	System is prompt in handling requests	0.7%	14%	14%	59.1%	12.2%
SA4	System is efficient in handling errors	2.2%	16.1%	13.6%	62.4%	5.7%
SA5	System security features are well implemented	1.4%	11.1%	9%	66.7%	11.8%

4.3.7 End-User Satisfaction with M-Banking Support Service Attributes

The study sort to determine the end-user satisfaction with m-banking support services attributes and findings in table 16 below reveal that majority of respondents were satisfied with reliability of the support services 74.5%. The attribute they were least satisfied with is support confidentiality 12% and support communication channels 12%.

Table 16: End-Users Satisfaction with M-Banking Support Service Attributes

	Attribute	Very dissatisfied	Dissatisfied	Neither	Satisfied	Very satisfied
SSA1	Support is reliable	2.2%	17.6%	5.7%	67%	7.5%
SSA2	Support is consistent	2.9%	21.4%	10.8%	58.1%	6.8%
SSA3	Support is private and confidential	1.4%	12.9%	14.7%	62%	9%
SSA4	Support communication channels are effective	2.5%	12.6%	14.3%	62.7%	7.9%
SSA5	Support is easily accessible	2.5%	15%	12.9%	59.9%	9.7%

4.4 Hypothesis Testing

The study used one sample *t*-test to analyze the three hypothesis in this study. For this test, the *t* column will represent *t*-test statistic value (the higher the *t* value, the lower the probability that the results happened by chance). The df column represents the degree of freedom (size of sampled used). The Sig. (2 tailed) represents the level of significance (*p*-value) shows the likelihood the results happened by chance. Our focus will be on *p*-value result where if $p < 0.001$ then the variables in the test are significantly related.

Table 17: One-Sample T-Test Test

One-Sample Test						
	Test Value = 4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H1	68.986	278	.000	23.401	22.73	24.07
H2	71.031	278	.000	23.201	22.56	23.84
H3	53.887	278	.000	22.018	21.21	22.82

H₁ M-banking information attributes satisfaction has a significant impact on overall end-user satisfaction of the system.

From table 16 above, the results of the *t*-test yielded $t(278) = 68.986$, *p*-value is < 0.001 thus signifying that m-banking information attributes and end-user satisfaction have a positive relationship. This result is also significant as the *p*-value is < 0.001 . This shows that m-banking information attributes has a direct impact on end-user satisfaction of the system thus the hypothesis is supported.

H₂ M-banking system attributes satisfaction has a significant impact on overall end-user satisfaction of the system.

Results from table 16 show that the *t*-test yielded $t(278) = 71.031$, *p*-value is < 0.001 which means there is a positive relationship between m-banking system attributes and end-user satisfaction. This result is significant as the *p*-value is < 0.001 . The result informs that m-banking system attributes have a direct impact on end-user satisfaction of the system and the hypothesis is supported.

H₃ M-banking support services attributes satisfaction has a significant impact on overall end-user satisfaction of the system.

Results from table 16 show that the *t*-test yielded $t(278) = 53.887$, *p*-value is <0.001 which signifies a positive relationship between m-banking support services attributes and end-user satisfaction. This result is significant as the *p*-value is <0.001 . The result informs that m-banking support services attributes have a direct impact on end-user satisfaction of the system and the hypothesis is supported.

Table 18: Results of Hypotheses Test

Hypothesis Number	Description	Result
H ₁	M-banking information attributes satisfaction → overall end-user satisfaction of the system.	Supported
H ₂	M-banking system attributes satisfaction → overall end-user satisfaction of the system.	Supported
H ₃	M-banking support service attributes satisfaction → overall end-user satisfaction of the system.	Supported

4.5 Regression Analysis

The researchers used SPSS regression analysis to investigate the nature and significance of the relationship between the independent and dependent variables.

Regression analysis is a statistical technique for modelling and analyzing numerical data that includes the values of a dependent variable (also known as the response variable) and one or more independent variables (also known as the explanatory variables) (Babatunde 2018).

The following checks will be done to ensure that data sets are suitable for regression analysis.

4.5.1 Multicollinearity and Singularity

To results returned as shown in table 19 below under the collinearity statistics column indicate that the tolerance test for all the independent variables >5 meaning there was no multicollinearity in the data. This is further confirmed when the tolerance is divided by 1 for

all the independent variables giving outputs not greater than 8 as shown by the Variance Inflation Factor (VIF). (Tabachnick and Fidell 2001)

Table 19: Results of Multicollinearity Test

Model	Coefficients ^a						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-1.399	.452		-3.093	.002		
timelyINFO	.057	.089	.028	.639	.523	.364	2.748
accurateINFO	-.174	.096	-.076	-1.813	.071	.397	2.516
well_presentedINFO	.179	.083	.104	2.156	.032	.304	3.293
reliableINFO	.505	.089	.279	5.656	.000	.288	3.472
comprehensiveINFO	.131	.075	.074	1.739	.083	.391	2.559
easeMBANKING	-.069	.093	-.028	-.748	.455	.503	1.988
accessibleMBANKING	.025	.069	.015	.363	.717	.421	2.374
1 prompt_requestMBANKING	.324	.082	.176	3.961	.000	.356	2.812
errorMBANKING	.078	.068	.044	1.135	.257	.460	2.174
securityMBANKING	.068	.084	.037	.807	.420	.335	2.986
reliablesupport	.353	.090	.210	3.910	.000	.244	4.099
consistentsupport	-.033	.079	-.020	-.414	.679	.292	3.425
confidentialsupport	.256	.106	.145	2.424	.016	.196	5.106
communicationchannelsupport	-.027	.102	-.016	-.267	.790	.203	4.930
accesssupport	.217	.103	.130	2.109	.036	.186	5.379

a. Dependent Variable: overall.satisfaction

4.5.2 Homoscedasticity, Residuals Independence and Linearity

The study explored the score distributions and variable relationships aspects. From the findings shown in table 20 the maximum cook's distance as .172 which is <1 implying that there aren't undue influences on the model. If the cook's distance is greater than one, then there might be problems with the model (Tabachnick and Fidell 2001).

Table 20: Residual Statistics

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.89	11.82	8.53	2.313	279
Std. Predicted Value	-3.305	1.424	.000	1.000	279
Standard Error of Predicted Value	.089	.675	.243	.121	279
Adjusted Predicted Value	.74	11.85	8.52	2.306	279
Residual	-3.513	4.219	.000	1.100	279
Std. Residual	-3.107	3.730	.000	.973	279
Stud. Residual	-3.448	4.018	.003	1.014	279
Deleted Residual	-4.327	4.893	.008	1.198	279
Stud. Deleted Residual	-3.522	4.139	.003	1.021	279
Mahal. Distance	.714	98.023	14.946	15.161	279
Cook's Distance	.000	.172	.006	.016	279
Centered Leverage Value	.003	.353	.054	.055	279

a. Dependent Variable: overall.satisfaction

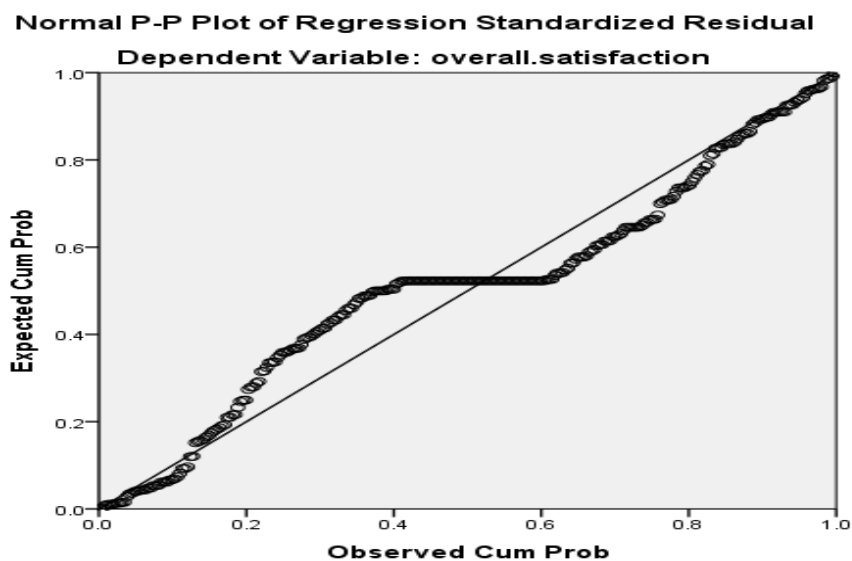


Figure 12: Normal P-P Plot

From figure 12 we can see that there is a straight line relationship between the independent and dependent variable scores. Homoscedasticity is satisfied as the figure also shows normal distributions of residuals about the dependent variable score. (Tabachnick and Fidell 2001) state that Durbin-Watson statistic of 2 or thereabout is acceptable. For this study, the Durbin-Watson statistic was 1.881 which is close to 2 implying the residual values are independent.

4.5.3 M-Banking Attributes Satisfaction and Overall End-User Satisfaction

The m-banking applications attributes studied were information, system and support service attributes.

Table 21: Summary of Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Information attributes	.740 ^a	.547	.546	1.726
System attributes	.776 ^a	.602	.600	1.619
Support service attribute	.813 ^a	.661	.660	1.493

a. Predictors: (Constant), service.support.attributes.satisfaction, Information.attributes.satisfaction, system.attributes.satisfaction

b. Dependent Variable: overall.satisfaction

Table 21 reveals that m-banking application information, system and support service attributes satisfaction have a strong positive correlation (0.740, 0.776, 0.813 respectively) to overall end-user satisfaction with m-banking applications.

Table 22: M-Banking Attributes Satisfaction Impact on Overall End-User Satisfaction

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.903 ^a	.816	.805	1.131

a. Predictors: (Constant), accesssupport, accurateINFO, errorMBANKING, comprehensiveINFO, accessibleMBANKING, easeMBANKING, securityMBANKING, consistentsupport, timelyINFO, prompt_requestMBANKING, well_presentedINFO, reliableINFO, reliablesupport, communicationchannelssupport, confidentialitysupport

The satisfaction of the information, service, and support service attributes generated R square =.816 in the model summary in table 22, implying that the independent variables explain 81.6 percent of the variance in overall end user satisfaction with m-banking applications.

Further research should be done to determine the other remaining 18.4% factors that impact overall end-user satisfaction with m-banking apps. The results also reveal a strong positive relationship as shown by the correlation coefficient 0.903.

This model also reaches statistical significance where the p -value is <0.001 as shown in table 23 which implies that the results are statistically significant.

Table 23: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1487.107	15	99.140	77.513	.000 ^b
Residual	336.384	263	1.279		
Total	1823.491	278			

a. Dependent Variable: overall.satisfaction

b. Predictors: (Constant), accesssupport, accurateINFO, errorMBANKING, comprehensiveINFO, accessibleMBANKING, easeMBANKING, securityMBANKING, consistentsupport, timelyINFO, prompt_requestMBANKING, well_presentedINFO, reliableINFO, reliablesupport, communicationchannelssupport, confidentialsupport

Table 24: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-2.740	.406		-6.753	.000
Information.attributes.satisfaction	.146	.017	.323	8.436	.000
system.attributes.satisfaction	.112	.022	.238	5.066	.000
service.support.attributes.satisfaction	.163	.017	.433	9.452	.000

a. Dependent Variable: overall.satisfaction

From the multiple regression performed on the data set, the following equation is derived.

$$\text{Overall end-user satisfaction} = (0.146) \text{ Information attribute satisfaction} + (0.112) \text{ System attributes satisfaction} + (0.163) \text{ Service Support attribute satisfaction} - 2.740$$

From these findings, we can state that if information attribute satisfaction is held constant, a unit increase in both system and service support attribute satisfaction would result in an increase of 0.112 and 0.163 respectively on overall end-user satisfaction of m-banking apps.

4.5.4 M-Banking Overall End-User Satisfaction and End-User Continued Use

To ascertain end-user overall satisfaction with m-banking applications, the study sort to find out their overall satisfaction and the likelihood of them continue using the application. Figure 13 shows that those respondents who were satisfied with m-banking applications were extremely likely to continue using the m-banking application while those respondents less satisfied with the system were extremely unlikely to continue using the m-banking application.

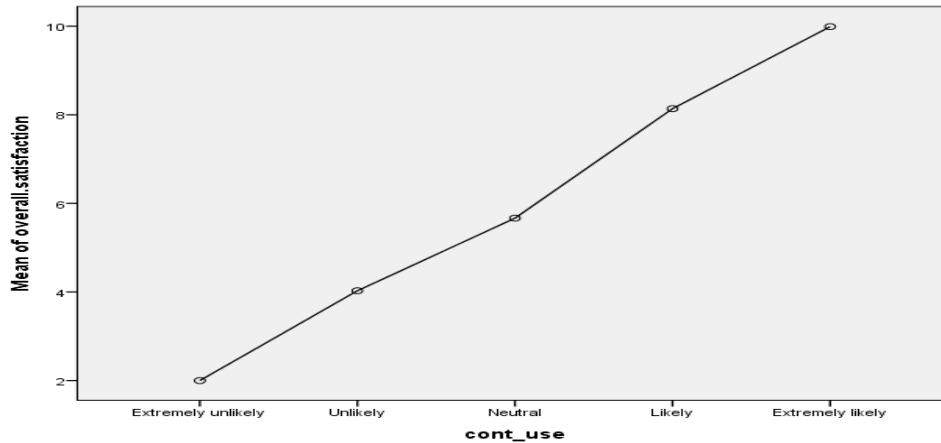


Figure 13: Means plot (overall end-user satisfaction and end-user continued use)

4.5.5 M-Banking Overall End-User Satisfaction and End-User Recommending the Application

From the analysed results, figure 14 show that those respondents who were satisfied with m-banking applications were extremely likely to recommend the m-banking application to others unlike those who were less satisfied with the system.

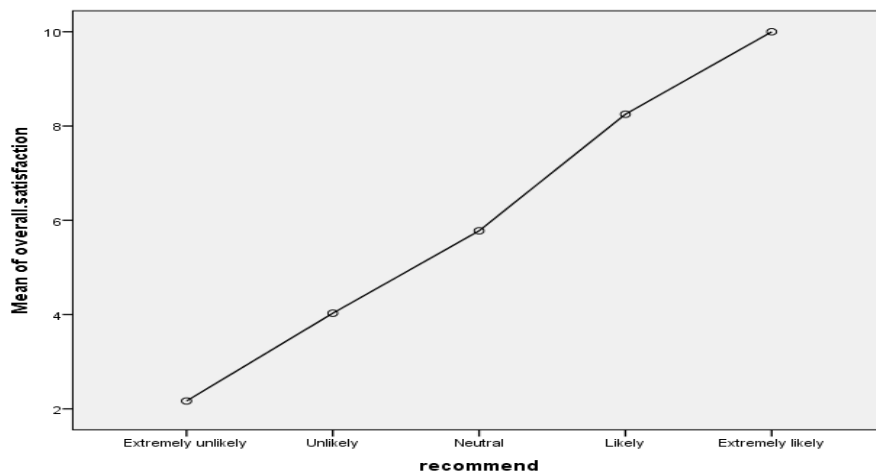


Figure 14: Means plot (overall end-user satisfaction and end-user recommendation)

4.4 Discussion

The study sought to assess overall end-user satisfaction of m-banking applications using satisfaction of the system attributes namely; information, system and support service attributes.

The dependent variable was overall end-user satisfaction with m-banking applications and the independent variables were information attributes satisfaction, system attributes satisfaction and support services attributes satisfaction.

Findings from the survey show that majority of the respondents were between the ages of 21-30 years (56.9%) and had undergraduate education level (51%) with the least age group 50 years and above (4.3%). This means younger respondents use m-banking applications more.

The findings also reveal that most of the respondents had IT skills making up (76.9%) while those without IT skills were (23.1%) which implies that the respondents had the technical know how to respond to the survey as it focused more on the m-banking system attributes.

The study found out that most respondents worked in the private sector (25.72%) while the least were unemployed (15.9%). Employed people tend to have access to a bank account for financial transactional purposes.

The study found out that majority of the respondents had an account with a commercial bank (96%) while only (4%) did not. Out of those who had a bank account, (94.07%) were aware of their bank offering m-banking services while (5.34%) were not aware. Majority of the respondents with bank accounts had also registered for the m-banking services (84%) while only (16%) had not registered. This was significant to the study as it targeted respondents with bank accounts and who registered for m-banking services as they would have a better insight of the survey needs.

Of the types of m-banking modes on offer, majority of the respondents preferred accessing m-banking services via an 'app' (72.8%) with least preferred mode of m-banking being (7.2%). This can be attributed with the penetration of mobile phones in the country and the banks leveraging on this to introduce services via mobile apps.(CAK 2017). (Kahandawa and Wijayanayake 2014) state that research has found that main reasons for internet banking users to switch into mobile banking are processing power, screen size, speed and security of mobile banking services.

Out of the m-banking application elements that respondents deemed very important, security of the m-banking application was rated highest by respondents (73.1%), reliability (51.6%), convenience (50.5%), cost (43%) and lastly m-banking app interface (36.9%). This

implies that m-banking users will pay a higher cost if the security of the system is well implemented. Other studies (Okombo 2015) found out that security is an integral part that end-users look at in assessing the value they would obtain m-banking services. While a study by (Jannat and Ahmed 2015) on factors influencing customer satisfaction on mobile banking services found out that cost had little impact on customer satisfaction.

The results show that there was a balanced use across all of m-banking application services on offer. With statement inquiry, balance inquiry, purchase of airtime, mobile payments and transfer of funds across banks/to mobile phones in a close range of (33%).

Results from the analysis for end-user satisfaction with information attributes show that most respondent were satisfied with the accuracy of information output by the system (89.9%) followed closely with information timeliness and reliability (85.4%) and (76%) respectively. The least attributes been information presentation on the interface (70.6%), information comprehensiveness (70.3%) and this implies that the system generates accurate banking information to its users in a timely and reliable manner but the presentation or user interface can be improved to better suit user needs. (Jannat and Ahmed 2015) in their study found out that accuracy of transaction details had a positive impact on customer satisfaction. For the m-banking system attributes, the study findings revealed that most respondents found the system easy to use (92.5%) followed by their satisfaction that the system security features are well implemented (78.5%). This findings are supported by (Kahandawa and Wijayanayake 2014) who in their study found out that ease of use and perception on risk influenced customer satisfaction with m-banking. System accessibility and promptness in handling user requests scored satisfaction levels of (71.7%) and (71.3) respectively.(Jannat and Ahmed 2015) (Ogonji 2015) states that the speed of operations, ease of use and accessibility are the strong predator of customer satisfaction. The least satisfactory system attribute been the m-banking application ability to handle errors (68.1%). This shows that if the system is easy to use and security features are well implemented more users will be more satisfied with the application. Other studies like (Okombo 2015) found out that users perceived use of a system had a significant effect on whether they would use m-banking services.

In terms of end-user satisfaction with support service attributes. The results show that reliability with support service scored highest (75%) while support service consistency scored the least (65%). The other m-banking service support attributes scored close satisfaction levels among m-banking end-users with support privacy and confidentiality (71%), support effective communication channels (71%) and m-banking service support

accessibility (70%). (Shrestha 2017) in their study recommends that banks should improve service quality in terms of communication, responsiveness and reliability of the support services offered.

The study findings also revealed that those end-users who were overall satisfied with m-banking were extremely likely to continue using the application 56.9% (mean=9.99) and recommend the application to others 56.1% (mean=10). (Mahalakshmi and Kalaiyarasi 2016) in their study found out that customer loyalty and service quality led to customer satisfaction of m-banking.

The three hypothesis formulated for this study were accepted as they all returned a p -value < 0.001 with indices $\mu > 4$ which was above the neutral position from the t -tests performed.

This gives a conclusion that;

H₁- M-banking information attributes satisfaction has a significant impact on overall end-user satisfaction of the system.

H₂- M-banking service attributes satisfaction has a significant impact on overall end-user satisfaction of the system.

H₃- M-banking support service attributes satisfaction has a significant impact on overall end-user satisfaction of the system.

How Satisfaction with M-Banking Information Attributes Influence Overall End-User with the System

The m-banking information attributes satisfaction had an R squared value of .547 which signifies that satisfaction with m-banking information attributes explain 54.7% of the variance in overall end-user satisfaction with the application. The model reaches a statistical significance Sig = .000 meaning the p value $p < 0.001$ implying the results are statistically significant. This results shows that when users are satisfied with m-banking information attributes they are more likely to be satisfied with the overall applications attributes. Thus banks and their applications developers should pay keen attention to those information attributes that the end-users find unsatisfactory to improve the overall satisfaction of their m-banking services.

How Satisfaction with M-Banking System Attributes Influence Overall End-User with the System

The m-banking system attributes satisfaction yielded an R squared value of .602 which signifies that satisfaction with m-banking system attributes explain 60.2% of the variance in

overall end-user satisfaction with the application. The model reaches a statistical significance Sig = .000 meaning the p value $p < 0.001$ implying the results are statistically significant. This finding means that satisfaction with m-banking system attributes influence overall satisfaction of the system. M-banking application developers should take into account improve on the system attributes the end-users find wanting. For this study the respondents reported dissatisfaction with how m-banking applications handle errors. They expect a seamless experience while using the app and not having to contact the banks for error handling. One of the factors the respondents considered very important to them was security, m-banking applications hold very sensitive and confidential economic elements that most end-users want assurances of a safe and secure transaction environment. This means if they feel that the security features are not been well implemented they may not be satisfied with the m-banking application.

How Satisfaction with M-Banking Support Service Attributes Influence Overall End-User with the System

The m-banking support service attributes satisfaction yielded an R squared value of .661 which implies that satisfaction with m-banking support service attributes explain 66.1% of the variance in overall end-user satisfaction with the application. The model reaches a statistical significance Sig = .000 meaning the p value $p < 0.001$ implying the results are statistically significant. These findings mean that satisfaction with m-banking service support attributes influences overall end-user satisfaction with the system in line with the literature reviewed. Banks should therefore improve the support services for m-banking applications, attributes like consistency of support services was reported to be poor by the respondents. Support service communication channels should be available and accessible at all times as m-banking applications allows end-users to access services 24/7.

Regression analysis show that information, service and support service attribute satisfaction yielded R square =.816 which implies that the independent variables explain 81.6% of the variance in overall end user satisfaction with m-banking applications. The results also reveal a strong positive relationship as shown be the correlation coefficient 0.903.

This model also reaches statistical significance where the p -value is < 0.001 as shown in table 22 which implies that the results are statistically significant.

CHAPTER 5: CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

5.0 Introduction

This chapter will provide summary of study results from chapter four, recommendations and suggestions for future studies. It is organized as follows; firstly, it presents findings summary in accordance to the study objectives, then recommendations for m-banking applications and suggestions for further research.

This study sought to evaluate if satisfaction with m-banking attributes had an influence on the end-user overall satisfaction of the system. The study main objective was to evaluate the end-user satisfaction with m-banking applications in Nairobi County, Kenya.

5.1 Summary of Findings

The research was conducted in Nairobi County and focused on users of commercial bank m-banking services. A survey was conducted to collect primary data from a sample population of 384. Descriptive and inferential statistics was carried out on data collected and presentations made.

The study found out that most users of m-banking applications were male and were between the age bracket of 21-30 years. Majority of the respondents had undergraduate training and have IT skills.

5.1.1 M-Banking App Information Attributes Impact on Overall End-User Satisfaction

The study's first objective was to determine how attributes of m-banking information outputs contribute to overall end-user information satisfaction.

Results from the analysis for end-user satisfaction with information attributes show that most respondent were satisfied with the accuracy, timeliness and reliability of information output by the system. The m-banking information comprehensiveness and presentation still has room for improvement. This implies that the system generates accurate banking information to its users in a timely and reliable manner but the presentation or user interface can be improved to better suit user needs. These findings support (Gürkut and Nat 2018) research where they recommended that IS should provide relevant, complete, timely and accurate information in order to increase user satisfaction.

5.1.2 M-Banking App System Attributes Impact on Overall End-User Satisfaction

This research also aimed at determining how attributes of m-banking technical system contribute to overall end-user information satisfaction.

The study revealed that most respondents found m-banking applications easy to use and were satisfied with how security was implemented. (Kasyoki 2012) states that m-banking users expect the system to proceed with their expectations and for it to be secure, this is also supported by (Jannat and Ahmed 2015) where they found out that the most influential factor for m-banking end-user satisfaction was security and trust. The respondents had indicated that the most important factor of m-banking app is security. The end-users were also satisfied with system accessibility and promptness in handling requests. (Ogonji 2015) states that defines that the speed of operations, ease of use and accessibility are the strong predator of customer satisfaction. The least satisfactory system attribute was the m-banking application ability to handle errors. This means that the m-banking application does not handle satisfactorily the errors arising from the application operation.

5.1.3 M-Banking App Support Services Attributes Impact on Overall End-User Satisfaction

The study also aimed at determining how attributes of m-banking support services contribute to overall end-user satisfaction.

In terms of end-user satisfaction with support service attributes. The results show that users were satisfied with reliability with support service when an issue occurs during operation but not with the consistency. This means that banks should improve on its consistency in user support. Other attributes accessibility, confidentiality and communication channels were satisfactory to the end-users.

It is also important to note that satisfaction with service attributes will tend to vary as opposed to satisfaction with information and system attributes. This is because users of an IS will receive similar experience with information and system attributes of the m-banking applications as these are inbuilt functions of the IS (Vaezi 2013) while the consistency of support services to the users might be different.

The study findings also revealed that those end-users who were overall satisfied with m-banking were extremely likely to continue using and recommend their banks m-banking app to others.

5.2 Conclusion

The objective of this research was to evaluate whether satisfaction with m-banking attributes has a positive influence on overall end-user satisfaction with the application. The model tested was adopted from the comprehensive model of attribute satisfaction of information systems by (Vaezi 2013).

The high uptake of mobile use and banks leveraging on this to provide banking services via m-banking gives an opportunity to study if these m-banking applications satisfies its end-users. Attributes of m-banking system; information, system and support service attributes were incorporated into the model to evaluate whether their satisfaction has a positive influence on overall end-user satisfaction of the system. The results from the model survey were assessed statistically using SPSS.

It was hypothesized and statistically confirmed that information, system and support service attributes satisfaction as a strong positive influence on the end-users' overall satisfaction with m-banking applications. Thus the hypotheses were supported.

The m-banking information attributes satisfaction had an R squared value of .547 which signifies that satisfaction with m-banking information attributes explain 54.7% of the variance in overall end-user satisfaction with the application. The model reaches a statistical significance Sig = .000 meaning the p value $p < 0.001$ implying the results are statistically significant. This results shows that when users are satisfied with m-banking information attributes they are more likely to be satisfied with the overall applications attributes.

The m-banking system attributes satisfaction yielded an R squared value of .602 which signifies that satisfaction with m-banking system attributes explain 60.2% of the variance in overall end-user satisfaction with the application. The model reaches a statistical significance Sig = .000 meaning the p -value < 0.001 implying the results are statistically significant. This finding means that satisfaction with m-banking system attributes influence overall satisfaction of the system.

The m-banking support service attributes satisfaction yielded an R squared value of .661 which implies that satisfaction with m-banking support service attributes explain 66.1% of the variance in overall end-user satisfaction with the application. The model reaches a statistical significance Sig = .000 meaning the p -value < 0.001 implying the results are statistically significant. These findings mean that satisfaction with m-banking service support attributes influences overall end-user satisfaction with the system in line with the literature reviewed.

5.3 Recommendations

The comprehensive model of attribute satisfaction of information systems by (Vaezi 2013) posits that overall end-user satisfaction with a system is derived from their satisfaction of the system functionality, information from the system and support services associated with the said system.

Thus from the results of this study, end-user's satisfaction with information attributes of the system revealed that commercial banks and m-banking software developers can further improve on presentation of m-banking application user interface to holistically improve end-user satisfaction.

In terms of satisfaction with system attributes, commercial banks and m-banking software developers need to pay more attention to how the system is able to handle errors that occur during operation. The m-banking application should be configured/developed in such a way that errors are handled promptly and efficiently.

Lack of consistency of the m-banking applications support service also need to be reviewed by commercial banks. Results show that end-users felt the support services consistency was poor compared to the other support service attributes. If banks avail 24/7 support or maybe incorporate help bots in the applications to help with providing support to m-banking users.

5.4 Further Research Work

This survey focused on m-banking applications users within Nairobi County only. Thus further studies are required to assess end-user satisfaction with m-banking applications on other counties.

The research also focused on m-banking attributes and their influence on end-user overall satisfaction of m-banking applications. From the results, R squared revealed that these attributes could explain up to 81.6% variance of the overall end-user's satisfaction with the system, further research should therefore be conducted to find out the remaining 18.4%.

This research focused on m-banking applications provided by commercial banks, while Sacco's too offer their clients services through m-banking applications. Research should be carried out to evaluate end-user's satisfaction with these Sacco's m-banking applications.

Further research could also be done to evaluate the major challenges experienced by m-banking applications end-users in relation to the system attributes.

Internet banking as a form of m-banking service was ranked least as the preferred mode of receiving banking services on the go. Further research should be conducted to identify reasons why most commercial bank clients didn't prefer internet banking.

5.5 Limitations of the study

This survey focused on m-banking applications users within Nairobi County only, this can be considered as a drawback as the findings can be misleading in relation to end-user's satisfaction of m-banking applications in other counties especially rural counties. Stronger network coverage and internet cover could influence end-users experience with the system compared to rural settings.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

SECTION A: DEMOGRAPHIC DATA

Instructions: Please respond to the following questions by ticking only **ONE** answer.

1. What is your gender?

Male

Female

2. What is your age bracket?

Below 20 years

21-30 years

31-40 years

41-50 years

Above 50 years

3. What is your highest level of education achieved or in the process of attaining it?

No Certified Schooling

Primary School

High School

Certificate

Diploma

Undergraduate

Post Graduate

4. Do you have Information Technology Skills?

Yes

No

5. Do you have a bank account with any of the commercial bank?

Yes

No

6. Does your bank offer mobile banking?

Yes

No

7. If yes, what mode of mobile banking does your bank offer?

Over Short Messaging Service (SMS)

Over Unstructured Supplementary Service Data (USSD)

Over mobile software application (APP)

8. Have you registered on mobile banking?

Yes

No

9. If yes, for how long have you been using mobile banking?

Less than 1 year

1 year

1-3 years

More than 3 years

10. How frequently do you use mobile banking?

Very infrequent

Somewhat infrequent

Neither frequent nor infrequent

Very frequent

11. Which is your preferred mode of mobile banking?

Over Short Messaging Service (SMS) banking

Over Unstructured Supplementary Service Data (USSD) banking

Over mobile software application (APP) banking

12. On a scale of 1 to 5 please state how often you use the following m-banking services on average in a month (where 1- Never, 2 - Seldom, 3 –Sometimes, 4 - Often, 5 – Always)

		1	2	3	4	5
A	Statement inquiry					
B	Balance inquiry					
C	Purchase airtime					
D	Mobile payments					
E	Funds transfer across banks					
F	Funds transfer to mobile operators e.g M-Pesa, Airtel Money					

SECTION B: MBANKING SATISFACTION

Satisfaction with Information Attributes

13. Overall, how satisfied or dissatisfied are you with the extent to which the information provided by the mbanking application...

	Very Dissatisfied	Dissatisfied	Neither	Satisfied	Very Satisfied
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13.1	... is timely					
13.2	... is accurate					
13.3	...is well presented					
13.4	...is reliable					
13.5	... is comprehensive					

Satisfaction with System Attributes

14. Overall, how satisfied are you with the extent to which...

		Very Dissatisfied	Dissatisfied	Neither	Satisfied	Very Satisfied
14.1	...mbanking application is easy to operate					
14.2	... mbanking application is accessible at all times					
14.3	...mbanking application is prompt in executing my requests					
14.4	...mbanking application system errors are handled promptly and efficiently					
14.5	...mbanking application security features are implemented					

Satisfaction with Service Attributes

15. Overall, how satisfied or dissatisfied are you with ...

		Very Dissatisfied	Dissatisfied	Neither	Satisfied	Very Satisfied
15.1	...reliability of support services offered by the bank					
15.2	... consistency of support services you receive					
15.3	...how support services make you feel the banking interactions are confidential and private					
15.4	...the communication channels used for service support.					
15.5	...how convenient it is to access support services.					

Overall satisfaction with m-banking applications

16. Overall, how likely are you ...

		Extremely unlikely	Unlikely	Neither	Likely	Extremely likely
16.1	...to continue using your banks m-banking app					
16.2	... to recommend the banks m-banking app					

Thank you for your co-operation.

APPENDIX 2: POPULATION SAMPLING TABLE

Required Sample Size								
Population Size	Confidence = 95%				Confidence = 99%			
	Margin of error				Margin of Error			
	5.0%	3.5%	2.5%	1.0%	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	146	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1,067	427	636	827	1,119
1,500	306	515	759	1,297	460	712	959	1,376
2,000	322	563	869	1,655	498	808	1,141	1,785
2,500	333	597	952	1,984	524	879	1,288	2,173
3,500	346	641	1,068	2,565	558	977	1,510	2,890
5,000	357	678	1,176	3,288	586	1,066	1,734	3,842
7,500	365	710	1,275	4,211	610	1,147	1,960	5,165
10,000	370	727	1,332	4,899	622	1,193	2,098	6,239
25,000	378	760	1,448	6,939	646	1,285	2,399	9,972
50,000	381	772	1,491	8,056	655	1,318	2,520	12,455
75,000	382	776	1,506	8,514	658	1,330	2,563	13,583
100,000	383	778	1,513	8,762	659	1,336	2,585	14,227
250,000	384	782	1,527	9,248	662	1,347	2,626	15,555
500,000	384	783	1,532	9,423	663	1,350	2,640	16,055
1,000,000	384	783	1,534	9,512	663	1,352	2,647	16,317
2,500,000	384	783	1,536	9,567	663	1,353	2,651	16,478
10,000,000	384	784	1,536	9,594	663	1,354	2,653	16,560
100,000,000	384	784	1,537	9,603	663	1,354	2,654	16,584
300,000,000	384	784	1,537	9,603	663	1,354	2,654	16,586

Source: Krejcie & Morgan 1970