MOBILE TELECOMMUNICATIONS QUALITY OF SERVICE AND CUSTOMER SATISFACTION IN KAMPALA, UGANDA

BY

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DECLARATION

I Emmanuel Muyomba, hereby declare that this dissertation is a result of my own effort and has never been submitted for any award to any university.

Signed..... Date ……

APPROVAL

This is to certify that this work has been done under my supervision and submitted for examination with my approval

Signature: …… Date ……

Supervisor

MRS. PROSS NAGITTA OLUKA

Supervisor

Signature…… Date ……

MR. MAYANJA KAMBUGU

DEDICATION

I dedicate this work to my parents, Mr Steven Bukenya and Mrs Justine Bukenya. I also dedicate it to my son Jesse Edmond Kamoga who was born during the time of this study and my daughter Shanelle Marie Nalubega who started school as I finalised this study.

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My heartily thanks go to my family and friends who have contributed to the successful completion of my studies in reasonable time. Special thanks go to my wife Olivia for her support during the study period.

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LIST OF ABBREVIATIONS

EDT	Expectancy Disconfirmation Theory
GSM	Global System for Mobile Communications
ICC	International Chamber of Commerce
ICT	Information and Communications Technology
IEEE	Institute of Electrical and Electronic Engineers
IJET	International Journal of Engineering & Technology
ITU	International Telecommunications Union
MID	Mean Interruption Duration
MTBI	Mean Time Between Interruptions
NP	Network Performance
QoS	Quality of Service
SMS	Short Message Service
TSP	Telecommunications Services Provider
UCC	Uganda Communications Commission

ABSTRACT

This study examined mobile telecommunications quality of service (QoS) and customer satisfaction (CS) in Kampala. The study had two objectives: One was to establish the relationship between network performance (NP) aspects of QoS and CS in Kampala and the second was to assess the relationship between non NP aspects of QoS and CS in Kampala. The researcher was perturbed by continuous information from Uganda Communications Commission (UCC), and other sources indicating that mobile telecommunications QoS was very poor in Kampala and Uganda at large. This prompted the study.

A cross sectional research design was adopted and quantitative approach was used. The study population was the mobile telecommunications subscribers in Kampala estimated at 792,718. The sample size for the study was 384. Self-administered questionnaires were used to collect data and a response rate of 75% was obtained.

Correlation results showed a significant weak positive relationship between NP and CS and a significant weak positive relationship between non NP aspects of QoS and CS. The findings provided an insight into customers' satisfaction within the mobile telecommunications domain much as the study was limited to Kampala and to mobile voice telephony and SMS.

Recommendations to TSPs included a need to emphasise both NP and Non NP QoS aspects for greater improvements in CS. Also, TSP training programs should be tailored to equip staff with necessary skills and knowledge to better serve the customers. TSPs should also increase the number of customer helpline staff and lines. Much as UCC carries out network performance tests; it was recommended that in addition nationwide surveys should be carried out to ascertain the non-network performance aspects of QoS of mobile telecommunications.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

The research aimed at establishing the relationship between quality of service (QoS) of mobile telecommunications and customer satisfaction in Kampala. In this chapter, a background to the study, the problem statement, purpose of the study, objectives of the research, research questions, research hypotheses, scope, significance of the study, conceptual framework and finally the terms and concepts as used in the study will be defined.

1.2 Background

1.2.1 Historical background

Historically, telecommunications infrastructure and services have been provided on a monopoly basis with the plain old telephone service as the main offering and the government owned telecommunications administration combining multiple roles as policy maker, regulator and operator. Technological advances in the 1980's and 1990's radically changed the telecoms sector, creating opportunities for market entry by a range of competitors (International Chamber of commerce (ICC), 2004). The author further asserts that governments realised that monopoly networks and services were limiting the development of new markets and services. With the introduction of competition and profit oriented players to provide telecommunications, governments had to ensure quality telecommunications services through independent regulators.

According to the World Bank and International Telecommunications Union [ITU] (2013) by the year 2010, forty two of the forty four countries in Sub Saharan Africa (excluding Somalia and Mayotte whose data wasn't reported) had an Independent regulator of communications. From the same source, four of the countries in Sub Saharan Africa have monopolies as the Telecommunications Services Providers while the remaining forty have competition. All the countries in East Africa have independent regulatory bodies and have full competition in the Telecommunications Industry and the regulators have mechanisms aimed at ensuring good quality services from the service providers (ITU, 2013).

The Uganda Communications Act (1997) provided for the restructuring of the communications industry in Uganda by establishing the Uganda Communications Commission, provided for its functions and administration; provided for the incorporation of Uganda Telecom Limited and Uganda Post Limited, the act liberalised and introduced competition in the telecommunications industry in Uganda. The Uganda Communications Act (2013), section 3 (f) states one of the objectives of the Act as introducing, encouraging and enabling competition in the communications sector through regulation and licensing of competitive operators to achieve rapid network expansion, standardisation as well as operation of competitively priced and quality services. Thus competition is upheld and quality of services is emphasized in the legal framework of the communications sector. The telecommunications sector is thus in the hands of private companies whose major aim is maximizing profits and they could neglect the QoS. This study explored the relationship between quality of services and customer satisfaction in Mobile Telecommunications in Kampala, Uganda.

1.2.2 Theoretical background

The Expectancy Disconfirmation Theory (EDT) was adopted for this study. Afullo (2004) theorises that quality as perceived from a customer stems from a comparison of what they feel or expect the product should offer with their perceptions of the actual performance of the product. The author notes that in practice the customer's view of quality may significantly differ from that of the service provider whose view of quality will be based on their perspective of the product offering. This is shown in figure 1 below.

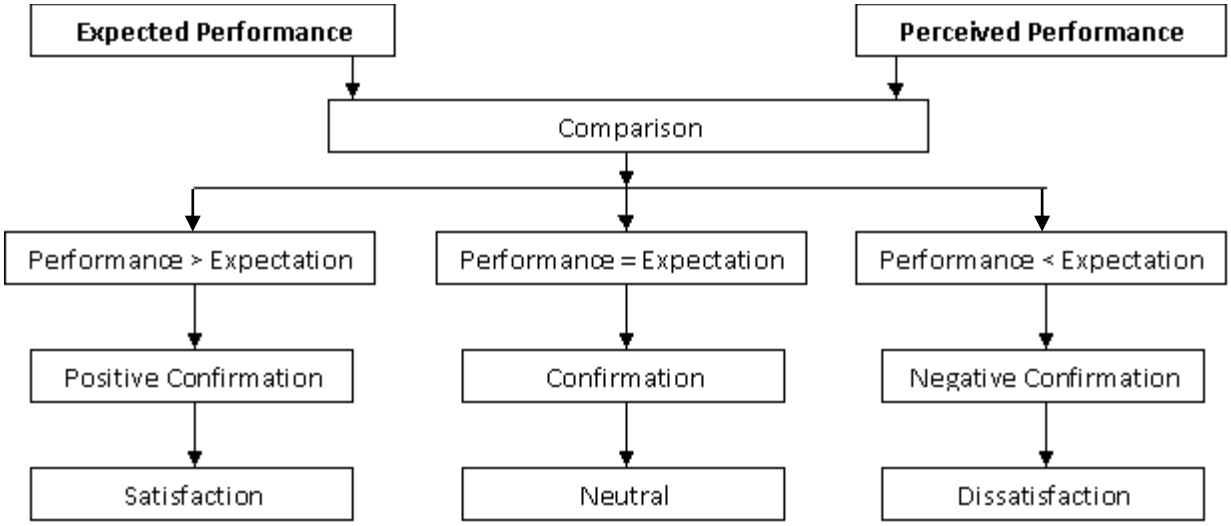

Figure 1: Disconfirmation Model of customer satisfaction

Source: Afullo (2004). Quality of Service in Telecommunications - The Customer's Perspective

The disconfirmation model of customer satisfaction above shows that the customer compares the perceived performance with the expected performance of a service. When a services' performance exceeds the expectations of the customer, then there is positive confirmation and

the customer is satisfied. If on the other hand the services' performance is below the customer's expectations then there is negative confirmation and the customer wouldn't be satisfied. Should the service just meet the customer's expectation, confirmation happens and the customer remains neutral. The EDT theory, together with the SERVQUAL model shall be expounded on in chapter two under the theoretical review section.

ITU (2008) and (ITU 1994) illustrate the relationship between QoS and Network Performance. QoS comprises both network performance (NP) and non-network related performance. The list of QoS criteria for a particular service would be dependent upon the service and their relevance could vary among the segments of the customer population (ITU 2008).

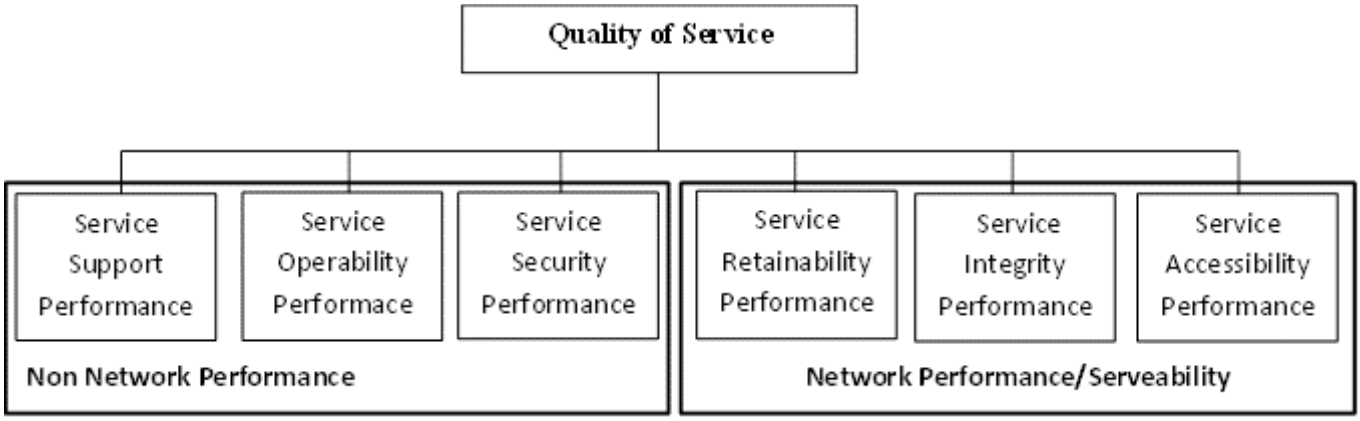

Figure 2: Quality of Service Dimensions

Source: ITU (1994) ITU-T Recommendation E.800: Quality of telecommunication services

From the provider's viewpoint, network performance is a concept by which network characteristics can be defined, measured and controlled to achieve a satisfactory level of service quality (ITU, 2008). This study covered both NP and non NP aspects of QoS.

1.2.3 Conceptual background

ITU (2008) defines QoS as the totality of characteristics of a telecommunications service that bear on its ability to satisfy stated and implied needs of the user of the service. This implies that the user is best placed and is the judge of good or bad QoS. QoS comprises both network performance like network congestion and non-network related performance aspects like handling of complaints.

Oliver (1980) and Leisen (2001) as quoted by Loke et al (2011) defined customer satisfaction as a personal feeling of either pleasure or disappointment resulting from the evaluation of services provided by an organization to an individual in relation to expectations. Yi (1990) asserts that customers buy services with pre-purchase expectations about anticipated performance, once the bought service has been used, outcomes are compared against expectations. If the outcome matches expectations, the result is confirmation. When there are differences between expectations and outcomes, disconfirmation occurs. Positive disconfirmation occurs when product or service performance exceeds expectations. Therefore, satisfaction is caused by positive disconfirmation or confirmation of customer expectations, and dissatisfaction is the negative disconfirmation of customer expectations (Yi, 1990).

1.2.4 Contextual background

The telecommunications sector in Uganda has been transformed by liberalisation and introduction of competition. An independent regulator is in place, which is the Uganda Communications Communication (UCC). Uganda Communications Act (2013) empowers the Commission to establish an intelligent network monitoring system to monitor traffic, revenue and quality of service of operators. In addition, Sections 3(i) and 3(m) of the

Telecommunications (Licensing) Regulations 2005 outline the importance of Quality of Service (QoS) as: - To adopt a consumer-oriented approach that focuses on delivery of quality services at reasonable and affordable costs; and to facilitate the introduction of new modern services and the expansion of existing services into modern and innovative quality services delivered at reasonable and affordable costs. Telecommunications quality tests carried out by UCC between May and July 2013 in Gulu, Jinja, Kampala, Lira, Masaka, Mbale, Mbarara and Mukono towns found that TSPs continue to fault on provision of quality services, falling short on both dropped and blocked calls (Kulabako, 2013). The relationship between customer satisfaction and QoS is however not known. In the undertaken study, Quality of Service was an independent variable whereas customer satisfaction was a dependent variable.

1.3 Problem Statement

Recognizing that that the development of the local telecommunications services sector is dependent on being globally competitive, governments world over have continued to advocate the introduction of full market competition in the local telecommunications services sector. Governments realised that monopoly networks and services were limiting the development of new markets and services (ICC, 2004).

Indeed the Government of Uganda identified that liberalisation of Telecom market was essential for rapid network growth and general improvement in the quality of services (Uganda Communications Act, 1997). At the time of the study, the sector had five main players i.e. Uganda Telecom, MTN (U) Ltd, Airtel (U) Ltd, Orange (U) Ltd and Warid Telecom (U) Ltd but Airtel had just acquired Warid Telecom Uganda Ltd and was expected to phase out the Warid Brand in due course (Kulabako & Arinaitwe, 2013).

Telecommunication service providers have to compete with each other to ensure optimal customer satisfaction in terms of products or services (Loke, Taiwo, Salim and Downe, 2011).

Despite the intense competition in Uganda, customer complaints were continually encountered in terms of dropped calls and network congestion among others thus causing anxiety and the regulator Uganda Communications Commission reporting poor QoS (Kulabako, 2012). In July 2013, the Minister of ICT also challenged UCC to address the QoS delivered by telecommunications operators in the country (Baguma, 2013). Also, results of UCC's QoS survey found that none of the TSPs met all the set performance indicators as shown in the table below.

Table 1: Quality of Service Performance by Major Telecommunications Services Providers in Kampala (May - July 2013)

Telecommunications Services Provider	Dropped Call Rate - Complies if less than 2%	Blocked call rate - complies if less than 2%	Successful Call rate - Complies if higher than 98%
UTL	0.65	5.56	93.8
MTN	0.85	3.31	95.9
WARID	3.1	1.15	95.8
ORANGE	1.48	2.4	96.2
AIRTEL	2.13	0.71	97.2

Source: (UCC, 2013) GSM mobile telephony quality of service results for the period May to July 2013

There was thus a need to establish the effect the reported bad mobile telecommunications QoS has had on customer satisfaction. There had been no research on this in Kampala and therefore, the study aimed to fill this knowledge gap. The research therefore investigated the relationship between mobile telecommunications quality of service and customer satisfaction in Kampala, Uganda.

1.4 Purpose of the Study

The purpose of the study was to investigate the relationship between quality of service of mobile telecommunication and customer satisfaction in Kampala, Uganda.

1.5 Objectives of the study

a) To establish the relationship between network performance and customer satisfaction in Kampala, Uganda.

b) To assess the relationship between non network performance aspects of QoS and customer satisfaction in Kampala, Uganda.

1.6 Research Questions

a) What is the relationship between network performance and customer satisfaction in Kampala, Uganda?

b) What is the relationship between non network performance aspects of QoS and customer satisfaction in Kampala, Uganda?

1.7 Hypothesis

a) There is a relationship between network performance and customer satisfaction in Kampala, Uganda.

b) There is a relationship between non network performance aspects of QoS and customer satisfaction in Kampala, Uganda.

1.8 Conceptual Frame Work

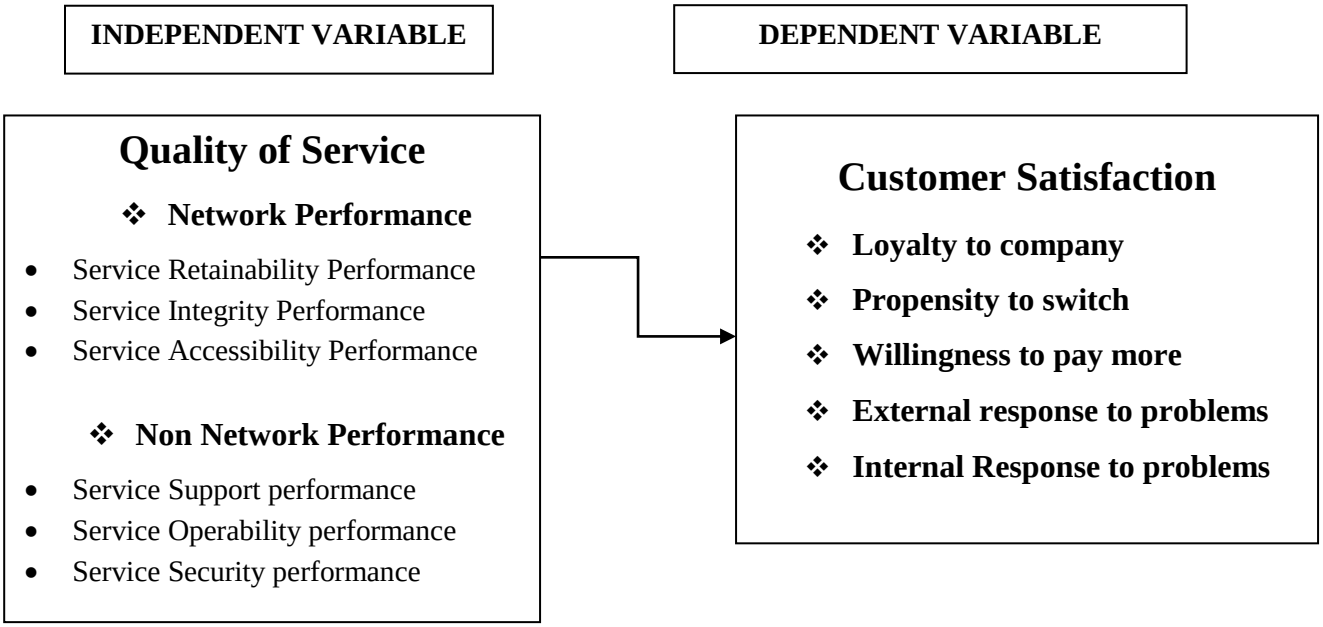

Figure 3: Illustration of the conceptual framework

Source: ITU (1994); ITU-T Recommendation E.800: Quality of telecommunication services, Zeithaml, Berry and Parasuraman (1996). The Behavioral Consequences of Service Quality, *Journal of Marketing*, 1996, 60, April: 31-46 and modified by the researcher

Figure 3 above shows the conceptual framework that was used in the study. Ganesh, Arnold and Reynolds (2000) and Caruana (2002) observed that if a customer perceives service quality to be high, he/she will have high levels of satisfaction. This shows that customer satisfaction depends on QoS as shown in the figure. The figure also shows that quality of service has dimensions of network performance and non-network performance aspects. Network Performance has indicators of accessibility, retainability and integrity of the service while non-network performance has dimensions of operability, support and security. The dimensions of customer satisfaction were adapted from Zeithaml, Berry and Parasuraman (1996). The

authors state that behavioral intentions are dependent variables with high validity because they are more closely related to actual behaviors and rich diagnostic value. The authors further assert that research Offers evidence that customer satisfaction or service-quality perceptions results in favourable customer behavior for the service provider.

According to ITU (1994), a user's degree of satisfaction with the service provided depends on quality of service; that is on the user's perception of the Support, Operability, Serveability and Security of the service. The serveability performance however, is the most generally affected and was fully focussed on in this study. It is subdivided into three terms; Service accessibility performance, Service retainability performance and Service integrity performance.

Service Integrity performance measures include: Interruption (Break of service), time between interruptions, interruption duration, mean time between interruptions (MTBI) and mean interruption duration (MID).

Service Retainability measures include: Connection retainability, premature release probability or cut-off call probability, release failure probability and probability of successful service completion

Service support performance measures include: mean service provisioning time, billing error probability, incorrect charging or accounting and billing integrity while Service accessibility measures include: service access probability, mean service access delay, network accessibility, connection accessibility and mean access delay, misrouting probability and no tone probability.

Service operability measures consist of: service user mistake probability, dialling mistake probability, service user abandonment probability and call abandonment probability and Service Security performance considers the protection provided against unauthorized monitoring, fraudulent use, malicious impairment, misuse, human mistake and natural disasters (ITU, 1994).

1.9 Scope of the Study

The study was carried out in Kampala, Uganda. The research specifically addressed mobile telecommunications which has the majority of users of telecommunication services in Uganda. There were 46 mobile cellular subscriptions per 100 inhabitants compared to 0.9 fixed telephone subscriptions (ITU, 2013). The services that were considered include Voice telephony, Short Message Service (SMS), mobile internet, and Value Added Services (VAS) like mobile money. Data was collected during the months of October and November 2013 from all the major Mobile Telecommunications Services Providers' clients living or working in Kampala, Uganda.

1.10 Significance of the Study

The findings of the study may be of use to the regulator of communications -Uganda Communications Communication, telecommunications companies in Uganda, consumer protection associations and other researchers with interests in quality of service and its relationship with customer satisfaction.

The findings may also guide telecommunication companies in improving customer satisfaction through improving QoS.

The Uganda Communications Commission as an independent regulator may find the conclusions and recommendations of this study worth considering for the review of policies, and regulations for the good of the mobile telecommunications sector.

This study will also act as a reference for scholars who will pursue further research as regards the aspects of QoS and customer satisfaction particularly in mobile telecommunications.

1.11 Justification of the Study

There was increased competition in the telecommunications sector especially when two new operators Warid Telecom Uganda and Orange Uganda Limited joined the Ugandan Market in 2008 and 2009 respectively (Jaramogi & Muwanga, 2009). This caused many promotions and different tariff plans that could have had an adverse effect on the quality of services offered by the telecommunications services providers. On the other hand, the operators would be expected to improve the quality of services offered so as to have a competitive advantage over their competitors in the sector. This research will help see the relationship between QoS and customer satisfaction of mobile telecommunications in Uganda.

1.12 Operational Definition of Key Terms and concepts

The Key terms in this study are defined as:

- **Accessibility:** The ability of a service to be obtained, within specified tolerances and other given conditions, when requested by the user (Ali, Shehzad and Akram, 2010)
- **Connection retainability:** that is the probability that a connection, once obtained, will continue to be provided for communication under given conditions for a given time duration.

- **Customer satisfaction:** Oliver (1980) and Leisen (2001) as quoted by Loke et al (2011) defined customer satisfaction as a personal feeling of either pleasure or disappointment resulting from the evaluation of services provided by an organization to an individual in relation to expectations.
- **Network Performance:** It's the technical performance of elements of the network or of the whole network (Afullo, 2004) yet ITU (2008) defines it as the ability of a network or network portion to provide the functions related to communications between users.
- **Quality of Service:** Is the totality of characteristics of a telecommunications service that bear on its ability to satisfy stated and implied needs of the user of the service (ITU, 2008)
- **Retainability:** The ability of a service, once obtained, to continue to be provided under given conditions for a requested duration (Ali, Shehzad and Akram, 2010).
- **Serveability:** "The ability of a service to be obtained within specified tolerances and other given conditions when requested by the user and continue to be provided without excessive impairment for a requested duration. NOTE: Serveability performance may be subdivided into the service accessibility performance, service retainability performance and the service integrity performance (ITU, 1994)."
- **Service Integrity:** The degree to which a service is provided without excessive impairments, once obtained (ITU, 1994).
- **Service support:** The ability of an organization to provide a service and assist in its utilization.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents and discusses the related literature on quality of service and customer satisfaction and seeks to position the work within scholarly context. Books, electronic journals, articles from newspapers, articles from publications, information from Uganda Communications Commission and recommendations of the International Telecommunications Union (ITU) and other resources from the internet have been used in literature sourcing. This literature review aims to assess research completed in areas related to this study and avoid repetitions and also to ably define QoS, customer satisfaction and the mechanisms governing their interaction. QoS and customer satisfaction in mobile telecommunications and the mechanisms through which QoS impacts customer satisfaction are the central concepts for this study. The main theories in which the study is grounded are reviewed to bring out the constructs which are of importance to the research.

2.2 Overview of Mobile Telecommunications Quality of Service and Customer Satisfaction

Ganesh, Arnold and Reynolds (2000), reported that if a business performs a service that surpasses customer expectations, the customer will be satisfied and is likely to be a repeat customer for the service provider. The assertion implies that poor service is a major cause of dissatisfaction among customers. Perceived expectations, perceived quality, perceived value, perceived usefulness, and perceived ease of use were critical factors for customer satisfaction Chou and Chang (2006). Afullo (2004) is in agreement with the above view stating that the role of customers' perception is a major consideration in the specification of quality and that

satisfaction is associated with the entire customer product-ownership experience. The author further asserts that companies in the telecommunications industry must have to operate closer to the market and customer needs and that customer needs are likely to be the main driver in the telecommunications industry. Thus QoS plays a major role in determining customer satisfaction.

2.3 Theoretical review

This section reviews the theories that were identified as the guiding principle in the study and how they were used.

2.3.1 The SERVQUAL Model

The SERVQUAL (Service Quality) theory and the Expectation Disconfirmation Theory (EDT) were reviewed. Parasuraman, Zeithaml, & Berry (1988) presented SERVQUAL as a multi-item scale developed to assess customer perceptions of service quality in service and retail businesses. The scale decomposes the notion of service quality into five constructs as follows: Tangibles - physical facilities, equipment and staff appearance; Reliability - ability to perform service dependably and accurately as promised; Responsiveness - willingness to help and respond to customer needs; Assurance – Knowledge and courtesy of employees and their ability to inspire trust and confidence; Empathy - the extent to which caring individualized service is given.

The five constructs when compared to the dimensions of quality of services as per ITU recommendations model do not exactly fit but there are some agreements. Responsiveness and Empathy from SERVQUAL is a good match to Service support while reliability from SERVQUAL matches service retainability and service integrity. The rest of the SERVQUAL

constructs are not comparable to the telecommunications QoS dimensions adapted for this study and thus the theory was not the best for this study. Negi (2009) used the five QoS dimensions of the SERVQUAL model and added two other dimensions that are network aspect, and convenience to conceptualize service quality in a study of perceived QoS in Addis Ababa, Ethiopia. The author noted that most quality features in the SERVQUAL scale are related with customer handling but the author's study incorporated, and investigated further, the added two dimensions of network aspect and convenience. This study has network performance as a major dimension of QoS. SERVQUAL represents service quality as the discrepancy between a customer's expectations for a service offering and the customer's perceptions of the service received, requiring respondents to answer questions about their expectations and perceptions (Parasuraman, 1988). This is in agreement with the Expectation Disconfirmation Theory below which was adopted for this study.

2.3.2 Expectation Disconfirmation Theory (EDT)

According to Parker and Mathews (2001) as quoted by Loke et. al (2011), the most popular descendant of the discrepancy theories is the Expectation Disconfirmation Theory (EDT) which states that the result of customers' perceptions of the difference between their perceptions of performance and their expectations of performance determines their satisfaction. Expectancy Disconfirmation Theory (EDT) can measure the customer's satisfaction from the difference between customer's expectation and experience in perceived products or services. The model consists of expectations, perceived performance, disconfirmation and satisfaction components (Elkhani and Bakri, 2010). The authors assert that Expectations define the customer's anticipations about performance of products and services and that EDT has the ability to define multiple manners of customers in purchase process. First, the customers have

an initial expectation based on previous experience of using a service. Expectation of such customers who repurchase from the same service provider is closer to reality. Second, the new customers without a first-hand experience about performance and quality of services that they tend to purchase from a specific service provider for the first time. The initial expectation of such customers consists of feedbacks that they receive from other customers, advertisement, and mass media Haistead and Hartman (1994) as quoted in Elkhani and Bakri (2010).

Perceived performance investigates the customer's experience after using services that may be better or worse than the customer's expectation (Spreng, MacKenzie, and Olshavsky, 1996). Both kinds of these customers will use purchased products or offered services for a while and can appreciate actual quality of presented services by the service provider (Elkhani and Bakri, 2010). Disconfirmation is defined as the difference between the customer's initial expectations and observed actual performance (Bhattacherjee and Premkumar, 2004) as quoted in Elkhani and Bakri (2010). Elkhani and Bakri (2010), further state that disconfirmation is divided into three types; positive disconfirmation, negative disconfirmation and simple disconfirmation. When actual performance of a service cannot meet the customer's expectation, negative disconfirmation occurs and leads to a customer's dissatisfaction. Positive disconfirmation leads to the customer's satisfaction, if perceived performance of a specific product or service is able to exceed a customer's expectations, then satisfaction. Finally, when there isn't any difference between customer's expectation and actual performance of specific product or service, it means perceived performance equals to expectation, thus simple confirmation occurs (Elkhani and Bakri, 2010).

2.4 Network Performance and Customer Satisfaction

Afullo (2004) asserts that Network Performance (NP) contributes towards QoS and defines network performance as the technical performance of elements of the network or of the whole network. In agreement with the same views is ITU (2008), and asserts that QoS comprises both network performance like network congestion and non-network related performance like handling of complaints (ITU, 2008). Huendling and Weske (2006) state that there is a whole set of different properties about different aspects related to a service that are often categorized as functional and non-functional properties. Generally speaking, functional properties describe what the service does and non-functional properties are used to describe how the service does it. Functional properties of a service in the context of this research are equivalent to the Network Performance component of QoS while non-functional properties of a service are the equivalent to the Non-network performance component of QoS. Thus the author's assertion is in agreement with (ITU, 2008). Network performance has the most effect on the perception of the user of a service which affects a user's degree of satisfaction. Network performance is subdivided into three terms: service accessibility performance; service retainability performance and service integrity performance (ITU, 2008). Afullo (2004) reports that the Singapore's regulator launched a Cellular Network Performance Measurement System (CNPMS) in July 2000 through which it surveys the service quality of Singapore's three mobile service providers. The parameters covered include call success rate, service coverage at street level in terms of signal strength, Voice quality and call drop out which means it does cover some network performance parameters which could be fitted in the three broad network terms from the ITU model used in this study.

2.4.1 Service Retainability Performance and Customer Satisfaction

According to ITU (2008), Service retainability is the ability of a service, once obtained, to continue to be provided under given conditions for a requested duration. It generally depends on the transmission tolerances, the propagation performance and reliability performance of the related systems. Afullo (2004) has a measure of service retainability which was termed service reliability though this was applied to internet and email services only. On the other hand, for this performance concept (ITU 2008) recommends the following measures to be used: service retainability; this is the probability that a service, once obtained, will continue to be provided under given conditions for a given time duration. Connection retainability; this is the probability that a connection, once obtained, will continue to be provided for communication under given conditions for a given time duration. Retainability of an established connection; this is the probability that a switched connection, once established, will operate within specified transmission tolerances without interruption for a given time interval. Premature release probability as known as cut-off call probability; this is the probability that an established connection will be released for a reason other than intentionally by any of the parties involved in the call. Release failure probability; the probability that the required release of a connection will not take place. Ali, Shezard and Akram (2010) had the same definition for service retainability but had different measures from those proposed by ITU (2008) that is call drop rate and handover success rate. These are network performance QoS aspects but can only be measured from the network equipment and not from the customer but a customer can be asked about dropped calls. This study aimed at establishing the relationship between service retainability performance and customer satisfaction by using relevant measures presented above.

2.4.2 Service Integrity Performance and Customer Satisfaction

Service Integrity Performance is the degree to which a service is provided without excessive impairments, once obtained (ITU, 2008). The author recommends the following measures for the integrity performance concept: Interruption also defined as break of service; Temporary inability of a service to be provided persisting for more than a given time duration, characterized by a change beyond given limits in at least one parameter essential for the service. It may be caused by disabled states of the items used for the service or by external reasons such as high service demand or an interruption of a service which is generally an interruption of the transmission, which may be characterized by an abnormal value of power level, noise level, signal distortion, error rate, etc. Afullo (2004) reported a measure of QoS used in the UK termed as Customer Reported Faults which describes the reliability of a TSP's network this measure is very similar to break of service above. Afullo (2004) also presented another measure of QoS that is Repeated Customer Reported Faults which is also close to ITU (2008)'s recommended Time between interruptions and Interruption duration; the time duration of an interruption. ITU (2008) recommends Mean time between Interruptions (MTBI); the expectation of the time between interruptions. Mean interruption duration (MID); the expectation of the interruption duration as other measures for service integrity. Only those measures that can be appreciated by the customer were considered in this study when investigating service integrity and customer satisfaction.

2.4.3 Service Accessibility Performance and Customer Satisfaction

According to ITU (2008), service accessibility is the ability of a service to be obtained, within specified tolerances and other given conditions, when requested by the user. Ali, Shehzad and Akram (2010) have the same definition and presented indicators for accessibility performance as paging success rate, SDCCH access success rate, SDCCH drop rate, call setup success rate and call setup TCH congestion rate all of which can be obtained from the network equipment but not from the customer. In contrast ITU (2008) recommends the following measures for service accessibility: Service access probability**;** the probability that a service can be obtained within specified tolerances and other given operating conditions when requested by the user. In the UK, Service Provision (SP) is a measure used to describe the ability of companies to keep their promises to provide services (Afullo, 2004). This is however a non-network performance aspect of QoS yet service access probability is a network performance QoS aspect. ITU (2008) also recommends Mean service access delay as a measure of QoS; The expectation of the time duration between an initial bid by the user for the acquisition of a service and the instant of time the user has access to the service, the service being obtained within specified tolerances and other given operating conditions. Network accessibility**;** the probability that the user of a service after a request receives the proceed to select signal within specified conditions is another measure recommended by ITU (2008) but has not been found in other literature. Other ITU (2008) recommended measures for service accessibility include: Connection accessibility; The probability that a connection can be established within specified tolerances and other given conditions following receipt by the exchange of a valid code. Mean access delay; The expectation of the time duration between the first call attempt made by a user of a telecommunication network to reach another user or a service and the instant of time the user

reaches the wanted other user or service, within specified tolerances and under given operational conditions. Accessibility of a connection to be established; the probability that a switched connection can be established, within specified transmission tolerances, to the correct destination, within a given time interval, when requested by the user. For user originated calls, it could express the probability of a successful call establishment on the first attempt. For operator handled calls, it could represent the probability of having a satisfactory connection established within a given time duration. In general, the tolerances should correspond to a level of transmission performance which makes the connection unsatisfactory for service such that, for example, a substantial percentage of users would abandon the connection. Unacceptable transmission probability measures the probability of a connection being established with an unacceptable speech path transmission quality. These measures cannot be obtained from the customer yet the customer is based placed to determine service quality (Afullo, 2004).

2.5 Non Network Performance aspects of QoS and Customer Satisfaction

Huendling & Weske (2006) assert that separating QoS properties into functional and non-functional is feasible and useful, because functional equivalence can be defined on two services with the same functional properties. Thus, a service can easily be replaced by a functional equivalent service with more suitable non-functional properties, e.g. lower cost, faster execution, and higher security. The implication to this research is that it's possible for two Telecommunications services providers to have similar Network Performance but differing QoS as long as their Non Network performance service aspects are different. It's also indeed possible for a provider to have excellent Network Performance whereas the QoS is poor if the Non Network performance components associated with the service are poor. This section shall review literature on the non-Network Performance components of QoS.

2.5.1 Service Support Performance and Customer Satisfaction

This study sought to establish the relationship between Service Support Performance and customer satisfaction. Afullo (2004) presented technical support as one of the measures of QoS in agreement with ITU (2008) who defines service support performance as the ability of an organization to provide a service and assist in its utilization. ITU (2008) gives an example of service support performance as the ability to provide assistance in commissioning a basic service, or a supplementary service such as the call waiting service or directory enquiries service and recommends the following measures of the performance concept: Mean service provisioning time; the expectation of the duration between the instant of time a potential user requests that an organization provides the necessary means for a service, and the instant of time when these means are furnished. Billing error probability; the probability of an error when billing a user of a service. Incorrect charging or accounting probability; the probability of a call attempt receiving incorrect charging or accounting treatment. Undercharging probability; the probability that a call attempt will be undercharged for any reason. Overcharging probability; the probability that a call attempt will be overcharged for any reason. Billing integrity (probability); the probability that the billing information presented to a user correctly reflects the type, destination and duration of the call attempt. This measure of service support is also used in the UK's measure of TSP's QoS but it's only referred to as billing and is said to describe the customer's perception of the accuracy of billing information (Afullo, 2004).

2.5.2 Service Operability Performance and Customer Satisfaction

ITU (2008) defines Service Operability Performance as the ability of a service to be successfully and easily operated by a user and recommends the following measures for the concept: Service user mistake probability; Probability of a mistake made by a user in his

attempt to utilize a service. Dialling mistake probability; the probability that the user of a telecommunication network makes dialling mistakes during his call attempts. Service user abandonment probability; the probability that a user abandons the attempt to use a service. Abandonments may be caused by excessive user mistake rates, by excessive service access delays, etc. Call abandonment probability; the probability that a user abandons the call attempt through a telecommunication network. These were considered when investigating the relationship between service operability and customer satisfaction in this study.

2.5.3 Service Security Performance and Customer Satisfaction

ITU (2008) defines Service Security Performance as the protection provided against unauthorized monitoring, fraudulent use, malicious impairment, misuse, human mistake and natural disaster but doesn't recommend the measures for this performance concept until further studies are done. The study measured security performance using the definition.

2.6 Summary of the Literature Review

The literature review focused on quality of service and customer satisfaction in mobile telecommunication. It was realised that most authors and the ITU agree that QoS has dimensions of network performance and non-network performance aspects. It was also realised that many authors are of the view that QoS contributes to customer satisfaction. The literature review has also helped to identify the measures that can be used in the study for the different quality of service concepts especially since previous studies were done basing on the SERVQUAL Model's conceptualisation of QoS which isn't the same for this study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter will deal with the methodology that was used in conducting the study on quality of services and customer satisfaction in mobile telecommunications in Uganda. It presents the study design, study population, sample size, sampling techniques, data collection methods, data collection instruments, Validity and Reliability of the instruments, data collection procedure, data analysis and measurement of the research variables.

3.2 Research Design

A cross-sectional research design was adopted to establish the state of quality of services and their relationship with customer satisfaction in Kampala. The above design was adopted because according to Babbie (2007) it involves observation of a sample of a population or phenomenon that is made at one point in time and this holds true for this study. Quantitative approach was used to quantify the number of respondents with a given opinion on all research questions.

3.3 Study Population

Kampala's population is estimated at (1.7233m) - One million, seven hundred and twenty three thousand three hundred people (Uganda Bureau of Statistics, 2012). There are 46 mobile cellular subscriptions per 100 inhabitants (ITU, 2013). Thus the study population is the number of mobile telecommunications subscribers in Kampala which is estimated at 792,718 computed

from mobile cellular subscriptions per 100 inhabitants and Kampala's estimated population above.

3.4 Determination of sample size

A sample is a subset of a particular population (Mugenda and Mugenda, 1999). Sekaran (2003) elaborates on the above definition when he defines a sample as a subset of a population from which researchers should be able to draw conclusions that would be generalizable to the population of interest. Sekaran (2003) further recommends sample sizes from 30 to 500 being appropriate for research. The sample size for the study was 384 mobile telecommunications subscribers adapted from Krejcie and Morgan (1970). The study involved sampling with some objective decisions determining who and how many respondents will take part in the study. Sampling allowed the findings to be generalized to the population yet it saved time and kept the costs low.

3.5 Sampling Techniques and Procedures

These are the techniques used when selecting an appropriate sample to represent the total population (Babbie, 2007). A sampling technique is a plan for obtaining a sample from a given population (Kothari, 2009). The study took into consideration the heterogeneous nature of the strata that formed the population. The population was stratified along the lines of different Telecommunications Service Providers (TSP) and data was collected from all the divisions of Kampala which are Nakawa, Central, Makindye, Kawempe and Rubaga. Each TSP was to be represented basing on the market share; MTN 42.2 %, Airtel - 21.8 %, Warid - 16.6%, UTL - 16.2%, Orange - 3%, others - 0.2% (Business Monitor International, 2013).

Quota sampling was used along the lines of TSPs and their market share to ensure that all TSPs are represented. In quota sampling people are selected according to some fixed quota. In proportional quota sampling, the major characteristics of the population are represented by sampling a proportional amount of each (Babbie, 2007). Proportional quota sampling was thus used in the study and the quotas were generated according to each TSP's market share as shown in table 2 below.

Table 2: Percentage market share and Number of Respondents from each TSP

Telecommunication Services Provider	Percentage Market share	Sample Size
MTN	42.2%	162
Warid	16.6%	64
Orange	3%	12
Airtel	21.8%	84
UTL	16.2%	61
Other	0.2%	1
OVERALL	**100%**	**384**

3.6 Data Collection Method

According to Sekaran (2003) data collection methods are an integral part of a research design. There are several data collection methods and if properly used the methods greatly enhance the value of research but for this study, a questionnaire survey is the method that was used in the study. Afullo (2004) asserts that this method in particular has many advantages including being cost-effective and it collects data directly from the source of perceived service quality.

3.7 Data Collection Instruments

Data collection instruments are the tools used to collect the necessary information for the study. (Mugenda and Mugenda, 2003).Since the study is quantitative, self-administered questionnaires were used to collect data

3.7.1 Self-administered questionnaires

This method was used because it is easy to administer, time saving and cost effective (Mugenda and Mugenda, 1999). It also generates unbiased responses since respondents are sometimes reluctant to report controversial or deviant attitudes on interviews but are willing to respond to an anonymous structured questionnaire (Babbie, 2007).

The questionnaire was set on a five point Likert scale. This involved the respondents indicating how closely their feelings matched the question or statement on a rating scale. The number at one end of the scale represented least agreement, or "Strongly Disagree," and the number at the other end of the scale represented most agreement, or "Strongly Agree." The Likert scale was chosen because it is unambiguous and allows for calculating the average index score for those agreeing or disagreeing with each individual statement and thus indicating the greater or lesser degree of prejudice reflected in a particular response.

3.8 Validity and Reliability of Instruments

Reliability measures the degree to which a research instrument yields consistent results after repeated trials while validity measures the degree to which the results obtained from the field are relevant to the study (Amin, 2005).

3.8.1. Validity

This was determined by setting questions that correctly represented the variables under study and gave four experts the questionnaires to judge if the set questions were valid for finding out the relationship between quality of services and customer satisfaction in Kampala. Content validity is indicated if the items in the data collection tool sample the complete range of the attribute under study, Schultz and Whitney (2005). It was determined by computing the Content Validity Index (CVI) as shown in the table below. The average CVI obtained from the

four experts was 0.81 well above the 0.7 minimum recommended by Amin (2005). The computation is shown in table 3 below.

Table 3: Content Validity Computation

Expert	Validity Score
1	73
2	70
3	92
4	89
Average	**81**

Source: Primary data

3.8.2 Reliability

In this study, the data collection instrument was pre-tested to assess its reliability. The instrument was piloted on a small group of ten (10) individuals. A reliability coefficient was computed to indicate the data's reliability. Cronbach's coefficient Alpha was adopted by the study to determine how items correlate among themselves. Cronbach's Internal consistency method is the most popular when using Likert scale Instruments (Amin, 2005). Reliability was measured numerically using the Cronbach alpha coefficient, where any value from 0.5 to 1 was regarded as reliable for internal consistence (Mugenda and Mugenda, 2003). The questionnaire was amended to remove mistakes and a final copy was presented to the study supervisors for approval before data was collected. Table 4 below shows the obtained Cronbach alpha values and since all were above 0.5 thus all were reliable.

Table 4: Computed Cronbach Alpha values

Dimension	Number of Items	Cronbach's Alpha value
Network Performance	7	0.755
Non Network Performance	14	0.729
Customer Satisfaction	11	0.778

3.9 Procedure of Data Collection

A letter of introduction was obtained from Uganda Management Institute, and presented to the participants that were contacted to take part in the study. A pilot study of data collection instruments was conducted in the area of study to get their validity and reliability. The questionnaires were then administered to respondents.

3.10 Data Analysis

The study employed quantitative methods of data analysis since it was purely quantitative. The data collected was edited, coded and later analyzed using SPSS computer package. Quantitative data was presented in form of descriptive statistics using mean and standard deviations for each of the variables used in the study, correlation and regression techniques. Pearson's coefficient (r) was used because the scale that accompanied the questionnaire was ordinal. Significance (p) was tested at 95% confidence levels based on two tailed correlation to determine the confidence in the findings. A positive correlation would indicate a direct positive relationship between the variables while a negative correlation would indicate a negative relationship between the two variables. The regression analysis used the adjusted R^2 values and significance values to determine the magnitude of the influence of the independent variables on the dependent variable (Amin, 2005). The correlation coefficient(r) was used to determine the strength of the relationship between as shown in table 5 below.

Table 5: Pearson Correlation Interpretation

Pearson's correlation coefficient(r)	Interpretation
0	No correlation
Less than 0.35	Low or weak correlation
0.36 – 0.67	Moderate or modest correlation
0.68 – 0.99	Strong or High correlation
1	Perfect Correlation

Source: Taylor (1990).

3.11 Measurements of variables

The questionnaire was designed to ask responses about mobile telecommunications quality of service and customer satisfaction. These were channeled into measureable elements to enable the development of an index of the concept. The variables for this study were measured using the interval scale. Thus it was possible to perform arithmetical operations on the data collected from the respondents, measuring the magnitude of the differences in the preferences among respondents by computing means and standard deviations. This was possible because the responses to the items in the study were tapped on a 5 point Likert scale to measure both the independent and dependent variables. It was therefore possible to measure the distance between 2 points on the scale (Sekaran, 2003). This is shown in table 6 below.

Table 6: Table showing the five points Likert Scale used

Statement	Points
Strongly Agree	5
Agree	4
Undecided/Neutral	3
Disagree	2
Strongly disagree	1

Source: Primary data

CHAPTER FOUR
PRESENTATION, ANALYSIS AND INTERPRETION OF FINDINGS

4.1 Introduction

This chapter presents analyses and interprets the result of the study findings. The data was collected using questionnaires whose validity and reliability had been ensured. The analysis is made of descriptive statistics and analysis of variance (ANVOA). The response rate is presented followed by the background information about respondents. Presentation and analysis of findings in relation to specific objectives of the study is then done.

4.2 Response Rate

In this study the sample size was 384 but out of 384 Questionnaires distributed, 291 were returned giving an overall response rate of 76% which is an acceptable response rate since it is above the 50% rate that Mugenda and Mugenda (2003) recommends. This indicates that much of the targeted population was realized and information generated can be generalized and used for decision making. The details are indicated in table7 below.

Table 7: response rate

Telecommunication Services Provider	Sample Size	Number of Respondents	Response rate
MTN	162	135	83
Warid	64	64	100
Orange	12	8	67
Airtel	84	50	60
UTL	61	33	54
Other	1	1	100
OVERALL	**384**	**291**	**76**

Source: Primary data

4.3 Background Characteristics of the sample.

In this section the background characteristics of the respondents are presented. The section presents gender distribution of the study respondents, their Telecommunications Services Provider, period of subscription, type of subscription and the division of Kampala where they worked or stayed. This information was considered useful in that it would reveal the relevance and knowledge base of the respondents to give informed responses.

4.3.1 Distribution of respondents by gender

The study composed of 291 respondents of which 157 were male and 134 were female. The study findings indicated that most respondents were men at 54% while 46% were females as illustrated in figure 4 below. This could mean that men were more willing to take part in the study. The study data was from nearly the same number of women and men so there was no gender bias in the findings.

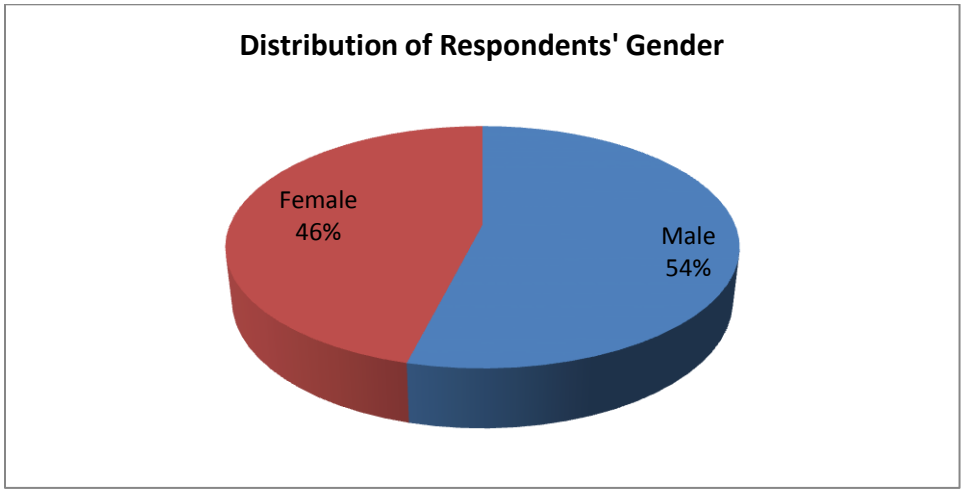

Figure 4: Demographic description of the sample by gender

Source: Primary data

4.3.2 Respondents period of Telecommunications Subscription

The number of years that a respondent had spent with a particular Telecommunications Services Provider is shown in table 8 below.

Table 8: Period of subscription to a particular network

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1 year	16	5.5	5.5	5.5
1-3 years	75	25.8	25.8	31.3
3-5 years	91	31.3	31.3	62.5
Over 6 years	109	37.5	37.5	100.0
Total	291	100.0	100.0	

Source: Primary data

As seen in Figure 5 above, 109 respondents had subscribed to their networks for over 6 years and they made up 37.5%. Those who had been with a particular TSP between 3-5 years were 91 (31.3%) while those between 1-3 years were 75 (25.8%). Those who had been with a telecommunications services provider for less than a year were 16 (5.5%). These figures make the study findings reliable since most of the respondents had substantial experience with their TSPs.

4.3.3 Type of Subscription

Type of subscription shows the payment plans of the respondents as presented in table 9 below.

Table 9: Type of subscription

	Frequency	Percent	Valid Percent	Cumulative Percent
Prepaid (load airtime)	271	93.1	93.1	93.1
Post-paid (Receive monthly bill)	20	6.9	6.9	100.0
Total	291	100.0	100.0	

Source: Primary Data

The study findings indicated that 271 (93%) of the respondents were using a prepaid payment plan. The rest (20) used the postpaid plan and were 7%. This is not surprising as most people in Uganda do not have permanent and reliable addresses where bills would be delivered. Prepaid payment plans are most convenient for TSPs and their clients. The study respondents were drawn from both subscription categories in proportions representative of the population.

4.3.4 Divisions of Kampala where respondents worked or stayed

The divisions of Kampala where the respondents worked or stayed are showed in table 10 below.

Table 10: Division of Kampala where respondents worked or stayed

Division	Frequency	Percent	Valid Percent	Cumulative Percent
Rubaga	57	19.6	19.6	19.6
Nakawa	126	43.3	43.3	62.9
Makindye	35	12.0	12.0	74.9
Central	47	16.2	16.2	91.1
Kawempe	26	8.9	8.9	100.0
Total	**291**	**100.0**	**100.0**	

Source: Primary Data

Respondents were obtained from all divisions of Kampala and these were selected at random. 43% of respondents lived or worked in Nakawa division while those from Rubaga division were 20%. Respondents from Kawempe, Central and Makindye divisions were 9%, 16% and 12% respectively. Central division could have produced a small number because very few people stay in the Central division given that it's the Central Business District of Kampala.

4.4 Descriptive results on Network performance aspects of quality of service

The first objective of the study was to establish the relationship between network performance and customer satisfaction in Uganda. According to the conceptual frame work presented in chapter one, network performance aspects of quality of service are measured using three indicators that were gathered by asking the respondents seven questions. The questions and associated responses are shown in table 6 below. It contains the questions posed to respondents about network performance aspects of QoS and the answers obtained giving their frequencies, percentages, mean, and standard deviation scores. Further, the mean values above three (>3.00) reveal agreement while the scores below three (<3.00) reveal disagreement in responses, similarly, the standard deviation scores less than one (<1) reveal communalities well as scores above one (>1) reveal divergences.

Findings from table 11 below reveal that more than half the respondents agreed that their phone calls were maintained to completion. This comprised of the 46.7% that agreed and the 13.1% that strongly agreed with the statement on the issue. 23.4% disagreed and 10% strongly disagreed with the statement. This combined gave 33.4% of telecommunications subscribers that reported that they drop calls.

On the other hand, 55% and 23% of respondents agreed and strongly agreed that a disconnection is promptly made when they end a phone call. This shows that 78% of respondents did not have any problems with prompt disconnection when they ended a phone call. 4.8% of respondents were neutral while 13.7% and 3.4% or respondents disagreed and strongly disagreed with the statement. This showed that generally the TSPs performance on service retainability is good.

Table 11: Descriptive results for Network Performance aspects of Quality of Service

Questions on Network Performance aspects of Quality of Service	Responses (Percentage Response)					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Service Retainability Performance							
Once you place a phone call, it's always maintained up to when you complete.	29 (10.0)	68 (23.4)	20 (6.9)	136 (46.7)	38 (13.1)	3.3	1.24
Once you end a phone call, a disconnection is promptly made.	10 (3.4)	40 (13.7)	14 (4.8)	160 (55.0)	67 (23.0)	3.8	1.05
Service Integrity Performance							
Once you place a phone call, it's clear for the whole duration of the call.	21 (7.2)	91 (31.3)	34 (11.7)	113 (38.8)	32 (11.0)	3.15	1.19
When you attempt to send an SMS, it is promptly sent.	11 (3.8)	64 (22.0)	24 (8.2)	49 (51.2)	43 (14.8)	3.62	2.05
Service Accessibility Performance							
When you make a call, you often get through on the first attempt.	35 (12.0)	102 (35.1)	28 (9.6)	103 (35.4)	23 (7.9)	2.92	1.23
You always have network bars on your phone.	24 (8.2)	79 (27.1)	21 (7.2)	120 (41.2)	47 (16.2)	3.3	1.26
Value added services like mobile money; SMS are available whenever you need them.	29 (10.0)	99 (34.0)	32 (11.0)	94 (32.3)	37 (12.7)	3.04	1.26

Source: Primary Data

From the same table 11 above, 38.8% and 11% of respondents agreed and strongly agreed to have clear phone calls for the whole duration of a call while 31.3% and 7.2% disagreed and strongly disagreed respectively. 11.7% were neutral. An average of 3.15 showed that almost half the respondents did not find their TSPs service integrity performance so good when it came to phone call clarity. There is thus a lot of room for improvement by the TSPs when it comes to clarity of phone calls.

51.2% and 14.8% of respondents agreed and strongly agreed respectively that their SMS are promptly sent whenever they attempt while 22% and 3.8% disagreed and strongly disagreed respectively. 8.2% were neutral. The mean was 3.62 showing that more people agreed to having their SMS promptly sent though a standard deviation of 2.05 means the views on this issue were very divergent. Much as the majority found the performance on this aspect acceptable, the TSPs still need to improve the aspect as the unsatisfied percentage (26%) is substantially big. All indicators of service integrity had an average above 3 that showed that majority did not find that dimension wanting. Since the values were below 4

Respondents were asked if they often got through on the first attempt of making a call, 35.4% and 7.9% agreed and strongly agreed with the statement while 9.6 were neutral. 35.1% and 12% or the respondents disagreed and strongly disagreed with the statement. A mean of 2.92 was obtained showing that the majority did not agree.

41.2% and 16.2% of respondents agreed and strongly agreed to always having network signal bars on their phone while 7.2% were neutral. 27.1% and 8.2% of respondents disagreed and strongly disagreed respectively. A mean of 3.3 showed that most respondents agreed while a standard deviation of 1.26 showed divergent views.

Findings also indicated that 32.3% and 12.7% agreed and strongly agreed respectively that value added services like mobile money and SMS were available whenever needed. Further, 34% and 10% of respondents disagreed and strongly disagreed while 11% were undecided.

Table 9 below shows the responses obtained from respondents when asked about their satisfaction with the quality of their network. This question was meant to establish what the respondents feel about the network performance of their telecommunications services provider.

Table 12: Respondents satisfaction with their networks' performance

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	186	63.9	63.9	63.9
No	105	36.1	36.1	100.0
Total	291	100.0	100.0	

Source: Primary Data

Table 12 above shows that 64% of the respondents were satisfied with the network performance of their TSP while 36% of the same respondents were not.

4.5 Correlation Results for Network Performance and Customer Satisfaction

The researcher sought to establish whether a relationship existed between network performance and customer satisfaction. This was done with the support of the Pearson correlation product moment technique. Table 13 below shows the results that emerged. It comprises of two variables; network performance and customer satisfaction, Level of significance (sig., at 95%) and N stands for number of respondent who returned the questionnaires and the Pearson correlation (R=.193**), sig (=001) N (=291). The R value of .193** reveals that a weak positive relationship was found between network performance and customer satisfaction in Kampala.

Table 13: Correlation results for Network performance aspects of quality of service and customer satisfaction.

		Network performance aspects of quality of service	Customer satisfaction
Network performance aspects of quality of service	Pearson Correlation	1	.193**
	Sig. (2-tailed)		.001
	N	291	291

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Primary Data

Table 13 above shows a weak positive correlation 0.193 between network performance aspects of quality of service and customer satisfaction. The correlation is significant at 95% level of confidence since the probability value is 0.001. This implies that there was a significant weak positive relationship between network performance aspects of Quality of Service and customer satisfaction as described in table 3. Network performance aspects of QoS thus do affect customer satisfaction. The better the network performs, the more TSP clients are satisfied. There are however other factors that affect customer satisfaction and these could include price and availability of TSP outlets and their products and services like scratch cards for loading airtime that were not investigated in the study.

4.6 Regression Results for Network Performance and Customer Satisfaction

A regression analysis; the model summary in particular was used to establish the variation or effect network performance had on customer satisfaction. The results that emerged are shown in table 14 below:

Table 14: Regression results for Network performance aspects of quality of service and customer satisfaction

Model	R	R Square	Adjusted R Square	*Std.* Error of the Estimate
1	.193[a]	.037	.034	.39864

a. Predictors: (Constant), Network performance aspects of quality of service

Source: Primary Data

The model summary as shown in table 11 above comprises of values; R, R squared, adjusted R square and the standard error of the estimate; where R=.193, R^2=.037, adjusted R^2= .034 and standard error =.39864 using the predictor; Network Performance aspects of QoS. The adjusted

R-square value of .034 indicates that Network performance was found to have a 3.4% effect on customer satisfaction and the remaining 96.6% was attributed to other factors. The adjusted R-square value is the coefficient of determination and the value that was obtained meant that network performance could account for 3.4% of the variations in customer satisfaction.

4.7 Descriptive results on Non Network performance aspects of Quality of Service

According to the conceptual frame work non network performance aspects of quality of service are measured using three indicators that were gathered by asking the respondents fourteen questions. The questions and associated responses are shown in table 15 below. It contains the questions posed to respondents about non network performance aspects of QoS and the answers obtained giving their frequencies, percentages, mean, and standard deviation scores. Further, the mean values above three (>3.00) reveal agreement while the scores below three (<3.00) reveal disagreement in responses, similarly, the standard deviation scores less than one (<1) reveal communalities well as scores above one (>1) reveal divergences.

Table 15: Descriptive results on Non Network performance aspects of quality of service

Questions on Non Network Performance aspects of Quality of Service	Responses (Percentage Response)					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Service Support Performance							
Service provider charges you the right amount for the services.	30 (10.3)	93 (32.0)	37 (12.7)	108 (37.1)	23 (7.9)	3	1.19
Your Airtime is not deducted under unclear circumstances.	57 (19.6)	95 (32.6)	16 (5.5)	86 (29.6)	37 (12.7)	2.83	1.38
Service provider assists you in using the services offered.	16 (5.5)	43 (14.8)	35 (12.0)	165 (56.7)	32 (11.0)	3.53	1.05

Questions on Non Network Performance aspects of Quality of Service	Responses (Percentage Response)					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
When you have complaints, they are satisfactorily addressed.	26 (8.9)	80 (27.5)	49 (16.8)	111 (38.1)	25 (8.6)	3.2	2.1
When you load Airtime credit on your phone, it is immediately reflected on your account.	07 (2.4)	21 (7.2)	13 (4.5)	160 (55.0)	90 (30.9)	4.05	0.93
You are always able to check your account balance.	10 (3.4)	44 (15.1)	22 (7.6)	145 (49.8)	70 (24.1)	3.76	1.09
The customer help line is promptly answered when you call.	84 (28.9)	112 (38.5)	23 (7.9)	46 (15.5)	26 (8.9)	2.37	1.29
The customer helpline staffs satisfactorily resolve your complaints.	32 (11.0)	86 (29.6)	49 (16.8)	104 (35.7)	20 (6.9)	2.98	1.17
Service Operability Performance							
Services from your provider are easy to use.	12 (4.1)	47 (16.2)	24 (8.2)	173 (59.5)	35 (12.0)	3.59	1.03
Mistakes are not made when using the services provided.	19 (6.5)	83 (28.5)	49 (16.8)	120 (41.2)	20 (6.9)	3.13	1.1
When many mistakes are made during service use, you abandon the service.	29 (10.0)	83 (28.5)	57 (19.6)	92 (31.6)	30 (10.3)	3.04	1.19
Service Security Performance							
There isn't un authorized monitoring of your phone services usage.	23 (7.9)	54 (18.6)	106 (36.4)	85 (29.2)	23 (7.9)	3.24	2.62
You are not likely to suffer loss from fraudsters through your phone.	26 (8.9)	93 (32)	78 (26.8)	72 (24.7)	22 (7.6)	2.9	1.1
You are not charged for unsolicited messages (SMSs)	51 (17.5)	75 (26.8)	39 (13.4)	98 (33.7)	28 (9.6)	2.92	1.29

Source: Primary Data

Table 15 above shows that 32% and 10.3% of respondents disagreed and strongly disagreed respectively that TSP charge the right amount for services rendered. 12.7% of the same respondents were undecided to this effect. 37.1% and 7.9% of the respondents agreed and strongly agreed respectively to same effect. A mean of 3 means generally respondents were neutral to the statement. This shows that many clients are not happy with the billing performance of TSPs which could mean that there is a knowledge gap with many not knowing how much they should be charged and under what circumstances different charges apply.

A statement asserting that airtime was not deducted under unclear circumstances had results that showed that 32.6% and 19.6% of the respondents disagreed and strongly disagreed respectively. 5.5% of the same respondents were undecided. About 30% and 13% of the respondents agreed and strongly agreed respectively. The mean was less than 3 meaning that generally respondents asserted that their airtime was deducted under unclear circumstances. This should send a message to TSPs to improve their billing systems and to sensitize their clients so that they appreciate how they are charged for the services provided because the findings could only mean that TSP clients don't understand how they are billed or the billing has so many errors.

Table 15 above also shows that 14.8% and 5.5% of the respondents disagreed and strongly disagreed respectively that service providers assist in using the services offered. 12% of the same respondents were undecided to this effect. 56.7% and 11% of the respondents agreed and strongly agreed respectively. A mean of 3.53 showed that generally service providers do assist in use of the services they offer and a standard deviation of 1.05 means the respondent's views didn't diverge so much. This shows that this service support aspect of non-network performance aspect of QoS is well executed by TSPs.

27.5% and 8.9% of the respondents disagreed and strongly disagreed respectively that complaints were satisfactorily addressed by their respective TSPs. 16.8% of the same respondents were undecided to this effect. 38.1% and 8.6% of the respondents agreed and strongly agreed respectively to same effect. The views on the issue were very divergent, given a standard deviation of 2.1. Much as the majority (56%) did not fault the TSPs when it came to addressing complaints raised, those not happy with the aspect (36%) make up a substantially big number that should not be ignored and TSPs need to improve their response to complaints raised. They could do this by ensuring that their staff is very knowledgeable and skilled to satisfactorily address client needs.

7.2% and 2.4% of the respondents disagreed and strongly disagreed respectively to airtime being immediately reflected on their accounts whenever they topped up. 5% of the same respondents were undecided to this effect yet 55% and 30.9% of the respondents agreed and strongly agreed respectively. A mean of 4.1 showed that generally airtime was reflected as soon as respondents topped up and a standard deviation of 0.93 showed that views on the issue were not divergent.

15.1% and 3.4% of the respondents disagreed and strongly disagreed respectively to always being able to check their account balance while 7.6% of the same respondents were undecided 49.8% and 24.1% of the respondents agreed and strongly agreed respectively. A mean of 3.76 obtained would imply that generally respondents were always able to check their account balance.

38.5% and 28.9% of the respondents disagreed and strongly disagreed to having the customer help line promptly answered when they called while 7.9% of the same respondents were undecided. 15.5% and 8.9% of the respondents agreed and strongly agreed. A mean of 2.37 obtained indicates that generally the customer help line was not promptly answered when

respondents called. These findings clearly show that TSPs need to increase the number of lines and staff that attend to customer help lines as that aspect of service support performed so poorly. Increasing the number of helpline staff would reduce the waiting time endured when a TSP client calls and this would improve customer satisfaction.

28.9% and 38.5% of the respondents disagreed and strongly disagreed respectively to having their complaints satisfactorily resolved by customer helpline staff while 16.8% of the same respondents were undecided. On the other hand 35.7% and 6.9% of the respondents agreed and strongly agreed respectively. A mean of 2.98 showed that generally respondents felt that their complaints were not satisfactorily resolved by customer helpline staff. It is clear that TSP customer helpline staff and other staff need to be better equipped with knowledge and skills, say through continuous training, to increase the resolution of customer complaints. It could also mean that TSPs need to review their customer complaint resolution processes so as to make them more efficient and effective.

Table 15 above also shows that 16.2% and 4.1% of the respondents disagreed and strongly disagreed respectively to a statement asserting that services from their TSPs were easy to use. 8.2% of the same respondents were undecided while 59.5 % and 12% of the respondents agreed and strongly agreed respectively. A mean of 4% obtained implies that generally speaking, services are easy to use and a standard deviation of 1.03 shows little divergence in views.

28.5% and 6.5% of the respondents disagreed and strongly disagreed respectively to making mistakes while using services of TSPs. 17% of the same respondents were undecided. About 41% and 07% of the respondents agreed and strongly agreed respectively. This showed that TSP services are generally easy to use.

From table 15 above, it's also seen that 28.5% and 10% of the respondents disagreed and strongly disagreed respectively to a statement stating that they would abandon the service if many mistakes were made.19.6% of the same respondents were undecided while 31.6% and 10.3% of the respondents agreed and strongly agreed respectively.

18.6% and 7.9% of respondents disagreed and strongly disagreed respectively to absence of un authorised monitoring of their phone services usage yet 36.4 % were undecided. 29.2 % and 7.9% of the respondents agreed and strongly agreed respectively. A standard deviation of 2.62 showed that views on the statement were very divergent. This big divergence in views shows that TSP clients had not been sensitized about the issue and don't have much trust in the TSPs regarding their privacy.

32% and 8.9% of the respondents disagreed and strongly disagreed respectively to a likelihood of suffering loss from fraudsters through their phones. 26.8% were undecided yet 24.7% and 7.6% of the respondents agreed and strongly agreed respectively.

Table 15 also shows that when respondents were asked whether they are not charged for unsolicited SMSs 26.8% and 17.5% of the respondents disagreed and strongly disagreed respectively and 13.4% were undecided. Of those remaining 33.7% and 9.6% of the respondents agreed and strongly agreed respectively. An average of 2.92 indicates that most respondents had been charged for unsolicited SMSs and a standard deviation of close to 1.3 showed that the views were divergent.

Table 16 below shows the responses obtained from respondents when asked about their satisfaction with the quality of customer service they received through the call centre (help line) or contact with their mobile service provider staff. This question was meant to establish

what the respondents felt about the non-network performance aspects of quality of service of their telecommunications services provider.

Table 16: Respondents satisfaction with non-network performance aspects of Quality of service

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	156	53.6	53.6	53.6
No	135	46.4	46.4	100.0
Total	291	100.0	100.0	

Source: Primary Data

Table 16 above shows that 53.6% of the respondents were satisfied with the network performance of their telecommunications services provider while 46.4% of the same respondents were not. It's noted that more respondents were satisfied with the network performance of their TSPs than with their non-network performance aspects of QoS.

4.8 Correlation results on Non Network performance aspects of Quality of Service

The researcher sought to establish whether a relationship exists between non network performance aspects of quality of service and customer satisfaction. This was done with the support of the Pearson correlation product moment technique. Table 17 below shows the results that emerged. It comprises of two variables; non network performance aspects of QoS and customer satisfaction, Level of significance (sig., at 95%) and N which stands for number of respondent who returned the questionnaires and the Pearson correlation (R=.245**), sig (=000) N (=291). The R value of .245** reveals that a significant weak positive relationship exists between network performance and customer satisfaction in Kampala.

Table 17: Correlations between Non-network performance aspects of quality of service and Customer satisfaction

		Customer satisfaction	Non-network performance aspects of quality of service
Customer satisfaction	Pearson Correlation	1	.245**
	Sig. (2-tailed)		.000
	N	291	291

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Primary Data

Table 17 above shows a weak positive correlation (0.245) between non-network performance aspects of quality of service and customer satisfaction. The correlation is significant since the probability value is 0.000 this implies that there was a significant weak positive relationship between non network performance aspects of QoS and customer satisfaction as derived from table 3 above. These results show that increases in non-network performance aspects of QoS would result in increases in customer satisfaction but not substantially.

4.9 Regression Results for Non Network Performance aspects of Quality of Service and Customer Satisfaction

A regression analysis; the model summary in particular was used to establish the effect of non-network performance aspect of QoS on customer satisfaction. The results that emerged are shown in table 18 below:

Table 18: Regression results for Non Network performance aspects of quality of service and customer satisfaction

Model	R	R Square	Adjusted R Square	*Std.* Error of the Estimate
1	.245[a]	.060	.057	.39386

a. Predictors: (Constant), Non Network performance aspects of quality of service

Source: Primary Data

The model summary table above comprises of values; R, R squared, adjusted R square and the standard error of the estimate; where R=.245, R^2=.060, adjusted R^2= .057 and standard error=.39386 using the predictor; Non Network Performance aspects of QoS. The adjusted R-square value of .057 indicates that non network performance aspects of QoS were found to account for 5.7% of the variations in customer satisfaction and the remaining 94.3% was attributed to other factors.

4.10 Descriptive Results for Customer satisfaction

According to the conceptual frame work presented in chapter one, customer satisfaction was measured using three indicators that were gathered by asking the respondents eleven questions. The questions and associated responses are shown in table 19 below. It contains the questions posed to respondents about satisfaction and the answers obtained giving their frequencies, percentages, mean, and standard deviation scores. Mean values above three (>3.00) reveal agreement while the scores below three (<3.00) reveal disagreement in responses, similarly, the standard deviation scores less than one (<1) reveal communalities well as scores above one (>1) reveal divergences.

Table 19: Descriptive Results for Customer satisfaction

Questions on Customer Satisfaction	Responses(Percentage Response)					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Loyalty to Company							
You would recommend your Mobile Service provider to someone who seeks your advice	12 (4.1)	43 (14.8)	38 (13.1)	155 (53.3)	43 (14.8)	3.6	1.11

Questions on Customer Satisfaction	Responses(Percentage Response)					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Your current mobile telecommunications services provider is your first choice to buy telecommunications services	14 (4.8)	69 (23.7)	51 (17.5)	121 (41.6)	36 (12.4)	3.33	1.11
Propensity to Switch							
You intend to spend less on your current telecommunications service provider in future	24 (8.2)	47 (16.2)	60 (20.6)	123 (42.3)	37 (12.7)	3.35	1.14
You intend to take some of your business to a competitor that offers better prices	17 (5.8)	46 (15.8)	51 (17.5)	134 (46.0)	43 (14.8)	3.48	1.1
You intend to take some of your business to a competitor that offers better quality	14 (4.8)	49 (16.8)	41 (14.1)	130 (44.7)	57 (19.6)	3.57	1.13
Willingness to pay more							
You would continue with your current service provider if their price increases somewhat	52 (17.9)	93 (32.0)	56 (19.2)	73 (25.1)	17 (5.8)	2.69	1.29
You pay a higher price than competitors charge for the benefits you currently receive from your service provider	54 (18.6)	92 (31.6)	56 (19.2)	79 (27.1)	10 (3.4)	2.72	1.62
External Response to problems							
You are likely to switch to another Telecommunications service provider.	21 (7.2)	78 (26.8)	59 (20.3)	88 (30.2)	48 (15.5)	3.2	1.2
You would share your frustration with others if you experienced a problem with your current provider's service	15 (5.2)	25 (8.6)	30 (10.3)	159 (54.6)	62 (21.3)	3.78	1.04

Questions on Customer Satisfaction	Responses(Percentage Response)					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
You would complain to external agencies like Uganda Communications Commission (UCC) if you experienced a problem with your current provider's service	19 (6.5)	57 (19.6)	64 (22.0)	100 (34.4)	51 (17.5)	3.37	1.17
Internal Response to problems							
You would complain to your service provider if you experienced a problem with their service	06 (2.1)	13 (4.5)	16 (5.5)	141(48 .5)	115(39. 5)	4.19	0.88

Source: Primary Data

Table 19 above shows that 14.8% and 4.1% of the respondents disagreed and strongly disagreed respectively to agreeing to recommend their mobile services providers to someone who sought their advice while 13.1% were undecided. 53.3% and 14.8% agreed and strongly agreed respectively. A mean of 3.6 shows that generally there was agreement though not strong.

The table also shows that 23.7% and 4.8% of the respondents disagreed and strongly disagreed respectively to a statement asserting their current mobile telecommunication service provider as their first choice to buy telecommunications services. 17.5% were undecided while 41.6% and 12.4% agreed and strongly agreed respectively. A mean of 3.3 meant that slightly more than half the respondents considered their then TSP their first choice for telecommunications services.

It's also shown that 16.2% and 8.2% of the respondents disagreed and strongly disagreed respectively to having intentions of spending less on their current telecommunication service in future while 20.6% undecided. Further, 42.3% and 12.7% agreed and strongly agreed

respectively. A mean of 3.35 indicated that generally respondent's intent to spend less on services from their TSPs yet a standard deviation of 1.1 showed some divergence in respondents' views.

Table 19 shows that 15.8% and 5.8% of the respondents disagreed and strongly disagreed respectively to be having intentions of taking some of their business to competitors of their TSPs that offered better services. On the other hand, 17.5% of the respondents were undecided while 46% and 14.8% of the respondents agreed and strongly agreed respectively. A mean of 3.48 obtained points to a fact that generally respondents intend to obtain services from TSPs whom they believe offer better services.

Results in the table show that when respondents were asked if they would take some of their business to their providers' competitor that offered better quality, 16.8% and 4.8% of them disagreed and strongly disagreed respectively while 14% were undecided. About 45% and 20% of the respondents agreed and strongly agreed respectively. A mean of 3.57 showed that respondents were more willing to change TSPs because of better quality prospects than because of price given that this mean is higher than that obtained above (3.48) when asked about doing the same for better prices.

32% and 17.9% of the respondents disagreed and strongly disagreed respectively to continuing with their TSPs if their TSPs prices increased somewhat while 19.2% were undecided. Further, 25.1% and 5.8% of the respondents agreed and strongly agreed respectively. A mean of 2.69 that was obtained shows that generally respondents would change TSPs following a price increment.

31.6 % and 18.6% of the respondents disagreed and strongly disagreed respectively to willingness to pay a higher price than competitors charge for the benefits they then received from their TSPs. 19.2% were undecided while 27.1% and 3.4% agreed and strongly agreed

respectively. A mean of 2.72 shows that respondents were not willing to pay more and a standard deviation of 1.62 shows that views on this were very divergent. This shows that TSPs don't have much room to increase prices without disappointing their clients.

Table 19 above shows that 26.8% and 7.2% of the respondents disagreed and strongly disagreed respectively to the likelihood of switching to another TSP while 20% were undecided. 30.2% and 15.5% of the respondents agreed and strongly agreed respectively. The average was above 3 at 3.2 showing that generally respondents were likely to change to another TSP though not so many. The views were divergent given that the standard deviation was 1.2

8.6% and 5.2% of the respondents disagreed and strongly disagreed respectively to a statement that asserted that they would share their frustration with others if they experienced a problem with their then TSP. 10.3% of the same respondents were undecided while 54.6% and 21.3% agreed and strongly agreed. A mean of 3.78 showed that most of the respondents would share frustration with others. TSPs should thus note that their unsatisfied clients in Kampala are very likely to discourage other potential clients from joining that particular TSP.

When asked if they would complain to external agencies like Uganda Communications Commission if they experienced a problem with their TSPs, 19.6% and 6.5% of the respondents disagreed and strongly disagreed respectively while 22% were undecided. 34.4% and 17.5% agreed and strongly agreed respectively. A mean of 3.37 shows that majority would actually complain to external agencies, while a standard deviation of 1.17 shows that views of the respondents were divergent. This shows that TSP clients expect UCC to be having mechanisms that can resolve their complaints.

Finally table 19 above shows 4.5% and 2.1% of the respondents disagreed and strongly disagreed respectively to a statement that asserted that they would complain to their TSPs if they experienced a problem with their service while 5.5% were undecided. 48.5% and 4.19% of them agreed and strongly agreed respectively. A mean of 4.19 means that most of the respondents would complain to their TSPs if they experienced a problem while a standard deviation of 0.88 shows that the views on this issue were not divergent.

Respondents were also asked whether they were satisfied with their telecommunications services provider and the responses obtained are shown in table 17 below.

Table 20: Respondents satisfaction with their Telecommunications services Provider.

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	175	60.1	60.1	60.1
No	116	39.9	39.9	100.0
Total	291	100.0	100.0	

Source: Primary Data

Table 20 above shows that 60% of the customers were satisfied with their respective telecommunication service providers while 40% of the same respondents were not satisfied with the respective telecommunication service delivery. Service delivery in the telecommunication sector is very competitive and therefore difficult to satisfy all the customers. This partly explains the dissatisfaction of 40% of the respondents with respective telecommunications service delivery.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a discussion of findings obtained from the data presented in chapter four. It also comprises of the summary, conclusion and recommendation of the study based on the objectives of the study.

5.2 Summary of Key findings

The data that was collected provided information on respondents' TSP, period of subscription, type of subscription and division of Kampala where they lived or worked. This background information showed that all TSPs were well represented as set out in the proportional quota sampling strategy that was used; it also showed that the majority of respondents had subscribed for a substantial period. 69 % had subscribed for over 3 years while 26% had subscribed for over a year giving a combined total of 95% meaning the respondents gave well informed views. The summary of the results pertaining to the study objectives are presented below.

5.2.1 Network Performance aspect of quality of service and Customer Satisfaction

The study established the relationship between network performance and customer satisfaction in Kampala which was one of the objectives. Network performance indicators that were measured included service retainability, Service integrity and service accessibility. Network performance was found to have a weak positive relationship with customer satisfaction as the

Pearson correlation (R) value obtained was 0.193. In the regression results, network performance was found to account for 3.4 % of variations in customer satisfaction.

5.2.2 Non Network Performance aspects of Quality of Service and Customer Satisfaction

The second study objective was to examine the relationship between non network performance aspects of quality of service and customer satisfaction in Kampala. Non network performance indicators of QoS that were measured included service support, service operability and service security. Non network performance aspects of QoS were found to have a very weak positive relationship with customer satisfaction as the Pearson correlation (R) value obtained was 0.245. In the regression results, network performance was found to account for 5.7% of variations in customer satisfaction.

5.3 Discussion of findings

The discussions attempt to answer the study research questions and to explain the dependent variable basing on the findings. The discussion is organized according to the themes derived from objectives of the study. In the course of the discussion attempts were made to cross reference the implications of the findings with the existing literature.

5.3.1 Network Performance and Customer Satisfaction

Quality of service and customer satisfaction are independent but closely related, implying that an increase in one is likely to lead to an increase in another (Sureshchandar, Rajendran and Anantharaman, 2002). The first objective of the study was to establish the relationship between network performance and customer satisfaction in Kampala. Correlation results of Network performance and customer satisfaction showed that there was a weak positive relationship between network performance and customer satisfaction. A positive relationship was expected

as had been predicted from the literature reviewed. Shahzad and Afsheen (2012) had done a study to determine the factors that influence customer satisfaction in Pakistan and had established that network coverage was among them which is an indicator of the service accessibility dimension of network performance. Findings of this study showed that up to 35% of respondents did not always have network coverage in Kampala, which also explains the low levels of customer satisfaction that resulted. Responses obtained about network performance generally showed that TSP clients felt there was much to be desired about almost all indicators of network performance. This is in contrast to the results of network performance published by Uganda Communications Commission (UCC) for the period May- July 2013. In the UCC results, only one operator hadn't complied with the dropped call rate (UCC, 2013) yet results from this study revealed that 33.4% of respondents suffered dropped calls when they placed phone calls which showed a very big variation between the study's results obtained from TSP clients and those obtained from measurements by UCC. The worst TSP's dropped calls reported by UCC had been at 3% and its perturbing to find that over 30% of respondents claimed to experience dropped calls in Kampala.

The worst performing aspect in this study was from the service retainability dimension where data showed that most respondents (47%) failed to get through on the first attempt of making a phone call while almost 10% were undecided. On the other hand, the best performing indicator was from service accessibility performance dimension where data showed that disconnection at the end of a phone call was promptly made for most respondents with 73% in agreement.

5.3.2 Non Network performance aspects of Quality of Service and Customer Satisfaction

Quality evaluations are not made solely on the outcome of a service, but also involve evaluations of the process of service delivery (Parasuraman, Zeithaml, & Berry, 1988). The

study thus also investigated non network performance aspects of QoS and customer satisfaction and indeed the study found that there was a significant relationship between non network performance aspects of QoS and customer satisfaction albeit weak.

Data collected about non network performance aspects of quality of service showed that many respondents (85%) were pleased with the aspect of immediate reflection of loaded credit on their phones which was a service support dimension indicator. This issue had the most positive response. On the other hand, the indicator that most respondents (68%) were not pleased was the promptness with which the customer helpline was answered. Also, a substantial number (40.6%) of respondents were not pleased with the resolution of complaints by the TSP customer helpline. Similarly, in a study done by Afullo (2004), a good proportion of customers were generally unhappy with complaint handling in both the UK and Botswana and this could mean that TSPs the world over need to streamline the way complaints are handled to achieve customer expectations which would increase customer satisfaction. There is no doubt concerning the importance of service quality and customer satisfaction as the ultimate goals of service providers and similarly, the need for customer satisfaction lies in its ability to result in economic success. Customer satisfaction is considered a prerequisite for customer retention and loyalty which helps in realising economic goals like profitability, market share, and return on investment (Sureshchandar, Rajendran and Anantharaman, 2002).

5.4 Conclusions of the study

The study findings have led to the following conclusions.

5.4.1 Network Performance and Customer satisfaction

There is a significant positive relationship between Network Performance and customer satisfaction much as it is a weak relationship. When a TSP invests in improvements in

network performance, the TSP's clients' satisfaction directly increases which could give them a competitive edge.

5.4.2 Non Network Performance aspects of QoS and Customer satisfaction

There is a significant positive relationship between Non Network Performance aspects of QoS and customer satisfaction much as it is a weak relationship. Investing in improvements in non-network performance aspects of QoS of a TSP directly increases customer satisfaction which could give a competitive edge.

5.5 Recommendations

The findings do provide an insight into customers' satisfaction within mobile telecommunications domain much as the study was limited to Kampala. Results of this study should encourage strategy development by TSPs for superior service quality management in both network performance and non-network performance aspects of QoS.

5.5.1 Network Performance and Customer satisfaction

TSPs should continue to invest in network infrastructure so as to ensure that network performance is not compromised especially as their subscribers increase.

If TSPs must choose between Network performance and non-network performance aspects of QoS, they should perhaps put emphasis on Non Network performance as the study findings indicated that it had a stronger influence on customer satisfaction compared to network performance aspects of QoS.

5.5.1 Non network Performance and Customer satisfaction

TSP Training programs should be tailored to equip staff with necessary skills and knowledge to better serve the customers and to remain competitive in the market. This would improve the non-network performance aspects of QoS and lead to increased customer satisfaction. A satisfied customer is a loyal customer and would bring more customers to the TSP.

TSPs should also increase the number of customer helpline staff and lines to improve on that aspect of service support which was the worst performing indicator.

Much as the TSPs regulator, UCC carries out network performance tests, it should in addition carry out nationwide surveys to ascertain the non-network performance aspects of QoS in the industry so as to enforce provision of quality services by TSPs. The findings obtained would support emphasis on the non-network performance aspects of QoS improvements.

5.6 Limitations of the study

The study findings may not be generalised to populations that are not urban Also, the study findings may not be relevant in markets where there is a monopoly TSP. They are also limited to mobile telecommunication services excluding mobile internet as the study mainly focussed on voice telephony and Short Message Service (SMS). The study findings are also limited to Mobile telecommunications and did not cover the fixed wireless telecommunications and fixed wired telecommunications.

5.7 Contributions of the study

The study showed that there was indeed a positive relationship between mobile telecommunications QoS and customer satisfaction in Kampala. It also showed that non network performance aspects of QoS influenced customer satisfaction more than network performance as more variations in customer satisfaction were due to the former. This is important to TSPs who are interested in means of creating competitive advantages and customer loyalty.

In addition, the study used a quality of service model that was developed and recommended by the International Telecommunications Union (ITU) to conceptualise quality of service. All previous studies that were reviewed had used the SERVQUAL model or its modifications. This sets this study apart and could be used by other scholars with interest in the ITU Quality of service model.

5.8 Areas recommended for future research

Given that the study was done in Kampala, Uganda's capital and a predominantly urban area, future studies could be done in a rural area of Uganda. Also, price was not among the factors studied yet it is likely to have an effect on customer satisfaction. Other factors like absence of number portability which would allow a subscriber to change a TSP but maintain the same phone number could also be investigated as some subscribers might be stuck with a TSP because they wouldn't want to change their phone number. In other words, a study could be done to determine the switching cost in mobile telecommunications in Uganda. The same study could also be done to cover the whole geographical area of Uganda. Also, a specific study could be done to cover mobile internet quality of service and customer satisfaction as social networks like Face book and Twitter in addition to over the top services like Whatsapp and

Viber have become immensely popular in recent times and are mainly made possible by mobile internet.

Given that the study findings showed QoS to account for almost 10% of variations in customer satisfaction in Kampala, a study could be done to establish all the factors that affect TSP customer satisfaction in Kampala.

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APPENDIX I: QUESTIONNAIRE FOR TELECOMMUNICATIONS SERVICES PROVIDER'S CLIENTS

Dear respondent,

I am Emmanuel Muyomba, a student at Uganda Management Institute pursuing a master's degree in management Studies. I am conducting a study on "Mobile telecommunications quality of service and customer satisfaction in Kampala". Given your status as someone who works, studies or stays in Kampala, you have been chosen purposely for the study. Your response is therefore very instrumental to the success of my research. I would like you to be part of this study by responding to the questions herein. The data given is strictly for academic purposes and it will be treated with utmost confidentiality.

Instruction: Please tick where appropriate

SECTION A: BIO DATA

1. **Gender** Male ☐ Female ☐
2. **Your responses for the rest of this questionnaire should be from your experience from ONE Mobile Telecommunications Services Provider. Please indicate the provider below.**

   MTN ☐ Warid ☐ Orange ☐

   Airtel ☐ UTL ☐ Other ☐ Please specify.....
3. **How long have you been a subscriber of that Network?**

   Less than 1 year ☐ 1—3 years ☐

   3—5 years ☐ over 6 years ☐
4. **Type of subscription**

   a) Prepaid (Load airtime) ☐

   b) Post-paid customer (Receive monthly bill) ☐

5. **Division of Kampala where you work or stay**

Rubaga ☐ Nakawa ☐

Makindye ☐ Central ☐ Kawempe ☐

SECTION B: NETWORK PERFORMANCE ASPECTS OF QUALITY OF SERVICE

6. Are you satisfied with the quality of your network?

Yes ☐ No ☐

In the table below please respond according to your first reaction to each statement by ticking in the box. Strongly Disagree =1. Disagree = 2. Undecided/Neutral = 3 Agree = 4 and Strongly Agree = 5

	Service Retainability Performance	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
B.1	Once you place a phone call, it's always maintained up to when you complete.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
B.2	Once you end a phone call, a disconnection is promptly made.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Service Integrity Performance					
B.3	Once you place a phone call, it's clear for the whole duration of the call.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
B.4	When you attempt to send an SMS, it is promptly sent.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Service Accessibility Performance					
B.5	When you make a call, you often get through on the first attempt.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
B.6	You always have network bars on your phone.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
B.7	Value added services like mobile money; SMS are available whenever you need them.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**

SECTION C: NON- NETWORK PERFORMANCE ASPECTS OF QUALITY OF SERVICE

1. Are you satisfied with the quality of customer service you receive through the call centre (help line) or contact with your mobile service provider staff?

   Yes ☐ No ☐

	Service Support Performance					
C.1	Service provider charges you the right amount for the services.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.2	Your Airtime is not deducted under unclear circumstances.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.3	Service provider assists you in using the services offered.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.4	When you have complaints, they are satisfactorily addressed.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.5	When you load Airtime credit on your phone, it is immediately reflected on your account.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.6	You are always able to check your account balance.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.7	The customer help line is promptly answered when you call.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.8	The customer helpline staff satisfactorily resolves your complaints.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Service Operability Performance					
C.9	Services from your provider are easy to use.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.10	Mistakes are not made when using the services provided.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.11	When many mistakes are made during service use, you abandon the service.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Service Security Performance					
C.12	There isn't un authorized monitoring of your phone services usage.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.13	You are not likely to suffer loss from fraudsters through your phone.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
C.14	You are not charged for unsolicited messages (SMSs)	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**

SECTION D: CUSTOMER SATISFACTION

1. Are you satisfied with your telecommunications services provider?

Yes ☐ No ☐

	Loyalty to Company					
D.1	You would recommend your Mobile Service provider to someone who seeks your advice	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
D.2	Your current mobile telecommunications services provider is your first choice to buy telecommunications services	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Propensity to Switch					
D.3	You intend to spend less on your current telecommunications service provider in future	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
D.4	You intend to take some of your business to a competitor that offers better prices	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
D.5	You intend to take some of your business to a competitor that offers better quality	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Willingness to pay more					
D.6	You would continue with your current service provider if their price increases somewhat	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
D.7	You would pay a higher price than competitors charge for the benefits you currently receive from your service provider	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	External Response to problems					
D.8	You are likely to switch to another Telecommunications service provider.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
D.9	You would share your frustration with others if you experienced a problem with your current provider's service	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
D.10	You would complain to external agencies like Uganda Communications Commission (UCC) if you experienced a problem with your current provider's service	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Internal Response to problems					
D.11	You would complain to your service provider if you experienced a problem with their service	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**

Thank you very much for your time!!

APPENDIX 2:

KREJCIE AND MORGAN MATHEMATICAL TABLE (1970)

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size

"S" is sample size.

APPENDIX 3: QUESTIONNAIRE FOR TELECOMMUNICATIONS SERVICES PROVIDERS' CLIENTS (Content Validity)

Dear respondent,

I am Emmanuel Muyomba, a student of Uganda Management Institute pursuing a master's degree in management Studies. I am conducting a study on "Mobile telecommunications Quality of service and customer satisfaction in Kampala". Given your expertise in the telecommunications industry, you have been chosen purposely to determine the validity of the questionnaire that is to be administered for data collection during the study. Your response is therefore very instrumental to the success of my research. I would like you to be part of this study by responding to the questions herein. The data given is strictly for academic purposes and it will be treated with utmost confidentiality.

Instruction: Please indicate a tick (✓) for each question you consider valid and a cross (X) for one you consider Invalid for measuring the indicators indicated in the questionnaire.

SECTION A: BIO DATA

7. Age

18—30 ☐ 31—40 ☐

41—50 ☐ 51 above ☐

8. **Gender** Male ☐ Female ☐

9. Level of education

Postgraduate ☐ Graduate ☐

Diploma ☐ Certificate ☐

Others ☐ Please Specify …….

10. What Mobile Telecommunications Network do you subscribe to?

MTN ☐ Warid ☐

Airtel ☐ UTL ☐

Orange ☐ Other ☐ease Specify…….

11. How long have you been a subscriber of that Network?

Less than 1 year ☐ 1—3 years ☐

3—5 years ☐ over 6 years ☐

12. Type of subscription

☐

c) Prepaid (Load airtime)

d) Post paid customer (Receive monthly usage bill) ☐

SECTION B: NETWORK PERFORMANCE ASPECTS OF QUALITY OF SERVICE

13. Are you generally satisfied with the quality of your network?

Yes ☐ No ☐

In the table below please respond according to your first reaction to each statement by ticking in the box. Strongly Disagree =1. Disagree = 2. Undecided/Neutral = 3 Agree = 4 and Strongly Agree = 5

	Service Retainability Performance					
1	Once you place a phone call, it's not cut off in the middle before you complete.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
2	Once you end a phone call, a disconnection is promptly made.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
3	Once you place a phone call, it operates under satisfactory speech quality for the whole duration of the call. (It's clear and loud enough)	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Service Integrity Performance					
4	When you make calls, they have acceptable quality for the entire duration of the call	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
5	When you send SMS, they are promptly delivered.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
6	Internet service on your phone is of acceptable quality whenever you use it	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Service Accessibility Performance					
7	When you make a call, you often get through on the first attempt.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
8	You always have a network signal from your service provider (Mobile signal bars)	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
9	Value added services like mobile money, SMS, Internet are available whenever you need them.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**

SECTION C: NON- NETWORK PERFORMANCE ASPECTS OF QUALITY OF SERVICE

2. Are you satisfied with the quality of customer service you receive through the call centre (help line) or contact with your mobile service provider staff ?

   Yes ☐ No ☐

	Service Support Performance					
1	Service provider does not make errors when charging for a service.(Doesn't overcharge or undercharge or your Airtime doesn't disappear under unclear circumstances)	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
2	Service provider assists in the utilization of the services offered	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
3	When you have complaints, they are satisfactorily addressed	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
4	When you load Airtime credit on your phone, there is no time delay for it to be reflected on your account.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
5	You are always able to check your account balance	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
6	The customer help line is promptly answered when you call it.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
7	The customer helpline staff are knowledgeable, polite and satisfactorily resolve your complaints	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Service Operability Performance					
4	Services from your provider are easy to use (e.g. Voice calls, SMS, Internet, Mobile money etc)	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
5	Mistakes are not made when using the services provided	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
6	When many mistakes are made during service use, you abandon the service	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Service Security Performance					
7	There isn't un authorized monitoring of your phone services usage	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
8	Your feel safe from fraudulent usage or misuse of the services provided.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
9	You never receive unsolicited SMSs	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**

SECTION D: CUSTOMER SATISFACTION

2. Are you generally satisfied with your telecommunications services provider?

Yes ☐ No ☐

	Loyalty to Company					
1	You would recommend your Mobile Service provider to someone who seeks your advice	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
2	Your current mobile service provider is your first choice to buy telecommunications services from	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Propensity to Switch					
3	You intend to spend less on your current service provider in future	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
4	You intend to take some of your business to a competitor that offers better prices	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Willingness to pay more					
5	You would continue with your current service provider if their price increases somewhat	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
6	You would pay a higher price than competitors charge for the benefits you currently receive from your service provider	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	External Response to problems					
7	You are likely to switch to another Telecommunications service provider.	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
8	You would complain to other customers if you experienced a problem with your current provider's service	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
9	You would complain to external agencies like Uganda Communications Commission (UCC) if you experienced a problem with your current provider's service	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**
	Internal Response to problems					
10	You would complain to your service provider if you experienced a problem with their service	**Strongly Disagree**	**Disagree**	**Undecided /Neutral**	**Agree**	**Strongly Agree**

Thank you