

**THE USE OF eTOM AND THE QUALITY OF
CUSTOMER EXPERIENCE IN ZAMBIAN
TELECOMMUNICATIONS CALL CENTERS FOR
PROCESS GAP IDENTIFICATION**

By

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A dissertation submitted in partial fulfillment of the requirements for the
degree of Master of Engineering in Telecommunications Systems

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DECLARATION

I hereby declare that this dissertation represents my own work and has not previously been submitted for a degree or other qualification at this or any other University. All sections of the text and results, which have been obtained from other workers or sources, are fully referenced.

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ABSTRACT

The study sought to identify gaps in the processes affecting the customer quality of mobile service experience in Zambian telecommunications call centers using eTOM. Enhanced Telecommunications Operations Map (eTOM) being defined as a business process framework that is service oriented and helps service providers in process management and enhancement. The data used was collected through surveys and interviews from thirty-one employees of two mobile service providers and three hundred mobile service customers in three districts in Lusaka. A problem to solution eTOM process flow was mapped using problem management process decompositions at level 3 and compared with the problem handling process flows in the telecommunication companies to identify gaps. Purposive sampling and random sampling techniques were used.

Customers reported their problems or complaints through telephone as the major communication channel to the call center. These complaint records were then captured in a fault management system and tracked through follow ups with customers that entailed calling them to find out if their problems were resolved. Resolution of the mobile complaints was carried out by call center agents who made escalations to other departments for the more complicated faults that involved billing, Value Added Services (VAS) and the mobile network. The study established that customer feedback was being provided on the complaint or problem resolution through the available channels of communication more especially through the phone.

The results of the study show that even though the processes for capturing, tracking and resolving customer mobile complaints or faults were present, some inefficiencies of late resolution of faults and delays in giving feedback were identified. Overall problem handling quality of customer experience was discovered to be acceptable with minor improvement needed in the areas of poor signal, data bundles and browsing failures problem handling. Hence, continuous process enhancement needs to be carried out in order to remedy the inefficiencies identified and improve the on the processes.

Key Words: Enhanced Telecommunication Operations Map, Quality of Experience, Call Centre, Processes

DEDICATION

It is with deepest gratitude that I dedicate this dissertation to God Almighty, who is my refuge and strength through whom impossible things become possible. This work is in memory of my beloved parents, Mr. David Mbilikita and Mrs. Jennifer Sakuwaha Mbilikita (both late) who taught me to believe in hard work. Further dedication goes to my siblings, Chilombo Mbilikita Hamabwe, Kakoma Mbilikita and Mujinga Mbilikita Chongola who offered support during the past four years of my master's journey.

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ACRONYMS AND ABBREVIATIONS

SLA	Service Level Agreement
BPM	Business Process Management
SMS	Short Message Service
MNO	Mobile Network Operator
Qos	Quality of Service
eTOM	Enhance Telecommunications Operations Map
OLA	Operational Level Agreements
SIP	Strategy, Infrastructure and Product
CRM	Customer Relationship Management
QoE	Quality of Experience
itSMF	IT Service Management Forum
TM Forum	Tele-Management Forum
ITU-T	International Telecommunication Union - Telecommunication
VAS	Value Added Service

CHAPTER ONE: INTRODUCTION

1.1 Background and Rationale

Enhanced Telecommunications Operations Map (eTOM) is a business process framework developed by Tele-Management Forum, that is service oriented and helps service providers in process management and enhancement (Valiente et al., 2012; Latifi et al., 2014). A business process framework is one that represents the individual guidelines, policies and procedures that are implemented by a company in order to enhance and improve its overall business operations. The eTOM framework is recognized as an international standard (ITU-T, 2004), which can be used as a guidance when analyzing network operations and management processes. Several companies in the telecommunications industry are now trying to adopt eTOM business framework for their business process management. One of the reasons in adopting eTOM business framework is the greater financial efficiency that results from eliminating gaps within processes (Interfacing Technologies Corporation, 2016).

All over the world, customer quality of experience has become a veritable tool for measuring organizational performance and relevance. Quality of Experience is the degree of delight or annoyance of the user of an application or service. It results from the fulfilment of his or her expectations with respect to the utility and or enjoyment of an application in light of the user's personality and current state (Le Callet et al., 2012).

Zambia has three telecommunication companies currently. With the exception of fixed line and international voice services, the telecommunication sector is open to competition with no restriction on foreign entry (Habeenzu, 2010). With such a lot of telecommunication companies Zambian customers have variety of choice with regards to service provision in the telecommunication sector, specifically the mobile part of it. In any telecommunication company, call centers usually represent the first contact of a customer with a given company. According to Anton et al. (2004), 80 percent of a company's interaction with its customers is through call centers and 92 percent of customers form their opinion about a company based on their experience with call

centers. Therefore, the quality of customer experience offered in call centers is of vital importance (Brezavšček and Baggia, 2014). In the absence of literature on process frameworks in Zambia, one wonders whether any standardized business frameworks are used in Zambian call centers. Thus, there is need for research on business process standardized frameworks for existing process analysis in order to identify gaps or redundancy that may affect quality of customer experience in the Zambian telecommunications industry.

1.2 Problem Statement

Lapses between the call center and the rest of the operational efforts of companies due to undefined process flows between the two often affect customer quality of experience. The root causes of poor customer experience stem from the inside often from cross functional disconnects (Rawson et al., 2013). Customers will not discern value from standalone functions or individuals but from processes which are actually responsible for the end to end work of delivering value to the customer.

1.3 Objectives of the Research

This research sort to identify gaps in the processes affecting the customer quality of experience in Zambian telecommunications call centers using eTOM. The objectives of the study were to:

1. Give an overview of eTOM functions and its use in business process management.
2. Identify how a problem or complaint is reported to the call center, worked on and reported back to the customer using eTOM process elements.
3. Find out what the gaps in the processes are based on eTOM and quality of customer experience
4. Find out what the current quality of customer experience is under problem handling in the Zambian telecommunication call centers.

1.4 Research Questions

This study was guided by the following research questions:

1. Why eTOM for business process management?
2. What are the eTOM process elements required for Problem Handling
3. What are the processes of reporting a problem or complaint to the call center, resolving the problem and reporting back to the customer?
4. What are the gaps in the processes based on eTOM?
5. What is the current quality of customer experience under problem handling in the Zambian telecommunication call centers?

1.5 Significance of the Study

One of the contributions of this study is in bringing out the role of eTOM and customer experience in identifying process gaps practically in the Zambian telecommunications industry. Since Trkman (2010) states that there are dangers in assuming that simply copying business processes or the approach towards their improvement from one successful case to another will bring the same benefits.

The results of this study are important in providing a starting point in identifying the areas where operational activities must be improved, an effort that can help the Zambian telecommunication companies find a competitive differentiator.

The results of this study also serve as a source of evaluation for further studies on eTOM and the quality of customer experience.

1.6 Ethical considerations

Ethical standards were adhered to, as consent from the respondents was sought using letters from the University of Zambia.

1.7 Organization of Dissertation

The dissertation is organized in six chapters. Chapter One is composed of the background, problem statement, objectives, research questions, significance of the study, ethical considerations and the organization of the dissertation. Chapter Two and Chapter Three provides the literature that was reviewed in the study. Chapter Four describes the methodology that was adopted in order to solve the research problem. Research findings are discussed in Chapter Five. Chapter Six presents the conclusions, recommendations and ends with suggestions for future research.

CHAPTER TWO: OVERVIEW OF BUSINESS PROCESS MANAGEMENT AND eTOM

2.1 Introduction

This chapter looks at the structure of eTOM and concepts of the Quality of customer experience in relation to the research study that make them suitable for use in process gap identification.

2.2 Business Process Management (BPM)

A Business process is the combination of a set of activities within an enterprise with a structure describing their logical order and dependence whose objective is to produce a desired result (Aguilar-Savén, 2004). Business processes are assets that create value for customers and are an important part of any organization. However, customers are often confronted with poor customer experiences due to broken processes, inefficient processes and manual processes (Jeston and Nelis, 2006). A situation resulting due to lack of business process management (BPM).

Business process management (BPM) has been defined by many researchers (Chang, 2006; Jeston and Nelis, 2006; Weske, 2006; Brudan, 2010). The definition of BPM adopted in this study is that of Koster (2009), who refers to BPM as a management discipline that takes a systematic, structured approach to support process management using methods, techniques and tools and involving humans, organizations, documents and other sources of information with the aim of reaching the organization's objectives. Various empirical researches specify that there is a positive correlation between process management and business success (McCormack et al., 2009; Skerlavaj et al., 2007). However, these earlier studies did not provide comprehensive and substantial benefits for BPM according to Vergidis et al. (2008). The reason being that there was a sole focus on one success factor of BPM such as processes or technology at the expense of the other equally important factors causing failure of a large number of earlier implementations (Grant, 2002). A study carried out by Trkman (2010) on critical success factors identified three guiding principles for BPM. The first one being the fit between the business environment and business processes supported by the contingency

theory. The second one being, the need for proper organization and continuous improvement efforts to ensure sustained benefits from BPM backed by the dynamic capabilities theory. Lastly, a proper fit between the tasks in the business processes and information technology or systems affirmed by the task technology fit theory. When BPM is properly implemented, it can impact a service industry's performance through increased revenue, cost reduction, cycle time improvement, increased customer satisfaction and improvements in any other metrics considered as important for creating value (Vukšić et al., 2013).

Business Process Management is based on the recognition that each product or service that a company provides to the market is the outcome of a number of activities performed (Weske, 2006). Business processes are definitely the key instrument in organizing such activities and also to improving the understanding of their interrelationships. Process management involves people, data as well as applications. Managed processes produce consistent value to customers and have the foundation for processes improvement (Chang, 2006).

Processes can be managed in a process framework (Chang, 2006). Business process frameworks enable organizations to monitor, measure and enhance their processes. The eTOM framework is an example of such a business process framework that supports different tasks connected with business process management in the Telecommunication industry.

2.3 eTOM Fundamentals

eTOM business process framework is an industry agreed set of integrated business process descriptions created with today's customer centric market in mind. The framework is used for mapping and analyzing operational processes (Chang, 2011). Telecom Operations Map (TOM) was developed by the Tele-Management Forum between 1995 and 1999 which eventually evolved into eTOM necessitated by the need to support processes of the entire service provider. The eTOM framework was then released as an ITU -T M.3050 standard in 2004 (ITU-T, 2004).

The business process framework is part of the Next Generation Operation Systems and Software (NGOSS) which is a series of best practice tools that enable business operations analysis against industry processes, applications and information standards (Jiejun, 2009). NGOSS is also known as TM Forum framework and consists of the shared information and data model (SID) framework, Integration framework and Telecommunications Application Map (TAM) framework in addition to eTOM. SID deals with the improvement, structuring and definition of the information that flows through an enterprise and TAM handles the applications supporting the business. The Integration framework is concerned with the interaction between the processes, information and application development while eTOM focuses on the customer and the processes that support the customer. The eTOM business process framework is a reference framework for categorizing all the business activities used by a service provider. The framework accomplishes this through definition of each area of business activity in the form of process components or elements that can be decomposed to express progressive detail (ITU-T, 2004). These process elements can then be positioned within a model to demonstrate organizational, functional and other relationships and can be combined within process flows that trace activity paths through the business. Categorization of the process elements and business activities is aimed at combining these in many different ways to implement end to end business processes which deliver value for the customer and service provider. The eTOM framework does not direct or constrain the way end to end processes can be implemented, rather it only guides the definition of standardized process elements to be used within an enterprise or organization (ITU-T, 2004). The eTOM processes are defined as generically as possible to support all products, services and channels that are used within the telecommunications industry.

The business process framework uses hierarchical decomposition in which large amounts of information are structured into multiple levels allowing the higher level views to present a summary view and greater details at the next lower levels. Hence, eTOM has at least four levels in details from 0 to 4 in which level 0 shows the whole enterprise view and level 1 shows how the major process areas are decomposed

(Leghroudi et al., 2011; Chang, 2011). Levels 2,3 and 4 are further decompositions of the previous processes' view.

2.3.1 eTOM and Other Frameworks

Other standards and frameworks related to eTOM such as IT Information Library (ITIL) and Zachman have been developed. ITIL is a best practice framework for IT service management (Soomro and Hesson, 2012). The framework was developed in the 1980's and is currently at version 3. On one hand, ITIL's concentration is on the IT service capabilities with a focus on the kind of services and service management that IT systems provide within organizations (Tele-Management Forum and IT Service Management Forum, 2009). eTOM on the other hand, concentrates on the business process view with a focus on the communication industry that it addresses.

Zachman is an international standard that provides a holistic approach to architecting systems (Priya and Nupur, 2014). The framework was developed in 1987 by John Zachman. The Zachman and eTOM frameworks both introduce a two dimensional approach. The Zachman framework dimensions are based on stakeholder's perspectives at the generic level and then a model view at a specific detailed level is provided. Functional viewpoints are covered by eTOM under the first dimension with business view points as the focus of the other dimension. The Zachman framework unlike eTOM does not allow for decomposition which is necessary for problem solving for the complex enterprise (Griffin, 2005).

2.3.2 eTOM Level 0 Processes

Strategy, infrastructure and product (SIP), operations and enterprise management are the three distinct process areas that the eTOM highest conceptual view consists of (Korzachenko and Vadim, 2010) as shown in Figure 1. SIP deals with strategy, infrastructure and lifecycle processes upon which operational processes depend. Included in this area are processes that define market strategies, resource strategies and the products or services that are made available to the market. Operations area covers the core of day to day operational management. Enterprise management which is the third distinct area, is concerned with management of the enterprise itself and includes

processes that support the other two areas. These three distinct areas represent the foundation of the business process framework and are referred to as level 0 processes (ITU-T, 2004; Benhima et al., 2013). The four horizontal functional process blocks reflect the major expertise and areas of priority required to pursue the business. The market, product and customer processes involve those dealing with sales, channel management, marketing management and product as well as offer management.

Others are operational processes such as managing the customer interface, ordering, problem handling, SLA management and billing. The service processes consist of those dealing with service development and delivery of service capability, service configuration, service problem management, quality analysis and rating. Resource processes deal with development and delivery of resource i.e. network and IT infrastructure together with its operational management. Aspects such as provisioning, trouble management and performance management are also involved. The supplier or partner processes include those dealing with the enterprise's interaction with its suppliers and partners. Thus involving both processes that develop and manage the supply chain that under pins product and infrastructure as well as those that support the operational interface with its suppliers and partners (Tele-Management Forum, 2012). The eTOM Level 0 final aspect shows the shareholders, employees and other stakeholders that interact with the enterprise as ovals shown in Figure 1.

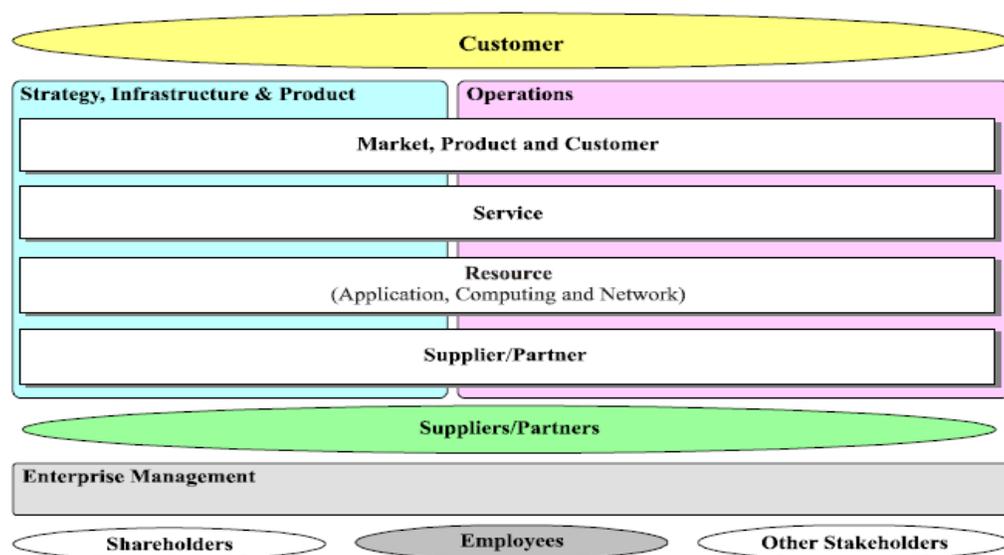


Figure 1: eTOM level 0 processes (ITU-T, 2004)

2.3.3 eTOM Level 1 Processes

SIP, operations and enterprise management are then decomposed into their constituent level 1 process groupings in Figure 2. There are seven end to end vertical process groupings under level 1 which are necessary for customer support and management of the business (Jiejn, 2009). Strategy and commit, infrastructure lifecycle management, product lifecycle management, operations support and readiness (OSR), fulfillment, assurance and billing are the end to end vertical process groupings.

The major focus of eTOM among these groupings is on the core customer operations processes of fulfillment, assurance and billing (FAB) (Korzachenko and Vadim, 2010; Jiejn, 2009). OSR enables support and automation for FAB. Fulfilment vertical end to end process grouping is responsible for providing customers with their requested products in a timely and correct manner. The process grouping translates the customer's business or personal need into a solution, which can be delivered using the specific products in the enterprise's portfolio. The process informs the customers of the status of their purchase order ensuring completion on time as well as a delighted customer (ITU-T, 2004). Assurance vertical end to end process grouping is responsible for the execution of proactive and reactive maintenance activities to ensure that services provided to customers are continuously available and performing to SLA or QoS performance levels. Dalia et al. (2010) define a Service Level Agreement (SLA) is an agreement between a client and a provider in the context of a particular service provision. This process performs continuous resource status and performance monitoring to proactively detect possible failures. The process grouping collects performance data and analyses them to identify potential problems and resolve them without impact to the customer. An additional responsibility is that of receiving trouble reports from customers. Billing vertical end to end process grouping is responsible for the collection of appropriate usage records, production of timely and accurate bills, provision of pre- bill use information and billing to customers. The process grouping also processes customer payments, performs payment collections, handles inquiries about bills, provides billing inquiry status and is responsible for resolving billing

problems to the customer's satisfaction. Prepayment for services is equally supported by this process grouping (ITU-T, 2004).

However, the three SIP vertical process groupings do not directly support the customer and work on different business time scales. Majority of the process groupings within enterprise management contain elements that relate to policy setting together with support of the enterprise. Such an example is that of human resources management that is concerned with both strategy and direction as well as supporting the management of human resources throughout the enterprise. These are sometimes collectively considered as the "corporate" functions and or processes (Jiejin, 2009). However, human resource management issues specific with call centers are usually associated with the processes in operations as it is a functionality associated with a process grouping that is not required throughout the enterprise.

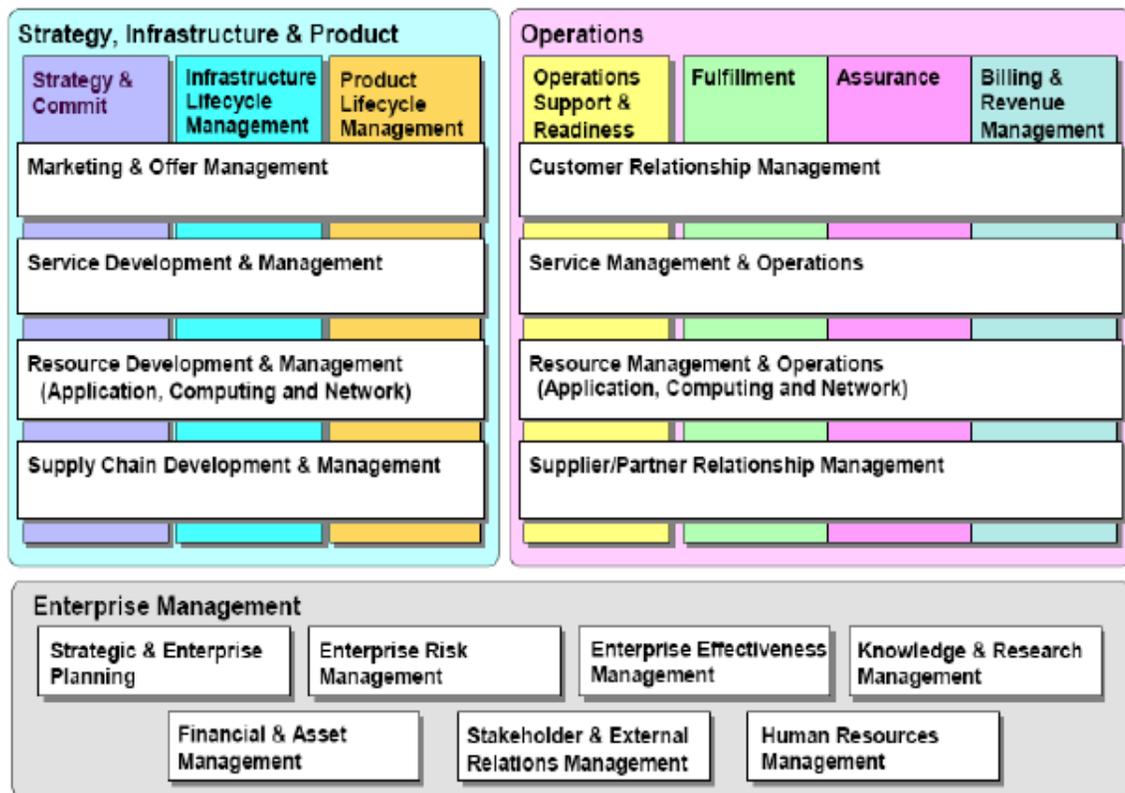


Figure 2: eTOM level 1 processes (ITU-T, 2004)

2.3.4 eTOM Level 2 Processes

The eTOM Level 2 business processes in the operations area are shown in Figure 3. The eTOM review only focuses on the Assurance vertical end to end processes grouping, with customer relationship management (CRM) problem handling as the scope of this study.

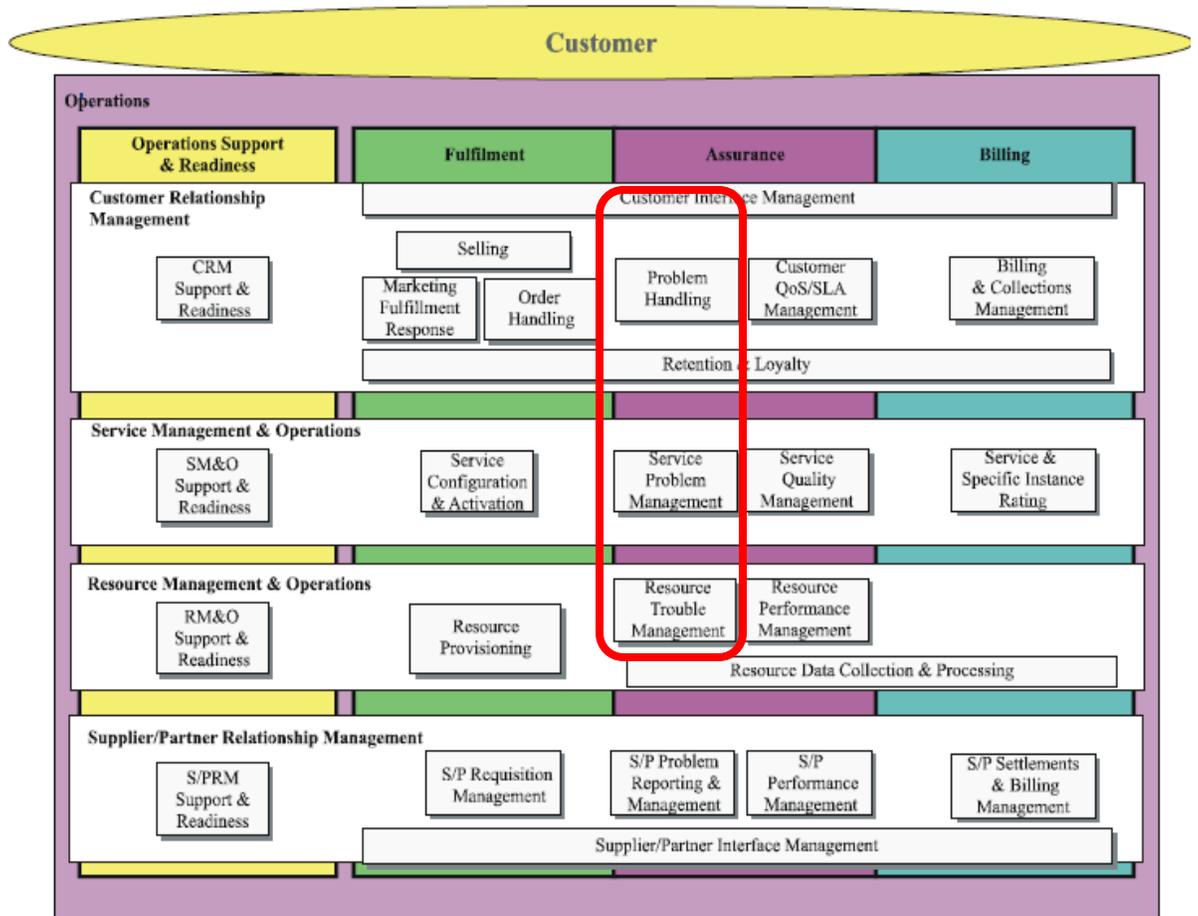


Figure 3: eTOM level 2 processes (ITU-T, 2004)

The Assurance process grouping is made up of process elements that represent part of the overall enterprise modeled in business process terms and can be applied with other similar process elements for application within a specific telecommunications company or domain. These process elements that deal with fault management are outlined as follows (Tele-Management Forum, 2012):

Customer Interface Management processes are responsible for managing all interfaces between the company and potential as well as existing customers. They deal with contact management, understanding the reason for contact, directing customer contacts to the right process, contact closure, contact results analysis and reporting.

Problem handling processes are responsible for receiving trouble reports from customers, resolving them to the customer's satisfaction and providing valid status on repair and restoration activity to the customer.

Retention and loyalty processes deal with all functionalities related with retention of acquired customers and the use of loyalty schemes in the potential acquisition of customers. They establish the complete understanding of the needs of the customer, a determination of the value of the customer to the company, determination of opportunities and risks for specific customers. These processes collect and analyze data.

Service problem management processes have a main objective of responding effectively to customer affecting service problems or failures. The reason is to minimize their effects on customers and to invoke the restoration of the service or provide an alternative service as soon as possible.

Resource trouble management processes are responsible for trouble management associated with specific resources such as networks, Information Technology systems, servers and routers. These processes efficiently and effectively manage resource trouble, isolate the root cause and act to resolve the resource trouble.

2.3.5 Problem Management Processes under Operations Assurance

The Customer Relationship Management (CRM) problem handling processes under Operations Assurance process grouping have a view on customer impact. A problem identified in the service layer is described as a service problem while a problem identified by the customer is categorized under the CRM layer. Each incident is qualified according to the layer of its origin. The focus of the process element is in resolving the fault as quickly as possible. While the business process framework does not contain process flows, it provides elements with which to build process flows. These elements can then be further decomposed and used as reference functions that

can be compared with the functions of the business processes of companies to indicate where there are gaps.

Chang et al. (2007) state that systems in a company have to be analyzed when deriving standard recommendation functions. After which, decomposition of eTOM level 3 processes have to be done and compared with the results of the company analysis. The results then need to be composed leading to the improvement direction in terms of eTOM level 3 standard recommendation functions and subsequent process flows. Figures 4, 5, 6, 7 and 8 give the eTOM 2 and level 3 process elements to be used when building a process flow of how a customer reported problem is handled up to resolution (Tele-Management Forum, 2012).

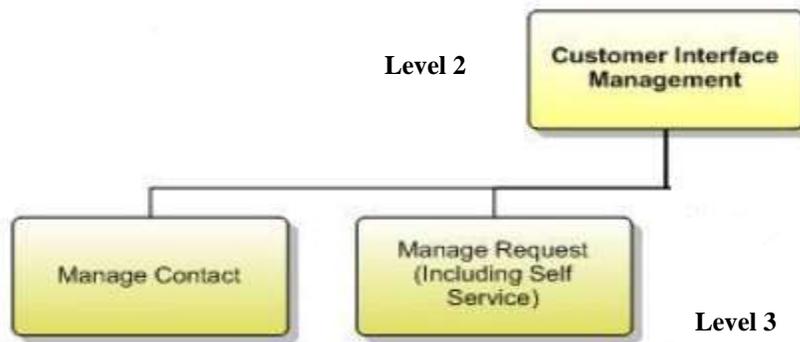


Figure 4: Part of customer interface management level 3 process decompositions (Tele-Management Forum, 2012 p.67)

Under Customer Interface Management there is Manage Contact level 3 process element that deals with the handling of requests between the customers and the company (Jiejn, 2009). The element covers the identification of the contact, its development, enhancement and update. After the customer is authenticated and authorized, they then proceed to the Manage Request process element in Figure 4 which receives requests and either lets the customer to automatically fulfil it or identifies and activates the necessary process to accomplish the request. In this case, Create Customer Problem Report level 3 process element under Problem Handling in Figure 5 is activated.

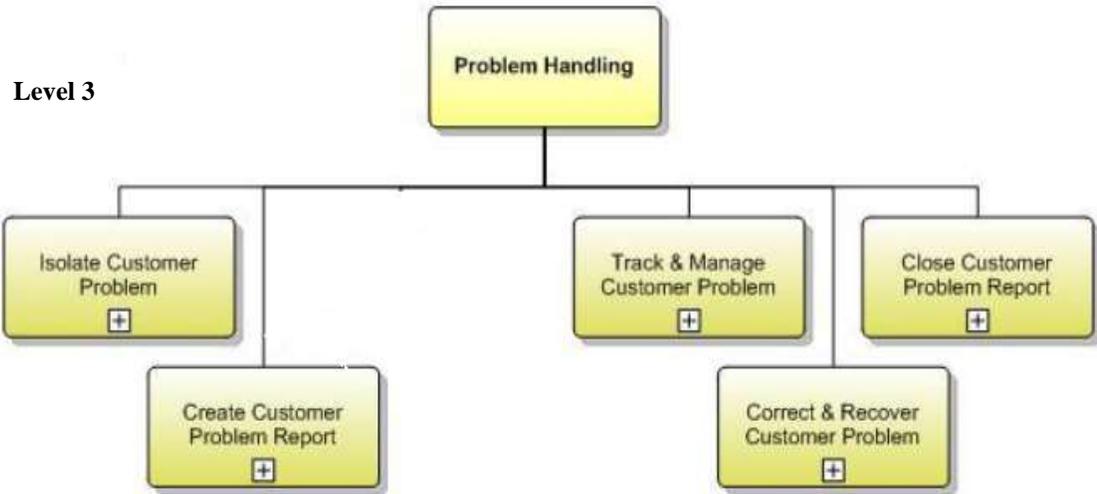


Figure 5: Problem handling level 3 process decompositions (Tele-Management Forum, 2012 p.82)

Create Customer Problem Report process element deals with the generation of new customer problem reports in which the customer information is captured following the customer contacts indication of a problem with their purchased product or service. After the ticket is created, Isolate Customer Problem process element is activated. The process element identifies the root cause of the customer problem and induces the Correct and Recover Customer Problem process if the problem is solvable at this level. Correct and Recover Customer Problem process is responsible for restoring the product or service to the normal operational state as efficiently as possible (Tele-Management Forum, 2012). Track and Manage Customer Problem process element is then activated to ensure that resolution activities are assigned, tracked efficiently and that escalation is invoked for any open customer problem reports. Resolution of the problem leads to the Close

Customer Problem Report process element which closes the customer problem report or ticket. The process is also responsible for contacting the customer to inquire about the customer’s satisfaction with the resolution of the problem and works in conjunction with the Validate Customer Satisfaction process in figure 6.

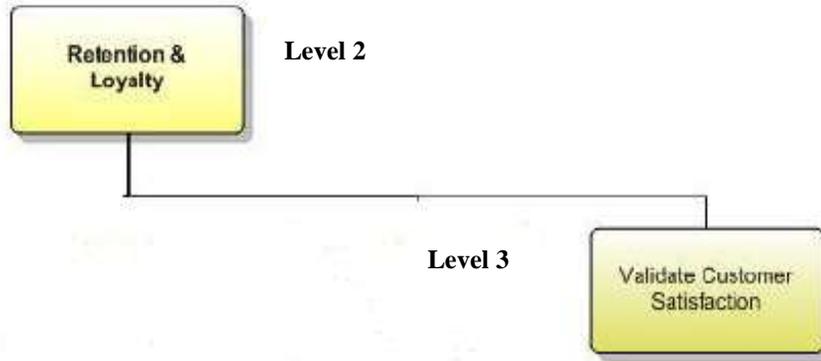


Figure 6: Part of retention and loyalty level 3 process decompositions (Tele-Management Forum, 2012 p.93)

Validate Customer Satisfaction level 3 process under Retention and Loyalty ensures that the customer is satisfied that the solution that was delivered meets their expectations. If the problem is not solvable at the Customer Relationship Management level then Diagnose Service problem is enabled under the Service Management and Operations level in Figure 7.

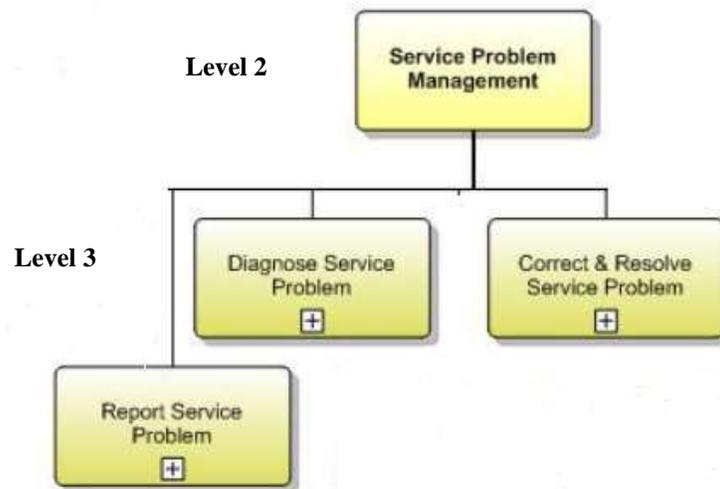


Figure 7: Part of service problem management level 3 process decompositions (Tele-Management Forum, 2012 p.115)

Diagnose Service problem process element identifies the root cause of specific service problems. If the problem is solvable at this level, the Correct and Resolve Service Problem process is initiated. Correct and Resolve Service Problem process is

responsible for restoring the product or service to the normal operational state as efficiently as possible. Report Service Problem process is then activated after the problem is resolved. Report Service Problem process element provides reports on the status of the problem to the Track and Manage Customer Problem process element which follows the normal closure steps outlined under Problem handling when the problem is resolved. In the case that the problem is not solvable at that level Localize Resource Trouble process in Figure 8 is activated under Resource Trouble Management.

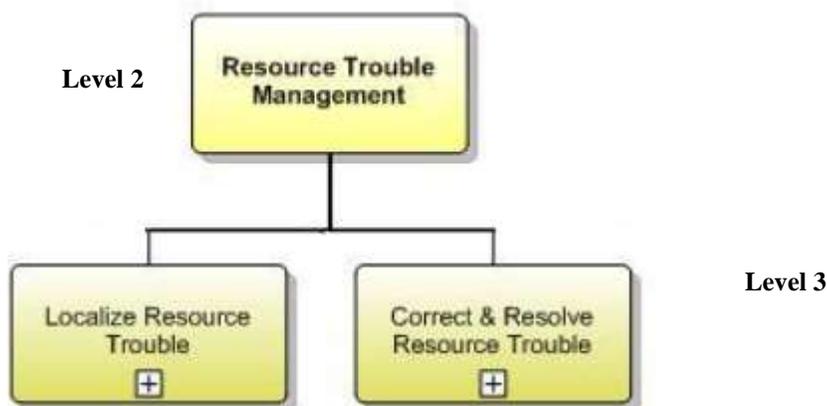


Figure 8: Part of resource trouble management level 3 process decompositions (Tele-Management Forum, 2012 p.155)

Localize Resource Trouble process is responsible for identifying the root cause of the specific resource trouble. If the root cause is associated with specific resources such as networks, Information Technology systems, servers and routers then the Correct and Resolve Resource Trouble process is then initiated to work on the problem. The problem status is then reported to the Track and Manage Customer Problem process element, the problem report is closed and customer satisfaction is validated.

2.3.6 Problem or Complaint Management

A number of studies have stressed the importance of complaint management mechanisms for companies (Komunda and Oserankhoe, 2012; Tronvoll, 2012; Choi and Mattila 2008; Garding and Bruns, 2015). Successful complaint handling has the

potential to remedy previously bad customer experiences into good ones. The complaint management process also provides companies with feedback and insights from customer's points of view that can be used in process review and analysis.

The anticipated quality of post purchase services in the event of product or service failure is a major factor that influences customers when choosing their companies. Since failures of products and services are bound to happen and cannot always be prevented, customers must have the choice to complain or report to the responsible company in such cases (Garding and Bruns, 2015). Therefore, companies should have adequate complaint or problem communication channels. A complaint channel being defined as the medium by which a customer reports a problem or complaint to a company (Marczyk et al., 2005). Mattila and Wirtz (2004) identified some of the communication channels available for customers to address complaints or problems to companies as: writing a letter (mail), sending an email, calling a hotline (phone) or visiting a shop (face to face). Clark (2013) later included social networks as an additional complaint or problem communication channel. These communication channels also serve as means of customer enquiries i.e. requests for information from the companies other than just complaint.

2.4 eTOM Advantages

The eTOM business process framework has been continuously evaluated for improvements so that it stays appropriate in the changing market scenarios. The framework brings the following advantages to the Telecommunications industry (Jiejn, 2009):

1. It makes available a standard structure, terminology and classification scheme for describing business processes and their constituent building blocks.
2. It supplies a foundation for applying enterprise wide discipline to the development of business processes.
3. It provides a basis for understanding and managing portfolios of IT applications in terms of business process requirements so that applications will better meet business needs.

4. It creates consistent and high quality end to end process flows, eliminating gaps and duplications in process flows. Thus creating opportunities for cost and performance improvement and for reuse of existing processes and systems.

2.5 Related Work

Various research studies on eTOM have been carried out since the time of the first framework document release. Similar research works are those of Botha (2010), who addressed the identified gap between customer feedback and the operational efforts of companies. A conceptual framework through which companies could enhance their customer experience by improving their internal business processes was developed. Botha (2010), used eTOM to map selected business processes in the South African telecommunications industry.

Other works are those of Chang (2011), who studied the business process management of Fulfilment and Operations Support and Readiness (OSR) business processes. Recommended standard functions under fulfillment and OSR were derived for a company and business flow diagram for a certain process in fulfillment drawn. Additionally, examples on how to evaluate process performance and optimize a function of a process under OSR were shown.

Another study carried out by Chang et al. (2007), looked at service problem and resource management in which primary necessary functions for process elements of eTOM were derived and compared with the functions of a Network Management System in a company. An improvement direction of the Network Operations Management was also proposed.

This study deals with problem handling, deriving eTOM recommended standard functions and comparing them with the process in the call center. It also addressed certain concerns that were not addressed in references (Botha, 2010; Chang, 2011; Chang et al., 2007) with regards to the channel of communication process between call centers and operations.

2.6 Summary

Business process management is essential for a company to stay competitive. Thus, it is necessary to have a common understanding of business processes in order to understand business process management. Once business processes are defined they can be subject to analysis and improvement. A framework is essential to facilitate improvements in business processes. One such business process framework is eTOM that sets a vision for the industry on how to compete successfully by having an approach that takes into account the business processes involved. Its ability to create consistent and high quality end to end process flows that eliminate gaps and duplications in process flows makes it suitable for this research study. The framework uses hierarchical decomposition as the basis for the process mapping. Process elements in eTOM framework represent every business process used by the company and each process element is clearly defined. The eTOM framework is defined as generically as possible so that it remains organization, technology service independent.

CHAPTER THREE: OVERVIEW OF QUALITY OF CUSTOMER EXPERIENCE

3.1 Introduction

There are different perceptions of quality corresponding to different stakeholders. Möller and Raake (2014) define quality as a set of inherent characteristics of a product, system or process to fulfill requirements of customers and other interested parties. Quality in the telecommunications industry is defined from two views which are Quality of Service (QoS) and Quality of Experience (QoE). QoS is defined from a system's perspective 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 (ITU, 2008). QoE on the other hand is defined from the user's perspective by Qualinet as the degree of delight or annoyance of the user of an application or service. It results from the fulfilment of his or her expectations with respect to the utility and or enjoyment of an application in light of the user's personality and current state (Le Callet et al., 2012).

Other definitions of QoE also place emphasis on the user's perspective (Fiedler et al., 2009; Schatz and Reichl, 2011) but differ in their perception of the factors that influence it. Utility in Le Callet et al. (2012)'s definition has to do with the perception and experiencing from a user's perspective which is designed to measure user satisfaction. Thus, the human characteristics being identified as one of the influencing factors of QoE. Some examples of human factors are gender, age, education, background, emotions and expertise level (Adam et al., 2016; Barakovic and Skopin-Kapov, 2013). Fiedler et al. (2010) consider QoE as the degree of delight of the user of a service, influenced by content, network, device, application, user expectations and goals and context of use. The definition introduces elements such as content, network and device that are grouped under system influencing factors. System factors allude to properties and characteristics that determine the technically produced quality of an application or service (Le Callet et al., 2012). Among the system factors are Quality of Service related parameters (Fiedler et al., 2010; Adam et al., 2016). Some examples of content factors include graphical design elements, semantic content, video spatial and

temporal resolution (Chen et al., 2016) while device factors denote end systems or devices of the communication path (Reiter et al., 2014). Schatz and Reichl (2011) define QoE as the degree of delight or annoyance of the user of an application or service as perceived subjectively and may be influenced by user state, content and context. Schatz and Reichl (2011) and Fiedler et al. (2010)'s definitions introduce the concept of context as an influencing factor of QoE. Context factors relate to the user's environment. Practical examples are location, space, duration, frequency of use, interpersonal relations, costs, subscription type, brand, nature of experience, compatibility, interoperability and additional informational artifacts (Le Callet et al., 2012). The factors that influence QoE differ per service but most researchers have classed the QoE influencing factors into human, system and context factors (Le Callet et al., 2012; Barakovic and Skorin-Kapov, 2013; Adam et al., 2016; Reiter et al., 2014).

3.1.1 QoE Assessments

There are currently two types of measurements for QoE in research which are subjective and objective measurements.

Fiedler et al. (2009) referred to QoE as a subjective issue that could be assessed by a person who has had an experience of something. These researchers also stated that QoE can to some extent be measured by means of questionnaires. Objective QoE methods are based on the measurement of technical parameters less or more related to the service quality (Zach et al., 2014).

3.2 Customer Experience

Quality of experience (QoE) is much closer to the concept of customer experience. Various research studies carried out on customer experience have shown its importance although many of these have different views on how to define customer experience and measure it (Shaw, 2005; Patricio et al., 2008; Verhoef et al., 2009; Brakus et al., 2009; Kim et al., 2011, Lemke et al., 2011). Among the notable benefits of good customer experience is the achievement of competitive advantage such as loyalty and profitability. Lywood et al. (2009) noted two common features in some of the definitions of customer experience. The first feature being the dimension that originates

from all the contact points between the customer and the company. Secondly, the strictly personal nature that takes on a customer at different levels.

Customer experience can be enriched through improved business processes designed to meet the needs of the customers. The performance of a process from a customer viewpoint can be measured by obtaining and analyzing data from the customer. The intent is to establish where gaps exist from a customer viewpoint and where improvement is needed in order to improve customer experience. Hunter (2009) identified eight data gathering methods used to measure customer experience as being telephone survey, mail survey, focus groups – in person, focus groups – online, one on one interviews, intercepts, user testing and customer complaints. Companies must understand the current experience delivered to their customers before they can improve their customer experience (Taylor, 2014).

A study by Islam et al. (2013) revealed that core service activities of telecommunication services, promotions and product variety have significant influence on customer experience. These researcher's views of core services were in terms of the network. Islam et al. (2013) did not consider response to a problem or request which Smith (2006) discovered to be the factor with the biggest impact on excellent customer experience. Response to a problem or request had greater influence on customer experience than even factors such as price, promotions, features (product variety), delivery of products or services and company's employees as perceived by the customers.

Hence, this research's focus on the call center or contact center as a forum for responding to problems or requests.

3.2.1 Customer Experience and Call Centers

Call centers are places where calls are placed or received in high volume for the purpose of sales, marketing, customer service, telemarketing, technical support or other specialized activities (Bodin and Dawson, 2002). Call centers are an essential part of most industries as they are the primary source of contact for customers. According to research studies, call centers allow companies to build, maintain and manage customer

relationships by solving problems and resolving complaints quickly, having information, answering questions and being available usually 24 hours a day, 7 days a week, 365 days of the year (Feinberg et al., 2005).

Most call centers also operate as contact centers by utilizing multiple channels other than the traditional telephone such as email, fax and internet. Call center customers want better experiences that provide easier ways of accessing services with timely responses. Hence, only the companies that deliver the right experience to customers will succeed in the broad market place. It is worth noting that customer experience is not the same as customer service. Customer experience is not about exhorting customer service personnel to be nicer as most companies do this. Customer experience is about being really clear about who the company's customers are, what they value, what the companies brand stands for and designing the processes and training personnel to deliver that every day (Smith, 2006).

Taylor (2014) stated that the key elements of customer experience related to call centers have to include;

1. The ease of access to information, purchase, inquire, complain or fix a problem.
2. The speed of access i.e. service level, hoops customers had to jump through – time to return an email, to resolve a trouble ticket.
3. Quality of interaction i.e. were they able to get done what they wanted to, if it was easy or efficient.

3.3 Related Work

Research studies on the quality of customer experience in the telecommunications industry is limited and far from sufficient. Some of the related works on QoE are those of Ickin et al. (2012) who carried out a research on the factors influencing quality of experience of commonly used mobile applications. These researchers conducted a 4 weeks user study involving 30 phone users in which they used a survey to obtain personal and phone usage information from the respondents. Context sensing software was also used to collect information from the user's phones, while experience sampling method via a survey was employed in obtaining QoE user feedback. The researchers

then utilized the Day Reconstruction Method through interviews in order to analyze possible relations between QoE ratings, QoS and user context. Lemke (2011) and co-authors also carried out a study on customer experience quality. These researchers defined customer experience quality as a perceived judgement about the excellence or superiority of the customer experience. A conceptual model for customer experience was developed from a research involving 40 individuals using repertory grid analysis. The results of their study indicated that experience was generated from communication, service delivery and usage encounters. This research focuses on finding out the actual quality of customer experience under problem handling. While Lemke et al. (2011)'s study was mainly on the determination of the factors that influenced customer experience quality and Ickin et al. (2012)'s research focused on mobile applications on a smart phone.

3.4 Summary

Provision of good quality of customer experience is essential for a company to achieve a competitive advantage. QoE can be measured by both subjective and objective means with factors influencing it grouped into human, system and context factors.

CHAPTER FOUR: METHODOLOGY

4.1 Introduction

This chapter looks at the systematic steps adopted in order to solve the research problem. The following are the areas covered: research design, study sample and population, data collection procedure, data analysis and the limitations of the study.

4.2 Research Design

The study used descriptive design in order to describe the state of affairs as it exists at present among the Zambian telecommunications call centers (Kothari, 2004).

The descriptive research process that guided the research was as shown in Figure 9 below.

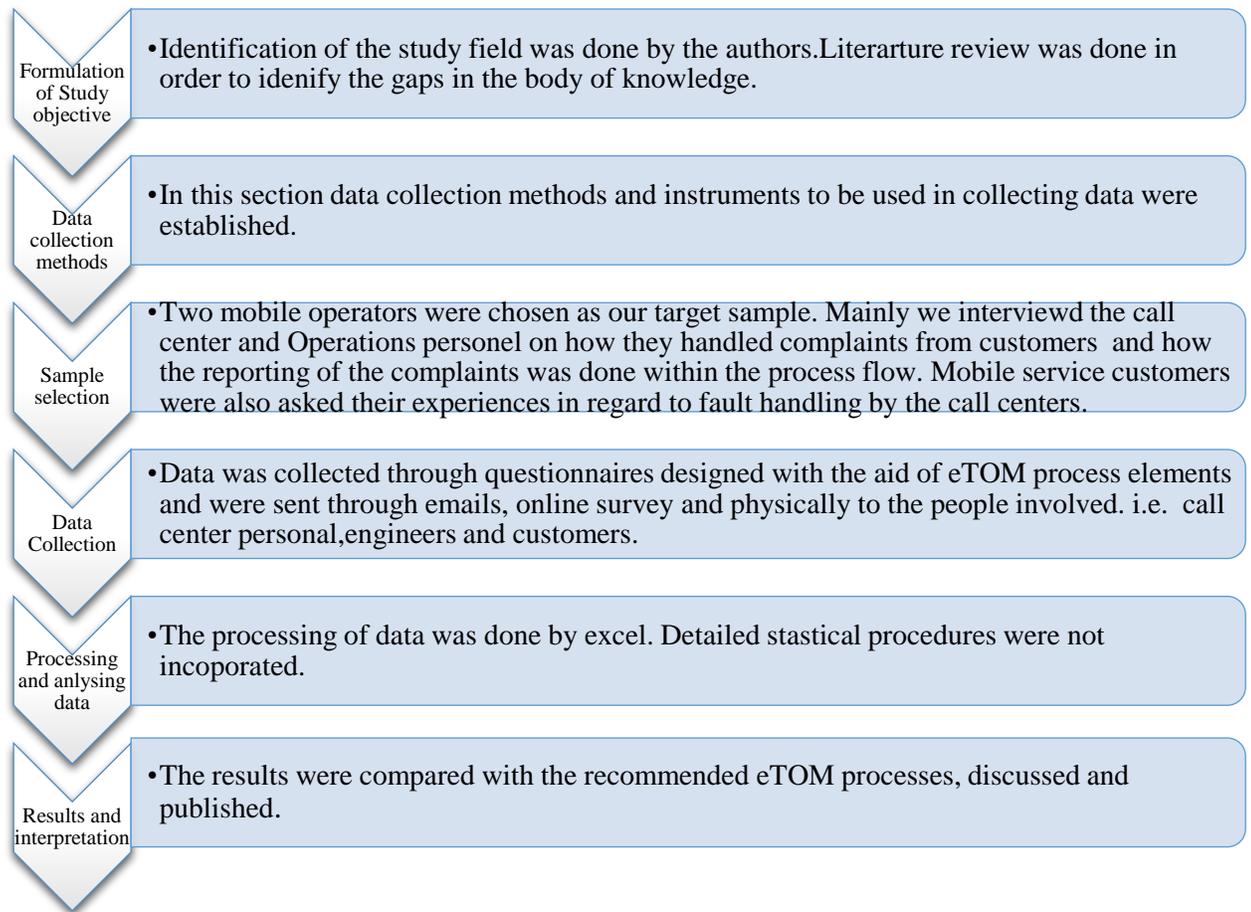


Figure 9: Descriptive research process (Kothari, 2004 p.37)

The main purpose of the research was to have an accurate description of any process gaps affecting the customer quality of experience in the Zambian telecommunications call centers by the use of eTOM. Justification for the use of eTOM for BPM to identify process gaps was highlighted in the literature review providing a solution to the first objective. Chang et al. (2007) showed that using necessary functions for process elements of eTOM and comparing these with existing processes or systems in companies was one method to be used for indication of areas that required improvement. Adopting this approach, questionnaires using eTOM Customer Relationship Management (CRM) problem handling process decompositions under operations assurance were designed.

The questionnaires were piloted using three people. Under this design, Semi structured questionnaires were distributed to Telecommunication company employees and structured questionnaires to their mobile network subscribers or customers. The first part of both questionnaires focused on collection of demographic data such as gender, age, position, working duration etc. The second part collected data on the process of reporting complaints or problems, resolving them and reporting back to the customer using eTOM process elements highlighted under subsection 2.3.6 hence resolving the second objective. These were then compared with eTOM processes in subsection 2.3.5 to identify gaps and hence addressing objective number three. Additional information obtained from the questionnaires was that of the current quality of customer experience in response to the fourth objective.

4.3 Sampling Technique

Purposive sampling was used to select the companies since the research was focused on the call centers in the telecommunication industry. The method of sampling involves identification and selection of individuals or groups of individuals that are proficient and well informed with a study of interest (Bernard, 2002; Cresswell and Plano Clark; 2011). In this case, the employees had to have been working in the call center or other departments which had a hand in resolving customer problems. The employees were from two telecommunication companies and were stationed in Lusaka.

Stratified random sampling technique was used for the mobile subscribers with a sample size of 300 mobile service customers from two telecommunication companies. According to Kothari (2004), this complex random sampling method sub-divides the sample frame into groups called strata and applies a probabilistic formula to determine how many samples need to be drawn from each stratum. The strata formed was based on three districts in Lusaka Province which has the largest population share in Zambia at 16.7% amounting to 2,191,225 people (Government of the Republic of Zambia, 2012). This limitation was due to time and resource constraints as the researcher was conducting this study while in full time employment.

The universe is the entire population of Zambia but due to the focus of this study, the units in the country are limited to mobile service subscribers. Strata information was obtained from the Zambian 2010 census of population and housing. Hence, the population of mobile subscribers in Zambia (sampling frame) is 70.3 percent based on the 2015 statistics as reported by Banda (2016) after conducting interviews with ZICTA. The sample size for each of the districts was determined using the formula in equation 1.

$$n_i = n \cdot P_i = n \cdot \left(\frac{N_i}{N}\right) \dots \dots \dots (1)$$

Where:

- n is the sample size which is 300 mobile service subscribers in this study
- n_i is the number of samples to be drawn from each i^{th} stratum (district).
- P_i is the ratio of the population per i^{th} stratum to the total population in a sampling frame N .
- N_i is the population per i^{th} stratum, in this study it is calculated as 70.3 percent of the population per district surveyed.
- N total population in a sampling frame. Table 1 below gives a summary of the sample sizes according to the districts using equation 4.

District	Population	Subscribers	Sample Size
Lusaka	1,715,032	1,205,667	243
Chongwe	181,816	127,817	26
Kafue	219,000	153,957	31
Sampling Frame	2,115,848	1,487,441(N)	300(n)
Universe (Zambia)	13,092,666	9,204,144	

Table 1: Sample size according to districts

4.4 Data Collection Procedure

Qualitative and quantitative data collection methods were used to collect the data needed for the research.

4.4.1 Primary Data Collection

Primary data was obtained using survey questionnaires from respondents as one of the methods of data collection in descriptive surveys (Kothari, 2004). The choice of this instrument was in order to collect large amounts of information from the study sample within a short period of time. Another reason for its use was to generate reliable data that allowed for robust statistical analysis (Dresch et al., 2015). Duration of the data collection was three months, from 11th March to 13th June 2016. The questionnaires were administered through email and online survey.

4.4.2 Secondary Data Collection

Secondary data for this research was obtained from such sources as journals, books, dissertations, papers presented at conferences and the internet.

4.5 Data Analysis

Descriptive statistics was generally used for data analysis. However, qualitative open ended questions were transformed into quantitative data using content analysis, a method recommended by Marczyk et al. (2005). Excel and Survey Monkey were the packages used for computation. The findings were validated from the professional or expert judgement by interviewing one employee not part of the sample from each of the telecom companies (Fraenkel and Wallen, 2006).

4.6 Limitation of the Study

This research study was limited to samples from employees of and mobile customers subscribed to two telecom companies due to ethical issues as permission for information from one other company could not be obtained. Hence, process views from employees of the other company could have an impact on the sample.

4.7 Summary

Descriptive design utilizing elements of both qualitative and quantitative methods guided the methodology of this research. The research instrument applied was the questionnaire administered to respondents selected purposively and randomly.

CHAPTER FIVE: FINDINGS AND DISCUSSIONS

5.1 Introduction

This chapter presents the results of the research and is divided into three sections. Analysis and discussions of the results collected from the questionnaires are mainly focused on identification of the processes of reporting complaints or problems to call centers, resolving the problems and reporting back to the customers. Current quality of customer experience results are equally discussed. The first part of this chapter provides demographic information of the respondents while the second part deals with fault process information. The last section concludes with customer experience customer responses. The information collected took into consideration the human, system and context factors influencing QoE discussed in section 3.1.

5.2 Demographic Findings

5.2.1 Telecom Employees

A total number of 25 questionnaires were distributed to Company A and another 25 to Company B employees of which 17 were received from Company A and 14 from Company B.

5.2.1.1 Telecom A Employees

The results from Company A show that the majority of the respondents at 52.9 percent were between the ages of 20 to 29. The age range of the respondents was from 20 to 49 years. The age range of 30 to 39 had 41.2 percent while the older age range of 40 to 49 were only at 5.9 percent.

About 82.4 percent of the respondents were call center agents, 5.9 percent were call center managers and the remaining 11.8 percent consisted of mobile operation engineers. In terms of gender there were 52.9 percent female respondents as compared to 47.1 percent male respondents.

Among the respondents, 52.9 percent worked for a duration of between 2 to 4 years for the mobile network operator while 17.6 percent spent a period of 5 to 10 years. 17.6

percent of the respondents worked for less than one year while 11.8 percent worked for one year.

5.2.1.2 Telecom B Employees

85.7 percent of the Company B respondent’s age range was between 30 to 39 years. The other respondents were 20 to 29 years with 14.3 percent.

The findings showed that 28.6 percent of the respondents were call center agents, 35.7 percent were call center managers and the other 35.7 percent were mobile operations engineers. 50 percent of the respondents were female and 50 percent were male respondents.

Among the respondents, 35.7 percent worked for a duration of between 2 to 4 years for the mobile network operators while 50 percent spent a period of 5 to 10 years and 14.3 percent spent the longest duration of between 11 to 15 years.

5.2.2 Mobile Service Customers

Table 2 summarizes the demographics of the customer respondents per Telecom Company. Majority of the respondents for Telecom A were between the ages of 30 to 49 years while Telecom B had between 18 and 39 years. It is also worth noting that a large number of the customers that responded for both telecom companies were employed by the Government. Further analysis of the demographics in line with QoE under the research’s objective three is discussed in section 5.4.

Table 2: Mobile service customers

Age	Frequency (MNO -A)	Percentages (%) MNO-A	Frequency (MNO -B)	Percentages (%) MNO-B
Below 18	2	1%	9	3.7%
18 - 29	30	15.4%	76	31.3%
30 - 39	102	52.3%	109	44.9%
40 - 49	44	22.6%	33	13.6%
50 - 59	15	7.7%	13	5.3%
60 - 69	1	0.5%	2	0.8%

Above 69	1	0.5%	1	0.4%
Gender				
Male	122	62.6%	110	45.3%
Female	73	37.4%	133	54.7%
Occupation				
Student	12	6.2%	50	20.6%
Employed in Government	102	52.3%	81	33.3%
Employed in private sector	47	24.1%	65	26.7%
Self employed	20	10.3%	28	11.5%
Unemployed	14	7.2%	19	7.8%

Table 2, cont.

5.3 Process Documentation

5.3.1 Quality of experience customer surveys

76.5 percent of the staff at Telecom Company A and 78.6 percent from Telecom Company B stated that surveys were currently being undertaken by the call centers in order to determine the quality of customer experience. On the customer side 36.8 percent Telecom A and 35.3 percent of Telecom B respondents stated that they had been contacted for their perceptions on the quality of experience offered by these companies.

Telephone interviews were indicated as one of the most common methods used to gather customer quality of experience information by both Telecom A and Telecom B staff in Figure 10. Others under methods of collecting quality of experience information in the figure below entailed call center data, listening to customer calls, viewing customer feedback on social media and 111 SMS. The methods identified by Telecom A and B employees are among the eight data gathering methods used to measure

customer experience identified by Hunter (2009). However, Telecom B did not conduct face to face interviews. The staff whose response was “Not applicable (N/A)” were those that indicated that they did not carry out any quality of customer experience surveys.

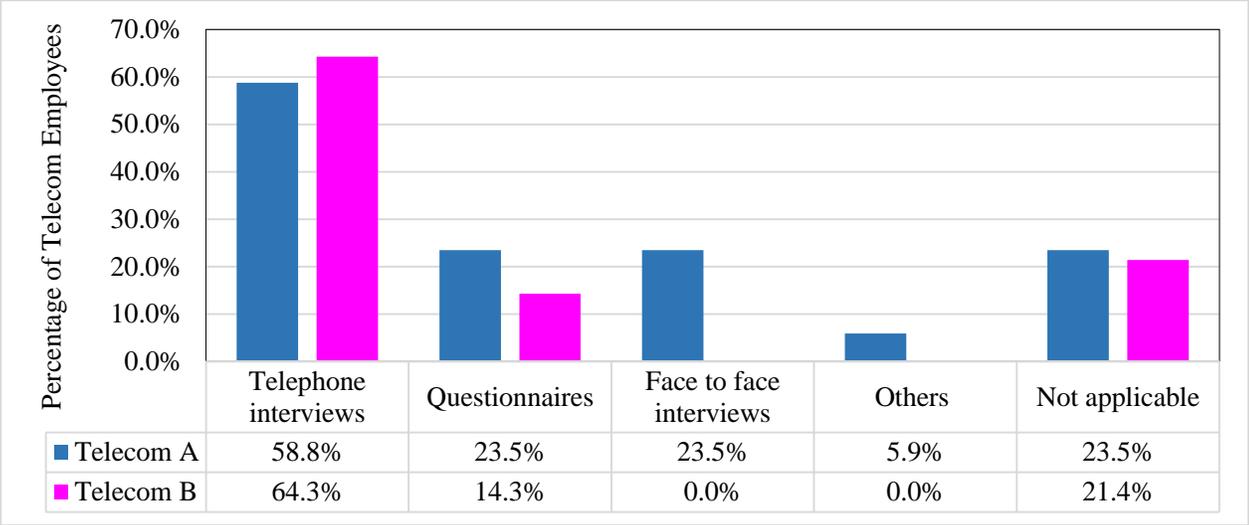


Figure 10: Customer QoE information gathering methods for Telecom A and B

5.3.2 Information collected from the surveys

First impression is among the information collected from surveys on QoE and deals with customer perceptions on greeting, kindness and politeness of the employees who attended to customers. Quality of interaction on the other hand indicated whether customer problems were resolved. The rest of the information gathered from customers as indicated by the telecom employees are specified in Figure 11.

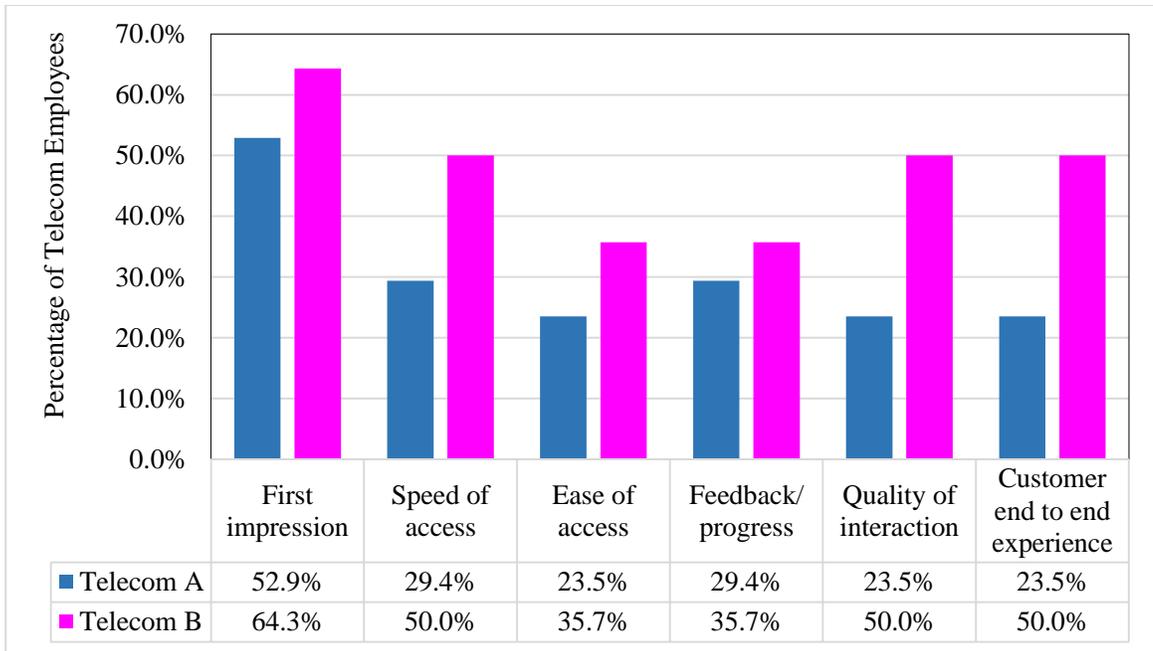


Figure 11: Telecom A and B staff responses on survey collected information

5.3.3 Customer complaint channels of communication

The findings of this study established that various channels for fault reporting were available. As 17.6 percent of the Telecom A staff stated that complaints at the call center were received by mail, 58.8 percent by email, 94.1 percent by phone, and 23.5 percent face to face, 70.6 percent by Facebook and 58.8 percent by WhatsApp. The percentages for Telecom B respondents were 14.3 percent for mail, 78.6 percent email, 100 percent phone, 14.3 percent face to face, 50 percent Facebook and 35.7 percent WhatsApp. Customers also confirmed the use of these channels for reporting their faults as shown in Figure 12. According to Garding and Bruns (2015), the availability of complaint or fault channels of communication was the first step towards successful fault or complaint management. Not applicable in Figure 12 is the response given by the mobile service customers with dual subscription to the telecom companies that never contacted customer care to report a fault.

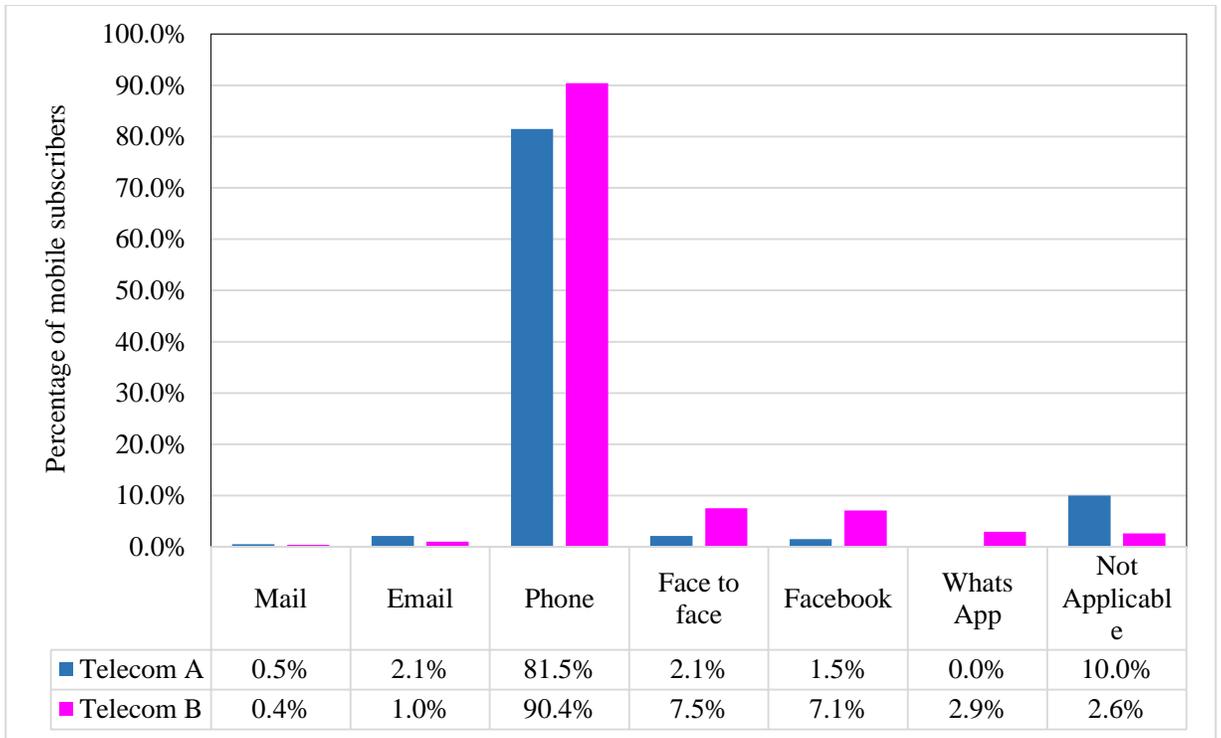


Figure 12: Customer percentage confirmation of communication channels

5.3.4 Mobile problem capturing processes

Mobile problem record capturing systems were present according to majority of the respondents from the telecom companies. 94.1 percent of the Telecom A and 100 percent of Telecom B respondents confirmed following processes whether documented or not when carrying out their work.

Dashboards indicating customer numbers and types of faults were one method of problem capturing mobile faults affirmed by the respondents in Figure 13. The greater number of respondents confirmed the use of a fault management system by call centers, operations and customer care employees. Complaint information in the system was manually entered. However, 29.4 percent of the Telecom A staff mentioned that their company did not have a record system to capture customer mobile fault data.

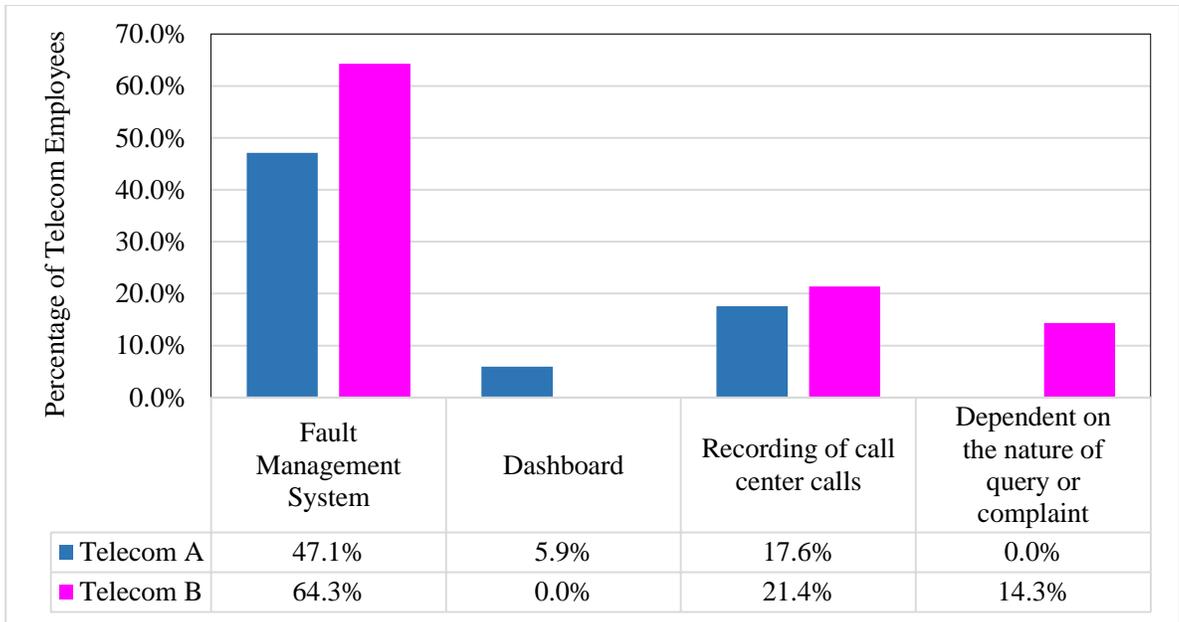


Figure 13: Telecom A and B methods of capturing mobile problems

Telecom B employees indicated that mobile complaints were manually entered in the Fault management system and a reference ID generated. Using the reference ID, details of the complaints and personnel assigned to handle them could be viewed.

5.3.5 Mobile problem tracking processes

About 82.4 percent of the Telecom A and 85.7 percent Telecom B staff agreed that their mobile network operators tracked customer mobile faults in order to ensure that they were being resolved. However, 17.6 percent of Telecom A and 14.3 percent Telecom B respondents disagreed.

The study revealed that mobile faults were mostly tracked by the fault management system and follow ups with customers as stated by the majority of Telecom A and B respondents as indicated in Figure 14. Reports were the other methods used to track mobile faults either through reviewing dashboard reports by Telecom A employees or through other complaint trackers by Telecom B employees that showed which cases were closed or opened. Supervisors generated a report which they submitted every after a shift was done and included the issues that were not resolved in the report to be followed up by the incoming team leader. The follow ups entailed calling the customers

to find out if their problems had been resolved. Telecom B employees indicated that they had a dedicated team for the follow ups. Some of the respondents identified reference numbers as being used while tracking but did not specify how it was done.

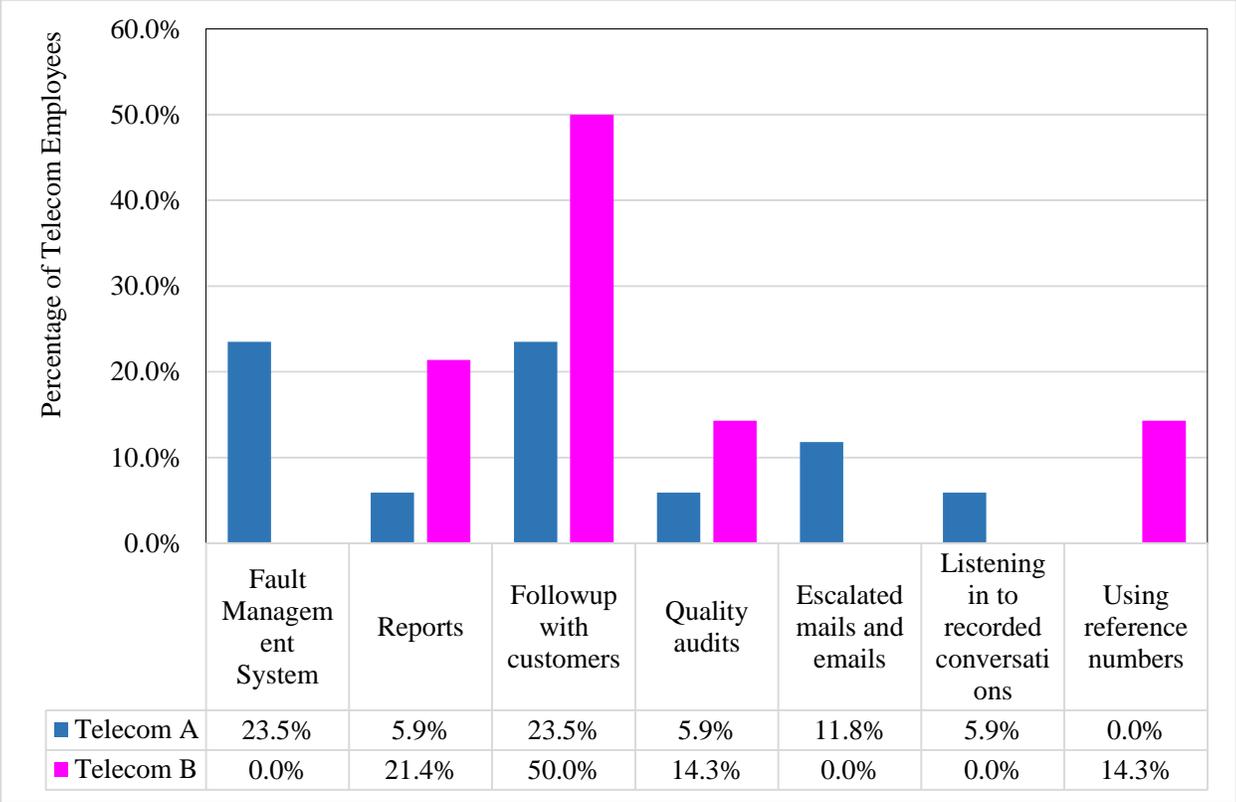


Figure 14: Telecom A and B methods of tracking mobile problems

5.3.6 Mobile problem resolving processes

Nearly all of the Telecom A and B respondents indicated that processes for resolving mobile service problems for customers were being used in their companies. The results displayed in Figure 15 summarize the processes of mobile service problem resolution.

These findings established that call center agents did the initial trouble shooting of mobile problems after customers made their reports. Mobile service problems were also handled by other department personnel such as mobile operations engineers, technicians and other non-customer facing staff. Regarding the mobile service problems, call center agents mostly dealt with airtime top ups, internet configurations, password resets for

mobile money or me2u, handset manipulations and subscription failures for promotional services. Problems not resolved firsthand were escalated to the relevant departments for instance complex complaints to do with billing, VAS and the mobile network. However, Telecom A staff stated that missing airtime problems were resolved through refunds. Finally, mobile service problems for customers were resolved by following formulated procedures affirmed by Telecom B respondents.

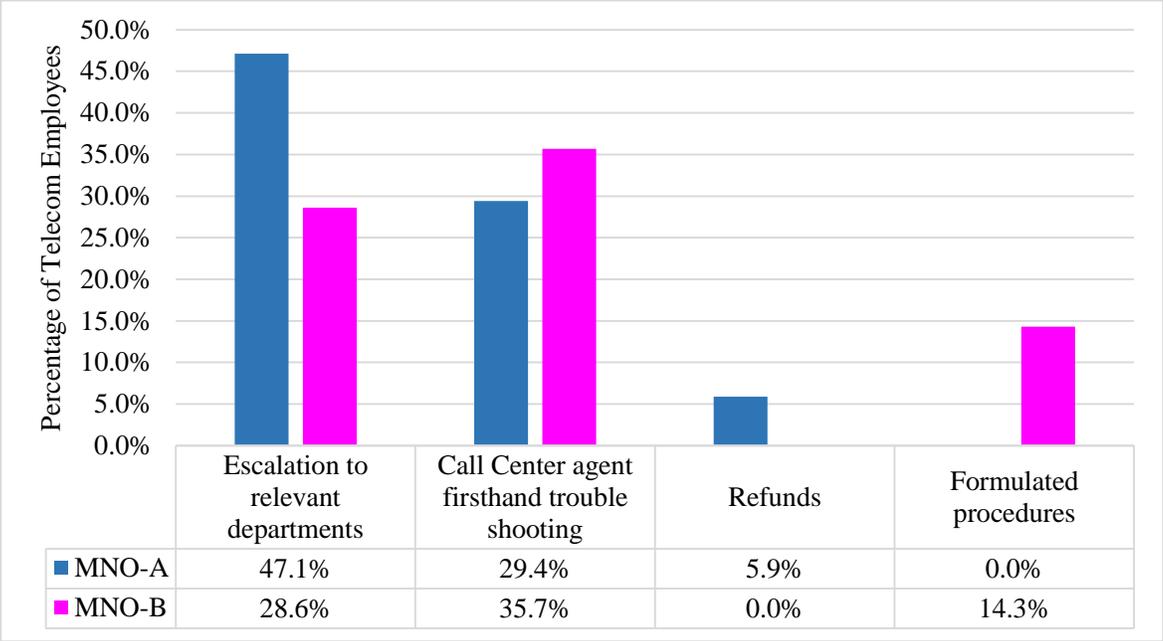


Figure 15: Telecom A and B staff responses on customer mobile problem resolution

5.3.7 Reporting progress on mobile problems to customers

The findings established that feedback on how the mobile network operators were tackling the mobile complaints was being conveyed to the customers. 88.2 percent of the Telecom A and 78.6 percent of Telecom B employees agreed to the statement while 11.8 percent from Telecom A and 21.4 percent from Telecom B indicated otherwise. Feedback on mobile problems was being done through the channels of communication available for reporting such as social media, phone and email. Affirmation to this was also made by 14.9 percent of Telecom A and 18.4 percent of Telecom B customers who had been contacted by the mobile service providers when their problems were not resolved or a delay occurred. The same channels of communication used to report

complaints or faults by customers were the ones used by companies to respond to customer complaints.

5.3.8 Challenges between the Call Center and other departments

Challenges did exist between the call center and other operational departments who handled customer mobile complaints or faults as indicated by 94.1 percent of the Telecom A respondents. 41.2 percent of the Telecom A respondents stated that late resolution of complaints was the most common challenge faced despite having indicated that they had SLAs in which mobile faults were resolved. Many reasons were attributed to this challenge such as lack of manpower and tendencies of staff to treat complaints lightly. Other reasons were the fact that other departments did not work over the weekend as well as lack of tools and transport. Delay in giving feedback by other departments to the call center was identified as the next challenge by 17.6 percent of the staff. Wrong assignment of personnel to resolve faults in the system was outlined by 13 percent of the respondents. 5.9 percent indicated false fault resolution reports by assigned personnel in the database and another 5.9 percent stated that unnecessary procedures and bureaucracy were other challenges. Other challenges affirmed by 5.9 percent of the respondents was that of differing SLA's in most departments and slow systems confirmed by 5.9 percent of Telecom A staff.

21.4 percent of Telecom B employees stated that they did not face any challenges with other departments when addressing customer complaints or faults. The rest of the 78.6 percent of the staff indicated that late resolution of complaints mostly attributed to overload of work in other departments.

5.3.9 Process Findings and eTOM

The findings from the questionnaire and interview with the staff from the two telecommunication companies provided the information required to come up with the current problem handling structures in these companies. Figure 16 shows the Problem to Solution eTOM process flow created from the process elements discussed in the Literature Review under subsection 2.3.5. While Figures 17 and 18 indicate the current problem handling process flow for mobile faults in the two telecommunication

companies. The problem to solution process deals with a technical complaint (problem) initiated by the customer, analyses it to identify the source of the issue, initiates resolution, monitors progress and closes the trouble ticket (Tele-Management Forum, 2013).

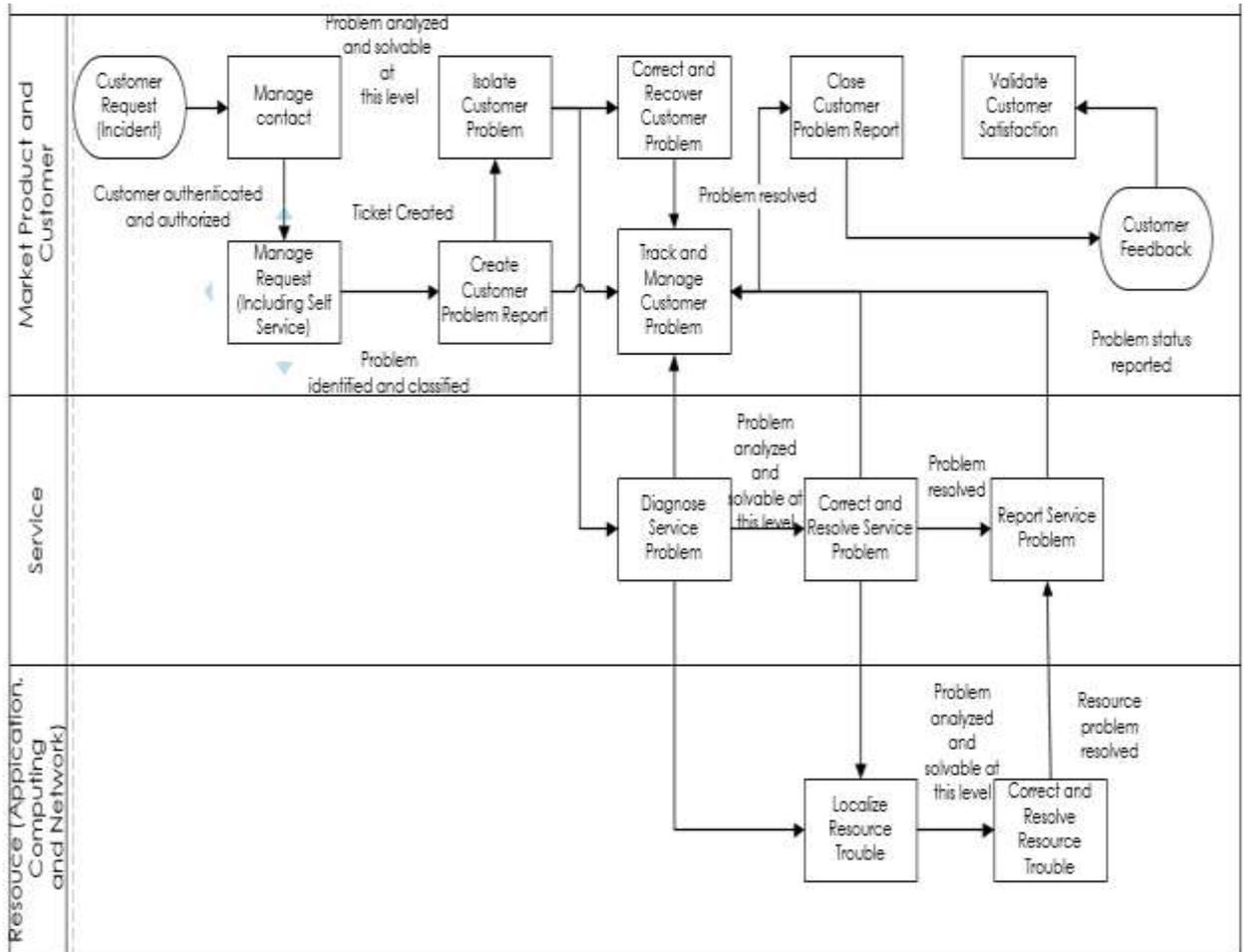


Figure 16: Problem to solution eTOM process flow (Tele-Management Forum, 2013 p.31)

The Telecom A process flow in Figure 17 indicates that processes for capturing, tracking and resolving of mobile service problems are present. The difference in the problem escalation flow is that problems to do with the network and service are under one function in Telecom A structure while there are separate under eTOM. The eTOM framework as discussed under section 2.3 does not constrain the way processes are implemented but rather provides the standard process elements to be used in a company

which in this case are also defined in Telecom A (ITU-T, 2004). When a customer accesses the company hotline, they are greeted by an automated telephony system that interacts with the caller. This system provides management of contacts and allows customers to solve their own problems and obtain information they are searching for as shown under Manage Request in Figures 17 and 18. When a customer requests for a call center agent and reports a fault, a ticket is created and the process continues as in Figure 17 up until the problem is resolved. The research revealed that there were no Operational Level Agreements between the call center and the other departments leading to late resolution of faults and delays in giving feedback.

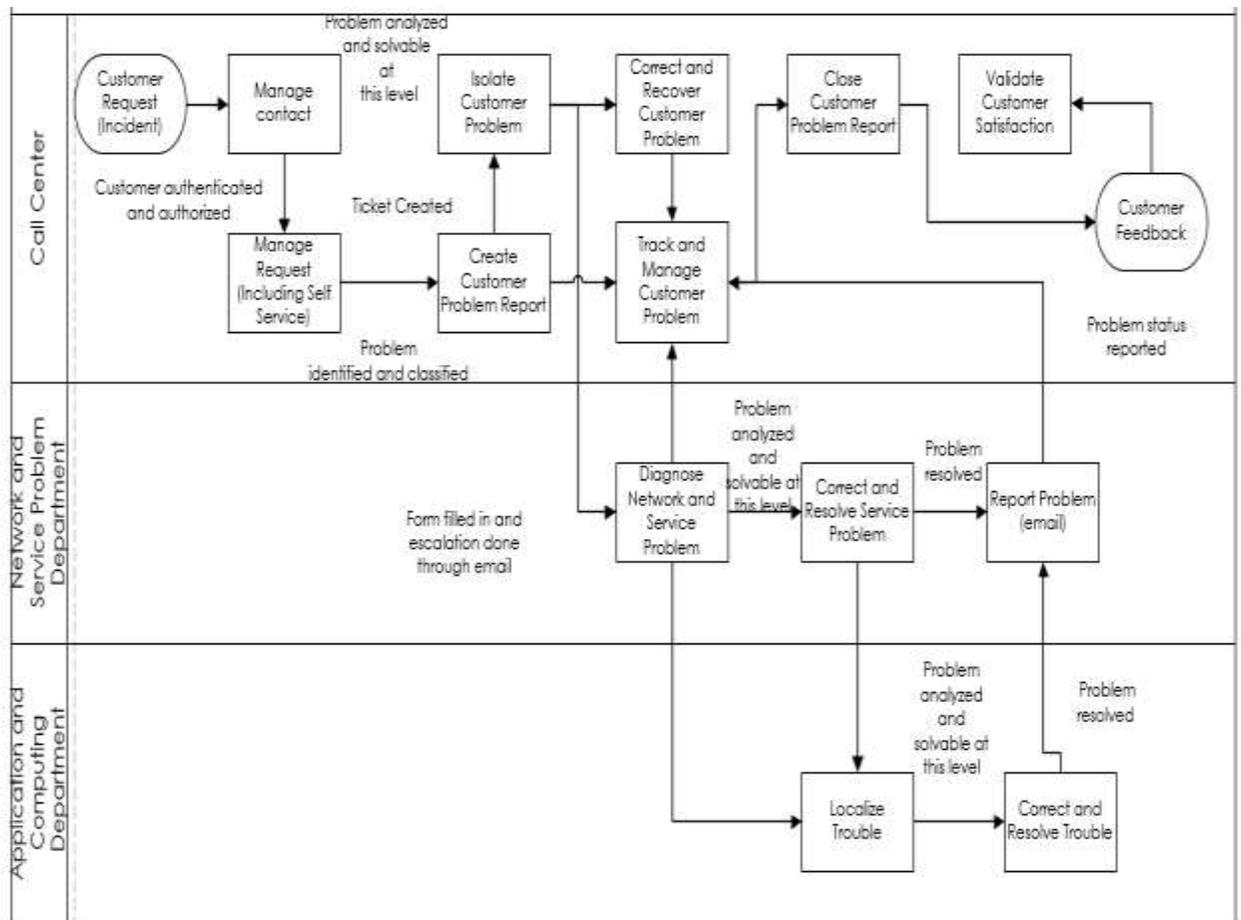


Figure 17: Telecom A problem to resolution process flow

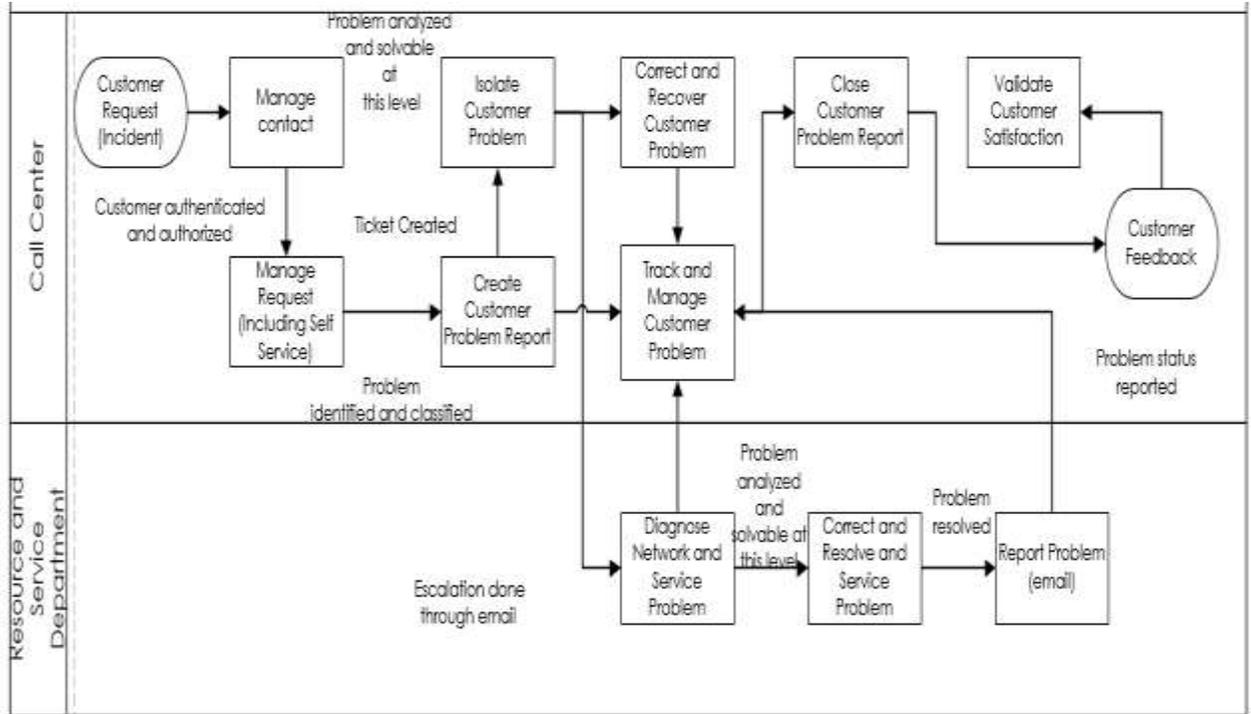


Figure 18: Telecom B problem to resolution process flow

The processes for capturing, tracking and resolving of mobile service problems are equally present in Telecom B as shown in figure 18. Resource and service problems are handled under one function in Telecom B while under eTOM there are two functions. Despite there being processes for resolution of faults, this research discovered weaknesses such as late resolution of faults.

5.4 Customer Experience

The research collected mobile service customer demographic information such as gender and age under human QoE influencing factors discussed in chapter 3 of the literature review. While location and frequency of reporting were obtained as context factors. Quality of interaction as to whether the faults reported were resolved was the unit used for evaluation under system factors.

5.4.1 Customer mobile subscription information

Figure 19 below, displays the mobile subscription for the customer respondents.

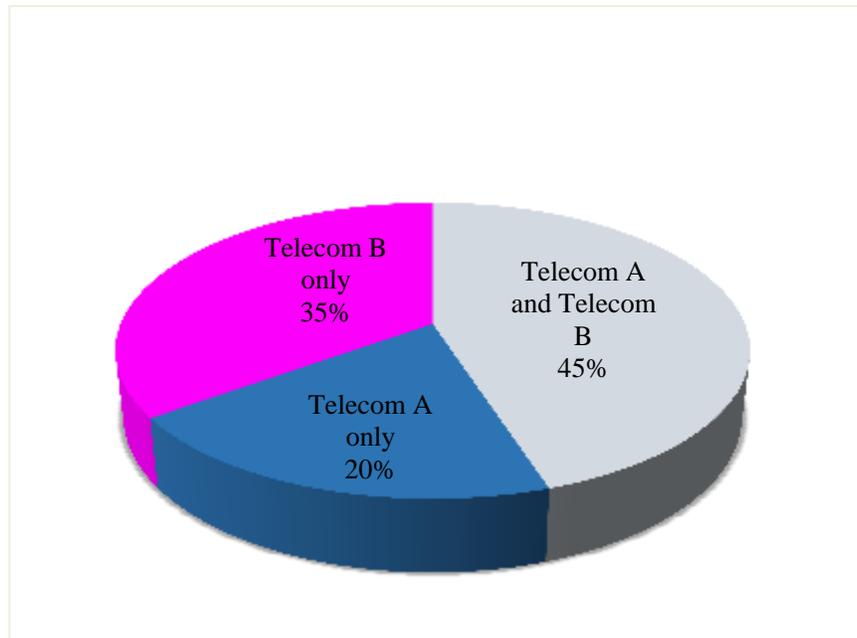


Figure 19: Customer subscription data

5.4.2 Customer experience on mobile service problem handling

Data in Figure 20 gives insight on the QoE in relation to age for mobile subscribers of Telecom A. The research results indicate that the most dissatisfied mobile service subscribers were between the ages of 30 to 39 at 10.8 percent. The rationale for this has nothing to do with the age range of the sample being the majority as shown in Table 2 since the rest of the ranges added up to 47.7 percent while only 4.5 percent indicated being unsatisfied. The most satisfied mobile service customers were also in the 30 to 39 age range.

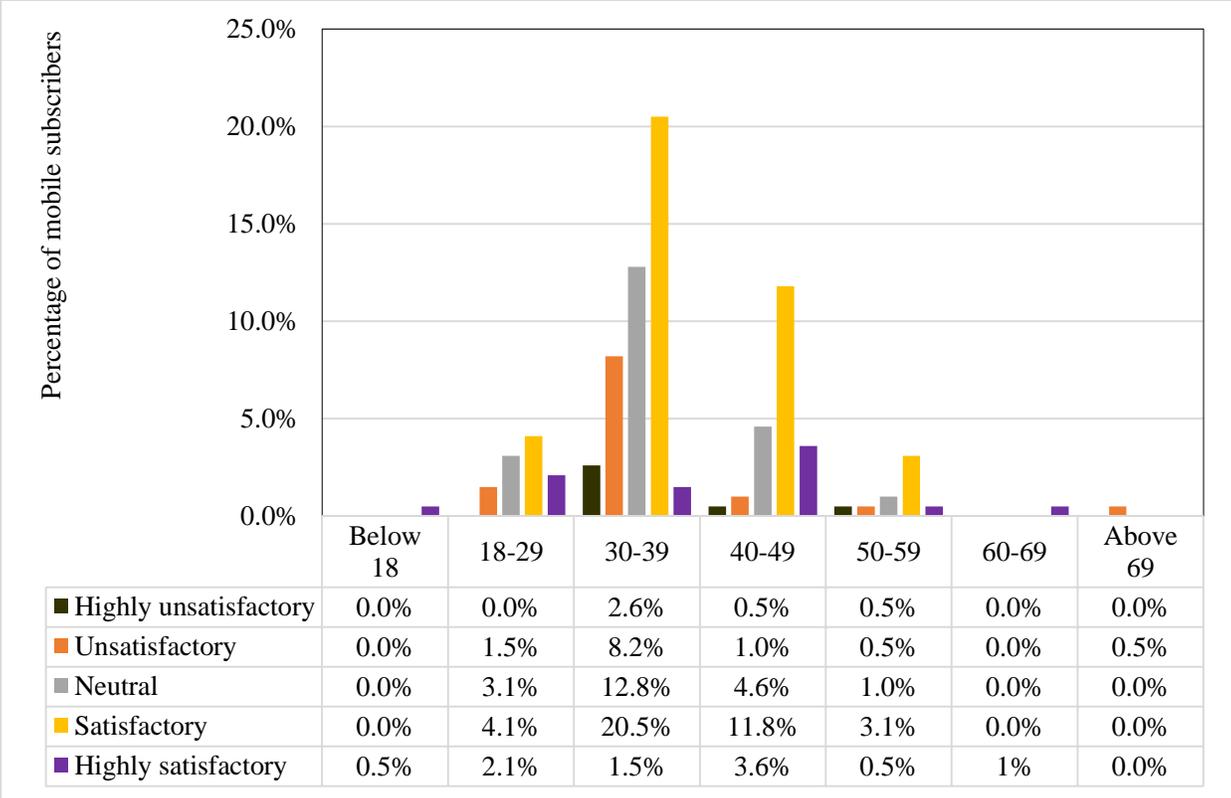


Figure 20: Telecom A QoE by age

Telecom B equally had the most dissatisfied and satisfied mobile service subscribers between the ages of 30 to 39 at 8.6 percent and 19.3 percent as indicated in Figure 21.

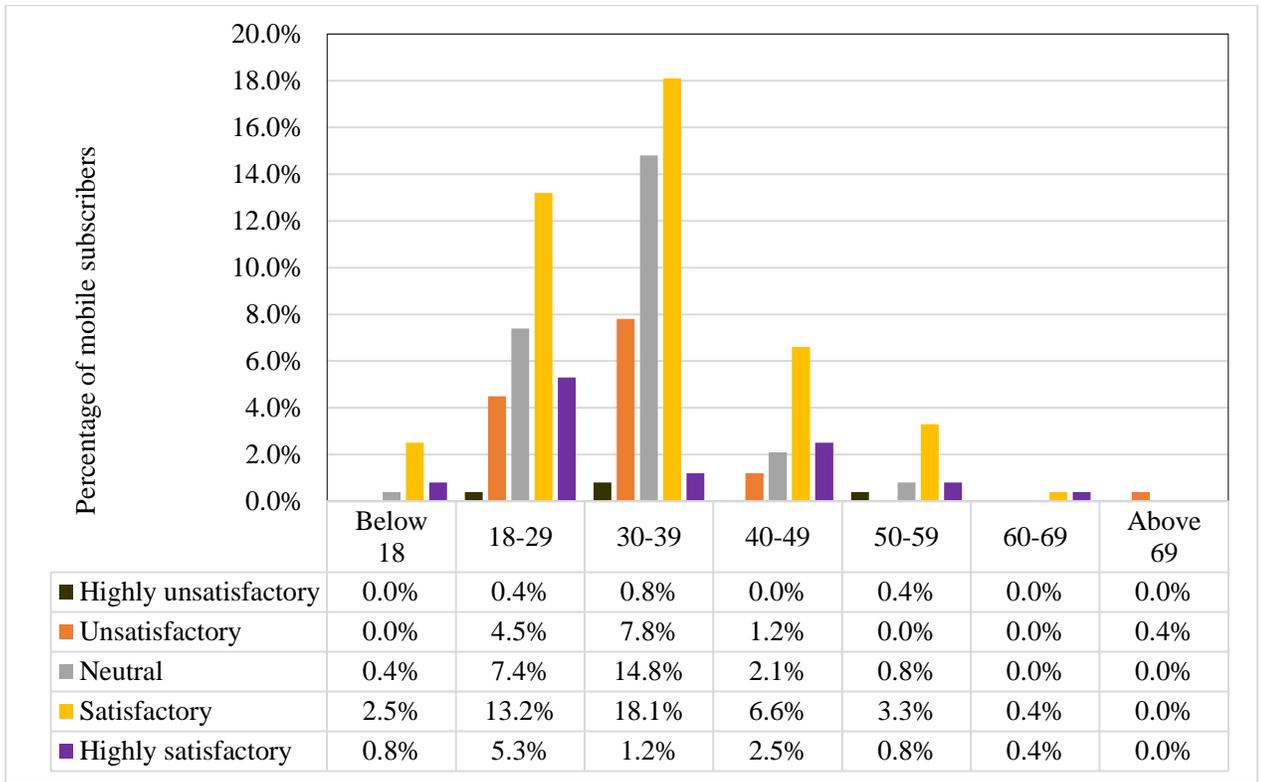


Figure 21: Telecom B QoE by age

Satisfaction and dissatisfaction rates are higher among the males than the females in both Telecommunication companies as described in Figures 22 and 23.

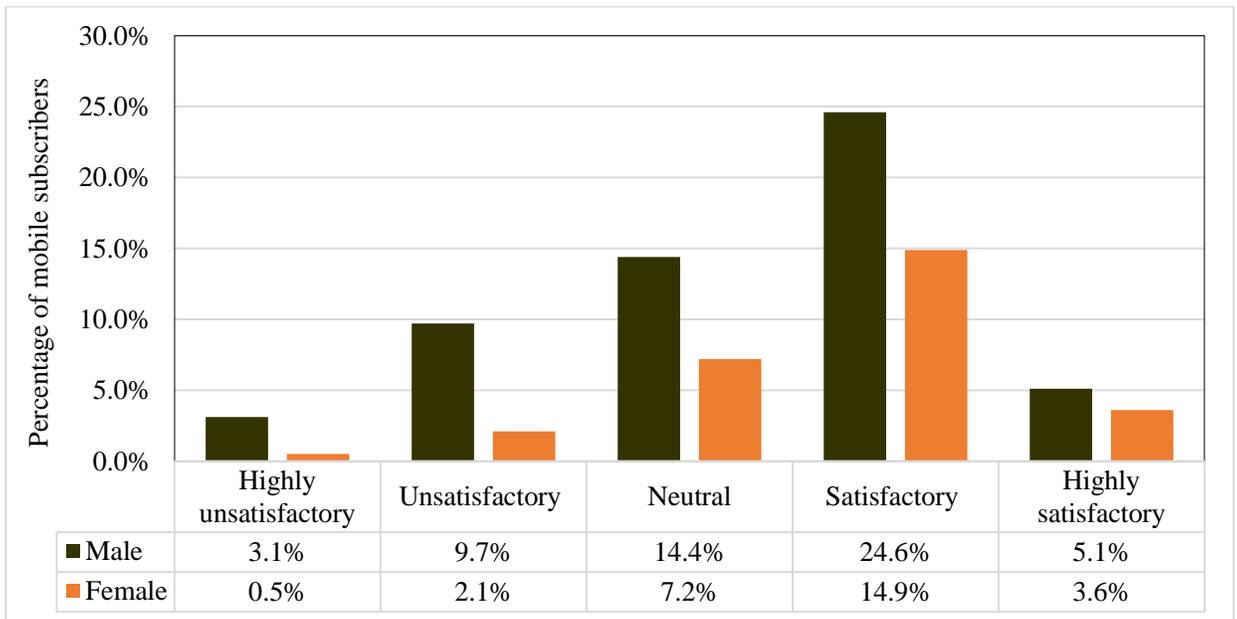


Figure 22: Telecom A QoE by gender

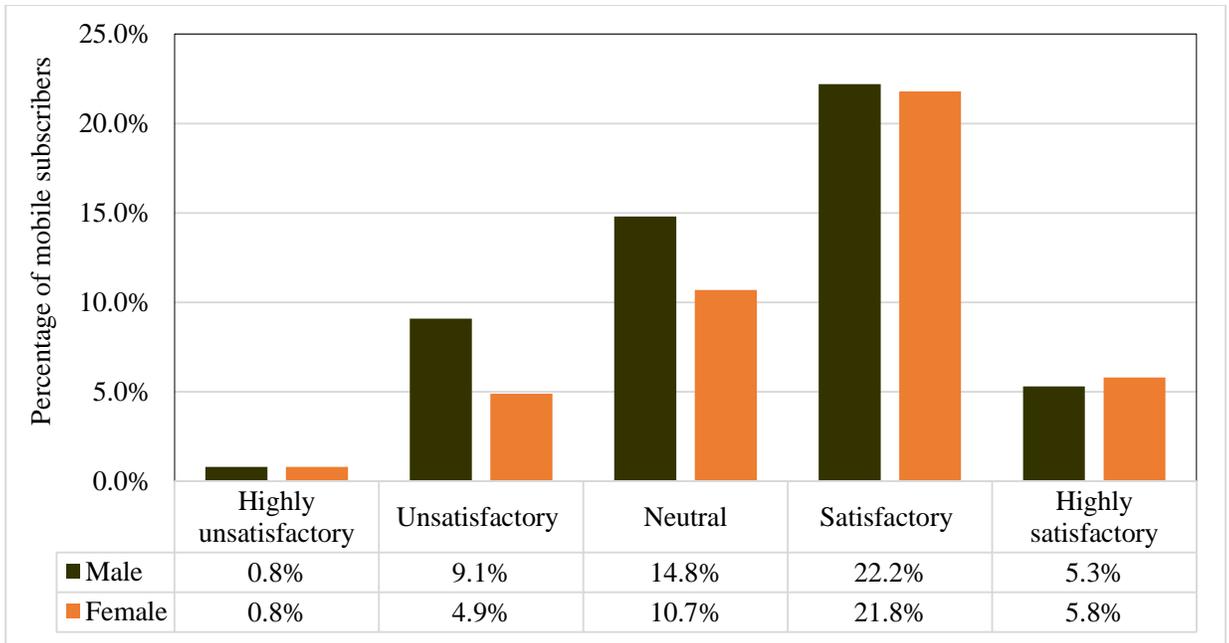


Figure 23: Telecom B QoE by gender

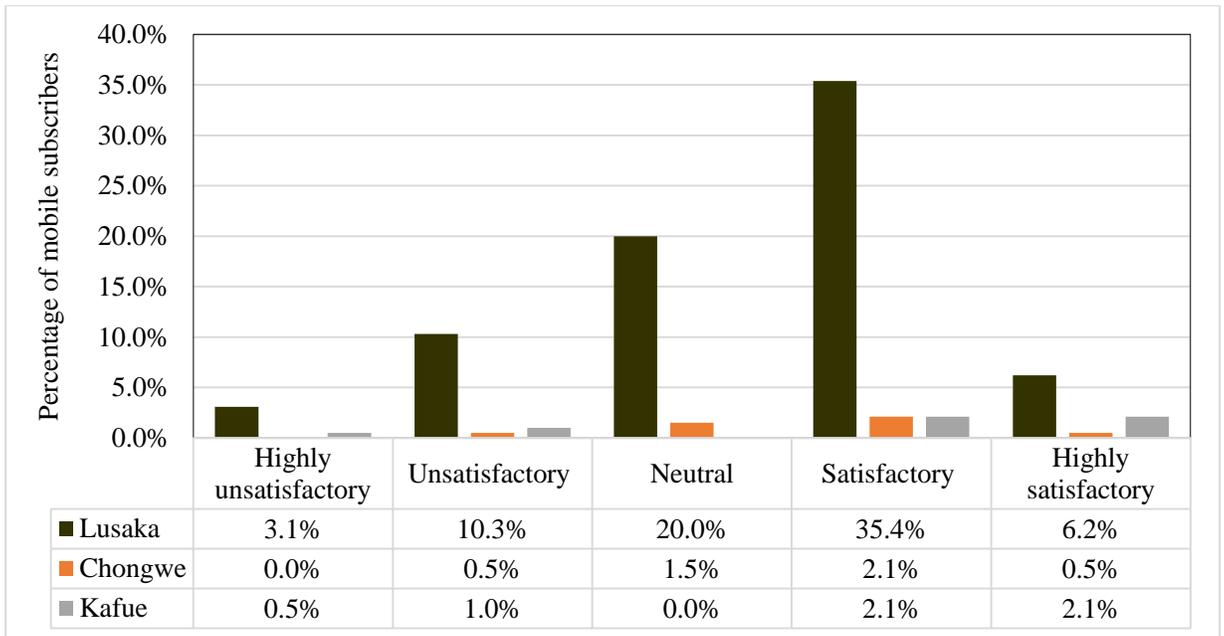


Figure 24: Telecom A QoE by location

Telecom A and B mobile service QoE in terms of Lusaka, Chongwe and Kafue locations is acceptable as the highly satisfied, satisfied responses are more than the

highly unsatisfied, unsatisfied responses (Ickin et al., 2012) as indicated in Figures 24 and 25.

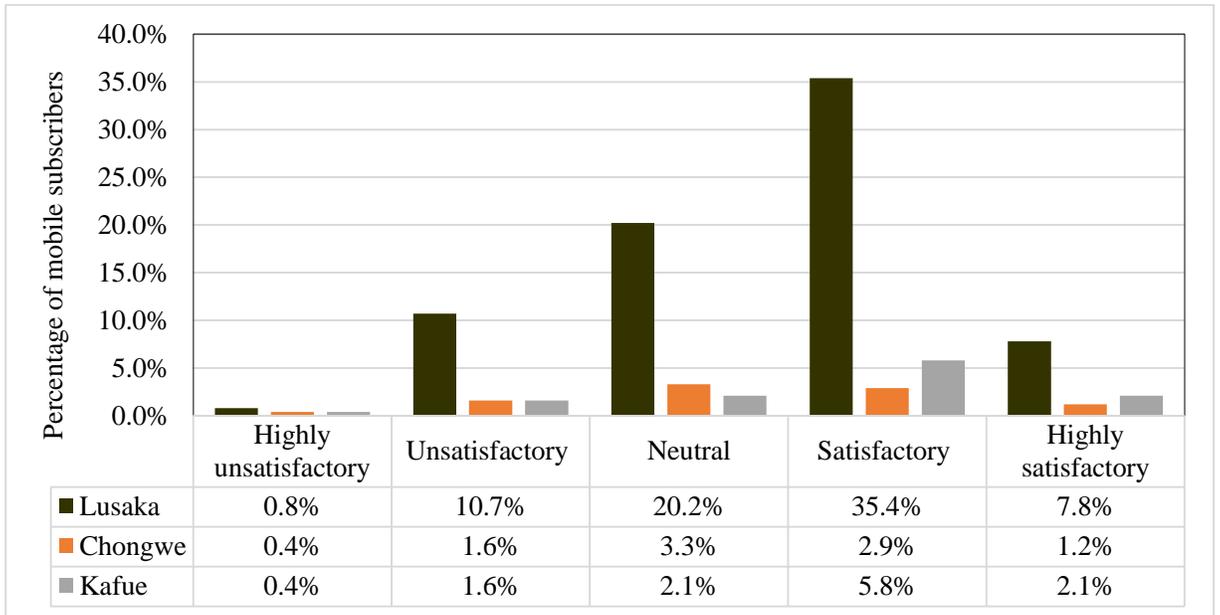


Figure 25 Telecom B QoE by location:

The research findings in Figure 26 indicate that the Telecom A mobile service subscribers who reported problems more than 3 times had the highest satisfactory responses at 28.2 percent. A similar situation prevailed among Telecom B mobile subscribers with the highest satisfactory responses at 26.3 percent as demonstrated in Figure 27. The findings further show that these respondents had all their problems resolved thus supporting the point stressed in the literature review about the quality of service offered in the event of product or service failure being a major customer influencing factor.

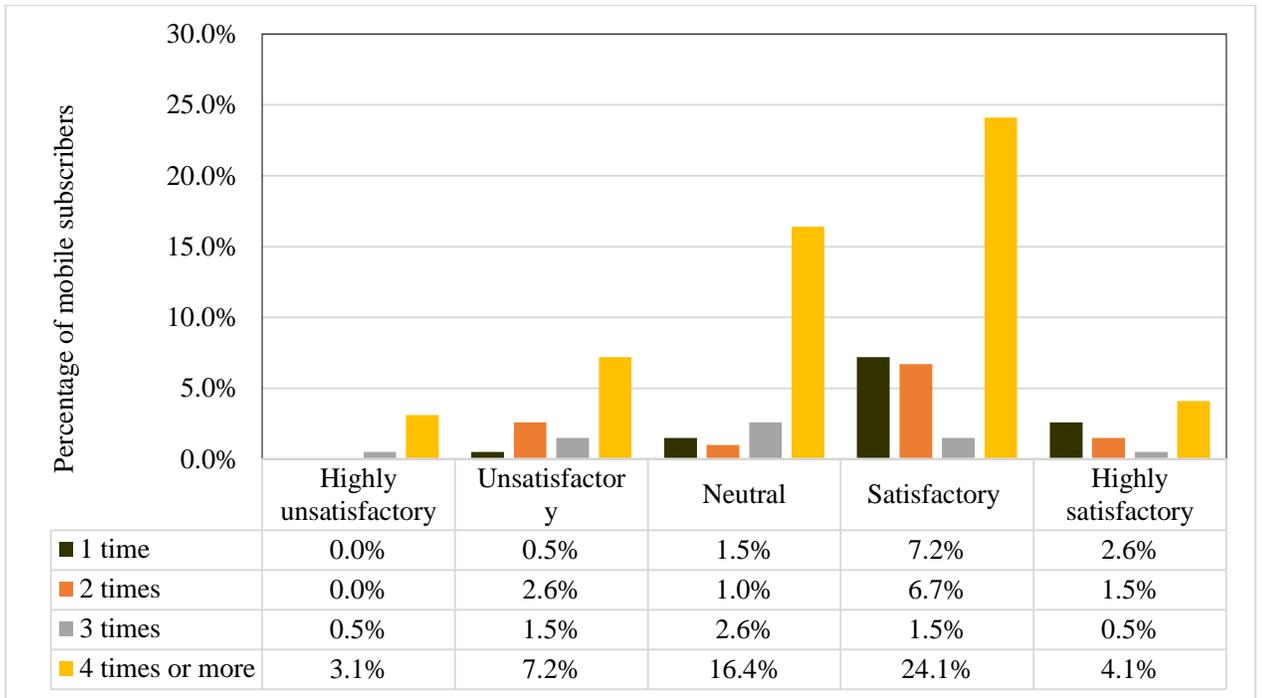


Figure 26: Telecom A QoE by frequency of fault reporting

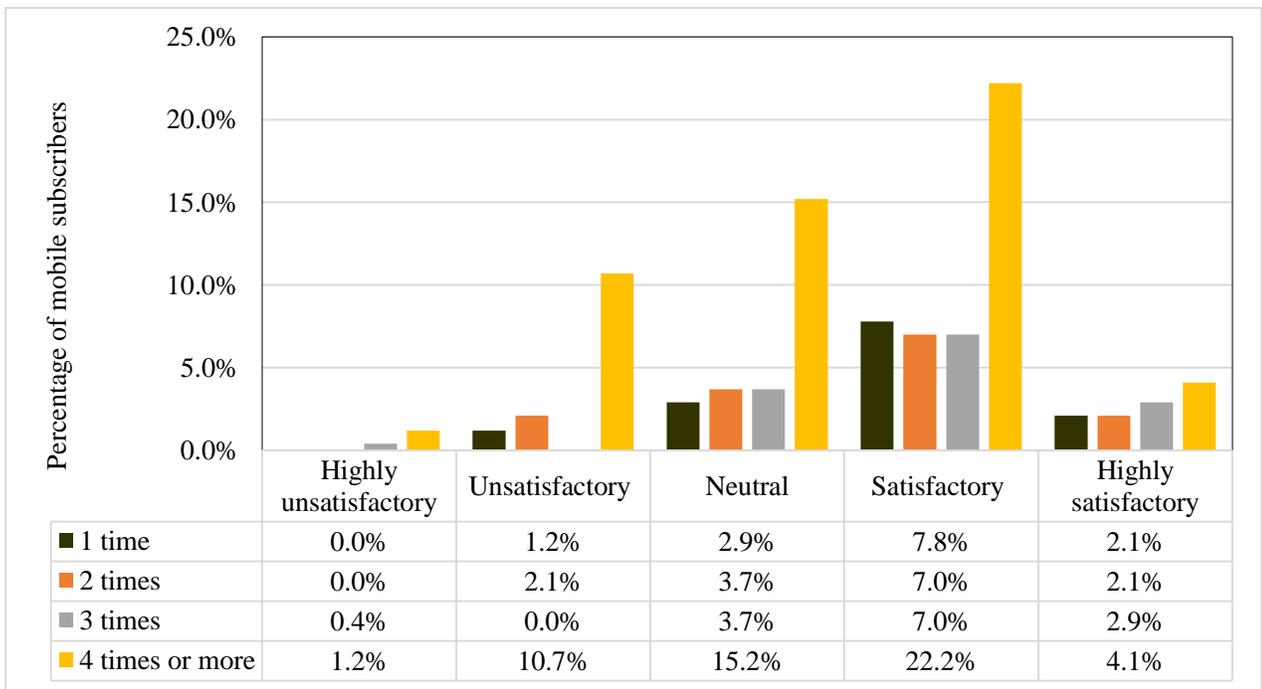


Figure 27: Telecom B QoE by frequency of fault reporting

About 14.9 percent of Telecom A and 3.7 percent of the Telecom B customers stated that they had never reported any faults or requested for information from their mobile service providers. Those who reported indicated their customer inquiry or complaint areas as shown in Figure 20. The percentages of customers whose faults were not resolved stood at 8.7 percent for Telecom A and 10.2 for Telecom B. No or poor signal was the highest problem reported not to have been resolved for Telecom A, while data bundles and failure to browse were the non resolved issues for Telecom B customers.

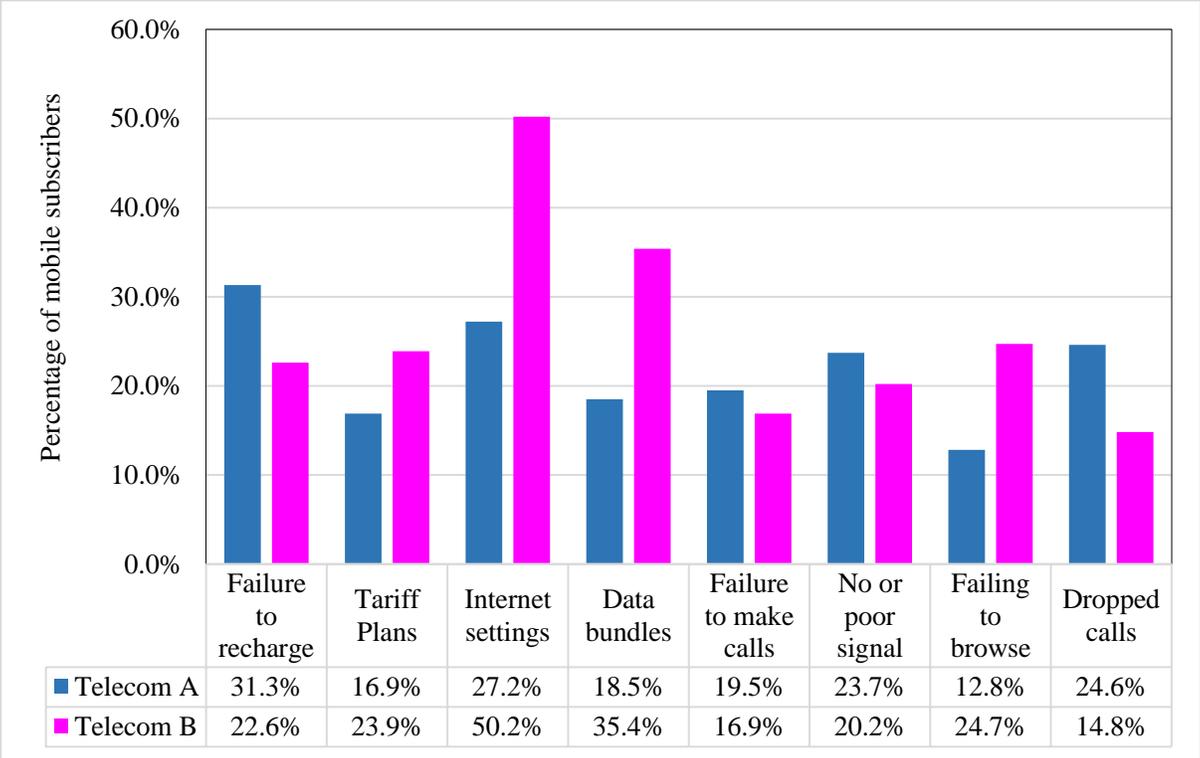


Figure 28: Customer inquiry or complaint types

In conclusion, the mobile service customers from both companies find their overall problem handling QoE acceptable as the highly satisfied, satisfied responses were more than the highly unsatisfied, unsatisfied responses. The mobile inquiry or complaint resolution experience for Telecom B was at 55.1 percent satisfied and highly satisfied customers and 15.6 percent for unsatisfied and highly unsatisfied customers. While

Telecom A was at 48.2 percent satisfied and highly satisfied customers and 15.4 percent for unsatisfied and highly unsatisfied customers as displayed in Figure 29.

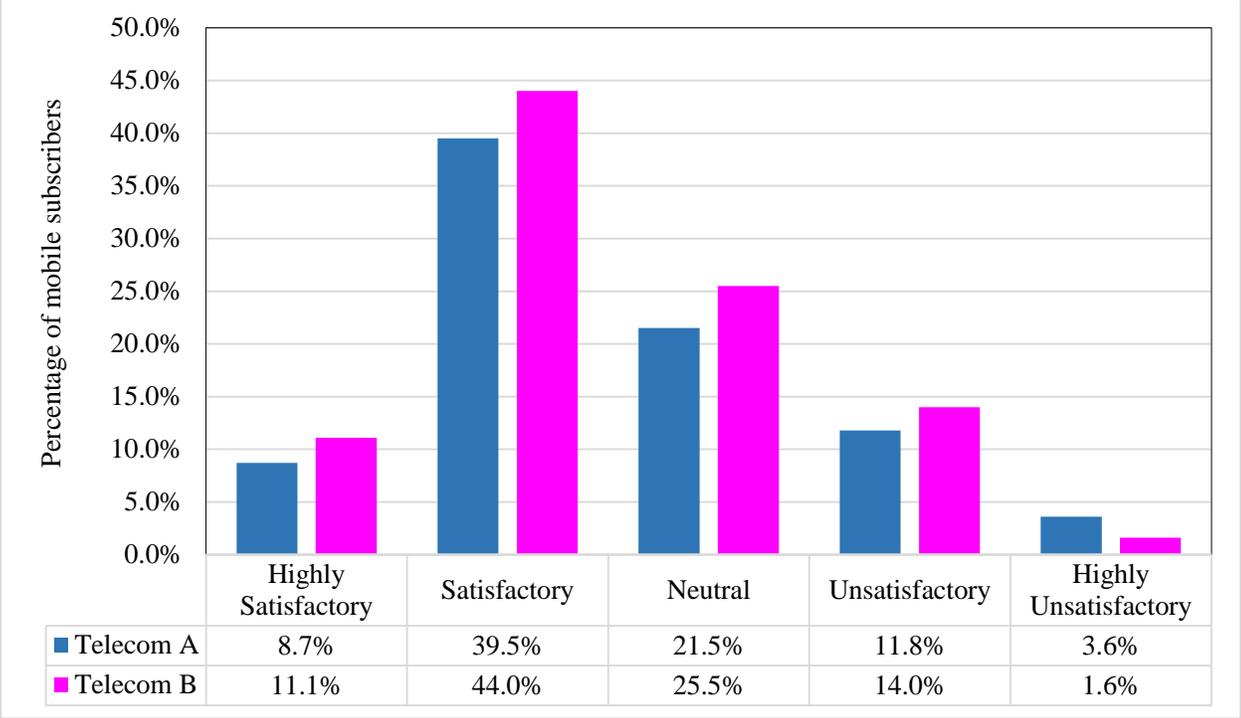


Figure 29: Overall mobile inquiry or complaint resolution customer experience

5.5 Summary

The findings revealed that the necessary processes under eTOM CRM problem handling were present in the Telecom Companies as well as adequate complaint channels. Delays in giving feedback and late resolution of customer complaints or faults were also observed to be affecting the customer quality of experience. On the overall, problem handling QoE among these telecommunication companies was found to be acceptable.

CHAPTER SIX: CONCLUSION AND RECOMMENDATION

6.1 Introduction

The purpose of this study was to identify gaps in the processes affecting the customer quality of mobile service experience in Zambian telecommunications call centers using eTOM. This was achieved by setting out specific objectives that were achieved as highlighted in the conclusion.

6.2 Conclusion

In conclusion, eTOM has been widely discussed in chapter 2 as a business process framework that supports different tasks connected with business process management. Among the framework's most significant contributions is its ability to create consistent end to end process flows, eliminating gaps and duplications in the process flows creating opportunity for cost and performance improvement. The business process framework also makes a standard structure and classification scheme for describing business processes. The objective on providing an overview of eTOM functions and its use in business process management was addressed by the literature review.

The second objective was to identify how a problem or complaint was reported, worked on and then reported back to the customer using eTOM. Thirty-one employees from two telecommunication companies were interviewed. The methods used were email surveys and interviews using the questionnaire in Appendix A. The study found that problems or complaints were reported through telephone as the major communication channel to the call center as discussed in section 5.3. These complaint records were then captured in a fault management system and tracked through follow ups with customers that entailed calling them to find out if their problems were resolved. Resolution of the mobile complaints was carried out by call center agents who made escalations to other departments for the more complicated faults that involved billing, VAS and the mobile network. The research established that customer feedback was being provided on the complaint or problem resolution through the available channels of communication more especially through the telephone.

The third objective was to find out what the gaps in the processes were based on eTOM.

In order to achieve this objective, it was necessary to first establish what process elements were needed for problem management in terms of mobile services in the call center. These process elements were identified and discussed under Operations Assurance in the literature review subsections 2.3.4 and 2.3.5. Problem to solution eTOM process flow was then mapped and used to identify gaps by comparing it with the problem handling process flows of the two telecommunications companies. The results of the research as discussed in subsection 5.3.9 show that the necessary processes for capturing, tracking and resolving of mobile service problems are present in both telecom companies. The difference for both companies as compared to the eTOM process flow is in the problem escalation flow from the call center to the other departments. While eTOM process flow has separate functions to handle resource and service problems, Telecom B has one department that handles these problems combined. Telecom A has two departments, however network problems are handled together with service problems unlike in the eTOM process where network problems are part of resource problem handling. The standard eTOM process elements are defined in these companies despite the disparity in how they are organized as eTOM does not constrain the way processes are implemented as discussed in section 2.3. Even though the processes for capturing, tracking and resolving customer mobile complaints or faults were present, some signs of weaknesses in these processes did exist. Such weaknesses were late resolution of faults and delays in giving feedback for both companies indicating some inefficiencies in the processes.

The fourth objective focused on finding out the current quality of customer experience being provided to the customers in the Zambian telecommunications call centers under problem handling. The aim of this objective was to understand the current experience being delivered to the customers and to establish where gaps existed from a customer viewpoint as explained in the literature review on section 3.2. Three hundred mobile subscribers from two telecommunication companies were interviewed. The methods used were email surveys, on line surveys and interviews using the questionnaire in

Appendix B. The QoE was measured in terms of the human, system and context factors highlighted in section 3.1. Gender and age were used under human factors, location and frequency of reporting were considered as context factors and Quality of interaction as to whether the faults reported were resolved as the system factor. The study discovered that the most dissatisfied and satisfied mobile service subscribers were between the ages of 30 to 39 for both companies. Satisfaction and dissatisfaction rates were higher among the males than the females. QoE in terms of the three district locations was acceptable. The results further point out that mobile service subscribers who reported more problems and had these faults resolved indicated the highest satisfactory responses. These results thus indicate that response to a problem has an impact on customer experience. Only 8.7 percent of Telecom A and 10.2 of Telecom B mobile subscribers had faults that were not resolved. Poor signal problem handling was the area where Telecom A needed to improve, while Telecom B needed improvement in the areas of data bundles and browsing failures.

In overall, the mobile service customers from both companies find their problem handling QoE acceptable as discussed in subsection 5.4.2.

6.3 Recommendations

Based on the findings of this study, the following recommendations are made:

1. Continuous process enhancement needs to be carried out in order to remedy the inefficiencies identified in this research and improve the business processes. One area to venture into is the introduction of Operational Level Agreements (OLA) between the call centers and the other departments in order to work on the late resolution of customer faults being experienced.
2. eTOM process framework be introduced and applied in the telecommunications industry in order to reap the benefits that it offers.
3. Many channels of communication to report problems were available but only the use of the phone is widespread hence the need for mobile service customers to be made aware of the other channels available.

4. Other studies need to be carried out on eTOM in areas such as Fulfillment, Billing and Operations Support and Readiness in Zambia in order to broaden the appreciation of its application.

6.4 Summary

The eTOM framework was successfully used to identify gaps in the processes affecting the customer quality of experience in Zambian telecommunications call centers. The study has applied the contingency theory by demonstrating the fit between the Zambian telecommunication environment and the eTOM problem handling business processes.

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APPENDICES

APPENDIX A: TELECOM EMPLOYEE QUESTIONNAIRE



THE UNIVERSITY OF ZAMBIA

QUESTIONNAIRE

Dear Respondent,

I am a student at the University of Zambia conducting a research regarding process gaps between Call Centers and Operations that affect customer quality of experience. This research is part of my course requirement.

Please fill in this questionnaire and add quality to this research. All information provided will be treated with strict confidence and will only be used for academic purposes. Also note that the identity of individual companies will not be disclosed.

INSTRUCTIONS:

Please tick or cross in the appropriate box provided for you next to the answer of your choice or write in the space underlined where your comment is required.

Thank You,
Kasweka Mbilikita.

1. Which of the following best describes your position within the Telecommunications Industry?

- Call Center Agent
- Call Center Manager
- Mobile Operations Manager
- Mobile Operations Engineer
- Mobile Operations Technician
- Other (please specify):

2. How long have you been working with your current company?

- Less than 1 year
- 2 to 4 years
- 5 to 10 years
- 11 to 15 years
- 16 to 20 years
- Other (please specify):

3. Please select your gender.

- Male
- Female

4. Please select your age.

- Below 18
- 19 - 29
- 30 - 39
- 40 - 49
- 50 - 59
- 60 - 69
- Above 69

5. Do you follow a process whether documented or not when you do your job?

- Yes
- No

6. Do you undertake surveys to determine the quality of customer experience?

- Yes
- No

7. What methods are used to gather information for the surveys?

- Face to Face Interviews
- Telephone Interviews
- Questionnaires
- Not Applicable
- Other (please specify):

8. If you answered yes to question 6, then select which areas of customer experience determined in the surveys, from the list. [tick all that apply]

- First Impression –greeting, kindness and politeness
- Ease of access - to information, to purchase, to inquire, to complain or to fix a problem
- Speed of access - Service Level Agreement (Waiting time in queue, problem resolution time)
- Quality of interaction – was the problem resolved or information obtained
- Feedback/ progress – on the problem or complaint communicated back to the customer
- Customer end to end or overall experience
- All of the above
- Other (Please specify):
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.....

9. How do you receive complaints or faults at the Call Center? [tick all that apply]

- Mail
- Email
- Phone
- Face to Face
- Facebook
- WhatsApp
- Other (please specify):

10. Once you receive the complaints or faults, do you offer a service to resolve the issue?

- Yes
- No

11. If you answered yes to question 10, who handles the Mobile faults or complaints? [tick all that apply]

- Call Center agents
- Mobile Operations Engineers

- Mobile Operations Technicians
- Other (please specify):

12. How do you get hold of personnel from other sections that need to work on the Mobile faults?

- Email
- Phone Calls
- Not Applicable
- Other (please specify):

13. Are Call Center agents trained in certain Mobile technical systems to resolve complaints or faults in the first instance?

- Yes
- No

14. What type of mobile faults or complaints do Call Center agents handle?

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15. Do you have set time frames in which Mobile problems are resolved?

- Yes
- No

16. Does the Call Center have set time frames with the other sections or departments for reporting back that the mobile complaints or faults have been resolved?

- Yes
- No

17. How long does it take for the other sections or departments working with the Call Center to report that Mobile faults or complaints have been resolved?

- Less than 2 hours
- Between 2 to 4 hours
- Between 5 to 7 hours
- Between 8 to 10 hours
- Not Applicable
- Other (please specify):

18. Does the Call Center track customer mobile queries or faults to see if they have been met?

- Yes
- No

19. If you answered yes to question 18, then how does the Call Center track customer mobile queries or faults to see if they have been met?

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20. Do you have a record system to capture customer mobile fault/complaint data?

- Yes
- No

21. If you answered yes to question 20, how does the record system used to capture customer mobile fault or complaint data work?

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22. Does the Call Center encounter any challenges with other departments or sections when addressing customer complaints or faults?

- Yes
- No

23. If your answer to question 22 is yes, then list any challenges faced with other departments or sections when addressing customer complaints or faults.

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24. Does your company have a process for correcting/resolving mobile service problems for customers?

- Yes
- No

25. If your answer to question 24 is yes, then specify how mobile service problems for customers are corrected or resolved?

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26. Does your company have a process for reporting the quality of customer experience on mobile service faults or problem handling to the other sections or departments that work on these problems?

- Yes
- No

27. If you answered yes to question 26, then specify how the quality of customer experience regarding mobile service faults or problem handling is reported to the other sections that work on these problems?

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28. Do you provide feedback on how you are tackling the customer's problem?

- Yes
- No

29. If there is a delay in resolving the mobile fault or complaint, does the Call Center contact the customer to explain why and agree on different timelines?

- Yes
- No

30. If you answered yes to question 28 or 29, then specify how the progress or feedback on customer mobile service problem reports or complaints is reported to customers?

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APPENDIX B: MOBILE SERVICE CUSTOMER QUESTIONNAIRE



THE UNIVERSITY OF ZAMBIA

QUESTIONNAIRE

Dear Respondent,

I am a student at the University of Zambia conducting a research regarding Mobile service customer experience. This research is part of my course requirement.

Please fill in this questionnaire and add quality to this research. All information provided will be treated with strict confidence and will only be used for academic purposes.

INSTRUCTIONS:

Please tick or cross in the appropriate box provided for you next to the answer of your choice or write in the space where your comment is required.

Thank You,
Kasweka Mbilikita.

1. Please select your gender.

- Male
- Female

2. Please select your age.

- Below 18
- 18 - 29
- 30 - 39
- 40 - 49
- 50 - 59
- 60 - 69
- Above 69

3. What is your occupation?

- Student
- Employed in Government
- Employed in Private Sector
- Self employed
- Unemployed

4. What is the range of your monthly income?

- K0 – K500
- K500 – K2, 000
- K2, 001 – K5, 000
- K5, 001 – K10, 000
- K10, 001 – K15, 000
- K15, 001 – K20, 000
- K20, 001 – K40, 000
- Above K40, 000

5. In which town do you stay?

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6. Which mobile service provider(s) do you subscribe with presently? (Choose all that apply)

- MTN
- Airtel
- ZAMTEL

Not Applicable (N/A)

7. How long have you been with the mobile service provider(s)? (Choose all that apply)

Mobile Service Providers	1 year or less	2 years	3 years	More than 3 years
MTN				
Airtel				
ZAMTEL				

8. How much money do you spend on the services of your mobile network providers per month (e.g. calls, sms, and data)?

Mobile Service Providers	K50 or less	K51 to K100	K101 to K250	K251 to K500	K501 to K1000	K1001 to K5000	Above K5000
MTN							
Airtel							
ZAMTEL							

9. Has your mobile service provider Call Center ever contacted you to request for your comments on the quality of experience in using their services?

Mobile Service Providers	Yes	No	Not Applicable
MTN			
Airtel			
ZAMTEL			

10. What areas of customer experience were you requested to comment on? Choose all that apply)

Areas of customer experience	MTN	Airtel	ZAMTEL
a. First Impression –greeting, kindness and politeness			
b. Ease of access - to information, to purchase, to inquire, to complain or to fix a problem			
c. Speed of access - Service Level Agreement (Waiting time in queue, problem resolution time)			
d. Quality of interaction – was the problem resolved or information obtained			
e. Feedback/ progress – on the problem or			

complaint communicated back to the customer			
f. Customer overall experience (e.g. from the time you report a complaint/fault to the time it is resolved)			
g. Not Applicable			
h. Other (please specify)			

11. How many times have you reported a fault or requested for information from your mobile service provider's Customer Care?

Mobile Service Providers	1 time	2 times	3 times	4 times or more	Never
MTN					
Airtel					
ZAMTEL					

12. What communication channels did you use to report your fault or request for information?

Mobile Service Providers	Mail (Letter)	Email	Phone	In person	Facebook	WhatsApp	N/A
MTN							
Airtel							
ZAMTEL							

13. What was the complaint/problem or inquiry on?

Problem area	MTN	Airtel	ZAMTEL	N/A
a. Failure to recharge				
b. Tariff plans				
c. Internet settings				
d. Data bundles				
e. Failure to make calls				
f. No or poor signal				
g. Failing to browse				
h. Dropped calls				
i. Not Applicable (N/A)				
j. Other (please specify)				

14. Were all the problems resolved to your complete satisfaction?

Mobile Service Providers	Yes by the mobile service provider	Yes by me or someone other than the mobile service provider	No the problem was not resolved	N/A
MTN				
Airtel				
ZAMTEL				

15. If you answered 'No' to question 14, then which problems were not resolved or why were you dissatisfied?

Problem area	MTN	Airtel	ZAMTEL
a. Failure to recharge			
b. Tariff plans			
c. Internet settings			
d. Data bundles			
e. Failure to make calls			
f. No or poor signal			
g. Failing to browse			
h. Dropped calls			
i. Not Applicable (N/A)			
j. Other (please specify)			

16. Were you aware who was dealing with your complaint at all times?

Mobile Service Providers	Yes	No	Not Applicable(N/A)
MTN			
Airtel			
ZAMTEL			

17. Did you know how to contact the person who was dealing with your complaint?

Mobile Service Providers	Yes	No	Not Applicable(N/A)
MTN			
Airtel			
ZAMTEL			

18. Did the person dealing with your complaint contact you to discuss the issues you raised?

Mobile Service Providers	Yes	No	Not Applicable(N/A)
MTN			
Airtel			
ZAMTEL			

19. If the problem was not resolved or a delay occurred in resolving your complaint/problem, did anyone contact you to explain why and agree on a different timescale for resolution?

Mobile Service Providers	Yes	No	Not Applicable – Not aware of a delay
MTN			
Airtel			
ZAMTEL			

20. Please indicate how you were contacted.

Mobile Service Providers	Mail (Letter)	Email	Phone	In person	Facebook	WhatsApp	N/A
MTN							
Airtel							
ZAMTEL							

21. How would you rate your overall mobile inquiry or fault resolution experience?

Mobile Service Providers	Highly satisfactory	Satisfactory	Neutral	Unsatisfactory	Highly unsatisfactory
MTN					
Airtel					
ZAMTEL					