An investigation into the challenges faced by a mobile service provider in meeting customer needs

by

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Declaration

I, Mr Omashan Vaughn Govender, hereby declare that this dissertation: An investigation into the challenges faced by a mobile service provider in meeting customer needs is my work except where indicated (in text and bibliography) and has not been submitted in part, or whole, at any other University.

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This research was conducted at the Durban University of Technology under the supervision of Dr S Govender and is approved for examination.

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ABSTRACT

The term “wireless network” pertains to a very comprehensive field and at different points in history, meant different things. For example, in 1901 it would have meant Marconi’s first transatlantic communication and later, to the walkie-talkie in the Second World War. Since the late 1940’s, large companies and emergency services have used wide area private networks which could also be catergorised as wireless networks. However, public consciousness of wireless networks only arose in the 1980’s through the commercial distribution of cellular mobile radio.

The telecommunications industry is experiencing a phenomenal revolution in which; the driving factors are innovative technologies, deregulation and globalization. Innovative technologies introduce dynamic changes in the way that telecommunication business is conducted. Deregulation is the liberalization of telecommunications which significantly increases the telecommunications market, while also allowing for strong competition amongst mobile service providers. Globalisation is the breakdown of legacy barriers which forces monopolistic service providers to compete in the international arena.

With service delivery being identified as one of the key components for a successful telecommunications service provider, along with the Quality of Service of their network, both components are evaluated to determine how efficient the organisation is within the mobile telecommunications industry. Telecommunications service delivery is a way of ensuring the Quality of Service delivered for outsourced and retained services. The responsibilities of the mobile operator include monitoring, analyzing and reporting on service delivery performance in order, to ensure that customer satisfaction is met or even exceeded by the mobile operator. The South African mobile telecommunication industry is experiencing phenomenal growth, just like the rest of the world. Over the last two decades, the South African mobile telecommunications industry has experienced dramatic changes. Fixed line service providers have expanded into the mobile arena. Mobile operators are trying to form mergers and purchase fixed line companies.

This study investigates the challenges faced by a mobile service provider in meeting internal customer needs. The Quality of Service (QoS) of the mobile network was evaluated and the various elements which contribute to challenges experienced by the service provider were identified. A mixed methods data collection method was employed for this study. To obtain the qualitative data, semi-structured interviews were conducted with management staff. Quantitative data was obtained through the use of questionnaires and an existing discourse analysis was conducted to identify characteristics on existing reports which were generated from within the organisation, for data collection.

The results showed that the mobile operators had to be innovative and competitive simultaneously. Mobile operators face various challenges. The increased level of competition amongst service providers ensured improved QoS and service delivery to consumers. The mobile operator's network foot print has to increase to provide its own network availability to clients. In order to avoid or reduce network sharing or roaming of network services as this comprises the client network coverage on the network. The mobile service provider should actively analyse network traffic to avoid potential disruptions and, to ensure that customers have a seamless connection.

This study concludes that the changing environment of communications forces organizations to consistently re-evaluate their strategies and necessary re-align their strategies to the business needs of the organisation. The initial planning entails making technology choices to meet the overall business goals. However, technology is changing at an exponential rapid rate; therefore the organization should reach the completion of the product life cycle to ensure that this product is still required in the market.

The main finding of this study reinforced the contention that planning is the most critical part of mobile network strategy. The organisation's strategy may change to accommodate environmental changes. However, these changes should not affect the life cycle of the blueprint design.

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Abbreviations

3G:	3rd Generation
3GPP:	3rd Generation Partnership Project
4G:	4th Generation
AfiCTA:	Africa Information & Communication Technologies Alliance
CSI:	Customer Satisfaction Index
CSM:	Customer Satisfaction Measurement
CSSR:	Call Set up Success Rate
DCR:	Dropped Call Rate
FTTH:	Fiber-to-the-home
FTTB:	Fiber-to-the-business solutions.
GSM:	Global System for Mobile communication
H LSM:	High Living Standards Measure
HSDPA:	High Speed Downlink Packet Access
HSPA:	High Speed Packet Access
ICASA:	Independent Communications Authority of South Africa
ICT:	Information and Communications Technology
ITA:	Information Technology Association
KMO	Kaiser-Meyer-Olkin
LLSM:	Low Living Standards Measure
LTE:	Long-term evolution
LTE:	A- Long-Term Evolution - Advanced

MBPS:	Megabits per second
MTSF:	Medium Term Strategic Framework
MS QUAL:	Multidimensional model for mobile telecommunication service quality
NDP:	National Development Plan
NFV:	Network functions virtualization
NPV:	Project Net Present Value
PQ:	Perceived quality
PV:	Perceived value
QoS:	Quality of Service
SP:	Strategic Plan
SDN:	Software-defined networking
SKA:	Square Kilometer Array
WCMD:	Wideband Code Division Multiple Access

CHAPTER ONE

INTRODUCTION

1.1 Introduction and Orientation to the study

Humans are the only species with a unique, sophisticated and rich form of communication - speech. Although communication was originally used as a method of ensuring cooperative work amongst individuals, it has gradually become entrenched in the human mind and is inspired by both business and social needs. Historically, all communication was face-to-face and people who shared similar values and interest would form villages or settlements. The invention of the telephone in the 1800s allowed for business and social networks to be maintained although people lived close to each other. It took almost 100 years to dramatically improve the fixed telephony network. The next great leap came with the introduction of mobile networks.

According to Al-Debei, El-Haddadeh and Avison (2008:4) being able to communicate from any location and at any time grants high levels of expediency and flexibility. It is undeniable that telecommunications and wireless networks and have brought unprecedented change to the manner in which business is conducted and in which people live their lives. This advancement in technology and the move to the third and fourth generation of cellphone services has gained popularity in research.

The introduction of cellular networks allowed people the flexibility of communicating by voice while away from fixed telephone lines, whether at the office or at home. The construction of the first generation digital cellular system was therefore based on the then prevalent designs in the fixed voice network, with specific extensions to add mobility (Charity and Wilton 2008: 10).

Globally, the mobile telecommunications industry is growing rapidly. Over the past twenty years, the market for mobile telecommunications has experienced the evolution from traditional mobile voice calls to the introduction of instant messaging, live video streaming, smartphones and a variety of tablets. Mobile telecommunications is evolving at a very rapid rate, with the demand for high speed data continuously increasing. Mobile telecommunications companies have to implement a very dynamic business strategy which can be easily implemented and adapted to the fast changing challenges that they encounter within their environment. Failure to do so will see telecommunication companies losing their competitive position in a highly aggressive industry, which will result in a loss to shareholders.

In South Africa, the market for electronic communications has experienced exponential growth and this trend is likely to continue into the foreseeable future. Electronic communication is undoubtedly the fastest growing industry in South Africa's economy. This is due to the speedy growth in broadband connectivity, mobile telephony and digital broadcasting. South Africa boasts of the most advanced communications network on the African continent (The Independent Communications Authority of South Africa Act 2006, (s2), (ss1)).

The South African telecommunications market has followed a transformation agenda based on the demands of its customers. Hence, mobile service providers have to meet the demands of clients by offering services that will distinguish them from their competitors. Customer satisfaction is of strategic significance in a competitive environment. If the levels of customer satisfaction are high in an organisation, there will be many benefits for that organisation. A company's financial performance is directly related to customer satisfaction, as evidence by many researchers (Gupta and Zeithaml, 2006; Smith and Wright, 2004).

Kim, Park and Jeong (2004:36) state service providers who have satisfied customers have a greater chance of longer relationships with these customers and the service provider has a higher possibility of being recommended to other users.

User satisfaction with a service is defined by the level of acceptance agreed upon by the customer. An evaluation of the mobile network can be done by retainability and accessibility, as well as by the experiences of the customer through the delivery of the service they have received. The capability of having a call connected without any interruption is defined as Retainability. When a user is trying to make a call and the system resources are not available, the ratio of rejections is defined as accessibility. Consumers have a right to settlement and hearing with regards to the lack of service delivery of the products and services rendered by the telecommunication service providers (The Independent Communications Authority of South Africa Act of 2006, (s2, (ss1)).

The viewpoint of Hugh *et al.* (2011:4), an organisation's business strategy has to be constantly evaluated. It is imperative for an organisation to identify how they should align their strategies in order to ensure competitive advantage. Business growth is critical to any organisation, therefore organisations should always strive to grow and improve its financials, customer service, service delivery and performance.

1.2 Background to the problem

According to the latest figures released by Statistics South Africa (2014: 29), the population of South Africa is around 49 million. A telecommunications survey indicating who had usage of telecommunication services within their households was also conducted. Nationally, 95% of households had access to either cellphones or landlines. Household landline usage was 0.2% in South Africa. This equates to 2.45 million South Africans not having access to telecommunications. By comparison, 81.9% of the households in South Africa have a minimum of one family member who has, uses or has access to mobile devices to make a call or access the Internet. Mobile communications access has connected more South Africans to telephony and has made it much more accessible to households to access the Internet.

Within the African context, South Africa possesses a dynamic and vibrant mobile market. With the number of mobile users increasing, competition amongst mobile service providers is becoming more aggressive. Traditionally, consumers only made voice calls but currently consumers utilize applications which require large data usage. The phenomenon of social media has exploded and all social media applications and platforms require large, fast and reliable internet connections (Forecast for the South African Telecoms Market 2013:1).

According to the National Information Communications and Telecommunications Policy (2014:39-41), four operators compete in South Africa's mobile market. The first two entrants to receive their mobile licences were Vodacom and Mobile Telecommunications Network (MTN). In 2001, Cell C was announced as the third mobile operator. In 2010, Telkom Mobile was announced as the fourth mobile operator in the South African mobile segment. This highlighted the importance of mobile networks, as mobile telecommunication is the future of telecommunications. Mobile service providers have to offer excellent QoS coupled with excellent service delivery as consumers have a choice of service providers and can easily move their business to another service provider.

Research evidence shows that QoS is perceived as the fundamental force in customer satisfaction by consumers (Kim *et al*. 2004; Zeithaml & Bitner, 2002). Mobile service providers have to ensure that customers have mobile services which are of good quality. In recent years, technological changes, globalisation, competition and increased customer demands have become major concerns for mobile telecommunication organizations. Technological factors overlap with that of organisational change and competition.

1.3 Problem Statement

Telecommunications is evolving at a very rapid rate, with the demand for high speed data continuously increasing. The dynamics of the telecommunications industry has changed dramatically in the last two decades. Disruptive competition and an uncertain regulatory environment are challenges facing telecommunications operators. Telecommunications markets and trends have changed as consumer behaviour continues to change.

Telecommunications companies have to implement a very dynamic business strategy which can be easily implemented and adapted to the fast changing challenges that they encounter within their environment. Failure to do so will see a telecommunications company losing its competitive position in a highly aggressive industry, which in turn will lead to a loss to shareholders. Telecommunications service providers face immense challenges to meet their customers' demands consequently, they have diversified their business models to expand their service and product offerings across different mediums. Mobile service providers have to offer services that will distinguish them from their competitors.

The South Africa Broadband Policy (2010:10) aims *"to ensure universal access to Broadband by 2019 by ensuring that South Africans are able to access Broadband either individually, or as a household, subscribe to a broadband service, or are able to access broadband services directly or indirectly at a private or public access point".* The South African government has identified the demand for technology and it has committed to providing service through the South African broadband policy. This has posed added challenges to mobile service operators who now have to meet the service delivery obligations of their customers, as well as those of government.

The Universal Service and Access policy of the South African Government requires all people to have access to basic communication services at affordable prices. The best form of providing telecommunication services to all parts of South Africa is via mobile communications due to the terrain and copper theft rate in South Africa, which makes fixed telecommunications very difficult to maintain (ICASA 2006:5).

Mobile service providers experience various challenges. These challenges are researched in this study in order to ensure the company's sustainability, profitably and dominance. An existing mobile service provider, which has a national mobile coverage presence, will be evaluated in this study.

1.4 Aim of the Study

The main aim of this study is to investigate the challenges faced by a particular mobile service provider in meeting customer needs. This study's purpose is to ensure that the customer services are not comprised in terms of the organisation's vision of service delivery within the mobile telecommunications environment Focus will be on internal customers who are staff of the organisation.

1.5 Objectives of the study

The following are the objectives of this study:

- To ascertain the extent of customers' need for a mobile network;
- To investigate the selected organisation's capability in meeting its customers' needs;
- To evaluate strategies that could address the factors hampering effective service delivery;
- To assess the impact of not meeting customer needs in the new mobile network; and
- To recommend future strategies for mobile telecommunications companies to implement in order to enhance service delivery;

1.6 Research questions

The study seeks to answer the following questions:

- What determines customers' expectations of a mobile network?
- What can the selected organisation do to meet customer needs?
- What strategies can be implemented to ensure effective service delivery?
- What is the impact on the organisation of failing to meet customer needs?
- What strategies can be implemented to improve growth and service delivery in mobile telecommunications?

1.7 Significance of the study

The research investigates the challenges faced by a mobile service provider in meeting customer needs. In this study, measuring service delivery will involve assessing the network and customers' experience of the mobile network, which will assist in determining whether the network offers a seamless connection between the sender and the receiver. Investigating the QoS and service delivery will also assist to establish the network's capabilities and will benchmark this to the original blueprint design of the mobile network.

The demand for mobile telecommunications has been on the increase subsequently, as users and devices become more advanced, the operating systems and applications that these devices utilise have placed pressure on mobile service providers. With instant messaging and social media platforms experiencing phenomenal growth, service providers face immense challenges to meet customer demands.

ICASA (2005:7) states that connectivity failure rates must not exceed 3% of all connections furthermore; the service provider must provide access and coverage of services within an area in which the licence was provided. Regulations are important as these recommend minimum requirements for subscribers and users (ICASA 2005:7).

ICASA's 2015-19 Strategic plan states that the Authority is steered by the Government's Medium Term Strategic Framework (MTSF) which shapes areas of importance in terms of socio-economic service delivery for every South African. The Strategic Plan is further impacted by the path of the National Development Plan (NDP) in relation to access to communications services and universal services; innovation and research development; broadcasting services and infrastructure; postal services and infrastructure; infrastructure sharing; and unbundling of the last mile (ICASA 2006:11).

ICASA's first mobile quality report was published in July 2011. The report states which found that current South African mobile service providers did not meet the majority of the minimum requirements for the Dropped Call Rate(DCR) and the Call Set up Success Rate (CSSR). In 2011, ICASA promised that it would conduct continuous testing on mobile network quality and publish the results of their findings on a quarterly basis. ICASA has indicated that some of the current mobile service providers have failed to honour service delivery agreements with the customers (Mobile Quality of Service report, 2011:1).

The South Africa Broadband Policy (2013:10) also states that the responsibilities of the authority towards realising this objective is to guarantee that broadband is made accessible to every citizen through the development of a radio frequency spectrum strategy for fixed mobile and wireless broadband access. During his 2015 State of the Nation address, President Jacob Zuma stated that 2015 would mark the commencement of the first phase of the government's broadband roll-out initiative. Therefore, this investigation becomes urgent because the government will select an organisation which will be the chosen lead agency to support the roll-out.

1.8 Research Methodology

Leedy and Ormrod (20012:12) define research methodology as “the general approach the researcher takes in carrying out the research project”. A researcher collects data; analyses and interprets this data; and makes meaning of the data. This helps increase the understanding of the phenomenon.

The objective and aim of this research are to establish the relevant challenges faced by a mobile service provider in meeting customer needs. The internal customers, which are the staff of the organisation, were selected to participate in this study. Internal staff currently utilise the mobile network to conduct their daily activities.

A mixed data methods approach was used for this study. Quantitative and qualitative data methods were employed. Employees from within the organisation, the internal customer, were used.

Leedy and Ormrod (20012:12) say quantitative research is a highly structured, vigorous, systematic process for generating information, and for the collection for primary data. Quantitative research comprises the identification of experimental occurrences or the possibility of exploring multiple occurrences. The quantitative approach uses a systematic process to obtain numerical data in a structured, objective and formal manner.

According to Kumar (2009:129), the data collection instrument must be formal, objective and systematic. A survey was conducted amongst junior managers and operational staff in order to obtain the quantitative data. To obtain the qualitative data, five managers were interviewed using semi-structured interviews.

This study compared internal customers' (staff) experiences of the mobile network against the QoS that the service provider had provided. Internal customers who are staff were used as the sample. Although the internal customers were staff, it was made clear to them that the purpose of the research was to strengthen the organisation's mobile offerings. They were advised not be biased towards the organisation. Participants were also free to describe the experiences and problems associated with the mobile network as they were advised that anonymity and confidentiality of all the information gathered will be managed by the company's systems administrator. No employees are identified or victimised in any way for participation in this survey. The research design accommodates all ethical requirements.

1.9 Clarification of key terms

- ***Quality of Service***: measures the service received from the mobile operator.
- ***Mobile telecommunications***: telecommunications that let the user connect equipment without a physical connection.
- ***Service Delivery***: is the level of service that the mobile operator provides to their clients.

1.10 Organisation of the study

The study follows the structure below:

Chapter 1: Introduction

This introductory chapter encapsulates the orientation of and introduction to the study. Chapter one highlights the problem statement; aim of this research; significance of the study; research questions; research objectives; research methodology, and clarification of key terms and the study's orientation.

Chapter 2: Literature review

Existing literature in the mobile telecommunications field is reviewed in this chapter, as well as the existing shortfalls of technology. This chapter also highlights the evolution of mobile technology and the demands that our current lifestyles has place on mobile telecommunications technology. The chapter also describes broadband initiatives, regulatory standards, mobile operators and globalisation.

Chapter 3: Theory and Models of a Mobile Operator

Chapter 3 evaluates the theory and various models used to evaluate Quality of Service and service delivery of a mobile operator in meeting customer needs. This chapter also highlights the various standards associated with mobile telecommunications.

Chapter 4: Research Methodology

The research method used for this research and the reason why this method was used is discussed in this chapter. A mixed methods research design is the preferred design model for this study. A qualitative element is incorporated into the primary quantitative study because the mixed method model is reported to fulfil the need to generalize and show the descriptive power of narrative.

Chapter 5: Research Findings and Analysis

The data collected from the sample population analysed in this chapter. Statistical analysis is used based on the frequency counts of customer experience and usage on the mobile network. Quantitative data is represented through techniques such as Chi-square and Pearson correlation. Qualitative data is analysed through interpretive data analysis and reports were generated.

Chapter 6: Conclusions and Recommendations

The results of this research and the recommendations provided on the improvements to the mobile operator are contained in this chapter, which elaborates on the key enablers that will assist the organisation to improve their QoS and service delivery offerings to their customers. Recommendations have been made to improve the organisation's QoS and service delivery to their clients.

1.11 Summary

This introductory chapter provided a broad overview and orientation to the study whilst also identifying the problems associated with this study. This chapter highlights the importance of the study on the advancement of technology and on how mobile operators have to incorporate these changes in order, for them to ensure their survival and dominance in the industry.

With technology changing at a rapid rate, the South African government has identified the importance of communication and has committed to various telecommunications projects, one being the broadband policy which is to roll out affordable broadband by 2020.

The concept of service delivery and Quality of Service are explored within the mobile organization as these are crucial elements within an organization. The critical components will be identified and evaluated in order to ensure the enhancement and sustainability of the mobile network.

The next chapter will expand on the literature review of this study. Literature will be reviewed on what has been done in relation to service delivery and the QoS of mobile operators.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a synopsis of the literature used to relate to the challenges encountered by a mobile operator in measuring the QoS and service delivery of the selected organisation. With the encapsulation of elements that have a fundamental impact on the factors that influence QoS and service delivery, various components that contribute to the QoS and Service delivery of a mobile operator will also be evaluated. The use of existing literature; books, journals, online sources, government publications and what other authors have contributed to this topic will be explored in this chapter.

The evolution of mobile technology and the demands that our current lifestyles have paced on mobile telecommunications technology coupled with the existing shortfalls of technology with also be explored in the chapter. Factors that influence mobile telecommunications such as competitive strategies, revenue generated within the mobile environment, broadband initiatives, regulatory standards, competitiveness of mobile operators and globalisation will be explored in this chapter.

2.2 The ICT Industry within South Africa

The Communications Guide of the Republic of South Africa (2012/3: 2-6) states that the South African information and communications technology (ICT) sector generates approximately 7% of gross domestic product. The mandate of the Department of Communication's is to construct an encouraging ICT environment which must ensure that South Africa has the ability to advance their socio-economic development objectives and support development in Africa. This mandate gives the department the power to lead government initiatives that will close the digital gap and give all South Africans universal access to ICT services.

The Communications Guide of the Republic of South Africa (2012/3: 2-6) states that the ICT industry in South Africa contributes 0.5% to the international ICT revenue. The building of a knowledge society and digital era has been prioritised by the department through three of its flagship programmes.

The Communications Guide of the Republic of South Africa (2012/3: 2-6) states that there is a need to expedite the building of modern digital infrastructure and the policy reform that will place the country strategically as an advanced knowledge economy by 2030. Such programmes include:

- The development of an integrated national ICT policy;
- A rollout of a nationwide broadband network; and
- The execution of the digital broadcasting migration policy.

2.3 Service delivery

According to figures from Statistics South Africa (2014:45), communication organisations in countries, improves market share by evaluating their competitors. South Africa is no exception. The Customer Satisfaction Index (CSI) or Customer Satisfaction Measurement (CSM) are instruments that used to evaluate competition amongst competitors. The CSI model is a structured model founded on customer satisfaction assumptions of perceived value (PV) and perceived quality (PQ), which are factors on which customers evaluate a company's image. Customer satisfaction is based on these elements. CSM is used to evaluate customer satisfaction.

2.4 Quality of Service

The sequence and extent of network rollout can have a major impact on project profitability. Addressing regions of high population density first can maximize potential revenue for the minimum infrastructure investment (Charity and Wilton 2008: 45).

This attractive result arises both because the area to be covered is minimized and also because this same area is likely to contain a high percentage of businesses, which are typically early adopters. This initial phase is usually followed by a coverage of regions where large numbers of people live and work (Charity and Wilton 2008: 46).

The selections pertaining to applications that are supported by the network as well as the QoS offered have a great impact and influence on network projects' profitability. Considerable attention must therefore be paid to the way in which coverage is rolled out if the project 'payback' period – the period that must elapse before the initial investment has been recovered through annual cash flows – is to be kept short. This 'payback' period, or the more comprehensive Project Net Present Value (NPV), which reflects the current value of a series of projected future cash flows at a specified discount rate, are the key metrics in assessing whether a particular project is viable. A change to the 'payback' period, direct influences the organisation strategy (Charity and Wilton 2008: 58).

2.5 Evaluating an Organisation's Strategy

Johnson, Whittington and Scholes (2011: 3) state that strategy is the direction that the organization will take in the long term. An organisation must fulfill all levels of its strategy, namely corporate, business and operational strategies. Corporate organisations must declare strategy statements to all of their shareholders. In today's dynamic environment, organisations have to continue to evaluate and benchmark their strategy to the Exploring Strategy Model (ESM) in order, to ensure their survival and dominance in their industry. A single strategy can no longer be defined for an organisation's entire existence. As an organisation's strategic position changes, its strategy should change. These attributes comprise of the organisation's environment, purpose, culture and capability.

The business prospects of a company have to be periodically evaluated by (Hugh, et *al*. 2011:4). The imperative question to management is “How should they align their strategies to ensure competitive advantage?” In order for a company to proceed in their intended direction, a continuous strategic outlook has to be developed to always grow the business and refine their customer services, service delivery, financials performance and processes.

Kim and Kettinger (2012:91) contend that the South African mobile telecommunication industry will experience significant challenges due to dynamic changes. Firstly, it has become costly and very difficult to retain existing customers in a market which has a high churn. Secondly, there is a great deal of difficulty in the acquisition of new customers as prospective subscribers are spoilt for choice in the perceived Quality of Service and performance they would receive from their service providers as their service providers offer various deals that are be highly competitive.

With service delivery being identified as one of the key components for a successful telecommunications service provider, the other component being the Quality of Service of their network, both components will be evaluated to determine how efficient the organization is within the mobile telecommunications industry (Martines and Martines, 2010: 100).

Service delivery has two distinct dimensions that identify service delivery, functional and technical quality. Functional quality is the effect of the communication procedure or how the distribution procedure and the service production are perceived. Technical quality is defined as the meeting of customer’s core service expectations. (Martines and Martines, 2010: 101).

2.6 Evolution of Mobile Technology

Sterwart (2009:20) is of the view that mobile telecommunications systems are rapidly evolving to ensure broadband service delivery to the end user. Long-term evolution (LTE) is the technology being developed to help achieve this objective. It is not just high performance and data rate improvements that characterise this evolution but also the important factors of simplicity, cost and efficiency. These additional factors are of the utmost importance to developing nations, where the future growth in mobile penetration will be at its highest. LTE will provide a cost-effective solution, founded on the principles of robust standardisation and rigorous testing, all of which are derived from a clear understanding of the industry's requirements.

The Advertising Standards Authority of South Africa (2016:1) ruled that mobile operators cannot claim to offer 4th Generation (4G) mobile services without proving it, following certain operator's claims at the time that it's 21 Megabits per Second (Mbps) High Speed Packet Access (HSPA) network was 4G. With mobile service providers arguing over the definitions of their mobile broadband offerings, it is understandable that consumers may be unsure as to what the differences are between technologies. The 3G and 4G labels you see on your smart phone display refer to 3rd Generation and 4th Generation mobile technologies. Long-Term Evolution - Advanced (LTE - A) and High Speed Downlink Packet Access (HSDPA) are also mobile broadband technologies. As mobile broadband infrastructure improves, including faster data transmission speeds, wireless data standards developed over time are grouped into these generations. Standards like LTE, HSPA+, and EDGE fall within these generation categories based on their data transmission speeds and when they were developed. The 3rd Generation Partnership Project (3GPP) oversees cellular telecommunications network technologies and provides specifications on the different mobile broadband standards.

The table below details the various mobile generations based on 3GPP's definitions.

Mobile telecommunications technology	
1G	Analogue technology, from the 1980s onwards.
2G	Introduced voice, SMS, and data services. GSM/GPRS, CDMAOne, PDC, iDEN, IS-136 or D-AMPS, EDGE.
3G	EDGE Evolution, CDMA2000 1X/EVDO, HSDPA (3.5G), UMTS-HSPA+ (3.75G), and LTE (3.9G).
4G	LTE-Advanced.

Table 2.1: Various mobile generations. What the difference is between 4G, LTE, 3G

Source: My Broadband (2016:1)

2.7 Revenue of top ICT Companies in South Africa

In order for businesses to ensure their sustainability, various forms of strategic coalitions, acquisitions and mergers have had to be accommodated between some companies. Service providers have improved their market share by embracing the technological revolution through incorporating applicable models. The South African government has highlighted this as one of its critical objectives in the national broadband policy. A combined entity facilitates superior business services, this allows for a strong challenge to other service providers.

A recent report by the GSMA predicts that mobile data usage in sub-Saharan Africa to move from under 40 petabytes per month (one petabyte = one million gigabytes) in 2013 to approaching 800 petabytes monthly in 2019. This would mean that data usage would increase twenty times over in just six years. Despite the boom in mobile data usage, fixed line connections are a great hindrance. (How much money does South Africa's top telecoms companies and ISPs make? My Broadband 2015: 1).

In order for South Africa to keep up to developing countries, fixed broadband penetration needs to be taken from the current level of 7% of every household to about 75%, as is the case in the United States, major European economies and Japan (How much money does South Africa's top telecoms companies and ISPs make? My Broadband 2015: 1).

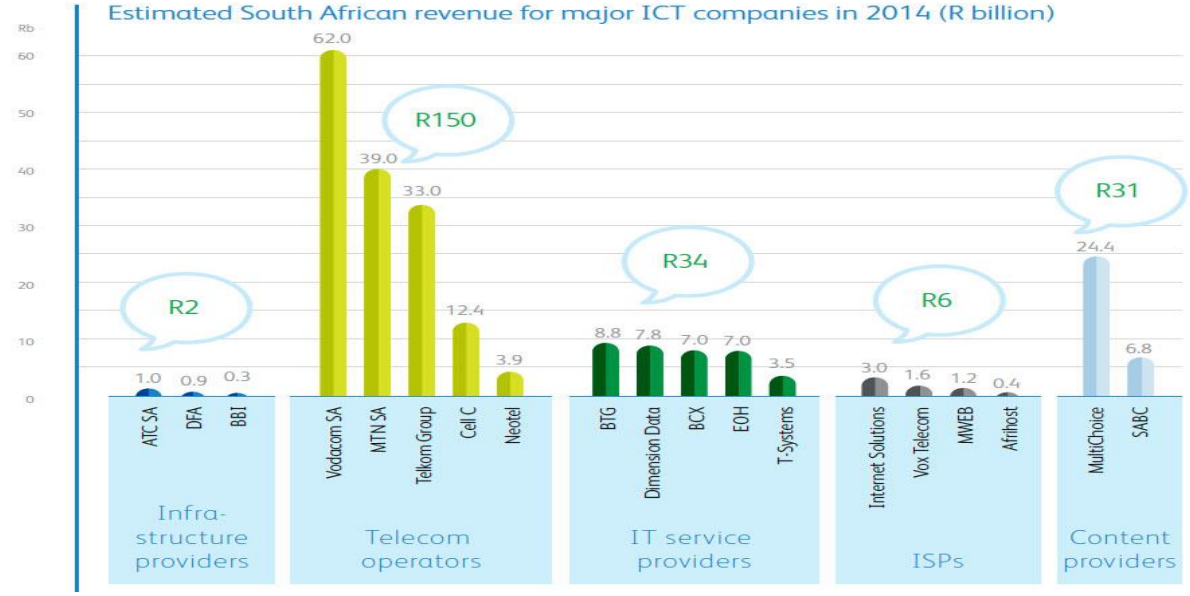

Figure 2.1: Estimated South African Revenue for major ICT companies. How much money South Africa's top telecoms companies and ISPs make Source: My Broadband (2015:1)

2.8 Broadband Initiatives

As reported in the White Paper of South Africa (2012:2-3), one of the greatest challenges to an organisation is that faces a great deal of competition and needs to differentiate itself and its product offerings from those of competitors. Service delivery is one method that can be utilised to differentiate a company from its competitors. The organization can increase its revenue streams and profitability through building customer loyalty by providing consistent and high quality services which will considerably create a competitive environment and discover new avenues to distinguish the product or the organisation. Constantly providing high customer satisfaction levels by successfully providing constant services of high value does not only build trust and customer loyalty, but also would enhance profitability and increases revenue streams significantly.

Telecommunications service organisations can offer customers a variety of services depending on the demands of the customer, organization maturity and service approach. Therefore, service delivery can be defined in a number of ways such as customer services, network coverage, network capability, bandwidth offering and globalisation. For the period 2009 to 2012, Statistics South Africa (2014:29) revealed that the Department of Communications committed to an annual enhancement of 25% with regards to the availability quality, cost and usage of communications and information technology, with the aim of developing the industry into conformance to the rest of the world by 2014. The fixed line telephone industry has been experiencing a decline instead of an increase over the past few years. The industry has experienced a 12% decline in fixed telephone lines from 2001 to 2012. This decline is attributed to consumers migrating to mobile service providers. Cellular phones have the advantage of being mobile and have an easier connection and prepaid billing system, which favours the lower subscriber market earning patterns. The decrease in fixed lines services highlights the problems encountered in the fixed line industry, which contribute to pull factors in mobile technology. There has been little growth in fixed line services. However, mobile services have experienced substantial growth, which is perhaps the reason why South Africa has experienced a net improvement of prices in telecommunications.

During the third edition of the Africa Information and Communication Technologies Alliance (AfiCTA) summit held In Braamfontein, Johannesburg on 2 September 2015, The Information Technology Association (ITA) stated that this is the era of the Internet. This is only the beginning of South Africa's digital story. At ITA it is believed that building a connected continent with an efficient and stable infrastructure will lead to the improvement of lives, even in the most impoverished regions of Africa. Through the collaboration of business and government, ICT leaders in Africa are realizing ways of improving the lives of people on the African continent. Durban winning the bid to host the 2022 Commonwealth Games, and also South Africa being involved in the Square Kilometer Array (SKA) project, is an indication that the African continent is alive with opportunity.

2.9 Regulatory Standards

Postal services, broadcasting and South Africa's communications are controlled by the regulator, ICASA. ICASA has the legislation to control licence agreements with licence conditions and terms; advance three sector regulation; manage and plan the radio frequency spectrum; and forecast customers to use these services. ICASA's policy (2009:7) stated that ICASA's functions include:

- Signal distributors, licensing broadcasters and telecommunications and postal services providers;
- Deciding of regulations;
- Imposing license conditions;
- Controlling, enforcing, planning, assigning and management of the frequency spectrum;
- Ensuring the inter-operability of networks; and
- Receiving and resolving complaints.

According to Charity and Wilton (2008: 4), the introduction of new regulations would affect future mobile operators. Consequently, this will inspire mobile operators to regularly review legacy equipment with a modern network which is more spectrally effective. More revenue is generated when the existing spectrum is more efficiently utilised. By the same token, if a similar air interface would be able to share bandwidth channels with minimal equipment changes, operators would benefit both financially and technologically (Charity and Wilton 2008: 4).

The objectives for these new operators are fundamentally mutual to these regulations as they:

- Guarantee that all user requirements are met;
- Enhance the economic advantages of spectrum ;
- Stimulate the usage of the spectrum through effective technologies; and
- Identify new avenues of ensuring the availability of additional spectrum (Charity and Wilton 2008: 4).

The new regulatory environment is less stringent and is characterised by:

- Market-driven allocation(spectrum auctions);
- Technology neutrality(subject to interference from management);
- Only the broad use designation(generally in line with the ITU);
- Autonomy to trade some or all of the licensed spectrum with others; and
- The ability to sub lease spectrum for secondary applications (Charity and Wilton 2008: 4).

According to My Broadband (2016:2), In South Africa, the shortage of the radio frequency spectrum is stifling broadband expectations. The South African government has been delayed in the rollout of its digital broadcast migration project which would make available more frequencies. This would have made way for 4G services which would provide quicker mobile internet services.

According to My Broadband (2016:2), since 2008, the South African government has missed many deadlines for the distribution of free digital TV set-top boxes and has only managed to distribute a couple of thousands from its 5 million target? For now, there is no completion date available for this process. In the meantime, mobile networks operators are optimizing their current spectrum for LTE service delivery. The dependence on mobile data is high in the country, which is critical to allow a greater spectrum to be made available, and to meet the high demands made by the population.

According to My Broadband (2016:2), an invitation has been issued by ICASA, to request for additional highly contested spectrum. South African network operators have been clamoring for spectrum to be issued to expand their high-speed LTE networks. Radio frequency spectrum from the complementary bands IMT700, IMT800 and IMT2600 form part of the invitation in which operators can apply.

According to My Broadband (2016:2), ICASA said the spectrum must be used to deliver mobile broadband wireless access services for rural and urban areas. Spectrum in the allocated bands – the 700MHz, 800MHz and 2,600MHz ranges – will be assigned in five lots, as illustrated below. Each lot will have a reserve price of R3 billion, with lot A not available in the current invitation to apply. The tables below indicate the different spectrums that will be made available.

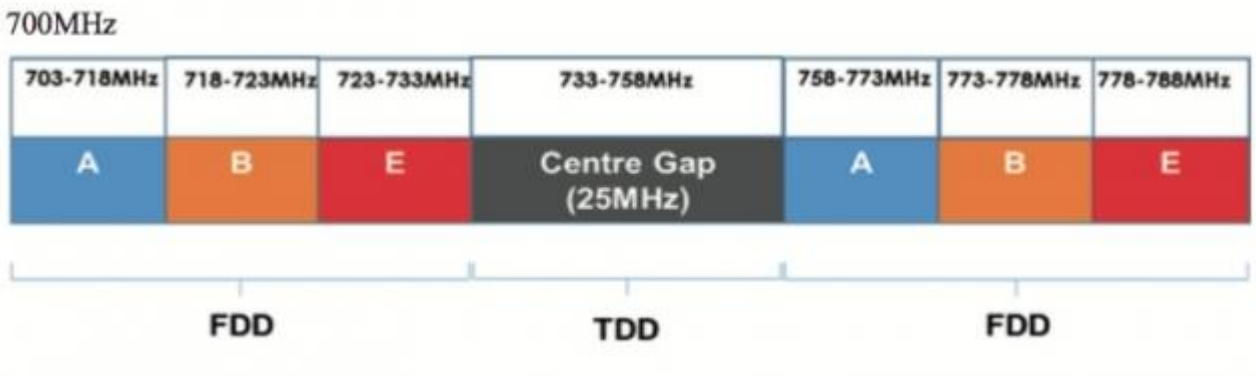

Table 2.2.1 700 Mhz Frequency Spectrum Allocation Breakdown

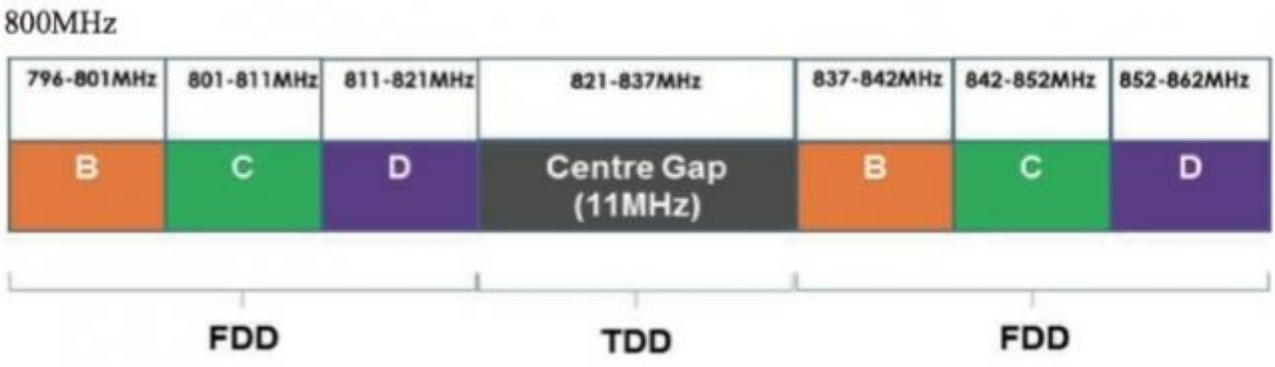

Table 2.2.2 800 Mhz Frequency Spectrum Allocation Breakdown

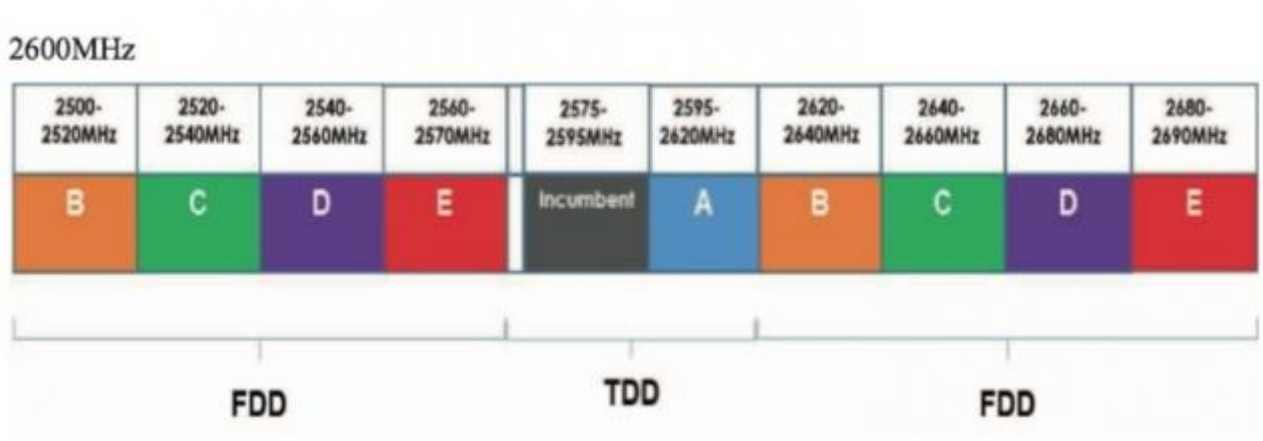

Table 2.2.3 2600 Mhz Frequency Spectrum Allocation Breakdown

Table 2.2 Frequency Spectrum Allocation Breakdown

Source: My Broadband (2016:1)

Qualifying operators will have to bid on the spectrum they want. Applicants will only be allowed to bid for one of the lots – B, C, D, or E. Lot A will be awarded through a separate process. Interested parties have until 15:00 on 3 October 2016 to submit their applications. Those who qualify for the bidding stage will be announced on 30 November 2016. ICASA hopes to announce the results of the auctions by 31 January 2017 and issue the licences between 14 and 28 March 2017 (My Broadband 2016:2).

2.10 Mobile Operators

According to Charity and Wilton (2008: 3), existing mobile operators will ensure their sustainability in the face of the decrease in mobile voice services by proposing a “one stop shop: for all the user’s telecommunications needs”. With acquisitions and mergers occurring within the industry, the operators can provide services such as application base across TV and common content, mobile systems and fixed internet systems also called “quadruple play”. Through the integration of content and communication charges occurring in a single bill, this attractive package creates a perception of offering a discount to end-users (Charity and Wilton 2008: 3).

For a new mobile service provider, the provision of high revenue margins will reduce churn-through customers, which will provide prospects for increasing profits in the long run. With the expectations of a fresh and supple charging structure, this will be centered on a combination of many metrics such as 'QoS', 'convenience' and 'content value' (Charity and Wilton 2008: 4).

Sidler (2016:1) states that the advancement of technology is currently upsetting established business models and industries, as well as generating prospects of new opportunities in established and new markets. "To compete in these markets, speed is everything". "Whether you want to roll out new content expand geographically, introduce new applications or develop a business model for a new customer segment, you need to act fast"; "Success will be measured by how fast you can enter a market, establish a leadership position and capture improved profitability early on".

According to Cullen (2016:7), "When you're a digital business with the network at the center of your innovation, you need to move rapidly wherever the market is going. The technology you choose is the platform for your business success, so choose wisely".

Cullen (2016:2) emphasizes that you need to continue to innovate, dream up new things and get them to your customers quickly. "It's OK if every effort isn't successful. Quickly move on and repurpose any technology investments you may have made." The major challenge for service providers today is their networks, as most were built for another era, when launch speed wasn't a priority. "To take advantage of new and emerging opportunities today, you need to migrate to a much more flexible network." Such a network should operate more efficiently at a lower cost and by being simpler to manage. Modernizing your network prepares you to compete amidst the intense global competition for markets and consumers. Innovations like software-defined networking (SDN); network functions virtualization (NFV); and open-source software make it possible to act on opportunities faster. Cullen (2016:2) state "You'll deliver cost-effective services, get them to market more rapidly, and lower the cost of your customer acquisition".

During the annual My Broadband Cloud and Hosting Conference in Sandton held on the 25 May 2016, guest speaker of Connection Telecom, MD Dave Meintjes stated that, “Mobile call volumes saw massive growth between 1995 and 2010”, with voice calls decreasing and mobile messaging and Voice Over Internet Protocol services on the increase. Traditional circuit-switched voice calls are declining rapidly, with VoIP and mobile messaging services taking over as the preferred method of communication. “Looking at the last 20 years for international voice terminated traffic, we saw an acceleration of volumes with the adoption of mobile voice,” said Meintjes. He stated that mobile voice yielded massive growth during the period 1995-2010, but this growth hit a ceiling in 2013, and is now flat. “Year-on-year growth declined to next to nothing in the last two years.” While traditional circuit-switch voice volumes declined, VoIP traffic saw strong growth in recent years.

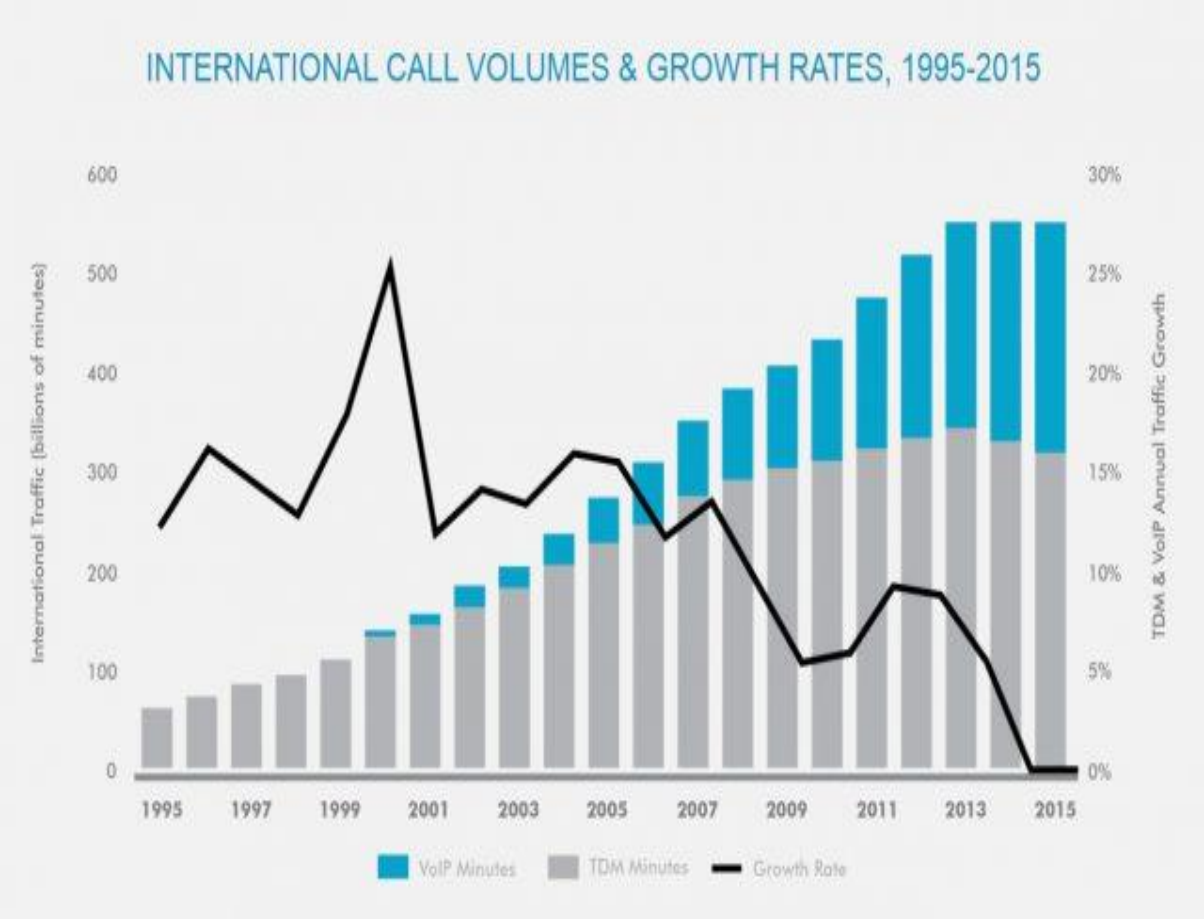

Figure 2.2: International call volumes and growth rates between 1995 and 2015

Source: My Broadband Cloud and Hosting (2016:4)

During the annual My Broadband Cloud and Hosting Conference in Sandton held on the 25 May 2016, Meintjes stated that decent broadband access with 3G and 4G mobile networks in emerging markets has grown from a 5% footprint in 2010 to 28% in 2015. “This has enabled OTT messaging and voice services to cannibalize the growth in terminated/originated voice.” As an example, OTT services took 8% of the voice market share globally in 2015 alone.

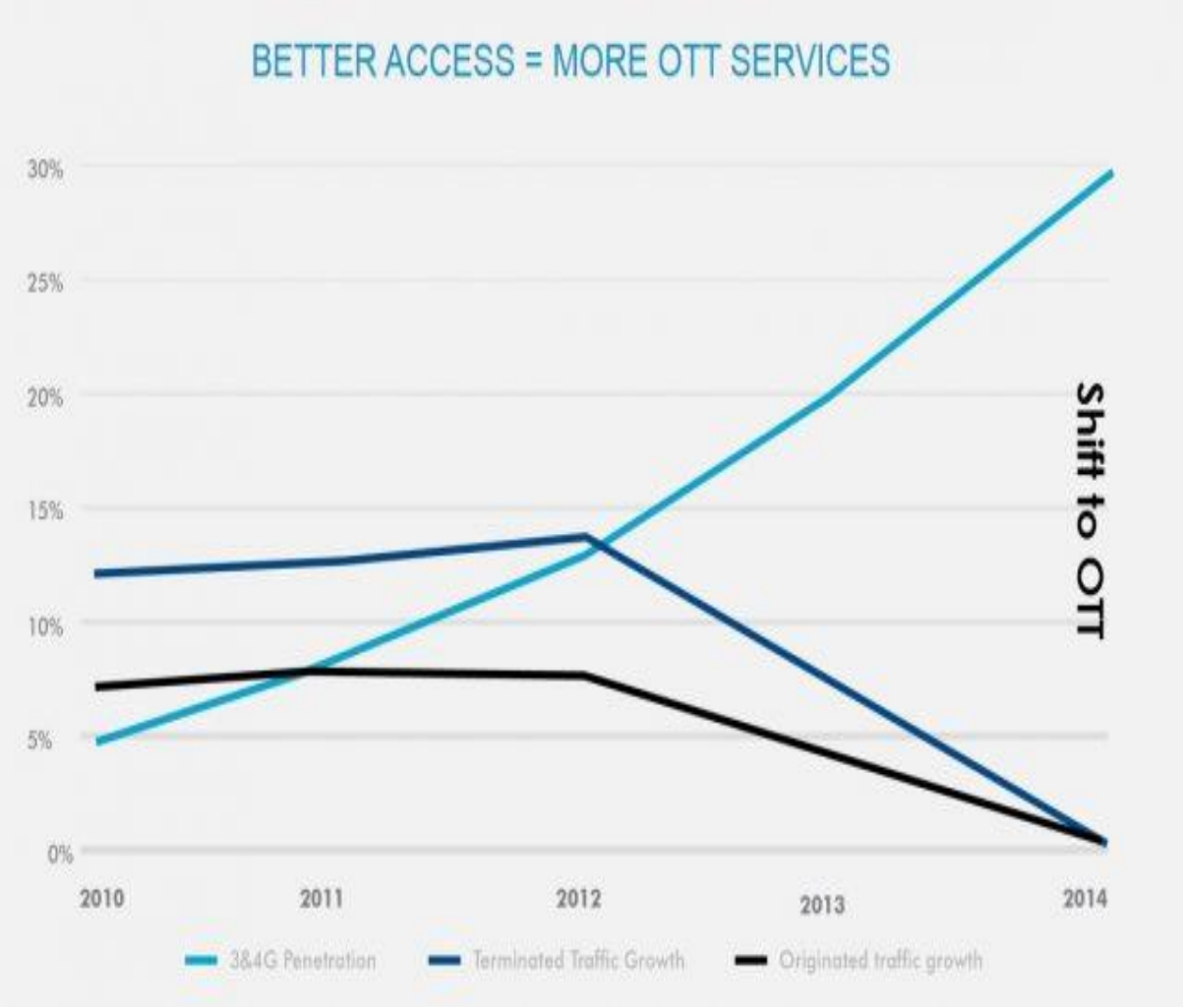

Figure 2.3: The impact of OTT services on voice traffic growth over the last five years. Source: My Broadband Cloud and Hosting (2016:9)

2.11 Globalisation

The cost of mobile data is high because regulation does not support competition (my broadband 2016:1). The World Bank states that the promotion of domestic competition amongst companies can generate growth and alleviate poverty within a small fiscal space and a slowly growing environment. Telecommunications accounts for up to 2.6% of the contributions to the industry and 1.7% of exports in South Africa. The report stated that, “Of the five key players in South Africa’s wireless broadband market, two operators account for a 70% market share”. “When firms compete, they offer lower prices and higher-quality products to win market share. Firms are also encouraged to innovate and become more efficient and productive” (My Broadband 2016:1).

A study by Research ICT Africa (2015:1) indicates that, South Africa had the fourth most expensive mobile data amongst Southern African countries. With average download speeds of 4.5Mbps, South Africa is ranked at 119th globally for average speed. “Evidence from other countries shows that improving broadband penetration has the potential to boost growth by 1.4%” (Research ICT Africa 2015:1). The phenomenal increase in users of broadband and the cumulative usage of data has resulted in business focusing on growth strategies of data, which is now captivating the broadband speed within the country. To avoid further broadband quality degradation, it is vital that the LTE high demand spectrum is distributed amongst mobile operators. (Research ICT Africa 2015:1). The emerging South African market which experiences challenges through the weak commodity prices, decreased demand of the Chinese and increasing interest rates in the US. This circumstance is worsened by local factors which include regulation uncertainty, drought and shortfalls in infrastructure. Increasing public debt and pressqures of inflation have also placed monetary and fiscal policy under pressure.

South Africa's GDP Growth Rate (2016:2) for the fiscal year 2016/2017 is predicted to continue marginally lower than the Sub Saharan Africa average rate of 4.5%. The GDP growth rate is forecasted to be 0, 8% in 2016, a decrease from 1.3% in 2015. Since 2009, this would be the lowest growth rate. For 2017 the forecasted growth is 1.1%. "In this prevailing weak economic climate, it is important for South Africa to look to other avenues outside the fiscal space to stimulate faster growth" "With this study, we offer evidence for one such route, competition policy, and hope this will enhance debate and reinforce the case for the bold policy decisions needed to revive the country's economy for faster growth, more jobs and poverty eradication" (South Africa GDP Growth Rate 2016:2).

Marshall (2016:1) states that, "South Africa has suffered currency effects, as did many developing markets this year. There were also impacts on communications service providers – the largest IT market segment in terms of spending – as they faced regulations that imposed decreased rates for interconnection and experienced accelerating decline of fixed services revenue."

	2015 Spending	2015 Growth	2016 Spending	2016 growth
Devices	5.568	6.7%	6.294	13.1%
Data Centre Systems	0.635	-3.2%	0.666	4.9%
Enterprise Software	1.869	-1.0%	2.042	9.3%
IT Services	6.311	-5.0%	6.544	3.7%
Communications Services	10.949	-9.1%	11.075	1.2%
Overall IT	**25.330**	**-4.3%**	**26.620**	**5.1%**

Figure 2.4: South Africa's IT Spending Forecast by Sector in Millions of US Dollars
Source: Marshall (2016:1)

Gartner (2016:18) states that in South Africa the spending growth in the device sector is outperforming all other sectors. The prediction is that by 2018, that the yearly spending on mobile handsets will exceed the $5 billion (R68 billon) point. Mobile app developers in South African can take complete advantage of this growth, in addition to delivering appropriate offerings into the African continent, and thus maximize on the growing markets to the North.

2.12 Summary

This chapter references and evaluates the literature on the QoS and Service delivery within the telecommunication environment. This chapter also identifies key attributes which can assist mobile service providers to be fore runners in their environment. This chapter also highlighted the evolution of mobile technology, and the demands our current lifestyle has placed on mobile telecommunications technology. This chapter also encompasses broadband initiatives, regulatory standards, mobile operators and globalisation of mobile telecommunications. The next chapter will reference evaluated theories and models which encapsulate the evaluation of the QoS and service delivery of a mobile operator. The next chapter will reference evaluated theories and models which encapsulate the evaluation of the QoS and service delivery of a mobile operator.

CHAPTER THREE

THEORY AND MODELS OF A MOBILE OPERATOR

3.1 Introduction

This chapter identifies the comprehensive functional and technical characteristics of mobile telecommunication service delivery. Mobile services of a technical nature include customers' perceptions of network quality, network coverage, service delivery, pricing plans and value-added services. Functional characteristics comprise customer service quality, convenience, billing systems, and employee competency. For this study, the multidimensional measurement model will be used to identify the challenges and to measure the QoS provided by a new mobile service provider. This model has been chosen because it assists in producing the findings to enable the organisation to identify and correct shortfalls which will promote sustainability within the mobile environment. There are various other theories that are referenced and benched in accordance with the organisation's operations.

3.2 Observational Theory for Mobile Ad Hoc Networks

Merro (2009:194) states that over the last twenty years there has been an explosion in the popularity of wireless technology, which can be attributed to its half-duplex nature. Wireless systems are limited to only one device which can either receive or transmit, but not simultaneously. Therefore, an observational theory for Mobile Ad Hoc Networks (MANETs) will be used to calculate the QoS of delivery of a mobile network.

3.3 Game Theory

With reference to the Game theory, the viewpoint of Johnson, Xiong and Christensen (2011:217) will be considered. The Game Theory tries to predict other organisations' strategies and incorporate these predictions into their strategies. The Game Theory is appropriate where competitors are interdependent. The outcomes of decisions made by an organisation will directly affect the decisions of its competitors. This phenomenon is termed Interdependence.

According to Srivastava, Dasilva and Menon (2009:1), The Game Theory consists of a wireless network with characterstics of a dynamic, distributed, self organising architecture. Through the use of predetermined protocols and algorithims in the network, every element has the ability to individually incorporate its based operation. The evaluation of the performance of networks is limited because of the dynamic and distributed nature of analytical models. Game Theory provides tools that may effectively suit the modelling interaction amongst dependent nodes in the network. Mobile service providers use this to first establish the demand and population sample of an area before designing their mobile network.

With reference to applying the correct strategy, the viewpoint of Johnson *et al.* (2011:210) will be examined. General strategies must be used and customised in line with competitors' strategies. If competitors are pursuing a cost strategy, a sensible suggestion is to use a differential strategy. Therefore, the selection of business strategies should interrelate with those of competitors.This section starts by evaluating business strategy in terms of competitor moves, particularly in hyper competition.

3.4 Quality of Service in the Mobile Telecommunication Industry

Definitions of service quality abound in the existing in the literature on mobile telecommunication. Akroush, Al-Mohammad, Zuriekat and Abu-Lail (2011:101) states that mobile QoS is measured by some researchers as the complete customer evaluation of a service provider based on customer experience and not by the multidimensional concept. Customer satisfaction is imperative in evaluating QoS, with reliability and network quality being second imperatives respectively (Wang and Lo, 2002).

According to Eshghi *et al*. (2008:48), thirty two relevant attributes in the mobile telecommunications sector through the use of literature have been reviewed. Using factor analysis, six factors have been identified, namely customer support, reputation, transmission quality, reliability, competitiveness and relational quality. These factors represent service quality elements. With the use of reliability, regression analysis and competitiveness had the maximum impact on the satisfaction of customers with relational and transmission quality following respectively. To discover the most imperative service quality factors to predict customers' repurchase intentions, regression analysis was conducted. Decisions that impact on customer purchases indicate that reliability and relational quality are imperative factors.

The recent QoS levels experiences of many mobile users requires decisive remedial and corrective regulatory actions. Failures and network outages of the subscriber charter and end user regulations have to be resolved when the authority finalises its review. The reviewed regulations will allow the Authority to fortify its complaints resolution structure and raise customer public awareness actions for the empowerment of data and voice subscribers in terms of their contract terms and conditions with their service providers (ICASA 2006, s2, ss1).

3.5 Service Delivery

In general, QoS is synonymous with Service Delivery. What are the perceptions of service delivery? How must service delivery be evaluated? Over the past thirty years, these two questions have been extensively deliberated by academics and are amongst the most common matters in marketing literature and management. Kotler and Armstrong (2011:20) postulate that most operators make the mistake of paying attention to a specific product, than focusing on service delivery and the QoS.

Two distinct dimensions identify service delivery, namely functional and technical quality. Functional quality is the effect of communication procedures or how distribution procedures and service production are perceived. Technical quality is defined as the extent to which customers' expectations are met by the core service (Martines and Martines, 2010: 101).

3.6 The multidimensional measurement model for Quality of Service of mobile telecommunications

Kim *et al*. (2004:88) postulate that satisfied customers have a greater possibility of remaining with their current service provider. The service industry of mobile telecommunications is rapidly increasing worldwide. Mobile operators will experience significant challenges due to dynamic changes in their environment. Firstly, it has become costly and very difficult to retain existing customers in a market which has a high churn. Secondly, there is a great deal of difficulty in the acquisition of new customers as prospective subscribers are spoilt for choice in their perceived QoS and the performance they receive from their service provider as their service provider offers various deals that are competitive.

Service providers who have satisfied customers have greater benefits for the company. Customer satisfaction directly affects a company's financial performance (Gupta and Zeithaml, 2006: 77).

According to Kim *et al.* (2004: 78), research evidence indicates that the key factor for customer satisfaction is customer's perception of QoS. It is critical to mobile operators to not only deliver services that customers want but to also enhance their QoS and customer satisfaction simultaneously.

For this study, the mobile operator's network quality will be evaluated and the Quality of Service of the mobile operator's network will be measured. The service delivery of customer services will also be evaluated. The other elements of the MS QUAL of the mobile service provider will be evaluated (Hosseini 2013: 15).

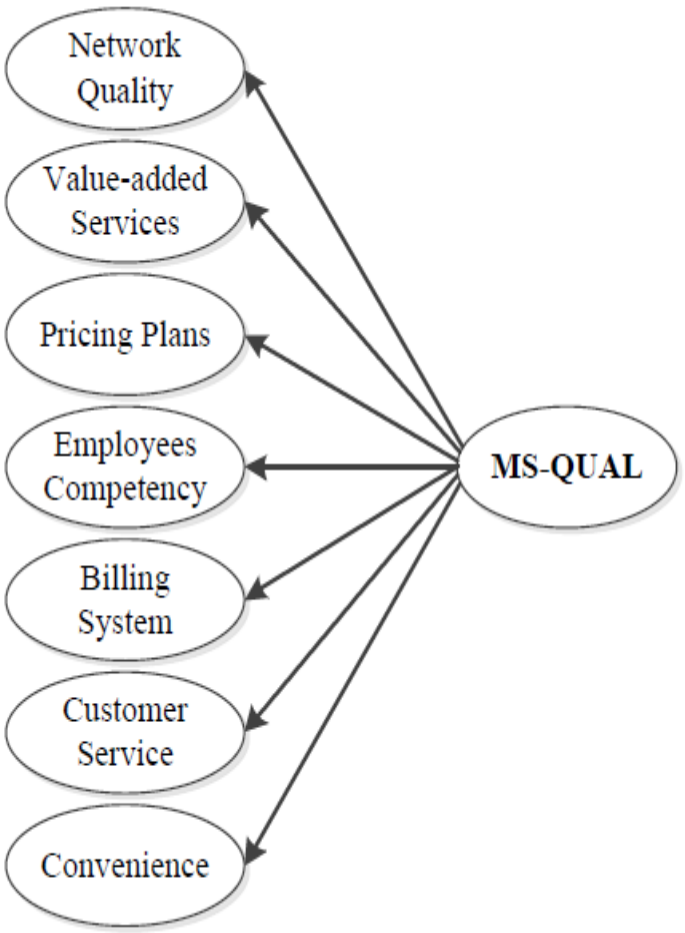

Figure 3.1: Multidimensional model for mobile telecommunication service quality
Source (Hosseini 2013:15)

3.7 The strategy clock

With reference to the strategy clock, the viewpoint of Johnson *et al.* (2011: 208) is of relevance. There are two distinct characteristics in the Strategy Clock. Firstly, it focuses more on the market than general strategies, as its priority is prices to consumers instead of expenditure uncured by the company. Secondly, there are continous choices available due to the circular design of the clock. An assortment of incremental adjustments can be made within the clock, namely differential strategies, low price strategies, non-competitive strategies and hybrid strategies.The strategy clock's emphasis on price, and its possibility for incremental amendments in strategy offers an extra active interpretation of strategy. Instead of an organisation being focused on flat conditions of cost or differentiation strategy, it can go around the clock.

3.8 Business Model and challenges in the Mobile Telecommunication Sector

Recently, mobile telecommunications and networks have been experiencing phenomenal growth which is shifting the operations of mobile businesses. This is evident as now that the industry is experiencing a move from a business that was focused on voice to a business that is moving to data (Dodourova, 2003:69). Mobile communications has evolved over the years, beginning with a Global System for Mobile Communications (GSM) to 3G Universal Mobile Telecommunications System (UMTS), to 4G Long Term Evolution (LTE) and 5th generation technology which will continue to enhance the QoS of new voice and data services. Through the convergence of technologies mobile customers are enabled to communicate more information at exceptional levels of convenience and flexibility. According to Dodourova (2003:67), innovative competencies currently rotate around 'content' and 'customers' instead of 'technology infrastructure'.

Camponov and Pigneur (2003:4) define a perception as "A detailed conceptualization of an enterprise's strategy at an abstract level, which serves as a base for the implementation of business processes". Haker (2004: 56) states that a Business Model concept can be defined as "a blueprint collaborative effort of multiple companies to offer joint propositions to their companies".

To differentiate between the strategy business concepts and BM, Magretta (2002:4) explains BM as: “The business model tells a logical story explaining who your customers are, what they value, and how you will make money in providing them that value”.

Componovo and Pigneur (2003: 5) dispute contend that five main elements which encompass the telecommunications business model, namely revenue flows, value proposition, core activities, target customers and business partners.

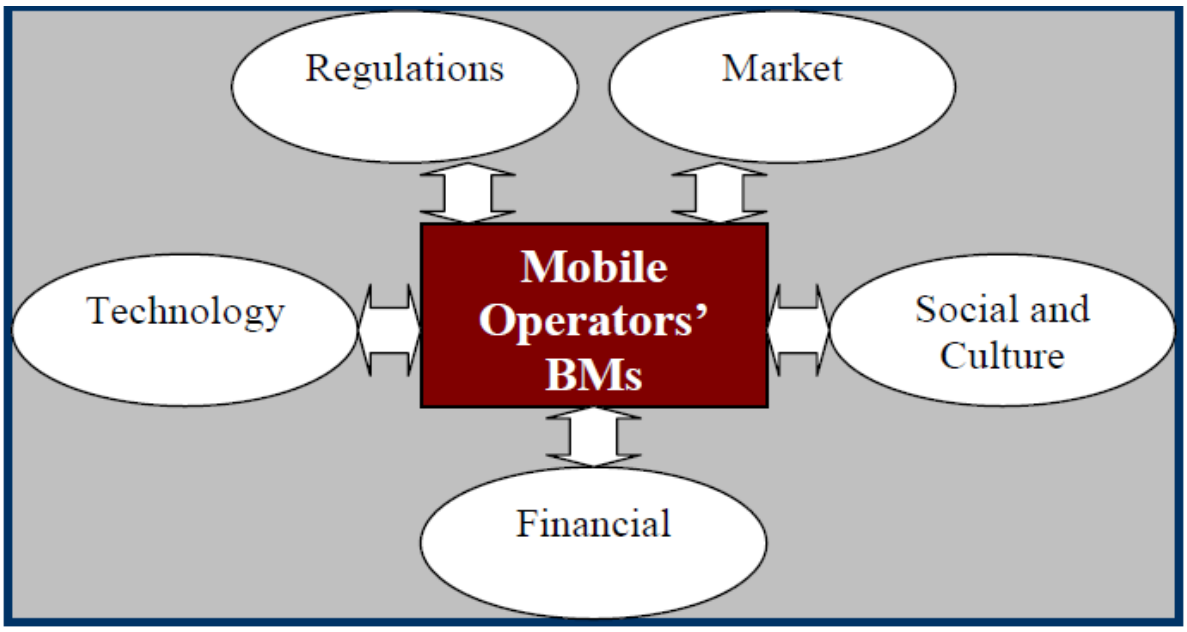

Figure 3.2.The Business Model for telecoms

Source: Al-Debie *et al.* (2008: 28)

The Business Model (BM) is a conceptual illustration of the organisation, whether it is graphical, textual and/or conceptual, designed by every financial arrangement, co-operational, core interrelated architecture, which is designed by the organisation for the present and the future, coupled with provisions to accomplish its objectives and strategic goals (AL-Debie *et al*., 2008: 28). With this inclusion of objectives and strategic goals, there is an indication that the BM essentially serves the strategic level of a variety of digital business organisations. BM is the representation of the intermediate level amongst the ICT-enabled business processes and business strategy.

Mobile Tech. Generation	Representative Products	Value proposition Characteristics and Quality
First Generation (1G) – 1980	• Total Access Communication System (TACS) – Europe • Nordic Mobile Telephone (NMT) system – Europe • Advanced Mobile Phone System (AMPS) – USA	• Voice analogue telephony • Paging • Low level of security • Limited Capacity
Second Generation (2G) - 1990	• Global System for Mobile communication (GSM) – Europe • Intermediate Standard (IS-95 and IS-136) – USA • Personal Digital Cellular (PDC) – Japan	• Voice digital telephony • Roaming • Call forwarding • Short Messaging Services (SMS) – 160 char • Low data rate
2.5G – 2.75G	• General Packet Radio Service (GPRS) – Stage 1 (2.5G) • Enhanced Data Rate for GSM Evolution (EDGE) – Stage 2 (2.75G)	• Multimedia Messaging Services (MMS) • Enhanced Messaging Service (EMS) – simple media • Location-based services • Access to Internet (Web browsing) • Higher data rate
Third Generation (3G) - 2002	• Universal Mobile Telecommunication System (UMTS)	• Virtual Home Environment (VHE) feature • Video on demand • High Speed • Video calls and chat • Mobile TV • Broadband wireless data • High speed internet access
Fourth Generation (4G, beyond 3G) – 2012-2015 (Proposed)	• Worldwide Interoperability for Microwave Access (WiMax) – Trials	• Premium quality • High security • Premium speed • Digital Video Broadcasting (DVB) • Interoperability with existing wireless standards

Table 3.1: MNO's Value Architecture and Value Propostion Correlation
Source: Al-Debie *et al.* (2008: 16)

3.9 Summary

This chapter has referenced and evaluated theories and models which encapsulate the evaluation of the QoS and service delivery of a mobile operator. Barriers have been identified which exist at various levels and throughout many organisations. This chapter also identifies how an rganisation can incorporate segements of models to define a model that will best suit that organisation. The next chapter will focus on the research methodology for this study.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents an exposition of the investigative methods used in this research.

The objective and aim of this research are to establish the challenges faced by a mobile service provider in meeting customer needs. For this study, a comparison was made of the internal customers' (staff) experiences of the mobile network against the QoS of that the service provider. The internal customers, which are the staff of the organisation, have been chosen to participate in this research since they are people currently using the mobile network to conduct their daily activities.

The research design, data collection methods, data collection techniques and data analysis are described. The research design includes the research process, sampling techniques, analysis techniques, data collection methods and the sample size employed in the study.

Leedy and Ormrod (2012:12) define research methodology as "the general approach that the researcher takes in carrying out the research project". A researcher collects data; analyses and interprets this data; and makes meaning of the data. This helps increase the understanding of the phenomenon.

4.2 Research Design

Leedy and Ormrod (2012: 192) suggest that quantitative research is a highly structured, vigorous, systematic process of generating information for the collection for primary data. This research type encompasses either recognizing the attributes of perceived occurrences or discovering possible relationships amongst two or more occurrences. The two phenomena, QoS and service delivery of the mobile network, will be evaluated. Quantitative research comprises of the identification of experimental occurrences or the possibility of exploring multiple occurrences. The quantitative approach uses a systematic process to obtain numerical data in a structured, objective and formal manner.

According to Biber (2010:14), a qualitative approach to answer research questions can be invaluable in a number of ways to positivistic research, starting with a generation of models and theories that will be used to evaluate these models. An emphasis of the qualitative approach is the participants' experience and meaning, which can also present a desirable need to develop a range of survey instruments from an assessment and evaluation of instruments in order to query objects on the surveys. With the addition of a narrative perspective to the findings of quantitative research, the statistical meaning of the data is illuminated. With qualitative data research results, an in-depth understanding is added which allows the researcher to explore subgroups or anomalies of the data (Biber, 2010:14).

Biber (2010:17) postulates that qualitative methodologies are a predominantly sensitive way of capturing the experience of the lives of individuals and groups, particularly those usually omitted from habitual knowledge-building research projects. Qualitative methodological approaches emphasise the importance of multiple subjective realities as an important source of knowledge building.

According to Giddings (2006:200), the belief that mixed method research is a combination of quantitative and qualitative approaches can be seen as a "new guise" used for positivity and is actually business as normal.

The mixed methods research design incorporates a qualitative element into a primarily quantitative study because the mixed method model is said to fulfil the need to generalize and show the descriptive power of narrative (Biber, 2010:14). An interpretative approach was also used because the epistemology of the researcher consists of multiple meanings produced or stories constructed by people in their "natural settings".

For this study, the mixed data methods approach was used. Quantitative and qualitative data methods were employed. Employees from within the organisation (internal customers of the organisation) were used.

In terms of the justification for the mixed methods approach to this study, reference is made to Biber (2010:5) who highlighted the following:

- ***Triangulation*:** Triangulation offers a combination of data received by all methods, which enhances the integrity of the research findings. Triangulation eventually fortifies and enriches a study's conclusion, thereby making it possible to advocate for both quantitative and qualitative methods.
- ***Complementarity*:** The mixed method approach allows the researcher to better understand the research problem and/or to elucidate the agreed result of the research, as it encompasses organizational cultures.
- ***Developmental*:** The mixed method approach aids in research by creating a synergistic effect of the data collected.

4.3 Research Instruments

To obtain the qualitative data, for the statistical evidence and the richer experience related data, semi-structured interviews were conducted with management within the Mobile environment. Junior management and operational staff from within the organisation participated in surveys contributing to the quantitative data that was obtained. A five-point Likert scale was used to measure the selected variables for this study. The Likert scale was chosen to allow the respondent an “uncertain” choice. If the respondent could not fully understand the concept of QoS, they were allowed to be “uncertain” on certain questions. The respondent was also allowed to agree or disagree with statements.

4.4 Sample

According to Biber (2010:500), quantitative-sampling designs rely on “laws of probability” in order to allow the use of statistical testing and to ascertain whether the research findings are in fact “true” with regards to the overall target population.

Furthermore, Biber (2010:50) describes a stratified random sample as being a situation in which the researcher divides the target population into desired groups and then randomly selects population elements until the target size is reached. For this study, employees who had a company subsidised handset were grouped. Employees were then randomly selected from this group until the target sample size was reached.

Qualitative sample approaches have the goal of looking at a process for subjective understanding, which is purposive sampling. For this study, five managers were selected from the Mobile environment and semi-structured interviews were conducted to gather the richer experience from within the organisation.

According to Biber (2010:51), the most common type of mixed methods sampling design comprises a sequential design using multi-level samples. For this study, junior management and operational staff were selected for the quantitative study and managers were selected for the qualitative study.

4.4.1 Sample Population

Neuman (2014:252) postulates that the specific collection of fundamentals of a study can be defined as the sample population. For this study, the target population was internal customers (staff) who access the mobile network. Although the internal customers were staff, it was made clear to them that the purpose of the research was to strengthen the organisation's mobile network so they should therefore not be biased towards the organisation.

To obtain consent from external customers was not possible as the organisation did not want the researcher contacting external customers on a one-on-one basis, since they had professional external research companies that conduct their research. The company suggested that the researcher rather use internal customers for this study. Therefore, the researcher resorted to using internal customers because internal customers also possessed the skill and experience to identify the shortcomings of the organisation.

These findings were compared to the analysis reports generated from within the organisation from both internal and external customers. These reports are generated quarterly by the organisation and they depict a customer's experience of the mobile network.

The total population of the staff of the organisation for this study is 1188. However, not all the staff had subsidised handsets. The number of staff that had subsidised handsets that actively use the mobile network was 588. These 588 staff members were identified for the quantitative study and the questionnaire was sent to them only. Of these, 198 staff responded, which yielded a 34% response rate.

Plowright (2011:38) suggests that the sampling population determines which cases or participants are included in the research. For the qualitative study, the sample population comprised five managers. Semi-structured interviews were conducted with these five regional managers.

The following business units were targeted: Network Engineering and Build; Information Technology; Network Field Operations; and Access Network Operations. The approach adopted was to survey the heterogenic population of internal staff over a period of two weeks.

4.5 Data Collection Methods

Being a survey, a questionnaire to evaluate the QoS provided by a mobile service provider was used. According to Biber (2010:19), an interpretative approach was used as the researcher's epistemology assumes several biased realities which comprise meanings or stories constructed or produced by respondents within their "natural" settings. A qualitative data method was employed in the form of semi-structured interviews.

4.5.1 Data Collection Techniques

According to Kumar (2009: 129), the data collection instrument must be formal, objective and systematic. A survey was conducted within the organisation for one month to obtain the quantitative data from junior managers and operational staff through questionnaires. To obtain the qualitative data, five managers were interviewed using the semi structured interview approach.

4.6 Data Analysis

Leedy *et al*. (2012:191) suggest that a correlation observation study is best used to observe the degree to which differences on one variable or attribute are associated with similarity on another variable or attribute, and that can be summarised through statistical analyses.

According to Cohen, Manion and Morrison (2011:407), qualitative data can be organised and analysed, according to the relevance to a particular issue or theme. For this study, thematic analysis was used to analyse the qualitative data obtained from the semi-structured interviews.

Patton (2012:432) suggests that the analysis of textual data cannot be embraced by a single method. Qualitative examinations transform data into answers. No blueprint can be used for that conversion. Although it is possible to get direction it is up to the researcher to determine the unique when - and if arrived at'. Qualitative methods are also effective in identifying tangible factors.

Secondary data was reviewed from customer complaints, which were received by the organization based on existing QoS research. Document analysis was conducted on the organisation's internal and external reports, based on performance and financial accomplishments. Various journals and technology forums were used to monitor and gather information on improving the service delivery of the mobile network.

4.6.1 Unit of Analysis

Only permanent employees who used the organisation's mobile network were selected to participate in the study.

4.7 Descriptive Statistics

Descriptive statistics was used to illustrate the fundamental elements from the quantitative data that emerged from this study. Bertram and Christiansen (2014:138) state that descriptive statistics summarise or transform the data set to a graphical analysis such as a graph or table.

For this study, statistical analysis was used to analyse the obtained data in the form of Chi – square tests and Pearson's correlation test. Percentages, ratios, mean, median and mode were used to analyse and describe the demographics and to compare them with each other. Descriptive statistics are used to gather meaning from quantitative data. Graphs and tables were used to represent the results, where applicable.

4.8 Pre-testing

With the intention to validate that the measures and instruments were understandable, legible and clear, a pre-test questionnaire was conducted with ten participants of the population sample. This pre-test questionnaire was also administered by the organisation's systems administrator. The link for the pre-test questionnaire was e-mailed to the participants, who then completed the questionnaires. Based on respondents' responses, the questionnaire was reviewed and completed. The pre-test was also used as a means of measuring the reliability of the questionnaire items. Cronbach's alpha was then calculated.

A pre-test of the semi-structured interview was conducted with two managers to confirm that the instrument and measures were clear, legible and understandable. This was administered by the researcher. Based on participant responses, the semi-structured interview was revised and finalised.

4.9 Delimitation of the Study

The research only targeted internal customers (staff) who used the organisation's mobile network. In this way, the experiences of the internal customers were expressed, rather than having them just give general assumptions of the organisation's network.

4.10 Limitation of the Study

Although the internal customers were staff, it was made clear to them that the purpose of the research was to strengthen the organisation's mobile network. Therefore, they were requested to not be biased in favour of the organisation.

4.11 Validity and Reliability of the Measuring Instrument

Leedy and Omrod (2007:29) state that validity is the extent to which an instrument measures what it is meant to measure. Reliability is the consistency with which a measuring instrument produces a particular result when what is measured has not changed (Leedy and Omrod, 2007:31).

4.11.1 Validity

For this study, the problem and method used were linked. A table of specification was used to measure content validity for the quantitative data. Validity as communication and pragmatic validity as action were used to measure the qualitative data.

4.11.2 Reliability

For this study, inter-rater reliability is used to assess the reliability of the quantitative data obtained. For the qualitative data, reliability describes consistency within the employed analytical procedures.

4.12 Trustworthiness

In terms of the justification for trustworthiness in this study, reference is made to Biber (2010:49) postulates that trustworthiness comprises the following:

- **Credibility**: Assurance in the 'truth' of the findings. For this study, participants are credible as they are from the organisation.
- **Transferability**: Indicating that the findings are applicable to other contexts. For this research, the mobile service provider's service is being compared to services from other mobile service providers.
- **Dependability**: Indicating that the findings are reliable and might be repetitive. For this study, the data obtained is dependable as the researcher has the respondents' information.
- **Confirmability**: The extent or degree of neutrality to which the discoveries of a study are moulded by the participants' and not the researcher's prejudice interest or motivation.

The researcher interviewed the respondents and they provided their input and concerns about the research problem. The internal customers also possessed the skill and experience to identify the shortcomings of the organisation. To obtain consent from external customers was not possible as the organisation did not want the researcher contacting external customers on a one on one basis, since they had professional external research companies that conduct their research. These findings were compared to the analysis reports generated from within the organisation from both its internal and external customers. These external reports were generated quarterly by the organisation and depict customers' experiences on the mobile network.

The results from this study will be used to make suggestions to the organisation on how to improve the quality of service provided to all its customers. Consequently, the company's network performance and network coverage will be improved. The following departments were targeted: Network Engineering and Build; Information Technology; Network Field Operations; and Access Network Operations. The approach followed was to survey the heterogenic population of internal staff during a two week period. This survey was conducted through a web - based application with the system administrator.

4.13 Ethical Considerations

The research design methods used have accommodated all ethical requirements as the organisation's code of conduct has been implemented in this research.

4.14 Anonymity and Confidentially

The internal customers were also free to express the experiences and problems associated with the mobile network, as they were advised that anonymity and confidentiality are guaranteed because all the information gathered will be managed by the company's systems administrator. No employees were identified or victimised in any way for participation in this survey. Participation in this research was also voluntary.

4.15 Summary

The information gathered from the semi-structured interviews and questionnaires was presented in this chapter. This chapter provided all the critical elements that are required to investigate the challenges faced by a mobile service provider in meeting customer needs. Refer to the instruments that were used for this research: Appendix A is directed at sample population. Appendix B was directed at the management of the organsiation. The next chapter provides a comprehensive discussion and analysis of the research that emanated from the administration of the research instruments results.

CHAPTER FIVE

DISCUSSION OF RESULTS AND INTERPRETATION OF FINDINGS

5.1 Introduction

An interpretation of the results of the research findings are presented in this chapter. The analysis approach outlined in this chapter is based on descriptive statistical methods for the quantitative data. Thematic coding was used to analyse the qualitative data. These results are presented in a narrative format.

5.2 Presentation of data from the Quantitative Study

The results that follow are responses from within the mobile service provider's organisation. The statistics of the sample are discussed, including the responses, interpretation, statements of findings and findings of the primary data. The primary tool used to collect the quantitative data was the questionnaire. The questionnaires were distributed by the systems administrator to staff that access the mobile network within the organisation. The data collected was analysed using SPSS version 23.0.

The results of the quantitative data collected are presented in the form of descriptive statistics utilising figures, cross tabulations and graphs. Use of inferential techniques was also made, which comprise of chi square values and correlations which are interpreted using the p-values.

5.2.1 The Research Instrument

Questionnaires were administered as the research instrument for the quantitative data, which comprised 42 components, using the measurement of levels at a scale, namely ordinarily or nominal level. The questionnaire comprised 7 divisions which evaluated critical components of the organisation as indicated below:

Section A – Biographical Data
Section B1 – Quality of Service
Section B2 – Bandwidth offering
Section B3 – Network coverage
Section B4 – Globalisation
Section B5 – Service delivery
Section B6 – Customer Service

5.2.2 Biographical Data

This section summarises the biographical characteristics the respondents.

Demographic Statistics

- **Age Analysis**
- **Years of Service**
- **Occupational Group**

a) Age Analysis

The descriptive statistics for the age was as follows.

N	Mean	Std. Deviation	Minimum	Maximum
198	46.045	8.0167	25.0	64.0

Table 5.1: Age Analysis

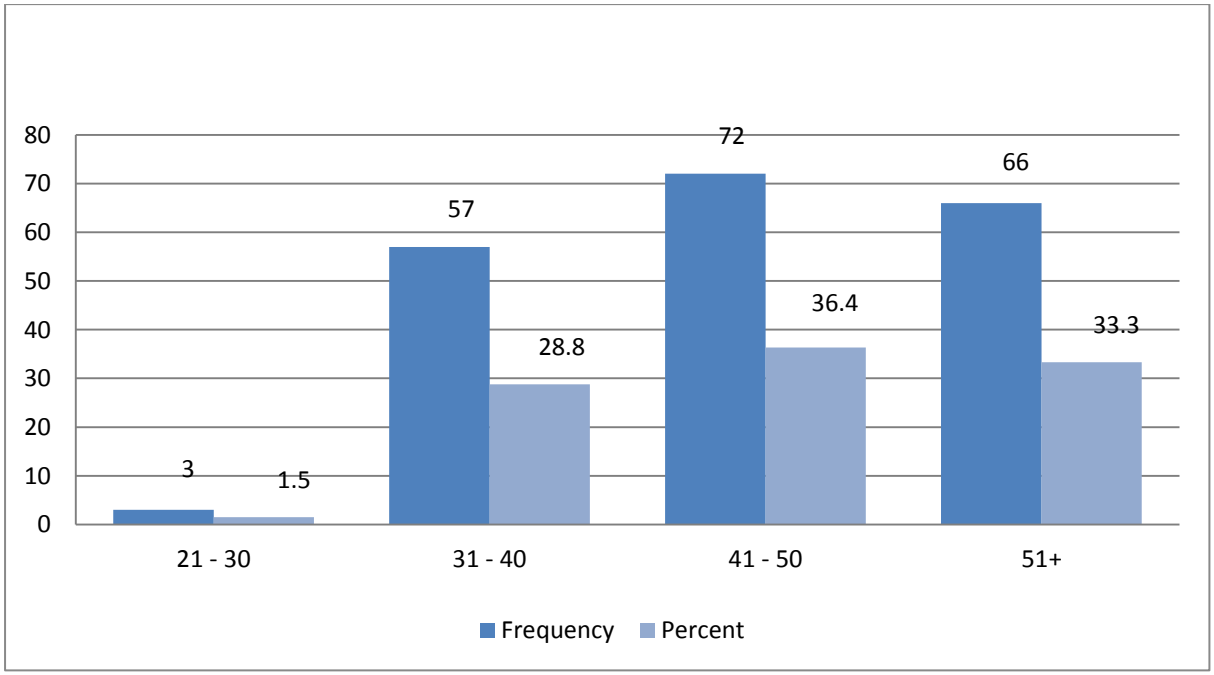

Figure 5.1: Descriptive Statistics for Age

From the sample size of 198 employees, the youngest employee was 25 years of age and the oldest was 64 years of age. The average age of the workforce was 42, with a median of 46 years. The age category of 41-50 years yielded the highest response rate of 36.4%. This indicates that the workforce is very experienced and exhibits greater responsibility and maturity.

b) Years Of Service Analysis

The number of years of service is summarised below.

N	Mean	Std. Deviation	Minimum	Maximum
198	22.333	9.8697	2.0	44.0

Table 5.2: Years of Service Analysis

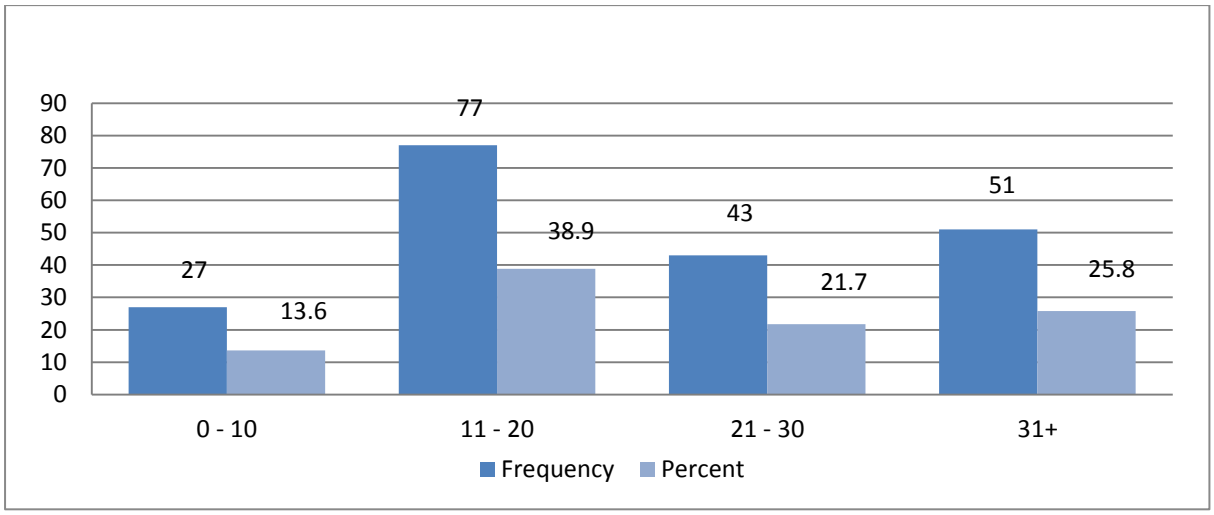

Figure 5.2: Years of Service Analysis

From the sample size of 198 employees, the employee with the minimum years of service who participated in the survey had two years of service and the employee with the maximum years of service had 44 years. The average length of employment was 22.3 years.

The median was 22.33 and the standard deviation ± 9.9 years. The highest response rate was 38.9%, which was from respondents between 11 - 20 years of service. This implies that respondents had been in employment for a long period with the organization and this also indicates that responses were received from experienced workers.

c) Occupational Group

Grade	Frequency	Percent
M6	71	35.9
OP1	127	64.1
Total	198	100.0

Table 5.3: Occupational Group

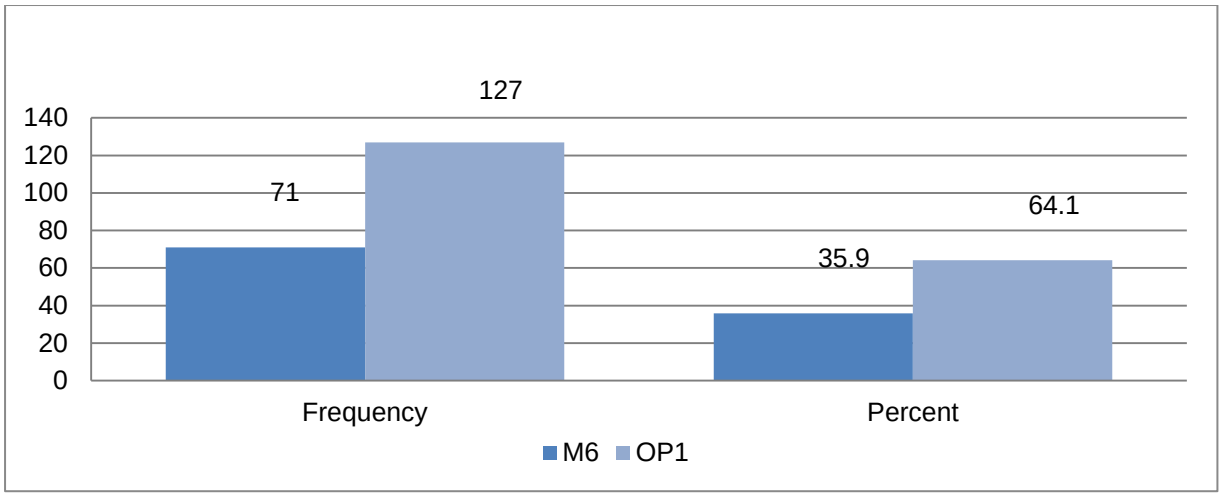

Figure 5.3: Level in the Organisation

From the sample size of 198, respondents were categorized into levels: 127 respondents were operational staff, which equates to 64 % of the respondents and 71 respondents were in junior management, which equates to 36% of the respondents within the organisation. Responses from both operational staff and management allow the researcher opportunity to have data from both the technical and management perspective from within the organisation.

The demographic data discloses that most of the respondents have around eleven to twenty one years of experience within the organisation. Most of the employees were between the ages of 41 and 50 years. This is significant as the respondents had long term relationships with the organisation. These respondents have been associated with the organisation consequently, so the future success and survival of the organisation would be vital to them.

5.2.3 Reliability Statistics

The fundamental characteristics of precision are reliability and validity. “Reliability is the consistency with which a measuring instrument yields a certain result when the entity measured hasn’t changed” (Leedy and Omrod 2009:29). A reliability coefficient of 0.60 and less is considered poor; reliability coefficient of 0.70 or higher is considered “acceptable” and a reliability coefficient of 0.80 or higher as good.

Cronbach’s Coefficient Alpha was used to establish internal consistency and reliability of the research questions. The table below reflects the Cronbach’s alpha score for all the items that constituted the questionnaire.

Question Number	Section Heading	Number of Items	Cronbach's Alpha
Q1.1 Q1.2 Q1.3 Q1.4 Q1.5	Network capability	5 of 5	.868
Q2.1 Q2.2 Q2.3 Q2.4 Q2.5	Bandwidth offering	5 of 5	.842
Q3.1 Q3.2 Q3.3	Network coverage	3 of 3	.842
Q3.4 Q3.5	Network coverage	2 of 2	.610
Q4.1 Q4.2 Q4.3	Globalisation	2 of 3	.621
Q4.4 Q4.5	Globalisation	2 of 2	.711
Q5.1 Q5.2 Q5.3 Q5.4 Q5.5	Service delivery	5 of 5	.828
Q6.1 Q6.2 Q6.3 Q6.4 Q6.5	Customer Service	5 of 5	.922
Overall		**30 of 30**	**.921**

Table 5.4: Cronbach’s Alpha

Customer Service, Service delivery, Network capability, and Bandwidth offering reliability score exceed .080 which suggests good Cronbach’s alpha value. This indicates that there is a degree of consistent, acceptable scoring for the different sections of the study. Globalisation and Network coverage have scores slightly less than the norm. This is mainly due to the small number of variables that constitute the sections or to misinterpretations by the respondents. However, the instrument was deemed reliable.

5.2.4 Factor Analysis

Rahn (2010:2) states that factor analysis is a numerical method used in data reduction. Factor analysis is typically used in survey research when a researcher wishes to characterize the number of questions into a smaller number of hypothetical questions. Factor analysis could be used to determine if the three measures really evaluate a similar thing. If they do this could be united to develop a new variable which would be a factor score variable which contains a particular score for each respondent.

The viewpoints of Rahn (2010:2) on factor methods are appropriate to an assortment of environments. There is no need to believe in factors already existing before conducting factor analysis. However, theoretically the factors are generally interpreted using names and are spoken of things that are real.

Prior to factor analysis being undertaken, the Kaiser-Meyer-Olkin (KMO), Measure of Sampling Adequacy (MSA) and Barlett's Test of Sphericity were run to determine whether the data can be subject to factor analysis.

The matrix tables are preceded by a summarised table which displays the findings of the Bartlett's Tests and KMO. It is required that the KMO and MSA be greater than 0.50 and Bartlett's Test of Sphericity lower than 0.05. In each case, the conditions are satisfied, which permit the factor analysis procedure.

Factor analysis was done only for the Likert scale items. Some elements were broken down into smaller elements. This is discussed below in the rotated component matrix.

5.2.5 Kaiser-Meyer-Olkin and Bartlett's Test

Question Number	Section Heading	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	Bartlett's Test of Sphericity		
			Approx. Chi-Square	Df	Sig.
Q1.1 Q1.2 Q1.3 Q1.4	Network capability	.773	465.695	6	.000
Q2.1 Q2.2 Q2.3 Q2.4 Q2.5	Bandwidth offering	.773	457.418	10	.000
Q3.1 Q3.2 Q3.3	Network coverage	.714	251.081	3	.000
Q3.4 Q3.5	Network coverage	.500	46.246	1	.000
Q4.1 Q4.2 Q4.3	Globalisation	.500	44.352	1	.000
Q4.4 Q4.5	Globalisation	.500	71.582	1	.000
Q5.1 Q5.2 Q5.3 Q5.4 Q5.5	Service delivery	.801	353.670	10	.000
Q6.1 Q6.2 Q6.3 Q6.4 Q6.5	Customer Service	.878	720.267	10	.000

Table 5.5: Kaiser-Meyer-Olkin and Bartlett's Tests

Network capability, Bandwidth offering, Network coverage, Globalisation, Service delivery and Customer Service have satisfied all the conditions for factor analysis. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy value must be more than 0.500 and the Bartlett's Test of Sphericity sig. value must be lower than 0.05.

5.2.6 Rotated Component Matrix

Component Matrix[a]

	Component
	1
I have accessibility to all my applications on current my service provider's mobile network.	.852
My current service provider's mobile network capability always exceeds my expectations.	.852

Component Matrix[a]

	Component
	1
I never experience any network congestion on my current service provider's mobile network.	.881
I never experience dropped calls on my current service provider's mobile network.	.881

Component Matrix[a]

	Component
	1
My mobile service provider caters for my bandwidth usage.	.790
I never experience bandwidth problems from my current mobile service provider.	.796
I am happy with my service provider's bandwidth availability.	.822
My mobile service provider offers good value for its bandwidth on its network.	.815
My mobile service provider offers the best pricing on bandwidth.	.709

Component Matrix[a]

	Component
	1
My mobile service provider's mobile network coverage is reliable.	.889
My mobile service provider's mobile network coverage caters for all my mobile requirements.	.893
I will recommend my mobile service provider to others.	.837

Component Matrix[a]

	Component
	1
I am satisfied with my current mobile network coverage.	.854
I will remain a customer of my mobile service provider.	.854

Component Matrix[a]

	Component
	1
My mobile service provider's mobile network offers the latest technology (LTE).	.746
All my devices are compatible on my service provider's mobile network.	.696
My mobile service provider's mobile network is constantly improving.	.814
My mobile service provider's mobile network conforms to international networks.	.785
My mobile service provider's mobile network has a world class network.	.813

Component Matrix[a]

	Component
	1
I am totally satisfied with the service delivery from my mobile service providers.	.906
My mobile service provider exceeds my service delivery expectations.	.911
My mobile service provider caters for all my mobile needs.	.856
I am a brand loyal customer to my mobile service provider.	.701

Component Matrix[a]

	Component
	1
My mobile service provider's customer services are efficient.	.874
My mobile service provider has easy channels to address customer queries.	.869
My mobile service provider's customer services are knowledgeable about the organisations products and services.	.858
All my interaction with my mobile service provider's customer services has been positive.	.881
I always receive feedback on any queries that I have from my mobile service provider.	.887

Rahn (2010:2) advises that factor analysis is a numerical method used in data reduction. A distinctive representation of factor analysis used in this research is when the researcher wished to condense the number of questions into a smaller number of hypothetical questions. The following contributed to factor analysis:

- The most important component analysis was used as the extraction method and the rotation method was Varimax with Kaiser Normalization. This is an orthogonal rotation method that reduces the number of variables that have high loadings on each factor. The analysis of the factors has been simplified.
- Factor analysis/loading indicates inter-correlations amongst variables.
- Items of questions that loaded similarly imply measurement along a similar factor. An examination of the content of items loading at or above 0.5 (and using the higher or highest loading in instances where items cross-loaded at greater than this value) effectively measured along the various components.

It was noted that the variables that constituted all the divisions uploaded flawlessly with 1 component (theme). This means that the objectives of each section measured what it set out to measure (Rahn 2010:2).

5.2.7 Section Analysis

The analysis below tracks the analyses of scoring patterns of the respondents per variable per section. Levels of disagreement (negative statements) were collapsed to show a single category of “Disagree” where applicable. For the levels of agreement (positive statements), a similar procedure was followed and were collapsed to indicate a single category of “Agree”.

The results are first presented using summarised percentages for the variables that constitute each section. The results are then analysed in terms of the importance of the statements.

5.2.7.1 Service Delivery

ICASA defines service delivery as the assessment of the network and customers experience on the mobile network which will assist to determine if the network offers a seamless connection between the sender and the receiver. The evaluation of the mobile network can be done by retainability and accessibility and by the experiences of the customer through the delivery of service they have received (ICASA Act 2006:2).

The graph below summarises the scoring patterns for the Service Delivery of the mobile operator.

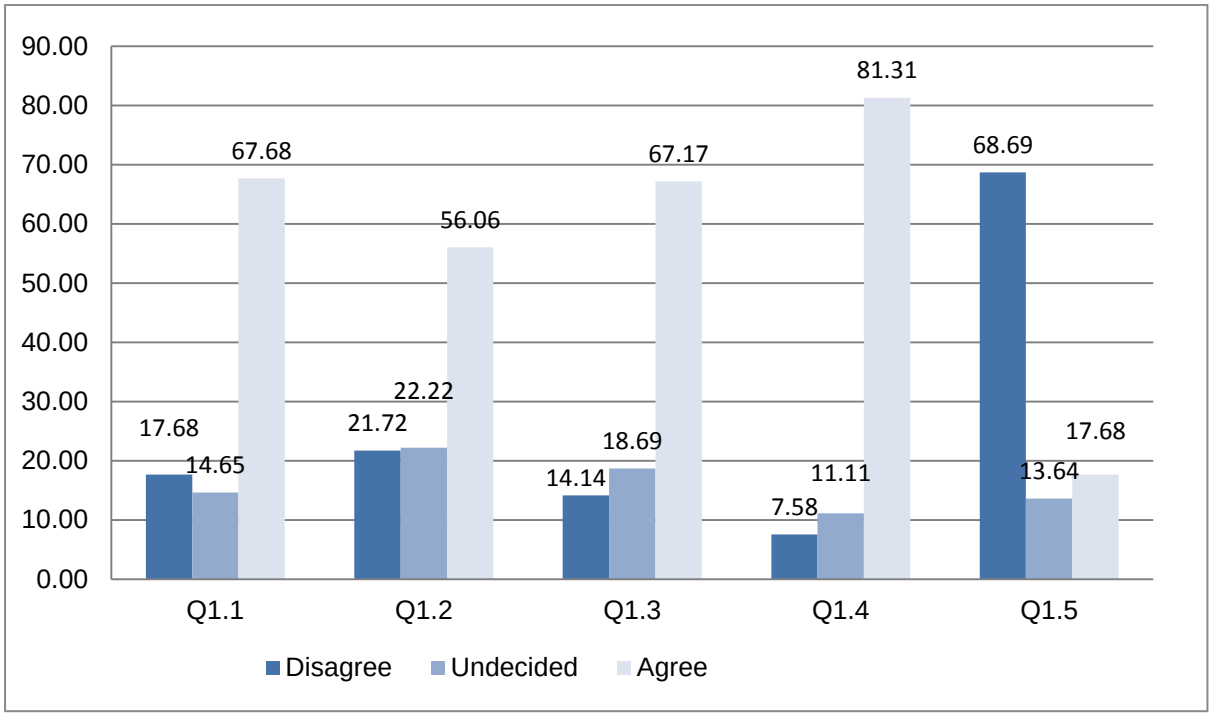

Figure 5.4: Service Delivery – Bar chart depicting the combination of responses

The subsequent patterns are observed:

Some statements show (significantly) higher levels of more occurrences, whilst other levels of more occurrences are lower (but still greater than levels of disagreement). The importance of the differences is tested below.

For Q1.1, by combining the responses “Agree + Strongly Agree”, 67.68 % of the participants indicated that they are satisfied with their mobile service provider’s Service Delivery. This is an indication that the mobile service provider is customer focused and service delivery orientated.

For Q1.2, by combining the responses “Agree + Strongly Agree”, 56.06 % of the participants indicated that their mobile service provider exceeded their expectations. This indicates that the service provider exceeded the expectations of the customers.

For Q1.3, by combining the responses “Agree + Strongly Agree”, 67.17 % of the participants indicated that their mobile service provider caters for all their mobile needs. This indicates that most of the participants’ requirements are being met by their current service provider.

For Q1.4, by combining the responses “Agree + Strongly Agree”, 81.31 % of the participants indicated that they are brand loyal to their mobile service provider. This indicates that the participants are proud to be associated with this brand.

For Q1.5, by combining the responses “Disagree + Strongly Disagree”, 68.69 % of the participants indicated that they would not consider changing to another mobile service provider. This highlights that the respondents are brand loyal to the mobile service provider. Kotler and Keller (2012: 263) claim that a brand is defined as a design, symbol, sign, term, name or comprises of a combination which is used to differentiate and identify them from competitors. Drotskie (2009:129) states that brands are largely perceptions. It is important to consider that the organsiations true brand identification is derived from results of the customer experience over a period of time. Therefore, it is important to note that brands reflect specific benefits or experiences that give meaning and identity.

5.2.7.1.1 The Analysis of Service Delivery revealed the following:

A significant 81.31% of the respondents are brand loyal to the mobile service provider. This signifies a strong relationship and bond with the organisation. Brand loyalty is a key enabler which ensures that customers stay with the brand (Statistics South Africa 2014: 43). A significant 67.68 % of the respondents also agreed that they are satisfied with the service delivery from their mobile service provider.

Most of the participants indicated that they would not consider moving to another service provider as they are satisfied with the service delivery from the current service provider and that their service provider exceeds their expectations. Evaluating service delivery is one of the objectives of this study. The majority of respondents indicated that they were satisfied with the service delivery from their mobile service provider. This correlates with figures released by Statistics South Africa (2014:45). These factors are the antecedents of overall customer satisfaction and the CSM also estimates the results when a customer is satisfied or not. This would explain that, overall, the respondents are satisfied with the service delivery they receive from the mobile service provider.

To ascertain if there was a significant difference in the scoring patterns of each statement, a chi-square test was conducted on Service Delivery. A null hypothesis states that the same number of respondents scored through every option for every statement. The alternate indicates a significant difference exists between the disagreement and agreement levels.

The scoring patterns are to some extent not-similar. This has been confirmed through the use of chi-square p-values ($p > 0.05$), which have indicated that the observed differences were not significant for each statement.

	Chi-Square	df	Asymp. Sig.
I am totally satisfied with the service delivery from my mobile service provider.	105.364	2	.000
My mobile service provider exceeds my service delivery expectations.	46.03	2	.000
My mobile service provider caters for all my mobile needs.	102.636	2	.000
I am a brand loyal customer to my mobile service provider.	205.485	2	.000
I would consider changing to another mobile service provider.	111.848	2	.000

Table 5.6: Levels of disagreement and agreement

If the sig.values highlighted are not more than 0.05, which suggests there were no similarities in the distributions.

As reported in the White Paper of South Africa (2012:2-3), one of the greatest challenges to an organisation is that it faces a great deal of competition and needs to differentiate itself and its product offerings from those of competitors. Service delivery is one method that can be utilised to differentiate a company from its competitors. The organization can increase its revenue streams and profitability through building customer loyalty by providing consistent and high quality services which will considerably increase the competition and discover new avenues to distinguish the product or the organisation. Service delivery is an element which can distinguish a company from its competitors. Constantly providing high customer satisfaction levels by successfully providing consistent services of high value does not build trust and customer loyalty only. However, this would enhance profitability and increase revenue streams significantly.

5.2.7.2 Bandwidth Offering

In South Africa, the market for electronic communications has experienced exponential growth and this trend is likely to continue into the foreseeable future. Electronic communication is undoubtedly the fastest growing industry in South Africa's economy. This is due to the speedy growth in broadband connectivity, mobile telephony and digital broadcasting. South Africa boasts the most advanced communications network in Africa (ICASA Act 2006, s2, ss1).

The table below reflects the scoring patterns for the Bandwidth Offering of the mobile operator.

		Disagree		Undecided		Agree	
		Count	Row N %	Count	Row N %	Count	Row N %
My mobile service provider caters for my bandwidth usage.	Q2.1	17	8.6%	15	7.6%	166	83.8%
I never experience bandwidth problems from my current mobile service provider.	Q2.2	51	25.8%	25	12.6%	122	61.6%
I am happy with my service provider's bandwidth availability.	Q2.3	29	14.6%	35	17.7%	134	67.7%
My service provider offers good value for its bandwidth on its network.	Q2.4	14	7.1%	23	11.6%	161	81.3%
My service provider offers the best pricing on bandwidth.	Q2.5	12	6.1%	35	17.7%	151	76.3%

Table 5.7: Bandwidth offering of the Mobile operator

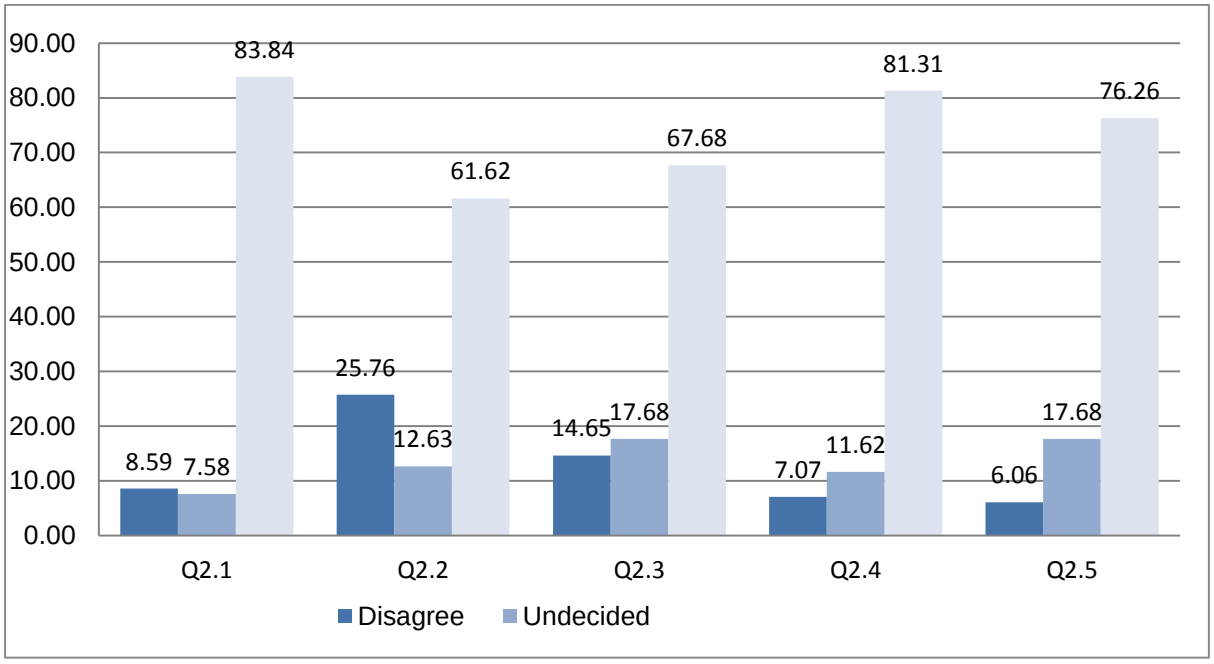

Figure 5.5: Bandwidth – Bar chart depicting the combination of responses

The following patterns are observed:

All statements indicate a greater level of more occurrences which are in agreement with the questions, whereas other levels of more occurrences are lower. The significance of the differences is tested below.

For Q2.1, by combining the responses “Agree + Strongly Agree”, 83.84 % of the participants indicated that their mobile service provider caters for their bandwidth usage. Indicators are that the service provider has made sufficient provision to cater for its users.

For Q2.2, by combining the responses “Agree + Strongly Agree”, 61.62 % of the participants indicated that they never experience bandwidth problems from their mobile service provider. This indicates that the service provider can still improve its bandwidth offering. However, bandwidth availability is dependent on network infrastructure and terrain.

For Q2.3 by combining the responses “Agree + Strongly Agree”, 67.68 % of the participants indicated that they are happy with their mobile service provider’s bandwidth availability. This indicates that the service provider can still improve its bandwidth offering. However, bandwidth availability is dependent on network infrastructure and terrain.

For Q2.4, by combining the responses “Agree + Strongly Agree”, 81.31 % of the participants indicated that their service provider offers good value on their network. This indicates that the service provider offers value within the market.

For Q2.5, by combining the responses “Agree + Strongly Agree”, 68.69 % of the participants indicated that their service provider offers best pricing on bandwidth. This can be attributed to costs involved in establishing a network.

5.2.7.2.1 The analysis of Bandwidth Offering revealed the following:

From the aforementioned results, 84% of the participants agree that their mobile service provider caters for all their bandwidth requirements and 82% of the participants agree that their mobile service provider offers good value. As reported in the White Paper of South Africa (2012: 2-3), one of the greatest challenges to an organisation is that it faces a great deal of competition and needs to differentiate itself and its product offerings from those of its competitors. The organization can increase its revenue streams and profitability through building customer loyalty by providing consistent and high quality services which will increase competition significantly and identify new avenues to actually distinguish the organisation or offering. As such, 'broadband offering' can be defined in a variety of ways.

A majority of 67% of participants agreed that they are satisfied with the service provider's bandwidth availability. This can be linked to a study by Research ICT Africa (2015:1) that found that South Africa had the fourth most expensive mobile data amongst 17 African countries. With average download speeds of 4.5Mbps, South Africa is ranked at 119 globally for average speed. "Evidence from other countries shows that improving broadband penetration has the potential to boost growth by 1.4%" (Research ICT Africa 2015:1).

For the period 2009 to 2012, Statistics South Africa (2014:29) revealed that the Department of Communications has committed to a yearly enhancement of 25% with regards to availability, quality, cost and usage of communications and information technology, in cogence with the aim of developing the industry into conformity with to the rest of the world by 2014. The fixed line telephone industry has been experiencing a decline instead of an increase over the past few years. The industry has experienced a 12% decline in fixed telephone lines from 2001 to 2012. This decline is attributed to consumers migrating to mobile service providers. Cellular phones have the advantage of being mobile and have an easier connection and prepaid billing system.

This would favour the lower subscriber market earning patterns. The decrease of fixed line services highlights the problems associated in the fixed line industry, which contribute to pull factors in mobile technology. There has been little growth in fixed line services. However, mobile services have experienced substantial growth, which is perhaps the reason why South Africa has experienced a net improvement of prices in telecommunications (Statistics South Africa 2014:29).

During the third edition of the Africa Information and Communication Technologies Alliance (AfiCTA) summit held In Braamfontein, Johannesburg on 2 September 2015, The Information Technology Association (ITA) stated that the world is the era of the Internet and that South Africa's digital story has only just began.

At ITA, it is believed that building a connected continent with efficient and stable infrastructure will lead to the improvement of lives, even in the most impoverished regions of Africa. Through the collaboration of business and government, ICT leaders in Africa are realizing ways of improving the lives of people on the African continent.

To ascertain if there was a significant difference in the scoring patterns of each statement, a chi-square test was conducted on Bandwidth Offering. A null hypothesis states that the same number of respondents scored through every option for every statement. The alternative indicates a significant difference exists between the disagreement and agreement levels.

The scoring patterns are to some extent not-similar. This has been confirmed through the use of chi-square p-values ($p > 0.05$) which indicated that the observed differences were not significant for each statement.

	Chi-Square	df	Asymp. Sig.
My mobile service provider caters for my bandwidth usage.	227.303	2	.000
I never experience bandwidth problems on my mobile service provider's mobile network.	76.394	2	.000
I am happy with my mobile service provider's bandwidth availability.	105.364	2	.000
My mobile service provider offers good value for its bandwidth on its network.	205.727	2	.000
My mobile service provider offers the best pricing on bandwidth.	168.212	2	.000
My mobile service provider's network coverage is reliable.	28.758	2	.000

Table 5.8: Bandwidth Offering Levels of Agreement and Disagreement

If the sig.values highlighted are not more than 0.05, which suggests that there were no similarities in the distributions.

5.2.7.3 Network Coverage

The table below shows a summary of the scoring patterns for the Network Coverage of the mobile operator.

		Seldom		Often		Mostly	
		Count	Row N %	Count	Row N %	Count	Row N %
My service provider's mobile network coverage is reliable.	Q3.1	71	35.9%	33	16.7%	94	47.5%
My service provider's mobile network coverage caters for all my mobile requirements.	Q3.2	71	35.9%	33	16.7%	94	47.5%
I will recommend my current mobile service provider to others.							
I am satisfied with my current service provider's mobile network coverage.	Q3.3	13	6.6%	28	14.1%	157	79.3%

Table 5.9: Network Coverage of the mobile service provider

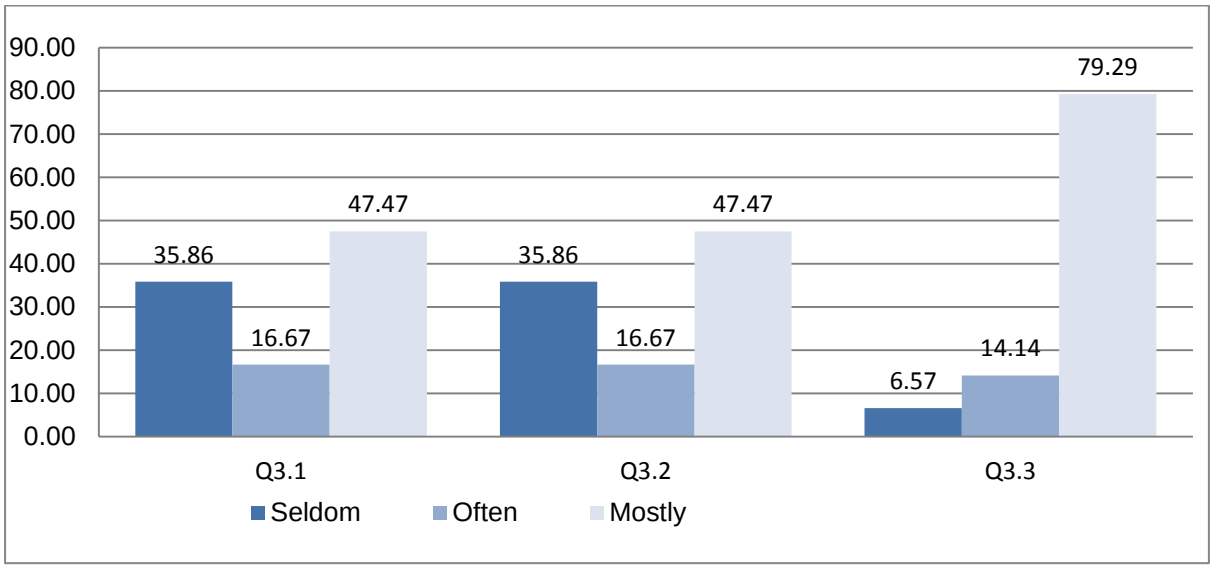

Figure 5.6: Network Coverage – Bar chart depicting responses

The subsequent patterns are observed:

Some statements indicate a greater level of additional occurrences, whilst other levels indicate additional occurrences which are low. The implications of the differences are tested below.

For Q3.1, by combining the responses “Agree + Strongly Agree”, only 47.47 % of the participants indicated that their mobile service provider’s network coverage is reliable. This is attributed to the incomplete network footprint that the service provider has.

For Q3.2, by combining the responses “Agree + Strongly Agree”, 47.47 % of the participants indicated that their mobile service provider’s network coverage caters for all their mobile requirements.

For Q3.3, by combining the responses “Agree + Strongly Agree”, 79.29 % of the participants indicated that they are satisfied with their mobile service network coverage. This suggests that participants are well covered through their service provider.

5.2.7.3.1 The analysis of Network Coverage has revealed:

Just over 79% of respondents are satisfied with the network coverage they received from their service provider. According to Charity and Wilton (2008: 46), the sequence and extent of the network rollout can have a major impact on project profitability. Addressing regions of high population density first can maximize potential revenue for the minimum infrastructure investment. This attractive result arises both because the area to be covered is minimized and also because this same area is likely to contain a high percentage of businesses, which are typically early adopters. This initial phase is usually followed by a coverage of regions where large numbers of people live and work.

However, 47% of respondents agreed that the network coverage of the service provider is reliable and 47 % of the respondents agreed that the service provider's network caters for their requirements. This is one of the major challenges that the service provider is faced with. The lack of a pronounced network footprint limits the organisation in selling its products and services to certain geographical areas only.

Sixteen percent of respondents indicated that they are experiencing poor network coverage from the mobile service provider. According to Charity and Wilton (2008: 4), this is one of the key areas in customer service that the organisation has to evaluate as this has a direct relationship with the service delivery that the organisation provides to its clients. However, this problem is not unique to this mobile service provider. With acquisitions and mergers occurring within the industry, operators can provide services such as application bases across TV and common content, mobile systems and fixed internet systems, also called "quadruple play". The mobile service provider has put measures in place to try and increase its network coverage. However, this has to improve.

To ascertain if there was a significant difference in the scoring patterns of each statement, a chi-square test was conducted on Network Coverage. A null hypothesis states that the same number of respondents scored through every option for every statement. The alternate indicates that a significant difference exists between the disagreement and agreement levels.

The scoring patterns are to some extent not-similar. This has been confirmed through the use of chi-square p-values ($p > 0.05$), which have indicated the observed differences were not significant for each statement.

	Chi-Square	df	Asymp. Sig.
My mobile service provider's network coverage is reliable.	28.758	2	.000
My mobile service provider's network coverage caters for all my mobile requirements.	28.758	2	.000
I will recommend my mobile service provider to others.	189.909	2	.000

Table 5.10: Network Coverage Levels of Agreement and Disagreement of the mobile service provider

If the sig.values highlighted are not more 0.05, which suggests that there were no similarities in the distributions.

		Disagree		Undecided		Agree	
		Count	Row N %	Count	Row N %	Count	Row N %
I am satisfied with my current mobile network coverage.	Q3.4	81	40.9%	34	17.2%	83	41.9%
I will remain a customer of my current mobile service provider.	Q3.5	10	5.1%	25	12.6%	163	82.3%

Table 5.11: Network Coverage Levels of Agreement and Disagreement of the mobile service provider

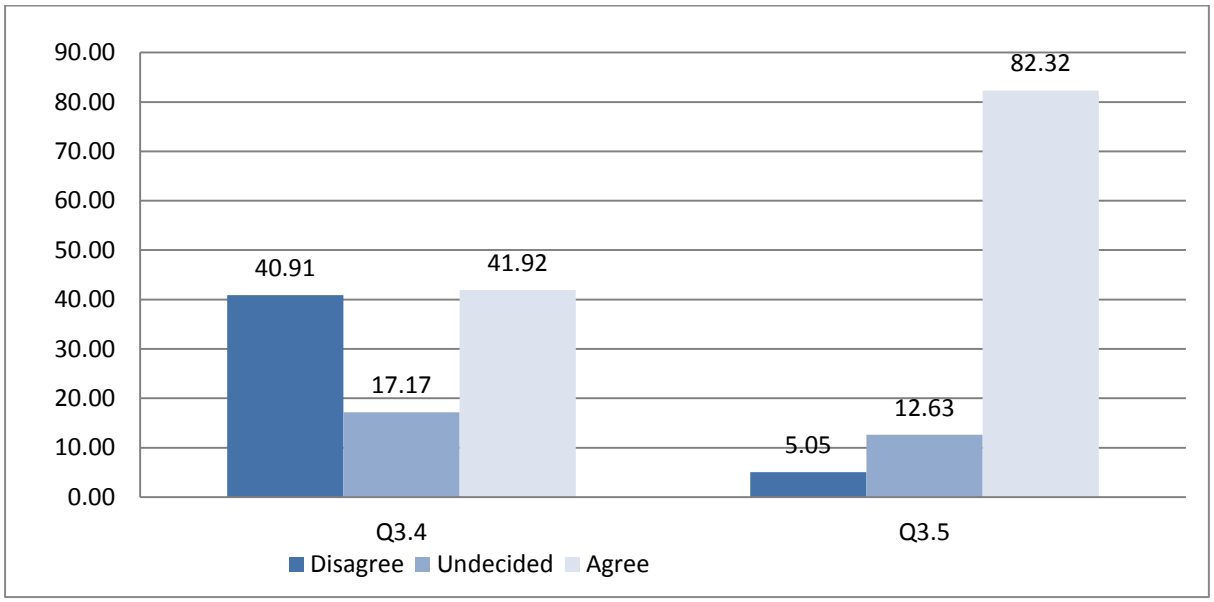

Figure 5.7: Network Coverage – Bar chart depicting a combination of the responses

The following patterns are observed:

Some statements indicate a greater level of occurrences which are in agreement with the questions, whereas other levels of additional occurrences are lower. The significance of the differences is tested below.

For Q3.4, by combining the responses “Agree + Strongly Agree”, 41.92. % of the participants indicated that they will recommend their service provider to others. A majority of participants would recommend their service provider to others.

For Q3.5, by combining the responses “Agree + Strongly Agree”, 83.32 % of participants indicated that will remain a customer of their mobile service provider. This indicates that clients are satisfied with the Service Delivery and the Quality of Service that they are receiving from their current mobile service provider.

The scoring patterns are to some extent not-similar. This has been confirmed through the use of chi-square p-values ($p > 0.05$) which indicate that the observed differences were not significant for each statement.

To ascertain if there was a significant difference in the scoring patterns of each statement, a chi-square test was conducted on Network Coverage. A null hypothesis states that the same number of respondents scored through every option for every statement. The alternate indicates that a significant difference exists between the disagreement and agreement levels.

	Chi-Square	df	Asymp. Sig.
I am satisfied with my mobile service provider's current mobile network coverage.	23.303	2	.000
I will remain a customer of my mobile service provider.	215.545	2	.000

Table 5.12: Levels of agreement and disagreement of the mobile service provider

If the sig.values highlighted are not more 0.05, which suggests there were no similarities in the distributions. This implies that the different manners in which respondents scored had significance for the following: Q4.1; Q4.2 and Q4.3.

5.2.7.4 Network Capability

The table below summarises the scoring patterns for the Network Capability of the mobile operator.

		Seldom		Often		Mostly	
		Count	Row N %	Count	Row N %	Count	Row N %
I have accessibility to all my applications on my current service provider's mobile network.	Q4.1	30	15.2%	15	7.6%	153	77.3%
My current service provider's mobile network capability always exceeds my expectations.	Q4.2	51	25.8%	49	24.7%	98	49.5%
I often think of changing my mobile service provider.	Q4.3	137	69.2%	24	12.1%	37	18.7%

Table 5.13: Network Capability of the mobile operator

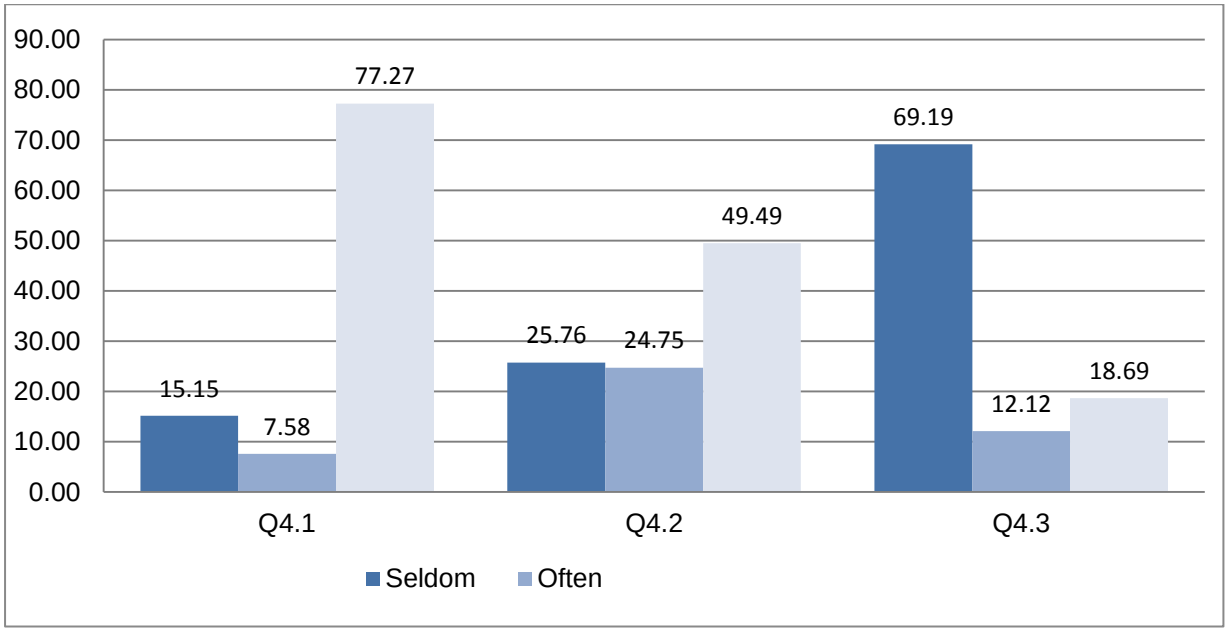

Figure 5.8: Network Capability – Bar chart depicting a combination of the responses

The following findings and patterns were observed:

Some statements indicate a greater level of more occurrences which are in agreement with the questions, whereas other levels of more occurrences are lower. The third statement has a higher level of seldom occurrence. The significance of the differences is tested below.

For Q4.1, 77.27 % of participants agreed that they have accessibility to their applications by the mobile operator.

For Q4.2, 49.49 % of participants agreed that the mobile service operator always exceeded their expectations, while 24.75 % of participants agreed that the mobile service provider exceeded their expectations. This implies that 74.24 % of the participants were satisfied with the Quality of Service they received from their current mobile operator.

For Q4.3, 69.19 % of participants did not think of changing their current mobile service provider. This suggests that the respondents were happy with the QoS which they had received from their current mobile operator.

To ascertain if there was a significant difference in the scoring patterns of each statement, a chi-square test was conducted on Network Capability. A null hypothesis states that the same number of respondents scored through every option for every statement. The alternate indicates that a significant difference exists between the disagreement and agreement levels.

The scoring patterns are to some extent not-similar. This has been confirmed through the use of chi-square p-values ($p > 0.05$), which indicate that the observed differences were not significant for each statement. The results are shown below.

	Chi-Square	df	Asymp. Sig.
I have accessibility to all my applications on my current mobile service provider's mobile network.	173.727	2	.000
My current service provider's mobile network capability always exceeds my expectations.	23.303	2	.000
I often think of changing my mobile service provider.	115.848	2	.000

Table 5.14: Levels of agreement and disagreement

If the sig.values highlighted are not more than 0.05, this suggests that there were no similarities in the distributions. This implies that the different manner in which the respondents scored had significance for the following: Q4.4 and Q4.5.

		Disagree		Undecided		Agree	
		Count	Row N %	Count	Row N %	Count	Row N %
I never experience any network congestion on my current service provider's mobile network.	Q4.4	81	40.9%	29	14.6%	88	44.4%
I never experience dropped calls on my current service provider's mobile network.	Q4.5	101	51.0%	22	11.1%	75	37.9%

Table 5.15: Levels of agreement and disagreement

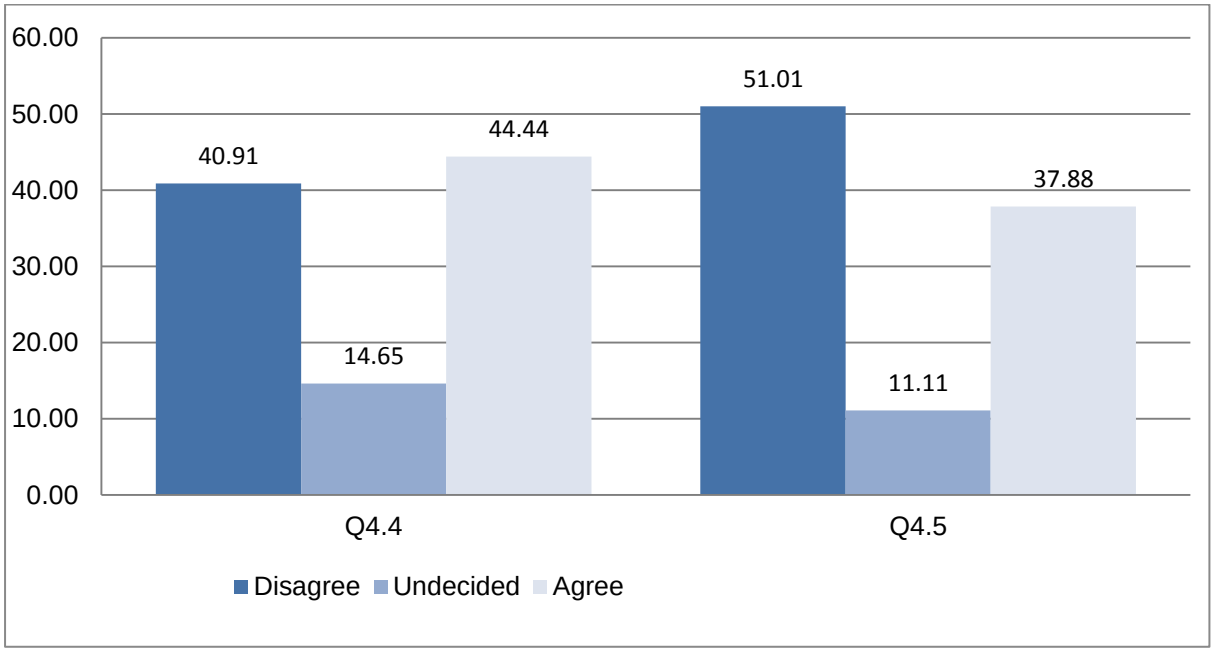

Figure 5.9: Network Capability – Bar chart depicting a combination of the responses

Q4.4 has agreement that 40.9% of users experience network congestion on the mobile network. This can be attributed to the fact that as the number of users increases on the network, the bandwidth available decreases. Users would receive slower response times to applications and will also experience congestion on the network. Therefore the mobile operator should continuously monitor their network and upgrade their bandwidth accordingly.

For Q4.5, 51.01% of users of the mobile network experience dropped calls that could be attributed to the fact that the mobile operator does not have complete network coverage and that the operator is sharing infrastructure in certain areas. During the changing between base stations “handovers” should occur. During this process, if there is not a seamless “handover” users would have no connection, thereby experiencing call termination. The user is unable to differentiate between the reasons why the call has terminated but the operator can attribute this to various reasons.

5.2.7.4.1. The analysis of Network Capability has revealed:

A significant 77.27 % of participants agreed that they have accessibility to their applications by the mobile operator. According to Cullen (2016:7), “When you’re a digital business with the network at the center of your innovation, you need to move rapidly wherever the market is going; the technology you choose is the platform for your business success, so choose wisely”. Modernizing the network prepares one to compete in the intense global competition for markets and consumers. Innovations like open-source software, software-defined networking (SDN) and network functions virtualization (NFV) make it possible to act on opportunities faster. The provider will deliver cost-effective services, get them to market more rapidly and lower the cost of customer acquisition.

A low 12% of respondents think of changing their mobile service provider. This is very positive as the service provider has a small percentage of people that they need to focus on, in order to improve their network capability. Cullen (2016:2) advises that one needs to continue to innovate, dream up new things and get them to customers quickly. “It’s OK if every effort isn’t successful. Quickly move on and repurpose any technology investments you may have made.” The major challenge for any service provider today is their networks as most were built for another era, when launch speed was not a priority. “To take advantage of new and emerging opportunities today, you need to migrate to a much more flexible network” Cullen (2016:2). Such a network should operate more efficiently, at lower cost and by being simpler to manage.

Forty one percent of respondents agree that they experience network congestion and 38% of respondents agree that they experience dropped calls on the network. This can be attributed to high numbers of users on the network, which the service provider did not initially plan for.

The service provider has to increase the capability of their network. The only way this can be accomplished is by increasing the network footprint. This would then increase the network capability of the mobile network. The advice of Sidler (2016: 1) needs to be heeded here, that the advancement of technology is interrupting established organisations and business models and creating a wealth of new chances in current markets and in new ones. “To compete in these markets, speed is everything”. “Whether you want to roll out new content, expand geographically, introduce new applications or develop a business model for a new customer segment, you need to act fast”. “Success will be measured by how fast you can enter a market, establish a leadership position and capture improved profitability early on” Sidler (2016:1).

5.2.7.5 Globalisation

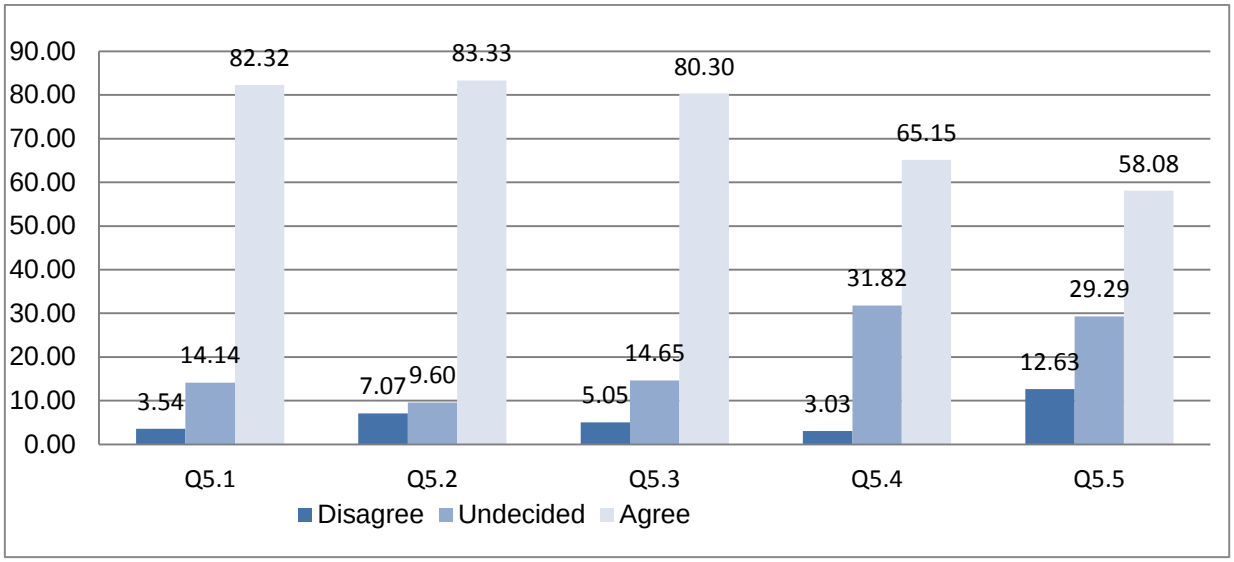

Figure 5.10: Bar Chart Representation of Globalisation

The following findings and patterns were observed:

Some statements indicate greater levels of more occurrences which are in agreement with the questions, whereas other levels of more occurrences are lower. The first, second and third statements have a higher level of agreement. The significance of the differences is tested below.

For Q5.1, by combining the responses “Agree + Strongly Agree”, 82.32 % of the participants indicate that their mobile service provider facilities the latest technology on their network. The service provider has made provision to incorporate and make available the latest’s technology to its users.

For Q5.2, by combining the responses “Agree + Strongly Agree”, 83.33 % of participants indicate, that all their devices are compatible on the mobile service provider’s network. Which indicates that the service provider has made provision to accommodate various user devices on their network.

For Q5.3, by combining the responses “Agree + Strongly Agree”, 80.30 % of participants indicate that their mobile service provider’s network is constantly improving. This indicates that the users have confidence in the service provider and they experience improvements by the service provider.

For Q5.4, by combining the responses “Agree + Strongly Agree”, 65.15 % of participants indicate that their service provider’s network conforms to international networks. This indicates that the service provider incorporated international standards in the design and implementation of their network.

For Q5.5, by combining the responses “Agree + Strongly Agree”, 58.08 % of participants indicate that their service provider has a world class network. This can be attributed to the service provider still being in the roll out phase of their mobile network.

		Disagree		Undecided		Agree	
		Count	Row N %	Count	Row N %	Count	Row N %
My service provider's mobile network offers the latest technology (LTE).	Q5.1	7	3.5%	28	14.1%	163	82.3%
All my devices are compatible on my service provider's mobile network.	Q5.2	14	7.1%	19	9.6%	165	83.3%
My service provider's mobile network is constantly improving.	Q5.3	10	5.1%	29	14.6%	159	80.3%
My service provider's mobile network conforms to international networks.	Q5.4	6	3.0%	63	31.8%	129	65.2%
My service provider has a world class network.	Q5.5	25	12.6%	58	29.3%	115	58.1%

Table 5.16: Summary of the scoring patterns for Globalisation of the mobile operator.

To ascertain if there was a significant difference in the scoring patterns of each statement, a chi-square test was conducted on Globalisation. A null hypothesis states that the same number of respondents scored through every option for every statement. The alternate indicates that a significant difference exists between the disagreement and agreement levels.

The scoring patterns are to some extent not-similar. This has been confirmed through the use of chi-square p-values ($p > 0.05$), which indicate that the observed differences were not significant for each statement.

5.2.7.5.1 The analysis of Globalisation has revealed:

With over 82% of the participants agreeing that their mobile service provider facilitates the latest technology on their network, the findings are similar to a study by Research ICT Africa (2015:1) in which South Africa had the fourth most expensive mobile data of 17 African countries. With average download speeds of 4.5Mbps, South Africa is ranked at 119th globally for average speed. "Evidence from other countries shows that improving broadband penetration has the potential to boost growth by 1.4%" (Research ICT Africa 2015: 1).

The phenomenal increase in users of broadband and the cumulative usage of data has resulted in business focusing on growth strategies of data, which is now captivating the broadband speed within the country. To avoid further broadband quality degradation, it is vital that the LTE high demand spectrum is distributed amongst mobile operators (Research ICT Africa 2015:1). The South African market is also emerging experiences challenges through weak commodity prices, decreased demand of the Chinese and increasing interest rates in the US. This circumstance is then exacerbated by local factors which include regulation uncertainty, drought and shortfalls in infrastructure. Increasing public debt and pressures of inflation have also placed monetary and fiscal policy under pressure.

A significant 83% of participants agreed that their devices are compatible on their mobile service provider's network.This can be linked to Gartner's (2016:18) assertion that the device segment is outpacing all other segments for spending growth in South Africa. Gartner's (2016:18) predicts that annual spending on mobile phones will break the $5 billion (R68 billion) mark by 2018. South African mobile app developers are well positioned to take full advantage of this growth, as well as to deliver relevant offerings further into the African continent, taking advantage of the burgeoning markets to the North.

Over 80% of participants agreed that their service provider is constantly improving their mobile network. The World Bank states that the promotion of domestic competition amongst companies can generate growth and alleviate poverty within a small fiscal space and a slowly growing environment. Telecommunications accounts for up to 2.6% of contributions to the industry and 1.7% of exports in South Africa. The report stated: "Of the 5 key players in South Africa's wireless broadband market, 2 operators account for a 70% market share". "When firms compete, they offer lower prices and higher-quality products to win market share. Firms are also encouraged to innovate and become more efficient and productive" My Broadband (2016:1).

A significant 65 % of participants agreed that their service provider conforms to international networks. This correlates with the South Africa GDP Growth Rate (2016:2) for the fiscal year 2016/2017 which is predicted to continue marginally lower than the Sub Saharan Africa average rate of 4.5%. The GDP growth rate is forecast 0, 8% in 2016, a decrease from 1.3% in 2015. Since 2009, this would be the lowest growth rate. For 2017, the forecast growth is to be at 1.1%. “In this prevailing weak economic climate, it is important for South Africa to look to other avenues outside the fiscal space to stimulate faster growth”. “With this study, we offer evidence for one such route, competition policy, and hope this will enhance debate and reinforce the case for the bold policy decisions needed to revive the country’s economy for faster growth, more jobs, and poverty eradication”(South Africa GDP Growth Rate 2016:2).

With over 58% of the participants agreeing that their service provider has a world class network, this finding is similar to Marshall’s (2016:1) statement: “South Africa has suffered currency effects, as did many developing markets this year”. “There were also impacts on communications service providers, the largest IT market segment in terms of spending – as they faced regulations that imposed decreased rates for interconnection and experienced the accelerating decline of fixed services revenue.”

	Chi-Square	df	Asymp. Sig.
My mobile service provider’s network offers the latest technology (LTE).	217.182	2	.000
All my devices are compatible on my mobile service provider’s network.	222.939	2	.000
My mobile service provider’s network is constantly improving.	199.303	2	.000
My mobile service provider conforms to international networks.	114.818	2	.000
My mobile service provider has a world class network	62.818	2	.000

Table 5.17: Levels of agreement and disagreement

If the sig.value highlighted is not more than 0.05, this that suggests there were no similarities in the distributions.

A significant 83% of respondents agree that all their devices are compatible on their service provider's network whilst 80 % of respondents agree that their service provider's network is improving. This implies that the service provider caters for consumers, while simultaneously improving their network.

5.2.7.6 Customer Service

The table below summarises the scoring patterns for Customer Service of the mobile operator.

		Disagree		Undecided		Agree	
		Count	Row N %	Count	Row N %	Count	Row N %
My current mobile service provider's customer services are efficient.	Q6.1	45	22.7%	28	14.1%	125	63.1%
My mobile service provider has easy channels to address customer queries.	Q6.2	60	30.3%	32	16.2%	106	53.5%
My service provider's customer services are knowledgeable about their products and services.	Q6.3	40	20.2%	45	22.7%	113	57.1%
All my interaction with my mobile service provider's customer services has been positive.	Q6.4	46	23.2%	38	19.2%	114	51.5%
I always receive feedback on any queries that I have from my mobile service provider.	Q6.5	45	22.7%	51	25.8%	102	51.5%

Table 5.18: Summary of the scoring patterns for Customer Service

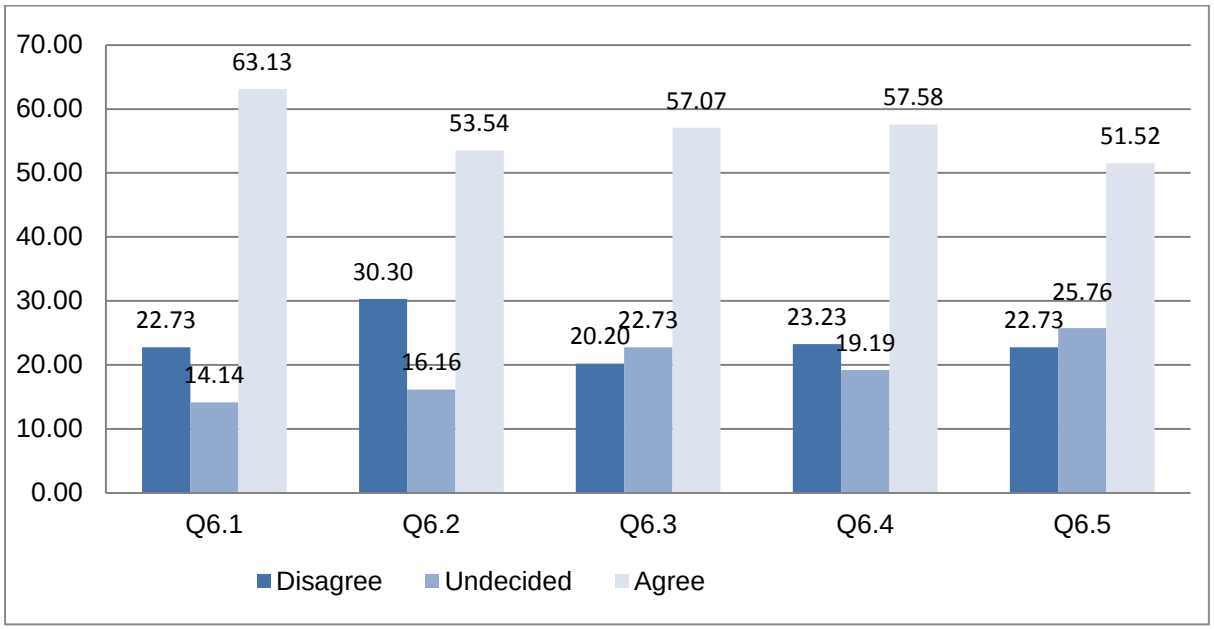

Figure 5.11: Bar Chart Representing: Customer Service

The following findings and patterns were observed:

Some statements indicate a greater level of more occurrences which are in agreement with the questions, whereas other levels of more occurrences are lower. The implications of differences are tested below.

For Q6.1, by combining the responses “Agree + Strongly Agree”, 63.13 % of participants indicate that their mobile service provider’s customer services are efficient. However, they have the ability to improve their customer services.

For Q6.2, by combining the responses “Agree + Strongly Agree”, 53.54 % of participants indicate that their service provider has easy channels to address customer queries. This indicates that the service provider does value its customer queries. However, they can incorporate other channels for customers to address queries.

For Q6.3, by combining the responses “Agree + Strongly Agree”, 57.07 % of the participants indicated that the customer service agents are knowledgeable. This indicates that the customer service agents have knowledge about the organisation’s products and services and customer service is important to the organisation. However, their knowledge and understanding has to be increased. The use of out-sourced consultants could affect the product knowledge of the organisation.

For Q6.4, by combining the responses “Agree + Strongly Agree”, 57.58 % of the participants indicated that their interaction with the mobile service provider’s customer service agents have been positive. This indicates that the service provider offers good customer service to its clients.

For Q6.5, by combining the responses “Agree + Strongly Agree”, 51.52 % of participants indicate that they receive feedback on queries that they logged with their mobile service provider. This can be attributed to the operator valuing customer feedback.

To ascertain if there was a significant difference in the scoring patterns of each statement, a chi-square test was conducted on Customer Service. A null hypothesis states that the same number of respondents scored through every option for every statement. The alternate indicates that a significant difference exists between the disagreement and agreement levels.

The scoring patterns are to some extent not-similar. This has been confirmed through the use of chi-square p-values ($p > 0.05$) which indicate that the observed differences were not significant for each statement.

	Chi-Square	df	Asymp. Sig.
My mobile service provider's customer services are efficient.	81.303	2	.000
My mobile service provider has easy channels to address customer queries.	42.303	2	.000
My mobile service provider's customer services are knowledgeable about their products and services.	50.394	2	.000
All my interaction with my mobile service provider's customer services has been positive.	52.848	2	.000
I always receive feedback on any queries that I have from my mobile service provider.	29.727	2	.000

Table 5.19: Customer Service Levels of agreement and disagreement

If the sig.values highlighted are not more than 0.05, this suggests there were no similarities in the distributions.

5.2.7.6.1 The analysis of Customer Service has revealed:

Over 63% of participants agreed that their mobile service provider's customer services are efficient. The organisation has to focus on improving this. Customer satisfaction is of strategic significance in a competitive environment. If the levels of customer satisfaction are high in an organisation, there will be many benefits for that organisation. A company's financial performance is directly related to customer satisfaction. This assertion evidence has been proven by many researchers (Gupta & Zeithaml 2006; Smith & Wright 2004).

Just 57% of participants agree that their interaction with their service provider has been satisfactory. Therefore, the organisation has to revise their measures to improve in the area. Kim *et al*. (2006:101) point out those customers that are satisfied have a greater possibility of remaining with their current service provider. Satisfied customers would have a greater chance to promote their service provider (Eshghi et al. 2008; Sweeney & Swait 2008).

Some respondents did have a good experience with the customer services of the service provider. The service provider has opened an active customer complaint department that processes each complaint lodged by a customer. Furthermore, there is a service level agreement in which the service provider has to resolve the customer's complaint. This is also a requirement by the various bodies that monitor the service provider's complaints.

With just 51 % of participants satisfied with the feedback they received, the organisation has to improve as this correlates to figures released by Statistics South Africa (2014:45) which indicates that the antecedents are critical to overall customer satisfaction. This which also encompasses the CSM which speculates on the findings of whether customer satisfaction is achieved or not. This would explain that overall, respondents are satisfied with the service delivery they receive from the mobile service provider. However, constantly being customer centric is relevant as it ensures that the organisation is customer-orientated.

5.2.8 Hypothesis Testing

The customary method of reporting a result entails a statement of statistical significance. From a test statistic, a p-value is generated. An important result is indicated with "$p<0.05$". These are the values highlighted with an*.

To ascertain if there was a significant difference in the scoring patterns of each statement, a second chi-square test was conducted between the variables. A null hypothesis states that the same number of respondents scored through every option for every statement. The alternate indicates that a significant difference exists between the disagreement and agreement levels.

In the appendix, the table summary and the results of chi-square are attached.

For example: The p-value between “The Mobile service provider’s network capability always exceeds my expectations” and “Gender” is 0.021. This signifies a relationship between the highlighted variables in yellow. The element of gender had a significant effect on how respondents responded to the network capability of the mobile service provider.

I never experience any network congestion on my mobile service provider’s network.	030*
I never experience dropped calls from my mobile service provider.	**042***
I never experience bandwidth problems on my mobile service provider’s network.	028*
My mobile service provider’s network coverage is reliable.	017*
My mobile service provider’s network coverage caters for all my mobile requirements.	028*
I will remain a customer of my mobile service provider.	20
I am satisfied with my current mobile network coverage from my mobile service provider.	047*
I am totally satisfied with the service delivery from my mobile service provider.	046*
My mobile service provider exceeds my service delivery expectations.	049*
My mobile service provider caters for all my mobile needs.	021*

Table 5.19: Hypothesis Testing of Levels of agreement and disagreement

Values which do not have an * have no important relationship.

5.2.9. Correlations

“The statistical process by which we discover the nature of the relationships amongst different variables is called correlation” (Leedy and Omrod, 2005: 265). A strong correlation is indicated by correlation coefficient that is close to either +1 or -1. This study identified a strong relationship with a coefficient > 0.70. Bi - variate correlation on the data was conducted. A total of eleven correlations were identified, tabulated and discussed.

The complete results are in the appendix.

The subsequent patterns have been identified from the results. Positive values specify that a direct relationship occurs amongst the variables and a negative value specifies an inverse relationship. All relationships of significance are indicated by an* or **.

	Statement A	Statement B	Correlation Strength
a	I am happy with my mobile service provider's bandwidth availability.	I never experience bandwidth problems on the mobile service provider's mobile network.	**.756****
b	My mobile service provider's network coverage caters for all my mobile requirements.	My mobile service provider's network coverage is reliable.	**.710****
c	I am satisfied with my current mobile network coverage.	My mobile service provider's coverage caters for all my mobile requirements.	**.758****
d	I will remain a customer of my mobile service provider.	I will recommend my mobile service provider to others.	**.870****
e	My mobile service provider exceeds my service delivery expectations.	I am totally satisfied with the service delivery from my mobile service provider.	**.850****
f	My mobile service provider caters for all my mobile needs.	I am totally satisfied with the service delivery from my mobile service provider.	**.708****
g	I am a brand loyal customer to my mobile service provider.	I will remain a customer of my mobile service provider.	**.757****
h	My mobile service provider has easy channels to address customer queries.	My mobile service provider's customer services are efficient.	**.763****
I	All my interaction with my mobile service provider's customer services has been positive.	My mobile service provider's customer services are knowledgeable about their products and services.	**.711****
j	I always receive feedback on any queries that I have from my mobile service provider.	All my interaction with my mobile service provider customer services has been positive.	**.793****

Table 5.21: Correlations

Respondents indicated that they were happy with the bandwidth and never experienced problems on their mobile network. This indicates that the organisation understands the expectations of their customers.

Respondents indicated that the network coverage is reliable. This indicates that the organisation's rollout strategy is efficient and effective, as customers are satisfied with the network footprint.

Respondents indicated that they were satisfied with the network coverage and that the coverage catered for all their mobile requirements. This indicates that the organisations understands customer requirements and are striving to exceed their expectations.

Respondents indicated that they will remain a customer and that they will recommend their mobile service provider to others. This is a tremendous accomplishment as the organisation has exceeded customer expectations. Their customers indicated that they want to be associated with the brand.

Respondents indicated that the mobile service operator exceeded their service delivery expectations and that they are totally satisfied with the service delivery from their mobile service provider. This is very positive as the organisation's strategy is aligned to meet service delivery within the organisation.

Respondents indicated that their mobile service operator caters for all their mobile requirements and that they are totally satisfied with their mobile service providers service delivery. This confirms that the organisation is technology and customer focused.

Respondents indicated that they are brand loyal to their mobile service provider and that they remain a customer of their mobile service provider. This confirms that the organisation has created a strong brand which customers want to be associated with.

Respondents indicated that their mobile service provider had easy channels for customer queries and they were efficient. This confirms that the organisation has implemented effective service delivery strategies.

Respondents indicated that their interaction with their mobile service provider was good and their mobile operator's customer services are knowledgeable about their products and services. This is a positive indication that the organisation has met its customer needs.

Respondents indicated that they always received feedback from knowledgeable customer services. This is a positive indication that the organisation has met customer needs.

5.3 Analysis of Reports - Network Capability

The graph below indicates the total number of complaints received by all customers on the network and the total number of calls logged by the mobile operator. Network capability will comprise the availability, congestion and dropped calls experienced by all users on the network.

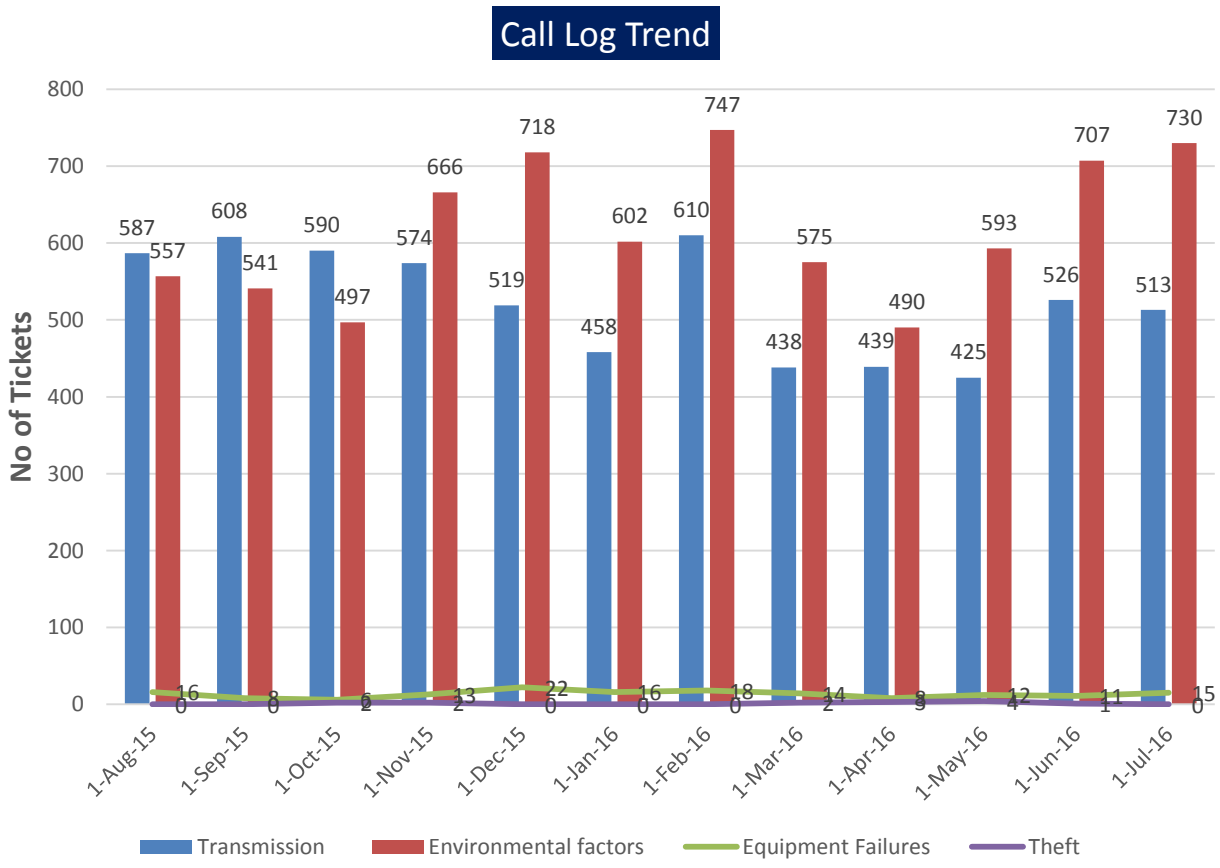

Figure 5.12: Bar Chart Representing Network Capability

The above figure 18 depicts the Network Capability of the mobile operator. The graph indicates the total number of mobile network failures and the reasons for these failures. Network capability comprises the availability, congestion and dropped calls experienced by all users on the network.

Document Analysis Network Capability

Below is a description root causes that affected the network capability of the mobile operator.

A. Transmission (Number of Tickets & Sites Affected)	
	1. Transmission Line Fault / Transmission Card Reset
	2. Cable Cut Issue
	3. H/W replaced from mobile operator
	4. ME Switch Reset
	5. Port Configuration of Metro Switch
	6. Planned Activity from mobile operator
	7. Clear While Localising
	8. Right When Tested
	9. Fiber Tails Cleaned
B. Environmental factors (Number of Tickets & Sites Affected)	
	1. Power
	2. Transmission Power
	3. High Temperature
C. Equipment Failures (Number of Tickets & Sites Affected)	
	1. Router Replaced
	2. Router IOS / Configuration Changed / Reset
	3. Loose Cable at Router end
	4. 2G / 3G Port Issue
D. Theft (Number of Tickets & Sites Affected)	
	1. Vandalised sites
	2. Site Decommissioned

Table 5.22: Document Analysis Network Capability

The figure below depicts the 2G Network availability of the service provider

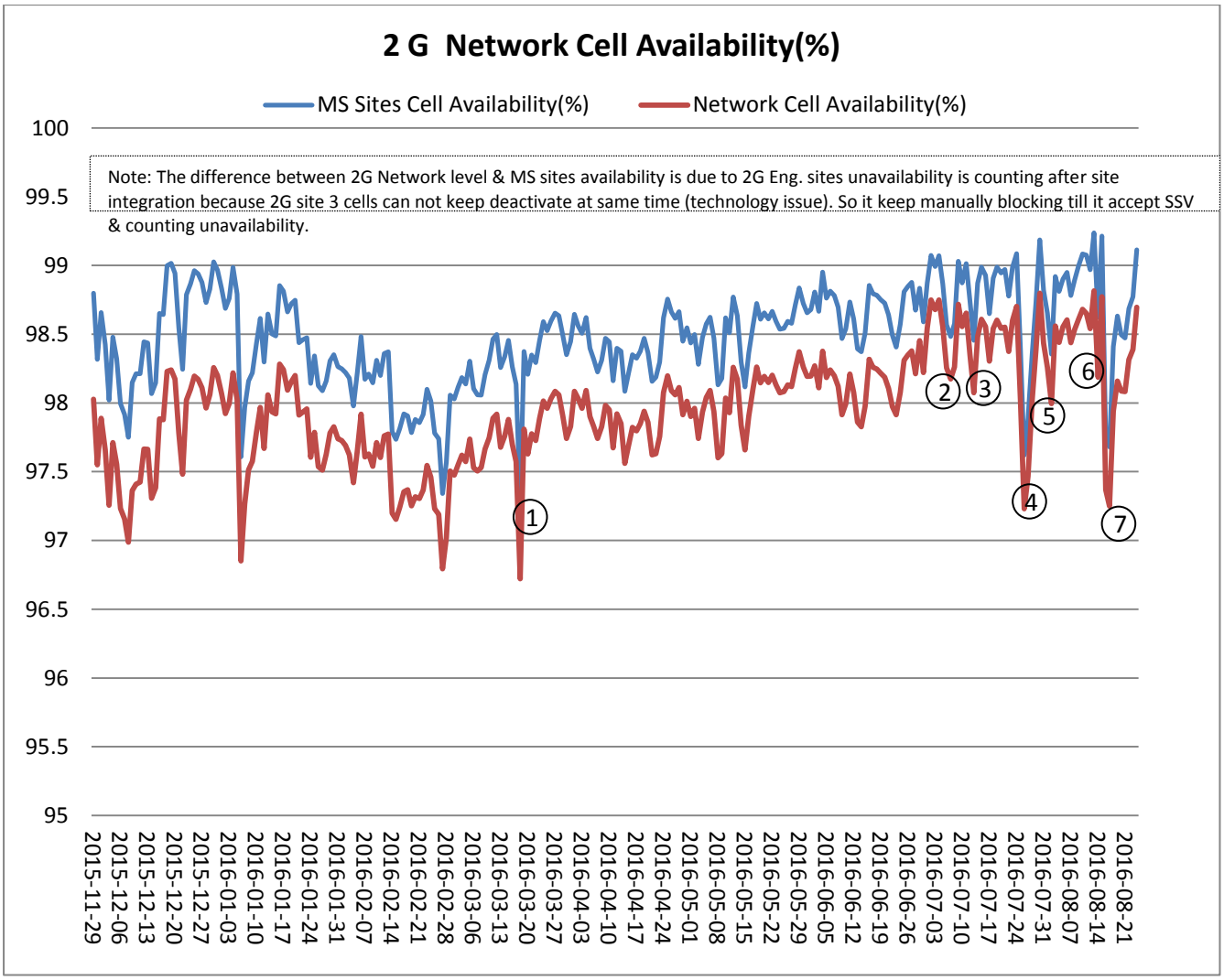

Figure 5.13: 2G Network Cell Availability

The table below indicates the root causes that affected the 2G network of the mobile operator.

1.2015-03-18: Degraded due to transmission
2. 2016-07-06: Degraded due to multiple packet loss of sites
3. 2016-07-13: Degradation due to sites packet loss issue
4. From 2016-07-26: Degradation due to stormy weather affecting multiple sites.
5. From 2016-08-02 to 2016-08-03: Degradation due to multiple packet loss sites issue TX issue.
6. 2016-08-14: Degradation planned work.
7. From 2016-08-16 Degradation due to cable break issue

Table 5.23: Analysis of the 2G Network

2G Network Call Drop Rate

Figure below indicates the total percentage of dropped calls experienced by the mobile operator.

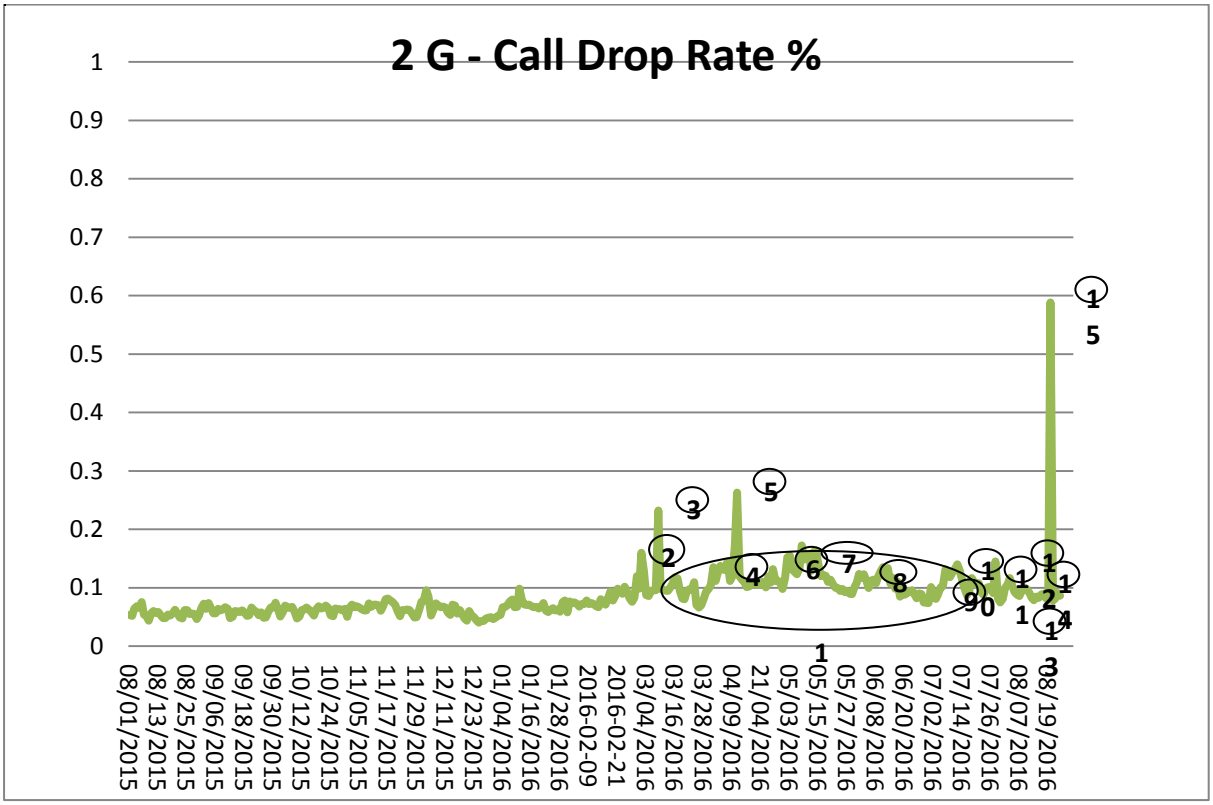

Figure 5.14: 2G Network Call Drop Rate

Table 5.24 indicates the root causes that affected the 2 G Call Drop Rate of the mobile operator's network.

1. From 2016-02-21: Degradation due to multiple Iub congested sites, MSO link congestion and packet loss sites.
2. From 2016-03-02 to 2016-03-04: Degraded due to external interference in region.
3. 2016-03-09: Degraded due interface expansion (board installation and configuration).
4. From 2016-04-02: Degradation due to congestion issue during busy hours
5. From 2016-04-10: LTE KPIs were degraded
6. 2016-08-14: Degradation due to planned work.
7. From 2016-08-16 Degradation due to cable breaks issue.
8. 2016-05-31: Degradation due congestion
9. 2016-07-01: Degradation congestion
10. 2016-07-07: Degradation due to poor coverage.
11. 2016-07-18: Degradation due to cut over from.
12. 2016-07-28: Degradation due expansion activity.
13. 2016-08-01: Degradation due to month end traffic and packet loss.
14. From 2016-08-02 to 2016-08-03: Degradation due to packet loss sites issue
15. 2016-08-20: Degradation due to TX fault

Table 5.24: Analysis of the 2G Call Drop Rate of the Network

The figure below illustrates the 3G Network Cell Availability of the mobile operator

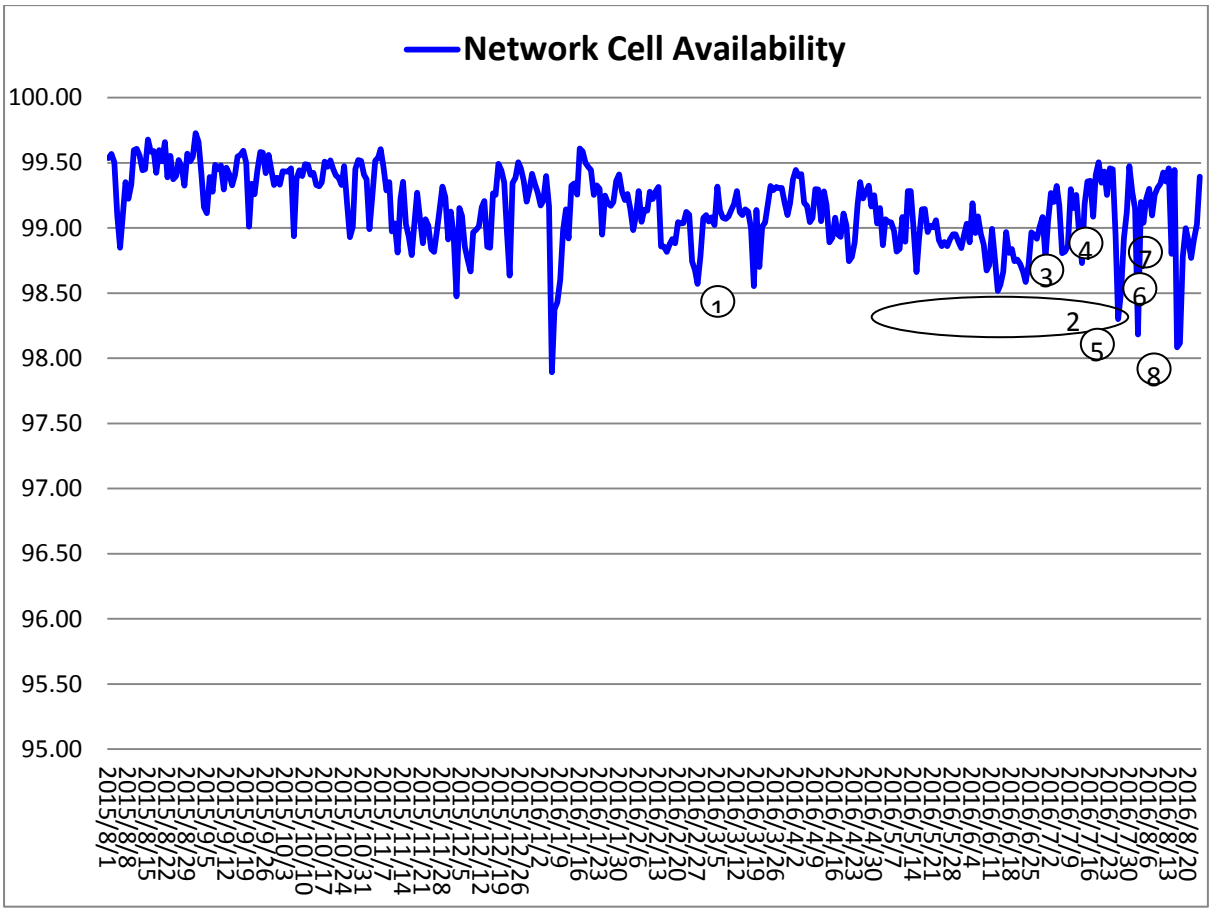

Figure 5.15: 3G Network Cell Availability

The table below indicates the root causes that affected the 3G Network Cell Availability of the mobile operator's network.

1. 2016-03-18: Degraded due to planned activity by transmission.
2. From 2016-04-14: Computer upgrade planned activity downtime causing cell availability degradation.
3. 2016-07-06: Degraded due to multiple packet loss sites.
4. 2016-07-13: Degradation due to multiple sites packet loss issue.
5. 2016-07-26: Degradation due to stormy weather affecting multiple sites.
6. From 2016-08-02 to 2016-08-03: Degradation due to multiple packet loss sites issue & TX issue.
7. 2016-08-14: Degradation due to planned work.

Table 5.25: Analysis of the 3G Network Cell Availability

The figure below indicates the total number of complaints of 3G dropped calls received by the mobile operator from their customers.

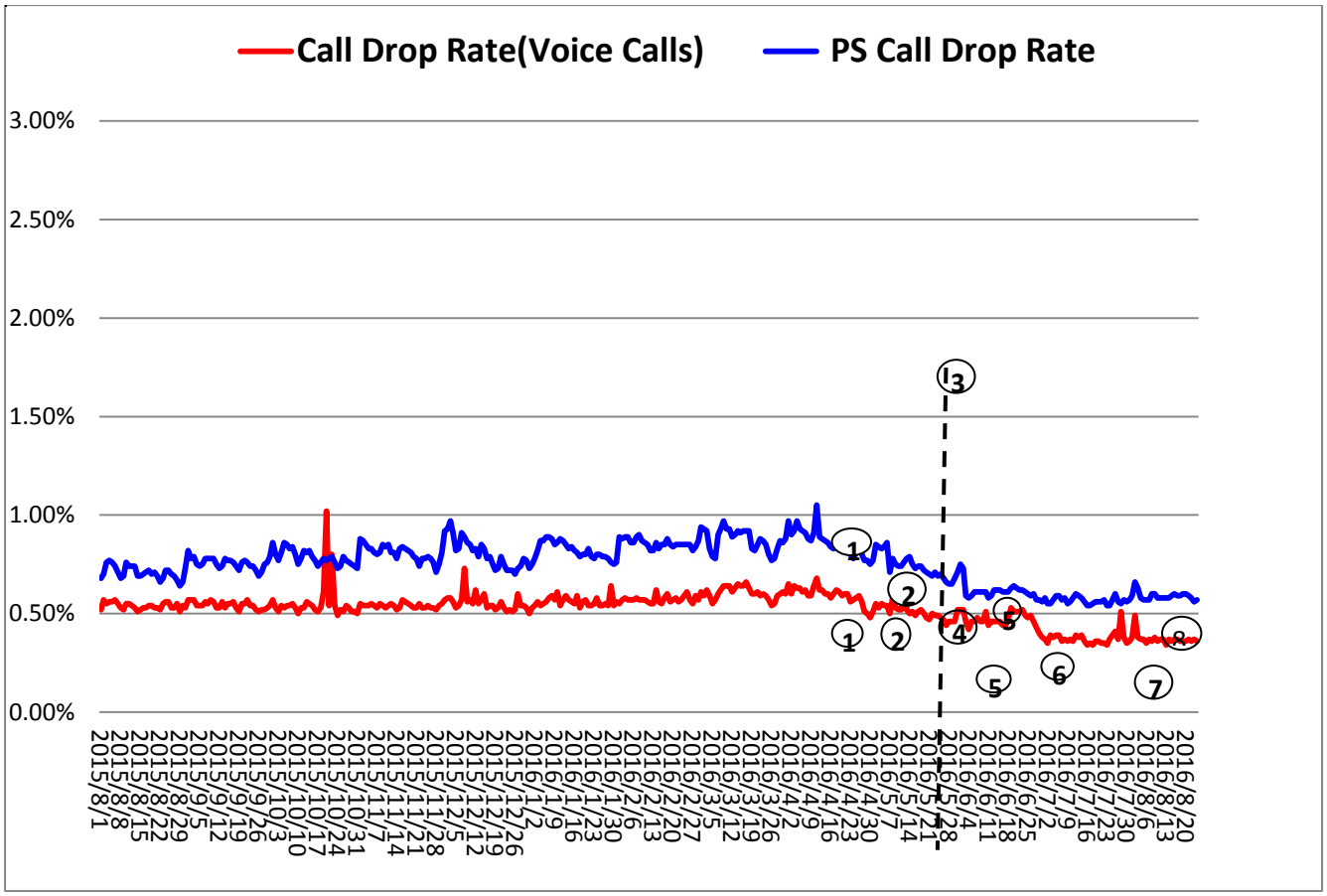

Figure 5.16: 3 G Dropped Calls

The table below indicates the root causes that affected the 3G Dropped Calls on the mobile operator's network.

1.2015-03-18: Degraded due to planned activity by transmission.
2. 2016-07-06: Degraded due to multiple packet loss sites.
3. 2016-07-13: Degradation due to multiple sites packet loss issues.
4. From 2016-07-26: Degradation due to weather affecting multiple sites.
5. From 2016-08-02 to 2016-08-03 : Degradation due to multiple packet loss sites issue & TX issue .
6. 2016-08-14: Degradation due to planned work.
7. From 2016-08-16 Degradation due to cable break issue.
2016-08-17 Degraded due to cable break.

Table 5.26: Analysis of the 3G Dropped Calls of the mobile operator

Figure 5.17 indicates the 4G radio network availability of the mobile operator's network.

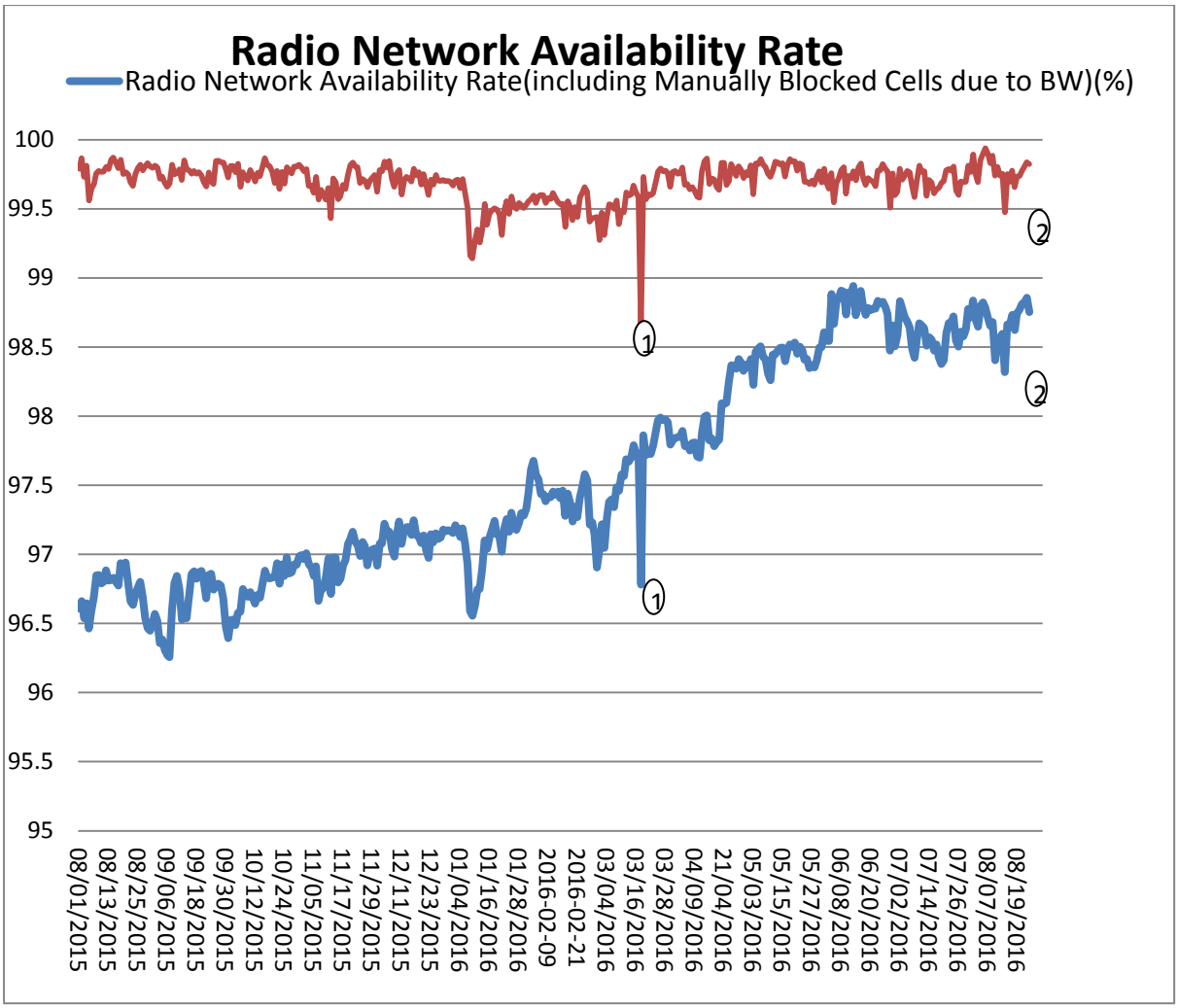

Figure 5.17: 4G Radio Network Availability Rate

1. 2015-03-18: Degraded due planned activity by transmission.
2. 2016-08-14: Degradation due to planned work.

Table 5.27: Analysis of the 4G Radio Network Availability Rate of the mobile operator

Table 5.27 indicates the reason for the unavailability of 4G Radio Network of the mobile operator.

Figure 5.18 indicates the 4G call drop rate of the mobile operator's network.

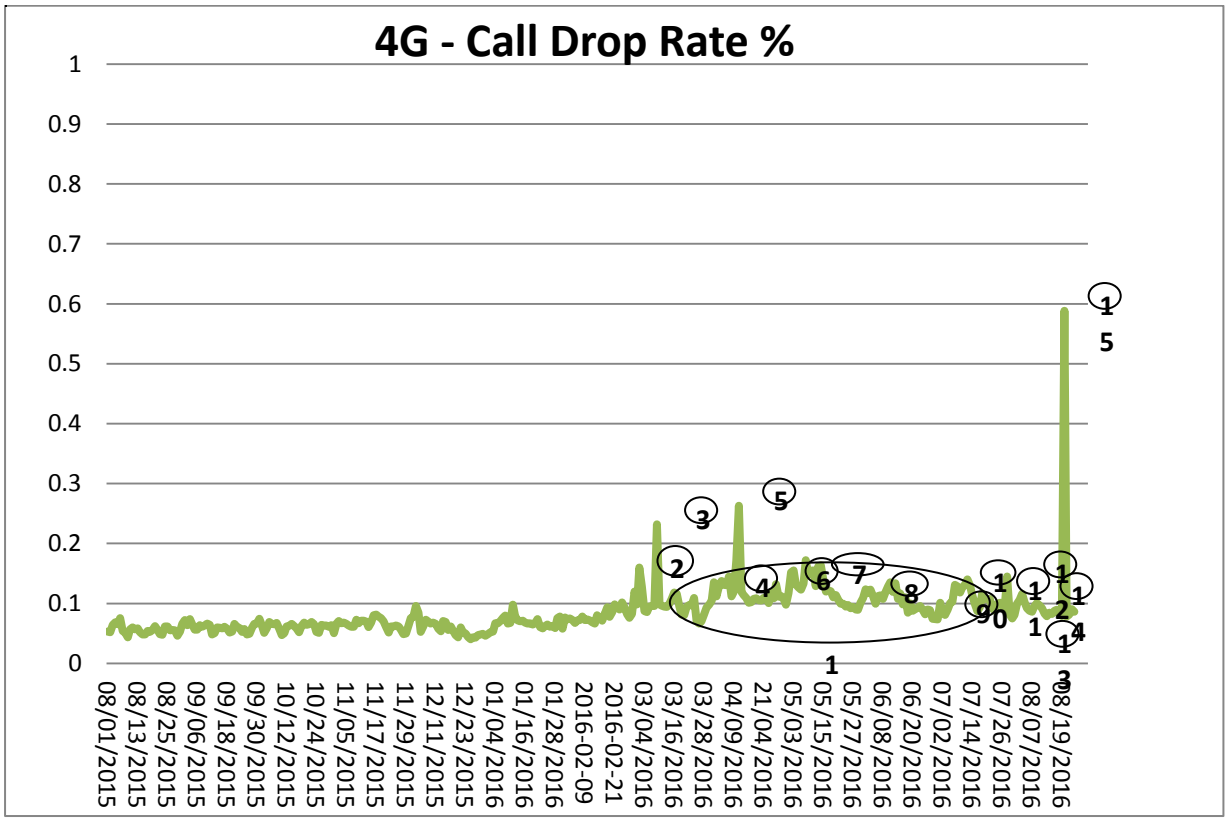

Figure 5.18: 4 G Call Drop Rate

The table below indicates the root causes of the 4G Call Drop Rate of the mobile operator.

1. From 2016-02-21: Degradation due to multiple congested sites.
2. From 2016-03-02 to 2016-03-04: Degraded due to external interference.
3. 2016-03-09: Degraded due to interface during expansion (board installation and configuration).
4. From 2016-04-02: Degradation due to internet link congestion issue during busy hours and packet loss sites
5. From 2016-04-10: LTE KPIs were degraded from due to sudden increment of internet IP attack and Packet losses
6. 2016-04-26: Degradation due to poor coverage area.
7. From 2016-05-02: Degradation due to month end traffic, poor coverage traffic and packet loss.
8. 2016-05-31: Degradation due to congestion/packet loss and multiple congested sites /packet loss with respect to beginning of month traffic.
9. 2016-07-01: Degradation due to congestion/packet loss with respect to beginning of month traffic.
10. 2016-07-07: Degradation due to poor coverage.
11. 2016-07-18: Degradation due to cut over.
12. 2016-07-28: Degradation due to expansion activity.

Table 5.28: Analysis of the 4 G Call Drop Rate

Service Delivery Customer Complaints

The figure below indicates: Service Delivery Customer Complaints

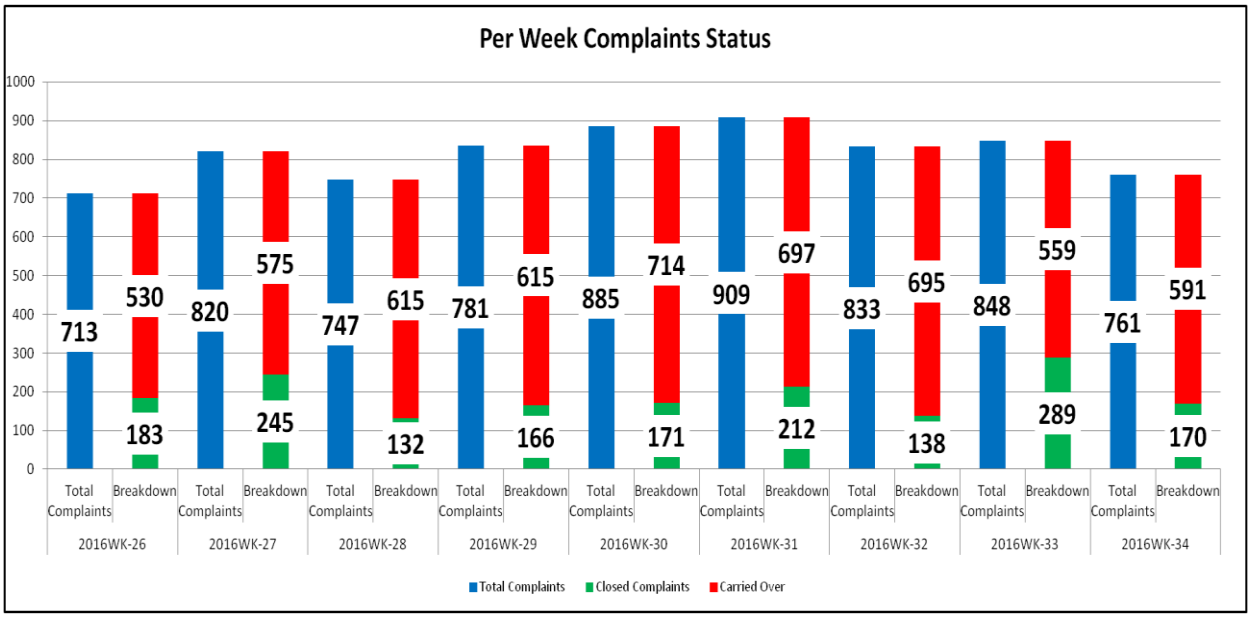

Figure 5.19: Service Delivery Customer Complaints

Figure 5.19 indicates the total number of service delivery customer complaints received by the mobile operator. However, due to the sensitive nature of these complaints the organisation did not want the researcher to use the breakdown of these complaints.

5.4 Summary of the Analysis of Reports

The data received from the analysis reports from the organisation comprises all customers (both internal and external) on the mobile network. From the data, both the internal and external customers have similar concerns regarding the mobile network. This confirms that the internal customers were not biased towards their organisation.

Figure 5.17 indicates the 4G radio network availability of the mobile operator's network.

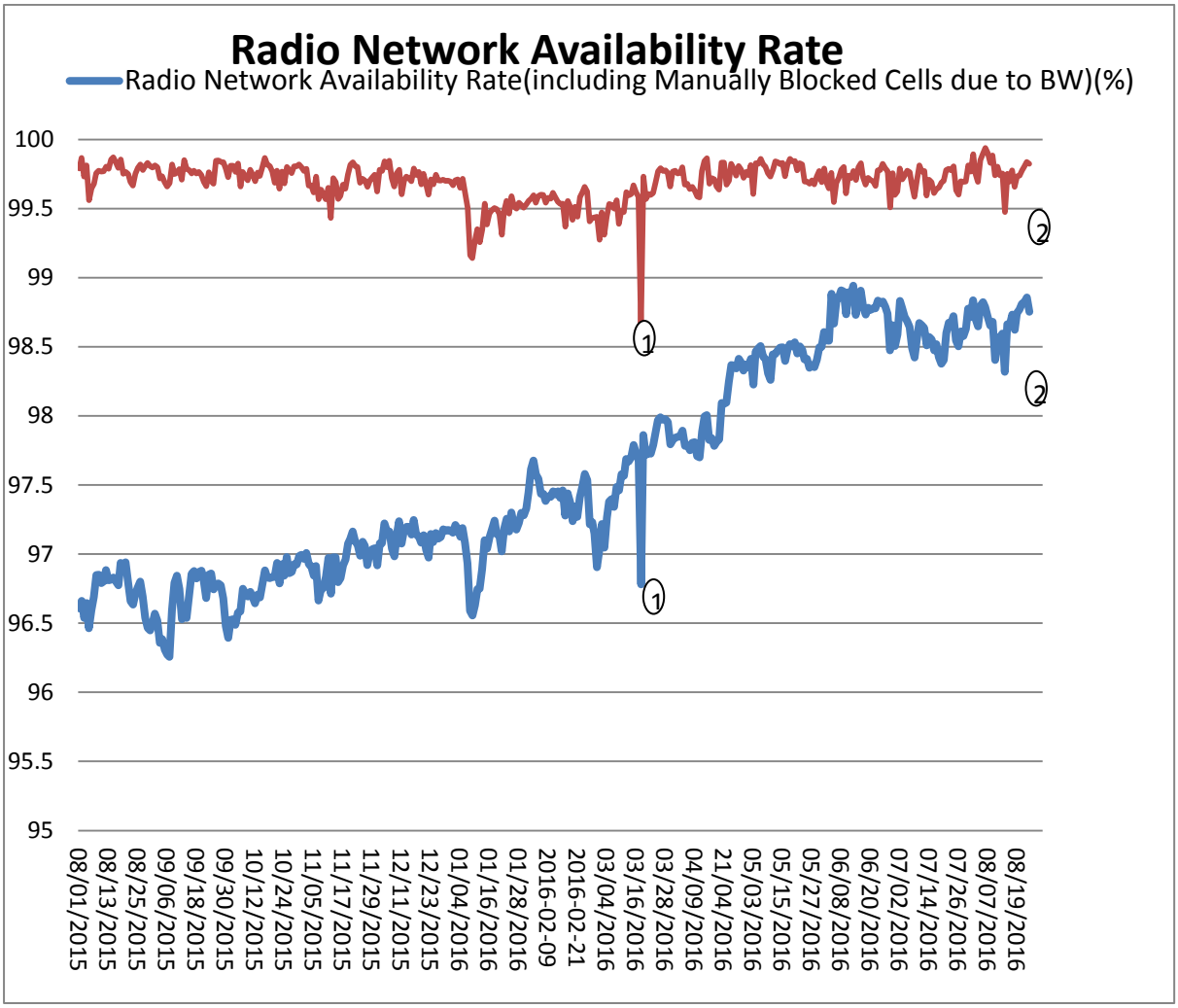

Figure 5.17: 4G Radio Network Availability Rate

1. 2015-03-18: Degraded due planned activity by transmission.
2. 2016-08-14: Degradation due to planned work.

Table 5.26: Analysis of the 4G Radio Network Availability Rate of the mobile operator

Table 5.26 indicates the reason for the unavailability of 4G Radio Network of the mobile operator.

Figure 5.18 indicates the 4G call drop rate of the mobile operator's network.

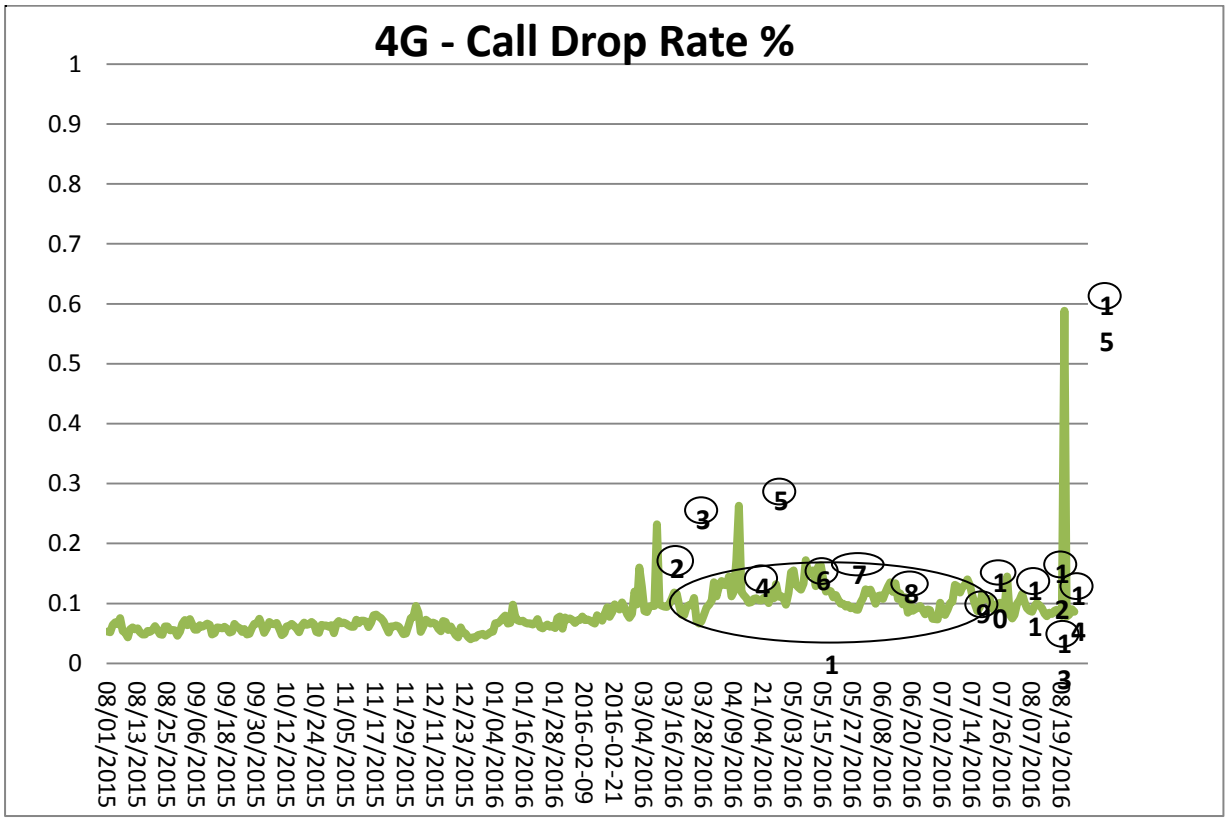

Figure 5.18: 4 G Call Drop Rate

The table below indicates the root causes of the 4G Call Drop Rate of the mobile operator.

1. From 2016-02-21: Degradation due to multiple congested sites.
2. From 2016-03-02 to 2016-03-04: Degraded due to external interference.
3. 2016-03-09: Degraded due to interface during expansion (board installation and configuration).
4. From 2016-04-02: Degradation due to internet link congestion issue during busy hours and packet loss sites
5. From 2016-04-10: LTE KPIs were degraded from due to sudden increment of internet IP attack and Packet losses
6. 2016-04-26: Degradation due to poor coverage area.
7. From 2016-05-02: Degradation due to month end traffic, poor coverage traffic and packet loss.
8. 2016-05-31: Degradation due to congestion/packet loss and multiple congested sites /packet loss with respect to beginning of month traffic.
9. 2016-07-01: Degradation due to congestion/packet loss with respect to beginning of month traffic.
10. 2016-07-07: Degradation due to poor coverage.
11. 2016-07-18: Degradation due to cut over.
12. 2016-07-28: Degradation due to expansion activity.

Table 5.27: Analysis of the 4 G Call Drop Rate

Service Delivery Customer Complaints

The figure below indicates: Service Delivery Customer Complaints

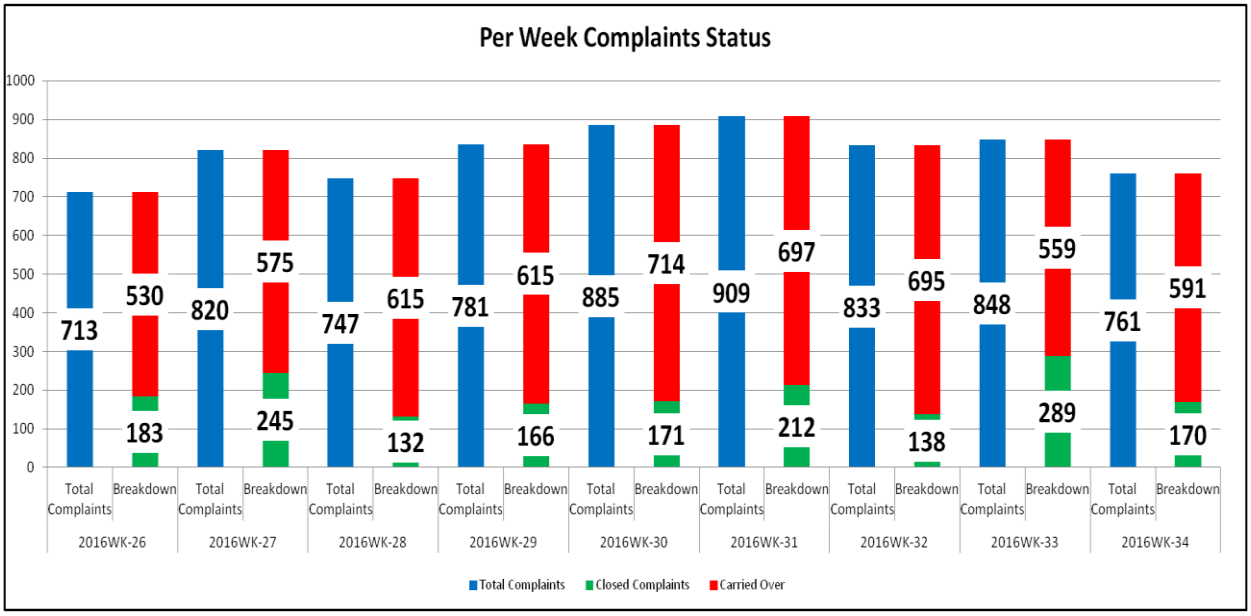

Figure 5.19: Service Delivery Customer Complaints

Figure 5.19 indicates the total number of service delivery customer complaints received by the mobile operator. However, due to the sensitive nature of these complaints the organisation did not want the researcher to use the breakdown of these complaints.

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5.5 Presentation of data from the Qualitative Study

5.5.1 Qualitative Analysis

The identification of passages or recording of images or texts which are grouped through a common theme or thought can be classified as thematic coding, which is a representation of qualitative analysis. This allows a person to guide the text into groups and thus establish a “framework of thematic ideas about it” (Gibbs 2007:19).

Thematic analysis comprises of diversity. However every selection is a representation of thematic coding. This comprises Framework analysis, Template analysis, phenomenological analysis, Interpretative and Grounded theory. It is critical to assess the text within an analytical or theoretical method instead of simply depending on a descriptive focus. Rigorous analysis is required through development, which will enable one to have the ability to recognize the pertinent concepts, even including the simplest (Gibbs 2007:20).

In qualitative research, theme identification is one of the essential tasks. It is also one of the most enigmatic. Clear explanations of theme discovery are seldom defined in reports and articles and if they do occur, they are delimited to footnotes or appendices. Procedures are communal amongst minor clusters of social scientists which very often hinder epistemological or disciplinary boundaries. Through the proposal-writing segment in the project, researchers find it difficult to clearly justify and explain strategies for determining themes. These are predominately cogent issues when reviewed with unfamiliar qualitative traditions.

5.5.2 Qualitative Results

The qualitative data obtained was analysed using thematic data analysis. The approach used was Interpretive. The data was presented according to the theme of each of the interview question. Five managers were interviewed for this study. To ensure anonymity, each of the mangers was labeled M1 to M5. In total, six themes were deduced from the data.

5.5.3 The following Themes have identified and will discussed:

5.5.3.1 Theme 1: Service Delivery of the mobile operator to its clients

Four of the respondents indicated that their mobile service provider met or exceeded their service delivery expectations. This finding lends support to the viewpoint of Martines and Martines (2010:101) that service delivery is how well the organisation meets customer expectations.

M1: *We have to offer something that distinguishes us from our competitors. Our service delivery has to be superior for us to gain and retain customers.*

M2: *They are trying to establish their network while their competitors were focusing on densification and upgrading of their network.*

M5: *Their service delivery was average compared to other operators, as the operator's products were not easily available at all branches*.

The respondents all agreed that the only element that distinguishes them from their competitors was their service delivery to their clients. This finding underscores the fundamental point of this study, which is to establish the challenges faced by a mobile service provider in meeting customer needs. The viewpoint of Goldman *et al.* (2010:99) is particularly relevant in that the key to service delivery is to try to comprehend what customers' requirements are. Developing the product from 'outside in', means beginning from the customer and concluding with technology. If this process is done the other way round, it would result in customer alienation and entrepreneurial narcissism.

5.5.3.2 Theme 2: Bandwidth offering to its clients by the mobile operator compared to its competitors

All respondents agreed that their mobile service provider provided high broadband speeds in the metropolitan area as this is where they have a stronghold of infrastructure. This is in line with contemporary technological growth of telecommunications and cellular networks that are experiencing massive changes in the operations of mobile communications (Dodourova 2003:60).

M1: *The network operator currently provides less than 1% of its sites with copper infrastructure. This will tell you that the operator is utilizing modern infrastructure. As you move away from the metro areas to the country and rural areas, the availability of infrastructure is less, and there is no funding to upgrade the infrastructure in these areas.*

M2: *The South African government has to re-distribute the 800 & 2600 MHZ frequency spectrum as this will allow for better and improved data penetration. Mobile operators should ensure that they try to acquire greater spectrum within this range to ensure better coverage. Ideally, the mobile operator should cater for a mobile solution that is capable with current user devices*.

M3: *Our organisations have won accolades in certain metropolitan areas for providing high broadband offerings.*

M4: *Numerous technical forums have reviewed and tested the organization's broadband offering and this has assisted the organisation to gain market share.*

M5: The demand for high speed broadband is increasing as the consumers have so many options in the devices and applications that are available. The demand will continue as mobile communications is the future of communications.

All respondents agreed that their service provider is providing high broadband services. However, with more highly developed applications and sophisticated devices being launched, this demand will only increase. This confirms that the telecommunications industry is currently undergoing a metaphorical change, from a market that was predominately voiceoriented to a market that is data driven. The merger of these technologies allows mobile clients to transfer much richer data in extraordinary stages of convenience and tractability. As such, new capabilities are based on ‘content’ and ‘customers’ instead of ‘technology infrastructure’ (Dodourova 2003:67).

5.5.3.3 Theme 3: Network Coverage provided by the mobile operator

The respondents all agreed that having complete network coverage is critical to the success of the organisation.

M1 and M2: *We agreed that the organisation had a weak network footprint in certain areas. They also agree on two key elements that hampered network coverage provided by the operator: Lack of funding and continuous change in strategy. With the lack of funding acquisition, building of new mobile sites is not possible. Hence there would be no network growth. The changing of the organisation strategy continuously shifts focus of the organisation as new milestones have to be achieved, without completing the life cycle of previous strategies.*

M3: *Network growth is dependent on resources available and co-operation from other vendors, since we are in a competitive environment; other vendors are using anti-competitive techniques to slow the deployment of our mobile network.*

M4: *Challenges exist in the acquisition and merging of organisations. They also have to fasttrack LTE/ Voice LTE platforms which offer high speed data. Supply their vendors and operators; reduce cost in maintenance, which will allow them to stand out within the mobile environment.*

M5: Network growth is determined from revenue earned. If an area generates high revenue, then the organistaion would continue to grow, the network in that area. Areas where there is little or no growth the organistaion will reduce the growth. This is based on the return of investment by the organsiation.

The respondents all agreed that having complete network coverage is critical to the success of the organisation. They also agreed that the organisation has a network sharing agreement with another service provider to cater for areas where the coverage is poor. Although, this agreement is required, it is costing the organisation too much. In terms of Game Theory, the viewpoint of Johnson *et al. (*2011:217) is particularly relevant.

The Game Theory tries to help organsations strategise and incorporate these predications into their strategies. The Game Theory is predominantly appropriate where competitors are interdependent. The outcome of decisions made by an organisation will directly affect decisions of its competitors. This is termed Interdependence. Although the mobile service provider does not have a complete network footprint, sharing network resources increases the mobile growth of the mobile service provider.

5.5.3.4 Theme 4: The reliability and capability of the mobile network

All respondents agreed that their mobile network is reliable and has the capacity to handle larger volumes of users. The users also agreed that the mobile network is monitored and network availability statistics is generated on a weekly basis with the organization.

M1*: During loadshedding, other aspects in the network fail, such as the transmission systems which cause a loss of communications to the mobile system, which causes interruptions to the mobile site, which in turn affects clients. This however is not poor design of the mobile network. This is a poor design from their vendor.*

M2: *All the failures we have experienced were due to load shedding and power surges, causing equipment in the network to blow up.*

M3: *The mobile network has surveillance and is monitored 24/7 365 days a year by the National Operation Center (NOC). Should a network failure occur, the relevant personnel are dispatched to attend to the problem.*

M4: *There are service level agreements (SLAs) in place with various vendors who currently maintain the mobile network. The SLAs are designed to ensure that should a network failure occur, the network traffic will switch over to another site to ensure that minimum interruptions are experienced by the user.*

M5: *Most of the sites have fiber connections, which have minimum losses, and offer high broadband network speeds. This was incorporated into the design of the network to ensure the reliability of the network. Fiber is much more reliable than copper.*

All respondents agreed that their mobile network is reliable and has the capacity to handle network failures, as their services are not affected when there is a network failure. The mobile service provider has identified that providing the customer with a reliable network is the critical component in meeting customer needs. In terms of reliability and capability of a service provider, Johnson *et al. (*2011:328) state that the dependence of organic growth on its internal abilities can be restricting and, is of significance because the use of existing abilities is not an easy task, as the podium for growth in terms of internationalism, innovation or diversification. Corporate entrepreneuship experiences radical change brought on by the organisation's individual ability. That is another reason why the organisation has engaged in sharing network infrastructure with other operators.

5.5.3.5 Theme 5: Change In Management of the Mobile operator

All five respondents agreed that changing top management continuously affects the strategy of the organization. The life-cycle of the strategy has never been completed but there have been various challenges attributed to this. Change management has an impact on environmental and social behavior. Communications is the key within the environment. In terms of applying the correct strategy, Johnson *et al.* (2011:514) state that the effectiveness and importance of successful decision making is important and can be easily exaggerated. Numerous decisions are not supported with actions. Numerous strategies are developing instead of being intentionally decided.

M1: *Each time that new management comes in, they come with a different strategy. Every time the strategy changes, the milestones increase. Some of these milestones are honestly unrealistic.*

M2: *The main reason they experience change in management is because of government and political interference, which results in the incorrect candidate being appointed!*

M3 and M4: *The organization's strategy has to continuously change. However; the change should be incorporated into the strategy. Every time new management is appointed, the entire strategy changes. This should not be the case. The management should take over from the old, not change the entire process.*

M5: *Management is only interested in their own benefits, as the management receives incentives and huge bonuses with time frames to accomplish certain tasks and they are rewarded very generously.*

The point of view above highlights a concern. While a fraction of management is raising concerns, a dilemma exists. The point of view of Johnson *et al.* (2011:33) is that in the change of strategy is predominantly applicable to strategy within an organisation. Evolution helps explain how any living system, including an organization, evolves through natural selection acting upon such variation. There is an ever-changing environment, different types of business, a variety of groups and individuals. Vertical integration is often favoured because it seems to 'capture' more of the profits in a value network. The reliability and capability is directly related to the funding and strategy of the organization. Change is good for an organisation. However, continuous change creates instability and raises concerns amongst customers and shareholders.

5.5.3.6 Theme 6: Customer Service provided by the mobile operator

All respondents agreed that they have to provide excellent customer service for the survival of the organization. Kim *et al*. (2006:88) posit that customers that are satisfied would not consider changing the current service provider.

M1: *The organization does not reward existing staff nor do they incentivize staff to offer excellent customer service. The staff should be satisfied with having a job, which should be their reward*.

M2: *The organization does not prevent skilled and talented employees from leaving the organization, as the organization feels that they can continue with the skills training of employees.*

M3: *I have witnessed the morale of the staff degenerate drastically compared to five years ago. I attribute this to the frustration of the employees because there is too much change in management and strategy within the organization*.

M4: *The management has outsourced many role. That is the reason for poor customer service as the consultants only want to be remunerated and are not concerned about the organisation's brand*.

M5: *The employee morale is at an all-time low due to restructing of the organization; no promotions, no retentions and no incentives for the employees.*

All respondents show signs of low morale and they tend to agree that internal clients/ staff have to be satisfied before the organisation satisfies external clients' needs. The respondents agreed that there is no reward for good customer service and this has to be addressed. This is a point of concern. If the clients are expressing concerns, then a problem exists. The perspective of Hughes, Ginnet and Curphy (2012:671) in worker motivation is pertinent. Performance challenges contribute to a lack of employee motivation. The important issue is whether or not employees decide to perform or display the ability to try to achieve the undertaking. Should this not happen, then management must initially understand the reason why staff are demotivated.

Four of the respondents indicated that their service provider provided excellent customer service with a variety of products available, with a strong drive being directed on the e-commerce aspect of service delivery within the operator. According to Kim *et al. (*2004), research evidence indicates that the key element of the customer's perceptions of service quality is customer satisfaction. Therefore, it is imperative that the focus of the mobile operator is not only directly at customer services, but also on the improvement of their service quality simultaneously.

Research has proven that there is a direct relationship between customer satisfaction and the financial indicators of an organisation (Gupta and Zeithaml 2006:77). The higher the level of customer satisfaction that exists in the organisation, the greater the reward for that organisation.

5.5.3.7 Theme 7: Quality of Service provided by mobile operator

All respondents agree that the Quality of Service that the operator provides to its clients comprises various factors. Some clients do not understand the technical aspects and the challenges faced by the operator. They are only concerned with experiencing a seamless connection on the network.

M1: *At times it is very difficult to offer good Quality of Service as there is poor coverage in certain area, and we rely on network sharing agreements. However, our clients don't understand that if they receive poor network service it is not necessarily our fault.*

M2: *There are measures in place to evaluate the Quality of Service that we provide to our clients. We have an independent contractor conducting drive tests, evaluating the network coverage and performance. However, due to financial constraints, the frequencies of these tests have been reduced drastically from monthly to every quarter within the financial year.*

M3: *We try our best to ensure that we give our clients the best Quality of Service, but sometimes there are challenges that are beyond our control. Take for example KZN, the terrain is very mountainous and to cover all areas is very difficult. Also, there are new developments springing up all the time. So we need more sites to be built to cover these areas. However, our funding has been drastically reduced. So we rely on our network sharing agreement, which is not our best option.*

M4: W*e give our clients good Quality of Service. Just look at the accolades that we have won and read the technical forum reviews. That speaks for itself. In today's technological environment, if people receive poor Quality of Service, they will post it in one of the social mediums.*

M5: *At times the business case comes first, so the focus of Quality of Service is not the priority. The organization's strategy determines the Quality of Service. Sometimes its focus is the H LSM and sometimes it's the L LSM market segments. It just depends on what the shareholders want the organisation to cover. Providing good Quality of Service should be our priority to ensure our sustainability.*

All respondents agreed that providing good levels of Quality of Service is paramount to the service provider. The findings of Akroush *et al*. (2011:101) indicate that previous researchers have evaluated mobile QoS as the customers 'entire experience with their mobile service provider. This is relevant to the findings of this study, which states the imperative aspect of evaluating service quality of a mobile service provider and, which is trying to predict the overall customer experience, satisfaction element, followed by reliability and network quality (Wang and Lo 2002).

5.6 Conclusion

The data from the semi-structured interviews and questionnaires was presented in this chapter. The data was analysed relative to the participants responding to critical research questions. From the quantitative and qualitative data, the data generated has shown that the service provider has identified key enablers to ensure the organisation's success. The next chapter encapsulates the results of this research and the recommendations provided on the improvements to the mobile operator.

CHAPTER SIX

DISCUSSION OF RESULTS AND RECOMMENDATIONS

6.1 Introduction

This chapter provides recommendations for the findings of this study on the improvements that a mobile operator can implement to evaluate Quality of Service.

The concept of Quality of Service and service delivery has been studied from various perspectives and therefore, there are various definitions. This chapter elaborates on key enablers which will assist the organisation in improving their QoS and service delivery offering to their customers. These enablers have been identified from the research conducted.

Recommendations will be made on how to improve the organisation's QoS and service delivery to its clients. These improvements will have positive influence on the future survival and growth of the organisation.

6.2 Conclusions

The analysis of the data was done in terms of expressions of involvement in responding to the key questions. Both changing technology and competition positively contributed to the growth of the mobile operator, as the mobile operator had to be innovative and competitive simultaneously.

The challenges faced by mobile operators are broken down into two classifications; increased complex services and those resulting from diverse and increased competition.

With increased competition levels, the results on improved services have improved and now end-users find it feasible to spend their money on these. This requires a radical analysis of end-user market behavior observations, and representing this in a satisfactory representation of products of commercial use, which could be used in service delivery management within the network operator and also through other entities with business agreements. The rise in the complexity of services means that greater management of the technical functionality is required which also incorporates the functionalities of integration into the current operator's network. This brings about difficulties for the related configurations and modeling of services. However, also accounting for the QoS specifications to technical configurations is also necessary.

The mobile operator's network footprint has to increase in order to provide its own network availability to clients and; to avoid or reduce network sharing or roaming of network services as this compromises the client network coverage on the network. Clients experience poor service delivery and they assume that it is from their service provider, only for the service provider to establish that the poor service delivery is due to network sharing or roaming agreements. This, however, can only be established once the client logs a network coverage complaint. Only then can an investigation be carried out. Where the service provider has no network coverage, rapid solutions must be deployed to cater for temporary coverage solutions. This growth in the network requires funding to be readily available to expedite network growth.

Increased bandwidth assists in reducing network connectivity in terms of "traffic congestion" for clients, so the client would receive a reliable and faster connection. The mobile service provider should proactively monitor the mobile network through the use of a sophisticated twenty-four-hour monitoring system. This will prevent and assess any potential disruptions that occur to the mobile network.

From the data collected relating to the key research concerns, the following can be concluded about the selected mobile operator:

6.2.1 Service Delivery

Although the organisation is currently meeting its service delivery agreements to its customers, more can be achieved in order to exceed service delivery to clients. It is significant to point out that 67% of respondents agreed that they are totally satisfied with the service delivery that they receive from the mobile service provider; whilst 81% of respondents agreed that they are brand loyal to their mobile service provider. These results indicate that the organization is providing good service delivery to its clients. However, there is room for improvement to offer exceptional customer service to clients as the majority of clients indicated that they are brand loyal to their mobile service provider.

The mobile operator should incorporate a network design that successfully administers the client's mobile communications to ensure that the client always has a mobile connection. There should be a seamless connection offered to the client. The client should not experience poor service delivery due to network limitations, high traffic usage and other network related issues. The Quality of Services that the client receives from the mobile service provider should be directly related to the service delivery received from the mobile operator. If the mobile operator has a stable and reliable mobile network, then the service delivery offered to the client would be of high quality.

6.2.2 Bandwidth

Currently, the organisation is meeting their clients' bandwidth requirements. However, with technology evolving at a rapid rate as new high end user equipment and applications are being launched, the organisation has to continually offer higher bandwidth at competitive prices in order to continue to meet their client's requirements. With 83% of respondents agreeing that their mobile service provider caters for their bandwidth usage and 81% of respondents agreeing that their mobile service provider offers good value for its bandwidth on its network, indications are that the organization is aware that clients are using high bandwidth and the organisation is making provisions to provide for this requirement.

The mobile network should be able to offer a high speed connection to all its users since as the demand for mobile broadband is growing exponentially. With applications that utilize voice and data technology, clients are using high broadband in their daily activities. The ideal transmission backhaul to be installed on all mobile sites should all be via fiber optic transmission connections. However, due to the location of certain sites, the terrain does not permit this type of connection. Therefore other types of transmission connections will have to be used, such as microwave or even copper connections. However, it is imperative that these connections types facilitate high throughput rates.

6.2.3 Network Coverage

Although the organisation currently has a network footprint, more has to be done to strengthen their network footprint. This will assist the organisation to reduce network sharing and network roaming costs and will also assist the organisation by reducing customer complaints through service delivery agreements. A majority 79% of participants are satisfied with their current mobile service provider's network coverage and 82% of respondents indicated that they would recommend their mobile service provider to others. Therefore, it is clear that the bulk of the participants are satisfied with their mobile service provider's network coverage.

Network coverage is one of the fundamental components in the MS – QUAL model, which is used to evaluate the Network Quality of the mobile operator. The radio planning process is intended to culminate in a baseline network layout satisfying the coverage and capacity requirements defined during the high level planning. During this process, the area to be covered will have been identified and a rough estimate of the number of sites needed to provide sufficient coverage and capacity will have been established. The definition of radio coverage is now more complex as subscribers expect to access multiple applications, each with its own unique QoS requirements (Hosseini 2013:15).

Although significant space has already been devoted to the predication of cell coverage, the purpose is to provide the radio planner with insights into the key parameters affecting cell radius and to indicate techniques for improving coverage that can be used, regardless of the specific air interface (Charity and Wilton 2008:95).

6.2.4 Network Capability

Currently the network capability is sufficient for the current subscriber base. However as the subscriber base increases, the network will be placed under strain and might not be able cater for growth. The organisation's strategy in growing the network has to be one of the critical factors. Emphasis has to be placed on this and adequate funding has to be made available. A significant 77% of respondents agreed that they are satisfied with their current mobile service provider's network capability and that they have accessibility to all their applications on their current service provider's mobile network. Furthermore, 69.19 % of respondents indicated that they seldom thought of changing their mobile service provider as their current mobile service provider's network capability meets their requirements.

6.2.5 Globalisation

Currently, the organisation's network is designed to accommodate international user devices and applications. The organisation has to ensure that they continually upgrade their network, in order to always be able to accommodate international and national network traffic requirements. A significant 82% of respondents agreed that their mobile service provider's network offers the latest technology. Whilst 83% of respondents indicated that their devices are compatible on the service provider's mobile network. A future 80% of respondents agreed that their mobile service provider is constantly improving their mobile network to cater for and align to international standards.

With technology evolving at a rapid rate, mobile operators have to ensure that they meet government standards in telecommunications. There are various bodies and organizations that ensure that networks and user devices are complaint with regulations. The service provider should try to obtain a greater portion of the 900 MHZ spectrum. This will assist with the penetration of the network coverage and will as reduce the number of mobile sites required to complete the mobile network.

6.2.6 Customer Services

In terms of Customer Services, much has to be done to improve customer services within the organisation as the current level of customer services is satisfactory. This is one of the key improvement areas the organisation has to focus on. Achieving higher levels of customer satisfaction has proportional consequences for the organisation because the customer base will increase; profits will increase; the organisation will become more competitive; and shareholder value will increase. It is noted that 63% of respondents agreed that their mobile service provider's customer services are efficient and they are content with their current mobile service provider's customer service. Fifty seven percent of respondents indicated that interaction with their mobile service provider's customer service agents have been positive.

Another fundamental in the MS – QUAL model is customer service, which was used to measure the QoS of the mobile operator. The mobile service provider must provide competent and skilled resources that are available to handle customer queries with efficient turnaround time. Clients want to be able to relay their complaints and want feedback and their complaints resolved in an efficient manner. Client do not want to wait for long queues, only to get a voice automated service or speak to a resource who does not fully understand their problem (Hosseini 2013:15).

Mobile users want a mobile operator that offers a flawless communication experience which can be customized to their telecommunications requirements. The mobile operator should strive towards the convergence of fixed and mobile services in order to offer a seamless connection of fixed and mobile service. Feedback to clients must also be prioritised and the client should receive consistent progress updates on the feasibility of new products and services.

6.3 Recommendations to the Organisation

In a mobile network, if the user moves further away from a base station that connects him/her, this will reduce the strength of the signal that the user would be able to connect too. The mobile device will search for the strongest strength within the cell and connect to the strongest cell. However, sometimes the signal strength is weak, which may cause the mobile device to reach its operation threshold and at this point service is not guaranteed and the service may 'drop'. The design of a mobile network caters for 'hand overs', which is a process that allows a device to connect to a stronger signal strength of a base station if the closest base station reaches its threshold point.

The greatest challenge that exists for a mobile operator is to create a process that incorporates an effective handover process. The provider must ensure that this is as unnoticeable and seamless to the client as possible. In certain instances a network operator may not have sufficient network coverage within certain areas and the operator may opt to share the network with an operator who has coverage within the area. This will ensure that a mobile user has complete network coverage. Even with network sharing, the "handover" or interconnection must be seamless and unnoticeable to the user. If network sharing is used, mobile operators must ensure that all devices have high priority on the network to avoid discontinuance issues.

The ideal life cycle of any mobile telecommunications network should broadly follow the process below:

6.3.1 Planning

The planning phase is where detailed studies should be made of system capacity and coverage to ensure that the network performance criteria are likely to be met.

The initial planning makes technology choices to meet the overall business goals. Planning is the most critical part of the mobile network strategy as this is where the blueprint of the mobile network is designed. According to Sidler (2016:1), the advancement of technology is changing the way business models and traditional industries are currently conducting business. This has created enormous opportunities in the new market, as well as in the existing market. “To compete in these markets, network coverage and speed is everything, whether you want to roll out new content, expand geographically, introduce new applications or develop a business model for a new customer segment, you need to act fast. Success will be measured by how fast you can enter a market, establish a leadership position, and capture improved profitability early on” (Sidler 2016:1).

6.3.2 Build

Once the planning phase is complete, the network build can commence. However, this phase also presents certain challenges, namely spectrum availability, site acquisition, environmental and logistical issues. The build roll out plan must coincide with the network blueprint. The architecture of the network must have the ability for expansion, as advocated by Charity and Wilton (2008: 10).

6.3.3 Implementation

Once a site has been built it, then it has to be commissioned. Once the network has been commissioned, users should then be allowed access to the network. This is to ensure that the client’s service delivery is not comprised as the Quality of Service would be of an acceptable level.

6.3.4 Maintenance

Performance of the network is subsequently routinely monitored to ensure that any equipment failure, software problems or other issues are quickly identified and rectified.

6.3.5 Optimize

Finally, the performance of the stable network is examined, and its configuration is optimized to maximize the capacity of the network, which will improve QoS delivery to subscribers.

The activities of the wireless network life cycle need to be integrated and synchronized with the mobile operator's core business process, leading to additional dependencies and complexity. However, with the dynamics of technology changing at a rapid rate, some phases of the generation of mobile networks will overlap.

This is the ideal process. However, due to changing business dynamics most investors require an almost immediate return on their investment. This poses enormous challenges and forces mobile operators to explore other sharing options to extend their network coverage so that they recover their capital expenditure as soon as possible. Network sharing and the outsourcing of key business elements are critical to ensure that a mobile network's footprint is established as quickly as possible.

The preceding discussion demonstrates how an ideal mobile network should be planned. The current mobile service has to have incorporated the key elements in the design phase. However, the preceding improvements can be made to ensure improved Quality of Service and Service Delivery for its mobile clients.

6.4 Limitations

This section discusses the limitation that became apparent during the progress of this research. Due to this topic being of a very technical nature, the literature review was limited to the information that could be obtained. Another element being, that I am an employee within the orgainsiation. I had to follow the confidentially agreement of the organistaion, which allowed me to conduct this research. I also had to maintain good working relationships with management and colleagues.

6.5 Recommendations for Future Research

With the demand for faster mobile broadband growing and with technology evolving at a rapid rate, future research should be on-going and focus on customer satisfaction and the feasibility of value added services that are provided by a mobile service provider. Communications methods are constantly changing, to meet the demanding lifestyles of individuals. Future trends will try to satisfy customers who require convergence from a single service provider.

6.6 Summary

The researcher set out to conduct an investigation into the challenges faced by a mobile service provider in meeting customer needs. The researcher has identified two empirical contributing factors which encompass the research questions: QoS and Service Delivery. These two components are critical to ensure the organisation's survival and have been explored at great lengths. The research has revealed that the organisation still has to improve on its QoS and Service delivery to clients. The organisation has to improve on its network coverage, cater for multiple technologies, and increase their current spectrum allocation. These aspects would greatly improve customer experience, meet customer needs and ensure efficient service delivery on the network. The organisation is competing in an extremely technological and aggressive marketplace. Failure to improve on the identified components will result in the gradual decrease in market share, which will reduce dividends and income to its shareholders, which will eventually lead to the demise of the organisation.

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APPENDICES

Annexure A: Questionnaire to Participants

I am currently pursuing my **Masters of Technology in Business Administration** from the **Durban University of Technology** (DUT).

As part of my studies, I am undertaking a research study to investigate the challenges faced by a mobile service provider in meeting customer needs.

In particular, the study focuses on the intention to understand customer needs which will result in improving the Quality of Service and service delivery which will improve customer experience and reduce network failures within the mobile network.

The purpose of this research is to understand customer needs in a mobile network. With this in mind, the researcher aims to explore forces that will assist to improve the satisfaction of customer needs and service delivery by a new mobile network provider. Based on the results, the researcher will make recommendations / comments concerning areas that may need improvement.

This research is purely for academic value and will not be used for any other purpose. Your participation in this vital research project will therefore be highly valued and appreciated.

Please note:

1. Participation is voluntary.
2. All responses will be anonymous and strictly confidential.
3. No participants name will be linked to any data.
4. The survey will take around 10 minutes to complete.
5. Closing date is end of business on 10 October 2015.

I _____agree/disagree to participate in this research project._____

Signature Date

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QUESTIONNAIRE

Respondent's Profile: The target population of this study is for Mobile users.

Section A: Biographical Information

(This section is not for personal identification and will be used only for profile analysis of the mobile user)

1. Please indicate your Occupational group (*Please mark with X*)

1.1 Senior Management (M3+)
1.2 Middle Management (M/S4/5)
1.3 Junior Management (M/S6)
1.4 Operational staff

2. Please indicate your Years of service (*Please mark with X*)

2.1 0-1 years
2.2 1-5 years
2.3 6-10 years
2.4 11-20 years
2.5 20+ years

3. Please indicate your Age (*Please mark with X*)

3.1 Below 20 years
3.2 20-29 years
3.3 30-39 years
3.4 40-49 years
3.4 50-59 years
3.5 60+ years

4. Please indicate your Gender (*Please mark with X*)

4.1 Male
4.2 Female

5. Please indicate your Race (*Please mark with X*)

5.1 African
5.2 Coloured
5.3 Indian
5.4 White

6. Please indicate your Region.

Research

Mobile Questionnaire

Dear ,

Please answer the following questions

1) * How would you rate Network capability

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
I have accessibility to all my applications on my current service provider's mobile's network.	○	○	○	○	○
My current service provider's mobile network capability always exceeds my expectations.	○	○	○	○	○
I often think of changing of mobile service provider.	○	○	○	○	○
I never experience any network congestion on my current service provider's mobile's network.	○	○	○	○	○
I never experience dropped calls my current service provider's mobile network.	○	○	○	○	○

2) * Please elaborate on what improvements can be made on the mobile network capability.

3) * How would you rate Bandwidth offering

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
My mobile service provider caters for my bandwidth usage.	○	○	○	○	○
I never experience bandwidth problems from my current mobile service provider.	○	○	○	○	○
I am happy with my mobile service provider bandwidth availability.	○	○	○	○	○
My mobile service provider offers good value for its bandwidth on its network.	○	○	○	○	○
My mobile service provider offers the best pricing on bandwidth.	○	○	○	○	○

4) * Please elaborate if your mobile service provider can make any improvement in their bandwidth offering.

5) * How would you rate Network coverage

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
My mobile service provider network coverage is reliable.	○	○	○	○	○
My mobile service provider network coverage caters for all my mobile requirements.	○	○	○	○	○
I am satisfied with my current service provider's mobile network coverage.	○	○	○	○	○
I will recommend my mobile service provider to others.	○	○	○	○	○
I will remain a customer of my mobile service provider.	○	○	○	○	○

6) * Please elaborate on how your current mobile service provider can improve their network coverage.

Next >>

50 % completed

7) * How would you rate Globalisation

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
My mobile service provider's network offers the latest technology (LTE).	○	○	○	○	○
All my devices are compatible on my service provider's mobile's network.	○	○	○	○	○
My service provider's mobile network is constantly improving.	○	○	○	○	○
My service provider's mobile network conforms to international networks.	○	○	○	○	○
My service provider's mobile network has a world class network	○	○	○	○	○

8) * Please elaborate on how your current mobile service provider can improve their Globalisation.

9) * How would you rate Service delivery

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
I am totally satisfied with the service delivery from my mobile service provider.	○	○	○	○	○
My service provider's exceeds my service delivery expectations.	○	○	○	○	○
My service provider's caters for all my mobile needs.	○	○	○	○	○
I am a brand loyal customer to my service provider's.	○	○	○	○	○
I would consider changing to another mobile service provider.	○	○	○	○	○

10) * Please elaborate how your current mobile service provider can improve their service delivery to you.

11) * How would you rate Customer Service

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
My current mobile service provider customer's services are efficient.	○	○	○	○	○
My mobile service provider has easy channels to address customer queries.	○	○	○	○	○
My service provider customer services agents are knowledgeable about Telkom products and services.	○	○	○	○	○
All my interaction with my mobile service provider customer service agents have been positive.	○	○	○	○	○
I always receive feedback on any queries that I have from my mobile service provider.	○	○	○	○	○

12) * Please elaborate on what improvements can be made by the moblie service provider to improve customer services.

Send

100 % completed

Annexure B: Semi-Structured Interview

Semi-Structured Interview

Dear Colleague,

I am currently pursuing my **Masters of Technology - Business Administration** at the **Durban University of Technology** (DUT). As part of my studies, I am undertaking a research assignment **to investigate** the challenges faced by a mobile service provider in meeting customer needs. In particular the study focuses on the intention to understand customer needs which will result in improving the Quality of Service and service delivery which will, improve customer experience and reduce network failures, within the mobile network. The purpose of this research is to understand customer needs in a mobile network. With this in mind the researcher aims to explore forces that will assist to improve the customer needs and service delivery by a new mobile network provider. Based on the results, the researcher will make comments/recommendations concerning areas that may need improvement. This research is purely for academic value and will not be used for any other purpose. Your participation in this vital research project will therefore be highly valued and appreciated.

Please note:

1. Semi-structured interviews will be conducted with management.
2. Only the researcher has access to the raw data.
3. The sole purpose of the project is research and no participants name will be linked to any data.
4. Please note although it may appear that there are some questions that overlap, each question has a specific purpose for the overall study.
5. The semi structured interview will take about **30 minutes** to complete.
6. Closing date is end of business on Monday, **4 November 2015**.
7. Kindly advise of a date and time, which is convenient to you, so that I could conduct this semi structured interview.
8. I have attached the semi structure interview schedule, for your perusal

I _____agree/disagree to participate in this research project._____

Signature Date

Kind Regards.

Vaughn Govender

0814729300

Semi-Structured Interview Schedule
Respondent's Profile: The questions in this section are not for personal identification and will be used only for profile analysis on the investigation into the service delivery provided by a new mobile network provider. The Service provider's network will be analyzed and will be referred to as the service provider. Anonymity of participants is guaranteed.
Section A: Biographical Information
1. Please indicate your occupational group (*Please mark with X*) 1.1 Senior Management (M3+) 1.2 Middle Management (M/S4/5) 1.3 Junior Management (M/S6)
2. Please indicate your Years of service (*Please mark with X*) 2.1 0-1 years 2.2 1-5 years 2.3 6-10 years 2.4 11-20 years 2.5 20+ years
3. Please indicate your Age (*Please mark with X*) 3.1 Below 20 years 3.2 20-29 years 3.3 30-39 years 3.4 40-49 years 3.4 50-59 years 3.5 60+ years
4. Please indicate your Gender (*Please mark with X*) 4.1 Male 4.2 Female
5. Please indicate your Race (*Please mark with X*) 5.1 African 5.2 Colored 5.3 Indian 5.4 White

Technical Aspect

Question 1: How would you rate the service delivery that current mobile service provider provides to their clients? Why?

_____

_____

Question 2: How is your current mobile service provider service delivery different compared to other mobile operators?

_____

_____

Question 3: How is your company's network rollout strategy different from other mobile operators?

_____

_____

Question 4: How do you cater for a customer high bandwidth requirements on your mobile network?

_____

_____

Question 5: How is your product offering different to other service providers?

_____

_____

Question 6: Why would you recommend your product offering to clients?

_____

_____

Question 7: How is the network coverage provided by your current mobile service provider?

_____

_____

Question 8: Is there is a weak network footprint in any areas? If yes, why?

_____

_____

Question 9: What measures have been implemented to ensure that there is network coverage in new developing areas?

_____

_____

Question 10: How reliable is current mobile service provider's network?

_____

_____

Question 11: Has your current mobile service provider experienced any catastrophic network failures? Elaborate.

_____

_____

General

Question 12: What challenges exist that prevent your mobile service provider from expanding their network?

_____

_____

Question 13: How is the relationship between mobile service provider and the other departments within your organisation?

_____

_____

Question 14: Do all departments share the same vision and strive to achieve a common goal?

_____

_____

Question 15: Why would you recommend customers to use your mobile service provider mobile network?

_____

_____

Question 16: How are all mobile human resources kept motivated within the organisation?

_____

_____

Question 17: How does job security affect the morale at the work place?

_____

_____

Question 18: How do you retain talent and expertise in your organisation?

_____

_____

Question 19: What has your mobile service provider accomplished, that distinguishes them from other mobile operators?

_____

_____

Question 20: What keeps you motivated, which ensures you give off your best at all times?

Annexure C
Pearson Chi-Square Tests

		Age - coded	Years service Code	Level	Gender	Race
I have accessibility to all my applications on my Mobile service provider's network.	Chi-square	4.360	2.928	1.278	.283	5.336
	Df	6	6	2	2	6
	Sig.	0.628	0.818	.528	.868	0.502
My Mobile service provider's network capability always exceeds my expectations.	Chi-square	11.766	7.906	3.748	7.705	10.150
	Df	6	6	2	2	6
	Sig.	0.067	.245	.154	.021*	.118
I often think of changing my mobile service provider.	Chi-square	2.694	5.832	.401	5.629	3.145
	Df	6	6	2	2	6
	Sig.	0.846	.442	.818	.060	.790
I never experience any network congestion on my current mobile service provider.	Chi-square	7.354	4.112	.582	3.000	13.986
	Df	6	6	2	2	6
	Sig.	0.289	.662	.748	.223	.030*
I never experience dropped calls from current service provider.	Chi-square	7.179	7.576	.347	6.327	8.381
	Df	6	6	2	2	6
	Sig.	0.305	.271	.841	.042*	.211
My current mobile service provider caters for my bandwidth usage.	Chi-square	3.852	4.752	2.809	.111	4.680
	Df	6	6	2	2	6
	Sig.	0.697	0.576	.245	0.946	0.585
I never experience bandwidth problems on my current mobile service provider's network.	Chi-square	4.970	14.156	2.131	1.653	5.445
	Df	6	6	2	2	6
	Sig.	0.548	.028*	.345	.438	.488
I am happy with bandwidth availability from my current mobile service provider.	Chi-square	4.545	8.863	1.183	1.177	4.948
	Df	6	6	2	2	6
	Sig.	0.603	.181	.554	.555	.551
My current mobile service provider offers good value for its bandwidth on its network.	Chi-square	6.209	7.392	.014	2.417	1.829
	Df	6	6	2	2	6
	Sig.	0.4	0.286	.993	.299	0.935
My current mobile service provider offers the best pricing on bandwidth.	Chi-square	4.838	5.910	3.438	5.529	3.762
	Df	6	6	2	2	6
	Sig.	0.565	0.433	.179	.063	0.709
My current mobile service provider network coverage is reliable.	Chi-square	9.026	7.032	8.180	2.073	9.699
	Df	6	6	2	2	6
	Sig.	0.172	.318	.017*	.355	.138
My current mobile service provider network coverage caters for all my mobile requirements.	Chi-square	10.995	11.596	7.168	5.863	6.186
	Df	6	6	2	2	6
	Sig.	0.089	.072	.028*	.053	.403
I will recommend my current mobile service provider to others.	Chi-square	4.288	10.603	4.635	3.102	1.985
	Df	6	6	2	2	6
	Sig.	0.638	0.101	.099	.212	0.921

I am satisfied with my current mobile network coverage.	Chi-square	3.935	8.350	9.090	6.105	5.952
	Df	6	6	2	2	6
	Sig.	0.685	.214	.011*	.047*	.429
I will remain a customer of my current mobile service provider.	Chi-square	11.881	7.170	7.780	2.164	5.148
	Df	6	6	2	2	6
	Sig.	0.065	0.305	.020*	.339	0.525
My current mobile service provider network offers the latest technology (LTE).	Chi-square	4.071	6.260	5.279	1.908	6.519
	Df	6	6	2	2	6
	Sig.	0.667	0.395	0.071	.385	0.368
All my devices are compatible on my current mobile service provider network.	Chi-square	1.900	2.279	.744	2.038	5.918
	Df	6	6	2	2	6
	Sig.	0.929	0.892	.689	0.361	0.432
My current mobile service provider network is constantly improving.	Chi-square	4.162	4.517	2.342	1.290	1.860
	Df	6	6	2	2	6
	Sig.	0.655	0.607	.310	.525	0.932
My current mobile service provider conforms to international networks.	Chi-square	5.393	3.209	.991	.628	3.684
	Df	6	6	2	2	6
	Sig.	0.494	0.782	0.609	0.731	0.719
My current mobile service provider has a world class network.	Chi-square	8.582	2.098	3.915	.248	1.274
	Df	6	6	2	2	6
	Sig.	0.198	.910	.141	.883	.973
I am totally satisfied with the service delivery from my current mobile service provider.	Chi-square	4.984	7.057	5.686	6.157	9.534
	Df	6	6	2	2	6
	Sig.	0.546	.316	.058	.046*	.146
My current mobile service provider exceeds my service delivery expectations.	Chi-square	8.657	11.845	6.022	4.438	5.982
	Df	6	6	2	2	6
	Sig.	0.194	.066	.049*	.109	.425
My current mobile service provider caters for all my mobile needs.	Chi-square	6.039	5.153	7.691	3.375	8.525
	Df	6	6	2	2	6
	Sig.	0.419	.524	.021*	.185	.202
I am a brand loyal customer to my current mobile service provider.	Chi-square	1.661	4.360	2.612	.916	9.742
	Df	6	6	2	2	6
	Sig.	0.948	0.628	.271	.633	0.136
I would consider changing to another mobile service provider.	Chi-square	3.145	4.210	2.252	1.542	11.822
	Df	6	6	2	2	6
	Sig.	0.79	.648	.324	.463	.066
My current mobile service provider customer's services are efficient.	Chi-square	3.994	5.952	1.076	2.224	7.272
	Df	6	6	2	2	6
	Sig.	0.677	.429	.584	.329	.296
My current mobile service provider has easy channels to address customer queries.	Chi-square	8.413	6.823	1.577	.041	7.294
	Df	6	6	2	2	6
	Sig.	0.209	.338	.455	.980	.294
My current mobile service provider customer services are knowledgeable about their products and services.	Chi-square	8.216	8.607	2.188	3.603	10.736
	Df	6	6	2	2	6
	Sig.	0.223	.197	.335	.165	.097

All my interaction with my service provider's customer services has been positive.	Chi-square	4.512	4.749	.116	.323	6.106
	Df	6	6	2	2	6
	Sig.	0.608	.576	.944	.851	.411
I always receive feedback on any queries that I have from my current mobile service provider.	Chi-square	11.397	10.672	1.855	.033	8.065
	Df	6	6	2	2	6
	Sig.	0.077	.099	.396	.983	.233