The Effect Of South African Internet Service Providers' Service Quality On Corporate End Users' Business Performance

by

Magandrie (Melanie) Naidoo

Student number: 70488606

Submitted in accordance with the requirements for the degree of

Doctor of Business Leadership

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: Professor Rembrandt Klopper

CO-SUPERVISOR: Professor Sam Lubbe

November 2016

PERMISSION TO SUBMIT

UNISA Graduate School of Business Leadership

Supervisors' Permission to Submit Thesis for Examination

Student Name: **Magandrie Naidoo**	Student No: **70488606**		
TITLE OF DISSERTATION/THESIS: *Evaluation Of South African ISPs' Service Quality, And The Impact Of This Service Quality On Customers' Business Performance*			
Qualification: Doctorate in Business Leadership (DBL)	UNISA Graduate School 0f Business Leadership		
		Yes	No
To the best of our knowledge, the thesis is substantially the student's own work she has acknowledged all reference sources.		X	
A certified English language practitioner has edited the thesis.		X	
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We agree that the thesis can be sumbitted for examination		X	
Supervisor's Name: Professor Rembrandt Klopper			
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Co-Supervisor's Name: Professor Sam Lubbe			
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Date: 04 November 2016			
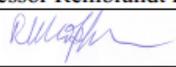
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ACKNOWLEDGMENTS

Writing this section of the thesis is a satisfying yet an emotional part of the doctorate journey. This has certainly been a very difficult journey, and many obstacles were encountered along the way. So many people have provided me with guidance and encouragement during this time, and for this I will be forever grateful.

- Firstly, a big thank you to GOD for giving me the strength and perseverance to complete my doctorate. Without my faith and belief in You, this would not have been possible.

- To my late grandfather, Michael; you attended all my graduations and it was your ultimate dream to see me achieve this. Unfortunately you were called to heaven much sooner than expected. Your voice of encouragement has always been present, even though you are not physically present. Thank you so much for your encouragement and support. I dedicate this accomplishment to you.

- To my supervisors, thank you for walking this journey with me. Your expertise, guidance, and encouragement have assisted me in getting through this.

- To my husband and children, thank you for your support and patience during this journey. I have sacrificed many hours of family time and memories in order to complete this journey. I am truly grateful for your patience and encouragement.

- To my mother and family, thank you for your love and support during this time.

- To the admins and support staff, librarian, and professors at the Business School, thank you for your guidance and support.

ABSTRACT

The Internet is used for commercial purposes, and companies utilise the Internet to stay competitive in the market. The increase in Internet adoption has led to an increase in Internet Service Provider (ISP) competition in the South African market, with Service Quality playing a key role in differentiation. ISPs are key stakeholders in the Internet industry, and therefore have a direct influence on Internet Service Quality. There have certainly been a number of studies conducted around the difficult, technical side of Internet Service Quality; however, very few studies have delved into the softer side of ISPs' Service Quality and the evaluation of the impact of this Service Quality on customers' business performance. This study aims to close this knowledge gap by providing a critical comparative analysis of South African ISPs, and the challenges experienced by ISPs. In addition, this study confirms a Service Quality measurement model for the South African Internet industry, and further contributes to the existing body of knowledge by investigating the impact of ISPs' Service Quality on corporate customers' business performance. This thesis employs an empirical, mixed-methods approach through the use of both qualitative and quantitative research strategies. The researcher interviewed top management at ISPs, and distributed online surveys to customers of ISPs. The findings of this research are beneficial to ISP management, and academics aiming to expand their research in this arena.

Keywords: Internet Service Providers (ISPs), Internet, Service Quality, South Africa, SERVQUAL, Business Performance, Customer Centric, Trustworthy, Reliable, Customer Satisfaction.

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TERMS AND ABBREVIATIONS

3D	Three-dimensional
4G	Fourth Generation
5G	Fifth Generation
ABC	Activity-based Costing
ADSL	Asymmetric Digital Subscriber Line
AHP	Analytic Hierarchy Process
ANOVA	Analysis of variance
ANP	Analytic Hierarchy Process
AS	Affect of Service
ASP	Application Service Provider
BSC	Balanced Score Card
CA	Cluster Analysis
CBR	Case-based Reasoning
CDMA	Code Division Multiple Access
CEO	Chief Executive Officer
CFA	Confirmatory factor analysis
CHPC	Centre for High Performance Computing
COW	Computers on Wheels
CTO	Chief Technical Officer
DEA	Data Envelopment Analysis
DM	Data Mining
DNS	Domain Name System

DPI	Deep Packet Inspection
DRC	Democratic Republic of the Congo
DSL	Digital Subscriber Line
DVB	Digital Video Broadcasting
EASSy	Eastern Africa Submarine Systems
ECNS	Electronic Communications Network Services
ECS	Electronic Communications Services
EDT	Expectation disconfirmation theory
EFA	Exploratory factor analysis
EFQM	European Foundation for Quality Management
EUISS	End-user information system satisfaction
FTTH	Fibre to the Home
GA	Genetic Algorithm
GDP	Gross domestic product
GM	Grönroos Model
GP	Goal Programming
GPRS	General Packet Radio Service
GPS	Global Positioning System
HDTV	High-definition Television
HSDPA	High-speed Download Packet Access
HSPA	High-speed Packet Access
IaaS	Infrastructure as a Service
ICT	Information and Communication Technology
IoT	Internet of Things
IP	Internet Protocol

IS	Information system
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
ISPA	Internet Service Providers' Association
IT	Information Technology
JSE	Johannesburg Stock Exchange
KMO	Kaiser-Meyer-Olkin
LAN	Local Area Network
LLU	Local Loop Unbundling
LTE	Long-term Evolution
LW	Linear Weighting
MBNQA	Malcolm Baldrige National Quality Award
MD	Managing Director
MIP	Mixed Integer Programming
MOP	Multi-objective Programming
MP	Mathematical Programming
MPLS	Multiprotocol Label Switching
NBP	National Broadband Policy
NED	Network Embedded Device
NN	Neural Network
NOC	Network Operation Centre
OBSC	Organisational Balanced Scorecard
OTT	Over the Top
PBSC	Personal Balanced Scorecard
PCA	Principal component analysis

POPs	Points of Presence
QFD	Quality Function Deployment
QOS	Quality of Service
ROM	Rust and Oliver Model
RST	Rough Sets Theory
SANReN	South African National Research Network
SAT-3	South Atlantic 3
SATRA	South African Telecommunications Regulatory Authority
SEM	Structural equation modeling
SIM	Subscriber Identity Module
SLA	Service Level Agreement
SME	Small and medium enterprise
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TBL	Triple Bottom Line
TCO	Total Cost of Ownership
TENET	Tertiary Education and Research Network
TICSA	The Internet Company of South Africa
TOPSIS	Technique for Order of Preference by Similarity to Ideal Solution
TPS	Total Performance Scorecard
TQM	Total Quality Management
UAE	United Arab Emirates
UIS	User information satisfaction
UNISA	University of South Africa
URL	Uniform Resource Locator

US	United States
USA	United States of America
USB	Universal Serial Bus
VANS	Value-added Network Service
VLDB	Very Large Data Bases
VoIP	Voice over Internet Protocol
VPN	Virtual private network
WACS	West Africa Cable System
WiMAX	Worldwide Interoperability for Microwave Access
WWW	World Wide Web

CHAPTER 1

ORIENTATION

1.1 INTRODUCTION

The late 1990s saw an increase in the use of the Internet for commercial purposes (Lewis 2005). The Internet commercial domain sparked much interest among both customers and Internet Service Providers (ISPs) and was seen as a channel of distribution (Cheng, Sheen & Lou 2006). The Internet Service Providers' Association (ISPA) of South Africa was formed in 1996. ISPA is South Africa's Internet industry body, which acts in the interest of ISPs registered on its database (ISPA [sa]). The increase in Internet adoption in the South African market paved the way for a number of ISPs to enter the market, which in turn promoted competition among ISPs in the industry. Service Quality plays a key role in differentiation in a competitive, service-centred market (Thaichon et al 2014).

This study investigates South African ISPs' Service Quality, and the impact of this quality on corporate customers' business performance. In addition, this study aims to aid in the development of a model to assess ISPs' Service Quality, and the results will assist ISPs by highlighting areas for improvement.

This chapter provides an overview of the study. The point of departure of this chapter forms the background of the study, followed by the problem statement, sub-problems, the aim and objectives, the research question, and sub-questions. Furthermore, this chapter clarifies the importance of the study, and provides a high-level overview of the research design, research phases, and delimitation of the scope of the study, followed by the nature and form of the results. The chapter ends with an outline of the plan of the study.

1.2 BACKGROUND TO THE STUDY

A number of significant differences were highlighted through the comparison of the Internet adoption and Internet penetration rates in Africa with the Internet adoption and Internet penetration rates in Europe and in the United States of America (USA). There are certainly distinct differences in the approach that developed and developing countries take when adopting the Internet, and they face distinct challenges (Wilson 1999).

Several studies (Skinner, Biscope & Poland 2003; Hargittai 1999; Roycroft & Anantho 2003) have revealed the barriers that stand in the way of Internet adoption and penetration in developing countries, such as costs, regulatory landscape, education, basic infrastructure, and economic conditions.

South Africa is a developing country, and therefore is exposed to the elements listed above.

1.2.1 Costs

According to Kiiski and Pohjola's (2002) study, there is a strong correlation between gross domestic product (GDP) per capita and Internet accessibility in countries. The majority of the African countries have low per capita income (Roycroft & Anantho 2003), whereas the affluent countries have a higher per capita income and have higher Internet adoption and penetration rates (Kiiski & Pohjola 2002). Although the Internet is considered to be a contributor to economic growth, there is a concern that the Internet contributes to the increasing divide between the income classes within countries.

In Africa, the Internet is not classified as a basic service, therefore people would rather pay for basic services such as water, electricity, and sanitation first than services such as Internet access (Kiiski & Pohjola 2002; Roycroft & Anantho 2003), whereas in the developed world the Internet is classified as a basic service, and therefore Internet adoption and penetration are high. The Internet is made up of several components and each component has an associated cost. The costs of the access medium, the Internet access subscription, and equipment have an effect on Internet diffusion (Kiiski & Pohjola 2002). Furthermore, adding to this constraint, not many African people have access to computers due to high equipment and maintenance costs (Roycroft & Anantho 2003).

1.2.2 Regulatory Influence

Regulations within a country play a vital role in influencing competition within the market, as well as significantly influencing Internet penetration (Brousseau, Marzouki & Meadel 2012), whereas monopoly within a market has a negative influence on Internet penetration (Hargittai 1999).

1.2.3 Education And Its Impact On Internet Adoption

Several studies (among which Kiiski & Pohjola 2002; Roycroft & Anantho 2003) support the notion that education influences Internet diffusion. Basic literacy skills such as reading and writing are fundamental when using the Internet. Knowledgeable people tend to adopt new technologies faster than the uneducated (Kiiski & Pohjola 2002). Another term for the gap between Internet knowledge and aptitude is known as the digital divide, and this issue is more dominant in developing countries (Ohemeng & Ofosu-Adarkwa 2014). Kiiski and Pohjola's (2002) study contrasts with Hargittai's (1999) study, which indicates that there is no correlation between education and Internet diffusion. According to Kiiski and Pohjola (2002), being fluent in English is another factor that influences Internet diffusion.

1.2.4 Basic Internet Infrastructure

The lack of basic infrastructure for Internet access is another factor that affects Internet penetration (Roycroft & Anantho 2003). The majority of African countries are faced with these challenges. A correlation exists between high Internet penetration rates and access to Internet infrastructure (Roycroft & Anantho 2003). Countries like the United States (US) are typical examples of this claim, whereas in rural parts of Africa the lack of electricity negatively affects Internet adoption and penetration (Roycroft & Anantho 2003). Furthermore, investing in Information and Communication Technology (ICT) and telecommunications infrastructure in a country helps strengthen and grow the economy (Ohemeng & Ofosu-Adarkwa 2014), yet developing countries spend less in this area because the focus is on investment in basic services.

1.2.5 Economic Conditions In Africa

Economics is another contributing factor to Internet adoption and penetration, and significantly influences technology adoption in developing countries (Roycroft & Anantho 2003). It is no wonder countries in Africa have severely lower Internet adoption and penetration rates compared to the developed nations such as the USA and Europe (Roycroft & Anantho 2003). There are no high-income countries in Africa, and only five countries (Gabon, South Africa, Mauritius, Réunion, and Seychelles) are classified as upper-middle-income countries (Roycroft & Anantho 2003).

Furthermore, not all developing countries adopt the Internet at a similar pace (Kiiski & Pohjola 2002). For instance, South Africa, although classified as a developing country, has the highest Internet penetration among the developing countries (Roycroft & Anantho 2003). The Internet industry's growth in both South Africa and Africa are attributed to the focus given by the relevant African ministers of states.

1.2.6   The Growth Of The Internet In South Africa

The Addis Symposium on Telematics was held in 1995. This conference brought together ministers from the various African countries. The conference's mandate was to initiate a workgroup that would focus on Africa's journey on the Information Technology (IT) bandwagon (Wilson 1999). The workgroup gave birth to a number of initiatives, which worked towards achieving this goal. In response to this, South Africa established Comtask, a task group initiated by the former president of South Africa, Thabo Mbeki. The purpose of this group was to evaluate and improve the IT infrastructure in South Africa. In addition, the local telecommunications provider, Telkom, was tasked to install telephones at every school, hospital, and library in the country. The sudden increase in telecommunications facilities helped to promote discussions in other industries in South Africa. The government in South Africa encouraged infrastructure development, content development, and skills development. A number of ISPs (Internet Solutions, Pipex, Internet Africa, Sprint SA, Saix [Telkom's Internet Service], Opennet [the government's Internet service], and Uninet) climbed on the bandwagon to provide Internet services to South Africans (Wilson 1999).

In June 1996, ISPA was established in South Africa, an industry body that represents close to 150 South African ISPs (ISPA [sa]). In July 1996, ISPA protested to the Competition Board against Telkom's inequitable ways regarding prejudiced pricing, as well as their influencing ways regarding network quality (Wilson 1999). These issues are typical by-products of a monopolistic market. At that stage Telkom was the only national operator, and had capitalised on the benefits of being in this position. Due to the complexity of the complaint, the Competition Board passed the issue over to the South African Telecommunications Regulatory Authority (SATRA) (industry regulator). SATRA had to evaluate ISPA's case as to whether Telkom, as the national operator, should exclusively provide Internet access, or should ISPs be given permission to provide Internet access under the Value-added Network Service (VANS) licence (Wilson 1999). It was later decided that

the latter would prevail and ISPs were thereafter awarded permission to provide Internet access (Wilson 1999).

The newfound permission granted by SATRA gave way to a host of opportunities in the South African ISP market. ISPs were able to take advantage of the tariff structure (Wilson 1999). The Internet industry was not a highly regulated environment, and ISPs preferred this type of environment as they felt that regulations would hinder the Internet industry's growth (Wilson 1999). This being said, the Internet industry in South Africa continued to expand, which led to an upsurge in competition. With increased competition in the industry, one would expect reduced pricing; however, this was not the case. In response to the rise in competition there was an increase in mergers and acquisitions in the market, and the quality of service provided by South African ISPs was not assessed or measured (Wilson 1999). There is still a gap with regard to the measurement of Service Quality in the Internet industry in South Africa, and the impact of this Service Quality on business performance is still unknown.

1.2.7   Service Quality Studies In Internet Industries Around The World

A number of Service Quality studies (Simsim 2011; Lee & Kim 2012; Hu & Liao 2011; Li, Shue & Lee 2008) have been conducted in Internet industries in other parts of the world. Internet connection technologies and customers' perspective of speed, price, capacity, and quality of connection in the US market have been surveyed (Simsim 2011). Simsim's (2011) study showed that in the US market there was a great demand for high-speed and better-quality Internet connections, and the majority of respondents would not mind paying a little extra in order to gain access to those two functionalities.

Further studies were conducted on the gender type that most often uses the Internet, preferred times to access the Internet, and the type of applications that are most often used on the Internet. In addition, Lee and Kim's (2012) study reviewed the source of most Internet problems. Past research indicated that the majority of the problems stemmed from issues in the core networks and servers; however, Lee and Kim (2012) suggested otherwise, stating that the majority of the problems occur near customers. Their study focused on connections made by customers and the failures experienced by customers.

In addition, there have been several studies on the quality of Internet paths. In most of the studies there was consensus on the role of Service Quality, whereby researchers have highlighted the benefits of Service Quality in aiding in customer satisfaction, decision making, loyalty, and retention (Hu & Liao 2011). Furthermore, the study by Li et al (2015) argued that customers ranked Service Quality much higher than incremental fee differences. In the Taiwanese market, however, this is not the case. In the Taiwanese market, 78% of business customers rated reliability as the most important factor.

Although research has been conducted on Service Quality in the Internet industry (Simsim 2011; Lee & Kim 2012; Hu & Liao 2011; Li et al 2015), the majority of this research was conducted in developed countries. The reviewed literature underlines the noticeable differences between customers' evaluation of Service Quality in the developed world versus the developing world (Choudhury 2008). The challenges experienced in Internet industries in developing countries differ from the challenges experienced in Internet industries in developed countries. Limited research has been conducted on the evaluation of ISPs' Service Quality in the South African Internet industry, and there is no confirmed model that can be used to evaluate ISPs' Service Quality in the industry. Furthermore, there is limited literature on the impact of ISPs' Service Quality on their corporate customers' business performance.

Several searches were performed on Science Direct and on Nexus by the researcher, and the results of the searches clearly indicate that there has been limited research in this space and therefore highlights this as a research gap worth pursuing.

1.3 RESEARCH PHASES

Problem-solving Research
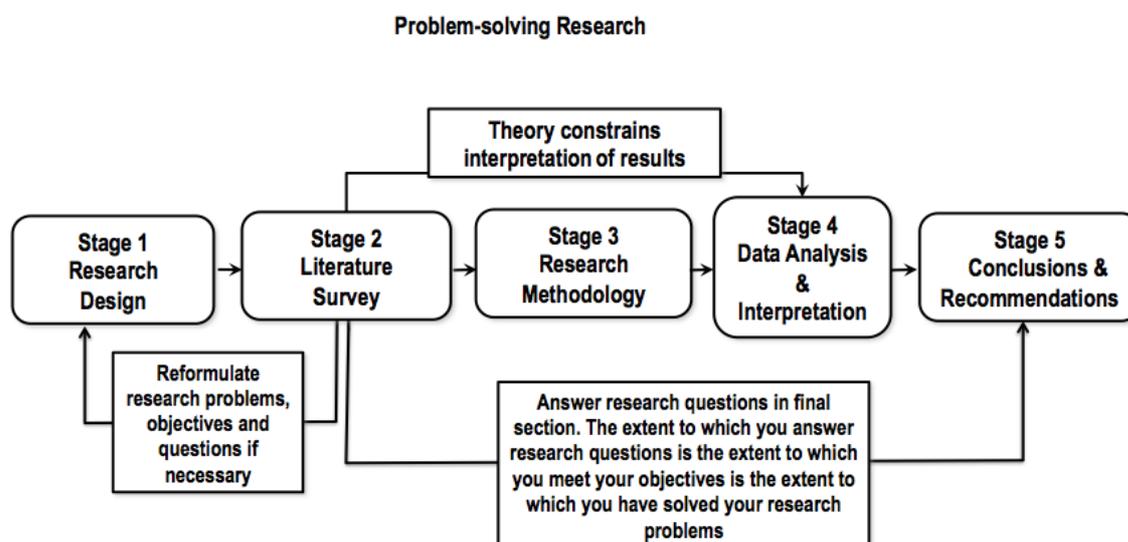
Figure 1.1: Phases of the research study (Adopted from Klopper 2012)

This study follows Klopper's (2012) problem-solving approach (see Figure 1.1). This alignment of research phases provided the researcher sufficient information to conduct the data analysis and interpretation. Although the figure might seem to illustrate a linear approach, this is not the case. The problem-solving approach is composed of phases that constantly need to be reviewed and changed. The researcher performed several iterations and revisions of each phase.

The research design phase stipulates the methods and procedures involved in conducting research. It is seen as an overall plan that outlines the data collection, data analysis, and data-measurement techniques.

The literature review stage involves an extensive review of existing literature in the research field. Search terms were extracted from the problem statement and used in the literature searches. The researcher had to constantly keep up to date with new information in the Internet industry and in the Service Quality domain.

Following the literature review stage is the research methodology phase, which discusses the chosen method and its suitability to the area of research. The researcher will further discuss the benefits and disadvantages of using the chosen method in the methodology chapter.

The research methodology stage is followed by the data-analysis and data-interpretation stages, which provide valuable insight for the conclusion and recommendation stages. The research questions were finalised in light of insights obtained from the literature review.

1.4   PROBLEM STATEMENT

This research project implemented Klopper and Lubbe's (2012) problem-solving approach to research; therefore in this section the overall problem is presented and divided into a set of interrelated sub-problems. It entails identifying and unpacking a general problem into sub-problems, which are aligned to the aim and objectives, and thereafter formulating research questions aligned with each objective. This procedure is outlined in Figure 1.2.
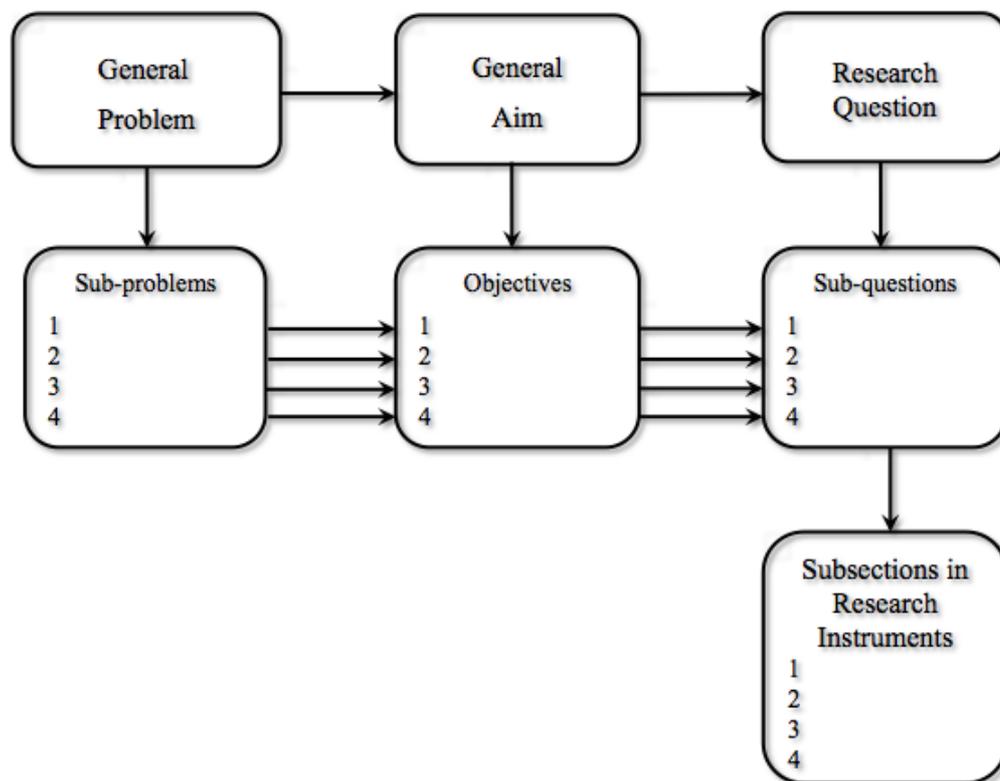
Figure 1.2: Aligning research problems, research objectives, and research questions (Adopted from Klopper 2008)

Figure 1.2 further indicates that for each sub-question there should be a section in one's research instrument (either in a questionnaire or in an interview schedule). This means that each sub-question in the problem statement is further unpacked into a series of more detailed research questions in one's questionnaire or interview schedule (Klopper 2012).

In keeping in line with Klopper and Lubbe's (2012) problem-solving approach, one must think about two scenarios. In the first scenario one would picture a perfect world with no problems, and in the second scenario one would imagine the chaos created by a particular problem.

Although several studies have been performed on Service Quality in Internet industries in other countries, these studies were conducted in developed countries. A limited number of studies have been performed in developing countries, especially in South Africa. Furthermore, prior studies focused on the more difficult, technical side such as actual Internet speed and quality, whereas this study focuses on the softer side of South African business customers' perceptions and expectations of the Service Quality received from their ISPs. Furthermore, the impact of South African ISPs' Service Quality on customers' business performance is yet to be understood. This study targets South African business customers and ISP management of South African ISPs. Furthermore, this study takes a mixed-methods approach through the use of data-collection instruments such as questionnaires and interviews. This approach results in understanding the impact of South African ISPs' Service Quality on corporate customers' business performance, and the development of a model to assess ISPs' Service Quality in the South African industry.

1.5   SUB-PROBLEMS

This study aims to address the following sub-problems in the pursuit to answer the problem statement:

- The appraisal of South African ISPs' Service Quality by business customers is yet to be understood.
- The impact of ISPs' Service Quality on South African business customers' business performance is still unknown.
- The challenges experienced by South African ISPs, and the impact of these challenges on their ability to deliver to business customers, are unknown.
- The gap between ISPs' perceptions of the Service Quality they provide and business customers' perception of the Service Quality they receive is yet to be determined.

1.6 THE AIM OF THE STUDY

Various academic studies have been conducted on the Service Quality in the Internet industries of developed countries; however, the literature reveals that little is known about ISPs' Service Quality in the South African Internet industry.

The aim of this study is to narrow the knowledge gap by conducting empirical research into South African business customers' perceptions and expectations of their ISPs' Service Quality, and to understand the impact of this Service Quality on business customers' business performance. In addition, this study assists in the development of a model to assess Service Quality in the Internet industry in South Africa.

1.7 THE OBJECTIVES OF THE STUDY

In order to accomplish the aim of the study, the following objectives need to be fulfilled:

- To assess South African business customers' perceptions and expectations of the Service Quality they receive from their ISPs.
- To investigate the impact of ISPs' Service Quality on business customers' business performance.
- To identify the challenges experienced by South African ISPs, and to investigate how these challenges impact the ISPs' ability to deliver the Service Quality business customers require.
- To identify the gap between ISPs' perceptions of the Service Quality they deliver, and business customers' perception of the Service Quality they receive.
- To develop and confirm a measurement model to assess ISPs' Service Quality in the Internet industry in South Africa.

1.8 RESEARCH QUESTION

What are South African business customers' expectations and perceptions of ISPs' Service Quality, and what is the impact of ISPs' Service Quality on customers' business performance?

1.9   SUB-QUESTIONS

This study also seeks to address the following sub-questions to the main research question:

- How do customers appraise ISPs' Service Quality in the South African market?
- What is the impact of South African ISPs' Service Quality on business performance?
- What are the challenges experienced by ISPs in South Africa, and the impact of these challenges on their ability to deliver the Service Quality South African business customers require?
- What is the gap between ISPs' management's perception of the Service Quality they provide, and business customers' perception of the Service Quality they receive?

1.10   THE IMPORTANCE OF THE STUDY

Various studies (Bienstock et al 2008; Choudhury 2008; Kaisara & Pather 2011; Hu & Liao 2011; Simsim 2011; Griffiths et al 2012; Lee & Kim 2012; Li et al 2015) indicate the importance of improving Service Quality, and have argued its influence on business performance. The majority of these studies have been performed in either developed countries, or in industries other than the Internet industry. This study makes an original contribution to the literature as it was conducted in a developing country, South Africa, on the Internet industry. In the South African Internet industry, limited research has been conducted on ISPs' Service Quality, and there is still a gap for a model to assess the softer, less technical side of ISPs' Service Quality. This study helps to fill this gap by measuring the difference between South African business customers' perceptions and expectations of the Service Quality they desire and the actual Service Quality they receive from their ISPs. Furthermore, this study contributes to the available literature on the impact of this Service Quality on corporate customers' business performance.

Regarding the Internet industry in South Africa, this study makes an original contribution and will benefit ISPs in identifying Service Quality gaps, which can be used by ISPs to improve their Service Quality. Furthermore, this study develops and confirms a model to assess the softer, less technical side of ISPs' Service Quality.

1.11 THE RESEARCH DESIGN

Research philosophy is the development of knowledge through the answering of a problem (Saunders et al 2007). The research philosophy one chooses informs the research strategy, as well as the methods used (Saunders et al 2007). Researchers must defend their choice of philosophy in relation to the alternatives available (Saunders et al 2007). According to Popper's (1963) Theory of Falsification, no sources are beyond scrutiny, and one cannot accept something as being true even if a respected scientist such as Einstein has written it. Researchers would always try to prove the theory wrong. Failing to prove the theory wrong will result in the theory being valid.
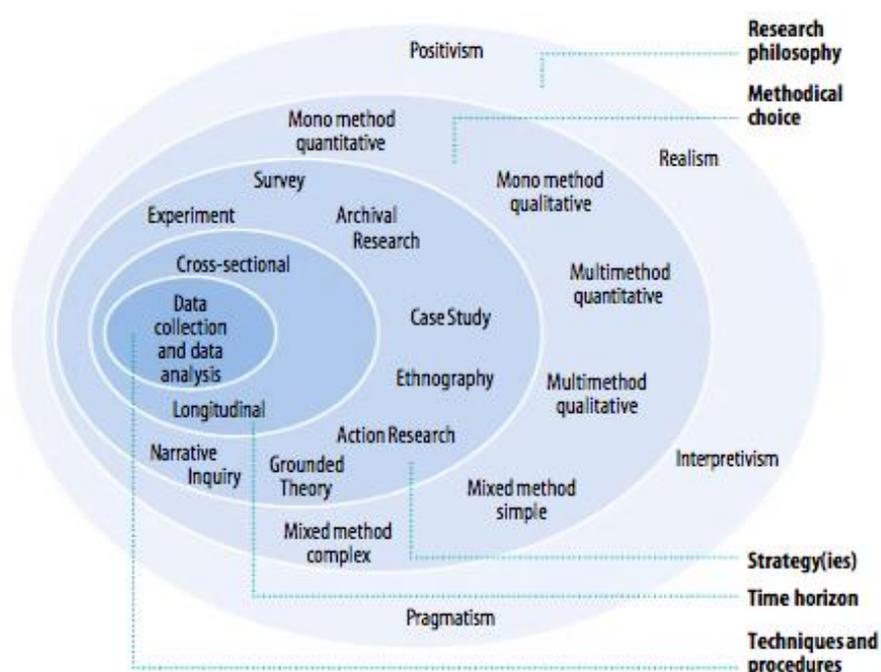
Figure 1.3: The research onion (Adopted from Saunders & Tosey 2013)

Figure 1.3 is an illustration of Saunders and Tosey's (2013) research onion. The outer layer of the onion represents the research philosophies. There are two schools of thought regarding research philosophy, namely Ontology and Epistemology. Epistemology relates to the theory of knowledge and what knowledge is acceptable, whereas Ontology is concerned with the assumptions researchers may have about the workings of the world (Saunders et al 2007). The research process should have a philosophical grounding. This research follows an epistemological philosophy as per Klopper and Lubbe (2012), which considers knowledge and ignorance, and the role of ignorance in problem-solving research.

Furthermore, this study follows the Realism and Interpretivism views. The Realism view in this study relates to South African customers' real perception of ISPs' Service Quality; whereas the Interpretivism view allows the researcher to conduct the research based on the principles of the SERVQUAL model, which serves as a form of guidance. Moreover, the results of the research contributed further to the refinement of the model.

This study confirmed a Service Quality model for the Internet industry, which incorporated the impact on business performance indicators. This original SERVQUAL model was initially developed in 1985 by Parasuraman, Zeithaml and Berry, and has been used by various industries such as hospitality, education, rural accommodation, tourism, IT services, banking, the public sector, telecommunications, retailing, catering, transportation, and healthcare (Tseng 2009; Badri, Abdulla & Al-Madani 2005). This measurement model was reviewed and adapted by the researcher and several experts in the industry to render it suitable to measure ISPs' Service Quality in the South African Internet industry. The researcher took guidance from Hinkin, Tracey and Enz's (1997) study in developing a reliable and valid measuring instrument. Past literature was reviewed to provide guidance on other forms of adaption of the model for other industries. In-depth structured interviews were conducted with ISP management, and after several iterations of coding, content analysis was performed, which provided further input and refinement of the online survey to measure ISPs' Service Quality. The research design will be discussed in further detail in the methodology chapter.

1.12   DELIMITATION OF THE SCOPE OF STUDY

The delimitations of this study were as follows:

The topic of research was chosen to bridge the knowledge gap in an industry that is of interest to the researcher, and to provide guidance on improvements in the Internet industry for developing countries. For this study, the researcher chose South Africa as the country to study as the researcher is based in South Africa, and is familiar with its Internet industry. Furthermore, logistically it was much easier to collect data in South Africa, compared to if the researcher chose another developing country.

This study focused on business customers' perceptions and expectations of South African ISPs' Service Quality, and therefore only South African business customers and South

African ISPs were included as participants.

The researcher used a closed-ended online survey, with a seven-point Likert scale. An online survey was chosen as it proved fitting to target business customers that use the Internet, as opposed to traditional paper-based surveys.

The researcher utlised Parasuraman et al's (1985) SERVQUAL model for this empirical research, subject to the literature review conducted in Chapter 2.

1.13 THE NATURE AND FORM OF THE RESULTS

The researcher presented the results in aggregated, summarised form through the use of tables, figures, and graphs. This method of presentation allowed the results to be presented in a clear, usable format for readers.

1.14 PLAN OF THE STUDY

Below is a high-level overview of each chapter.

Chapter 1 – Orientation
This chapter provides a high-level overview of the research. The chapter provides the background of the study, the research phases, problem statement, sub-problems, the aim and objectives, and the research question and sub-questions. Furthermore, the importance of the study and the research design is explained. In addition, the delimitations of the scope of the study, and the nature and form of the results are presented.

Chapter 2 – Theoretical Foundation of the Study
This chapter provides an overview and analysis of the various theories and conceptual frameworks evident in the Service Quality domain. This chapter provides the theoretical underpinning which forms the foundation for the researcher to build on.

Chapter 3 – Literature Review
This chapter provides a review and analysis of existing literature, such as Internet trends in South Africa and in the rest of the world. Furthermore, this chapter critically analyses prior

studies conducted in the Internet and Service Quality arenas. In addition, this chapter provides a comparative analysis of the ISPs in South Africa.

Chapter 4 – Research Design and Methodology

This chapter describes the research methodology employed in the study. This chapter presents the research design, the philosophical assumptions underpinning the research, followed by the process, justification, sampling, data collection, data analysis, data and design quality, and ethical consideration of both Phase 1, which is the qualitative research, and Phase 2, which is the quantitative research.

Chapter 5 – Research Findings and Data Analysis

This chapter presents the research findings, which are provided in three phases. Phase 1 comprises the qualitative research findings, whereas Phase 2 presents the quantitative research findings. Phase 3 consists of a discussion of both Phase 1 and Phase 2's findings under the appropriate research questions.

Chapter 6 – Recommendations

This chapter provides the recommendations, the study's contribution to the body of knowledge, the limitations of the study, and provides suggestions for future research.

1.15 CONCLUSION

This chapter acts as the principal foundation of the study as it outlined the various stages involved in solving the identified research problem.

This chapter provided a brief overview of the research at hand by providing insight into the problem statement, sub-problems, the aim and objectives, the research question and sub-questions. In addition, this chapter presented the importance of the study, as well as insight into the research design and research phases utilised in the study. Furthermore, the delimitation of the scope of study, the nature and form of the results, and the plan of the study were outlined.

The next chapter analyses various theories and models relevant to this study, and serves as the theoretical foundation of this research.

CHAPTER 2

THEORETICAL FOUNDATION OF THE STUDY

2.1 INTRODUCTION

This chapter provides the theoretical framework, which includes an in-depth understanding of Service Quality definitions, theories, and models relevant to this research. An analysis of the theories and models pertinent to the study provides the foundation for the research.

The chapter begins by unpacking the Service Quality definitions found in the literature, followed by the distinct characteristics of services versus products. In order to understand the impact of South African ISPs' Service Quality on corporate customers' business performance, one needs to unpack theories around customer satisfaction and Service Quality.

In past literature, theories of satisfaction were derived from discrepancy theories (Aigbavboa & Thwala 2013), therefore this chapter commences by examining two common discrepancy theories, namely the multiple discrepancies theory and customer-based discrepancy theory. Despite satisfaction theories stemming from discrepancy theories, scholars still tend to use a more common and valued user satisfaction theory known as the expectation confirmation theory (Aigbavboa & Thwala 2013). This chapter will unpack this theory and its relevance to the study.

Furthermore, this chapter analyses the evolution of Service Quality in the academic world by investigating the suitability of existing models to this study, such as the Grönroos Model (GM), the Rust and Oliver Model (ROM), SERVQUAL, SERVPERF, and E-S QUAL. Based on the analysis and research gaps identified in the literature review, a suitable model will be selected to steer the study.

2.2 DEFINITION OF SERVICE QUALITY

Service Quality has been researched extensively (Parasuraman et al 1985; Parasuraman, Zeithaml & Berry 1988; Bienstock et al 2008; Blery 2009; Tseng 2009; Hu & Liao 2011; Kaisara & Pather 2011; Simsim 2011; Griffiths et al 2012; Lee & Kim 2012; Li et al 2015), and there are various contributions to the definition of Service Quality. According to some

of the founding researchers of Service Quality, Service Quality is an indefinable and inarticulate construct (Parasuraman et al 1985). Furthermore, tangible product quality can be explained and measured, whereas it is much more arduous to define and measure Service Quality (Parasuraman et al 1985). Zhao et al (2012) concurred; viewing Service Quality as a complex concept, which can be measured through two methods. The first method views Service Quality as the discrepancy between customers' expectations and perceptions of the service, whereas the second method views Service Quality as the customers' holistic view of the organisation and its services.

2.3   SERVICE VERSUS PRODUCT CHARACTERISTICS

All services have three common characteristics; namely intangibility, heterogeneity, and inseparability (Parasuraman et al 1985). Services are seen as intangible because they cannot be touched, counted, or measured; services are heterogeneous because they do not remain the same, and can vary from supplier to supplier; and services are seen as inseparable because the delivery and usage of services go hand in hand and cannot be separated (Parasuraman et al 1985).

Service is certainly a difficult concept to measure, and every industry has its own techniques and procedures to monitor and measure this concept. The Internet industry is no different, and is made up of tangible Internet Service Quality, and intangible ISP Service Quality. As indicated in Chapter 1, this study's area of focus is on the softer, intangible side of ISPs' Service Quality.

The next section will unpack the various theories and models that influence the theories of satisfaction and in turn have a bearing on Service Quality.

2.4   THE MULTIPLE DISCREPANCIES THEORY

Michalos developed this theory of measuring net satisfaction in 1991 (Schulz 1995). The framework contains variables, which include socio-demographics, social support, and self-esteem. Schulz (1995) was of the opinion that socio-demographic variables had to be re-evaluated because they are more susceptible to change over time.
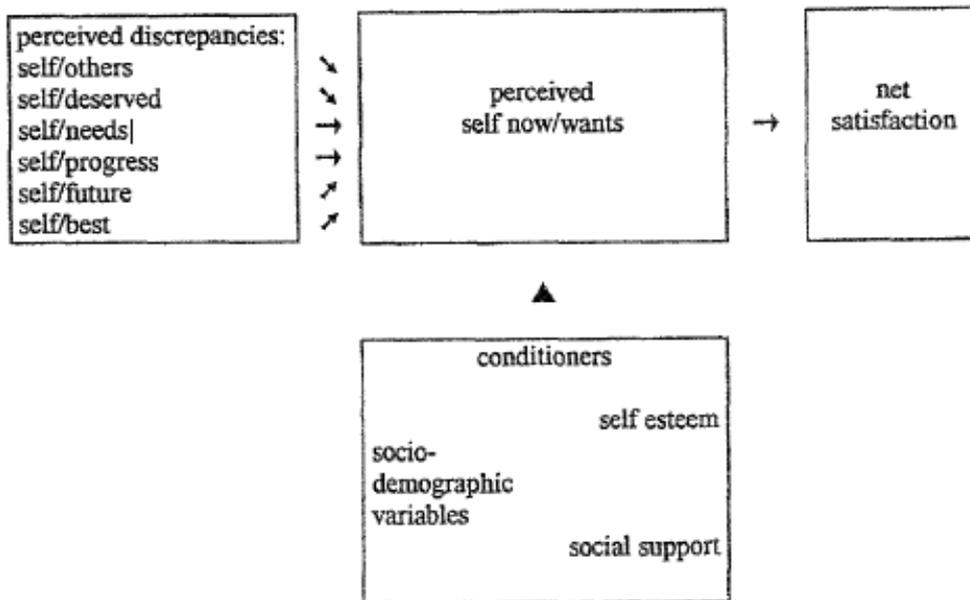
Figure 2.1: Multiple discrepancies theory (Schulz 1995)

This model pertains to measuring life satisfaction and happiness. The model measures what one has now against what one wants, which is the net satisfaction (Schulz 1995). Although the model measures the satisfaction gap between has and want, the model is not applicable to the study, as this study seeks to measure customer satisfaction and the Service Quality gap.

2.5   CUSTOMER-BASED DISCREPANCY THEORY

Satisfaction is the foundation of the discrepancy theory, and is viewed as the difference between what is expected and what is actually received (Oliver 1981). Furthermore, the discrepancy theory examines the difference between the before and the after state of perception (Dwivedi et al 2008). Non-conformance is known as disconfirmation, and this is when either expectations exceed performance, or expectations are lower than performance, or when expectations equal performance (Oliver 1981).

The customer-based discrepancy theory focuses on main constructs such as customer satisfaction and user satisfaction, and independent constructs such as manipulated expectations, manipulated performance, perceived performance, perceived expectations, and disconfirmation (Churchill & Suprenant 1982).

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Customer satisfaction is measured through various variables such as repeat purchases and brand loyalty, which in turn affect the profit of a company (Churchill & Suprenant 1982). A number of studies (Fornell 1992; Oh 1999; Gronholdt, Martensen & Kristensen 2000; Singla 2012) have been conducted on measuring customer satisfaction in different industries, and the majority of the studies used the disconfirmation paradigm, which compares experience with expectation (Churchill & Suprenant 1982). Furthermore, Churchill and Surprenant's (1982) study determined the interrelationship between expectations, perceived performance, disconfirmation, and satisfaction. According to Churchill and Surprenant's (1982) study, there is a negative correlation between expectations and disconfirmation. Moreover, there is a difference in the response to performance and satisfaction measurements for durable and non-durable products.

Ang and Soh's (1997) study measured the connections between user information satisfaction (UIS), job satisfaction, and users' computer background. The study utilised demographic variables but did not focus on the relation of these variables to other variables. The study highlighted that there was no relation between the computer background variables and UIS or job satisfaction, whereas there was a significant correlation between UIS and job satisfaction. What this basically states is that in order to improve end-user employee job satisfaction, one would need to increase the UIS components, such as user knowledge of information systems (IS) and the Service Quality of service providers (Ang & Soh 1997).

Au, Ngai and Cheng's (2002) study investigated the strengths and weaknesses of current end-user information system satisfaction (EUISS) measurements. The majority of the studies focused on the quality of the actual IS, rather than the softer, human side, whereas DeLone and McLean's (2003) study focused on the interrelationship between the six IS success dimensions, namely information, system quality, Service Quality, intention to use, user satisfaction, and net benefits. These dimensions test a combination of technical and social variables. It is worth noting that technical factors such speed, robustness, and upgrade flexibility affect end-user satisfaction (Au et al 2002). This study highlighted the lack of a theoretical foundation for the EUISS construct, and the gap in understanding how different levels of satisfaction are present when IS performance is constant.

Erevelles, Srinivasan and Rangel's (2003) study focused on customer satisfaction in the ISP market. They investigated the attributes that led to consumer satisfaction, switching

behaviour, and perceptions of ISP consumers in Southern California, in the USA. According to Erevelles et al (2003), limited research has been conducted in the ISP market. The study used the expectation disconfirmation theory to investigate ISP customer satisfaction and switching behaviour. The study's findings indicated that customers of ISPs tended to have low expectations and low perceptions. In addition, factors such as customer service, ease of use, and pricing influenced customers' decision to select an ISP.

2.6 EXPECTATION CONFIRMATION THEORY

This theory suggests that expectations, together with perceived performance, lead to post-purchase satisfaction (see Figure 2.2). If expectations are higher than performance, the customer is dissatisfied; whereas if performance is higher than expectations, the customer is satisfied (Oliver 1981). A satisfied customer tends to purchase more, which therefore has a bearing on the company's share of the market (Naeimeh & Aryati 2012).
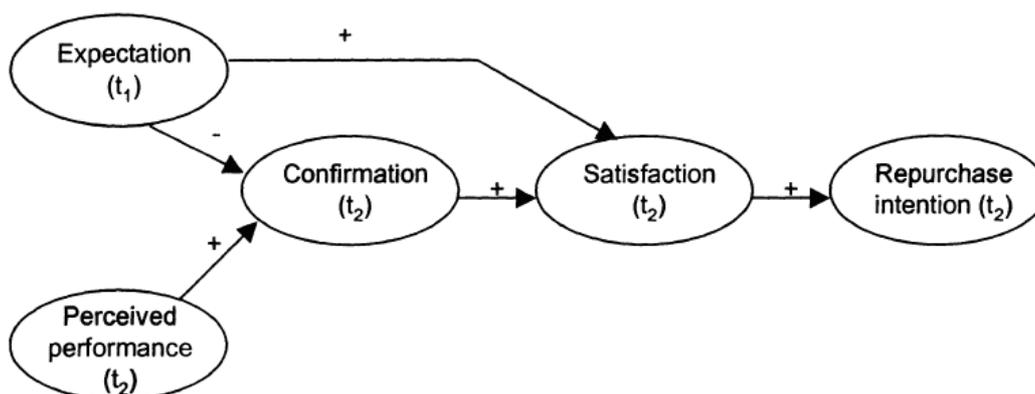
Note: t_1 = pre-consumption variable; t_2 = post-consumption variable

Figure 2.2: Expectation confirmation theory (Adopted from Bhattacherjee 2001)

This theory examines the satisfaction with and repurchase of a product or service after the use of that product or service (Bhattacherjee 2001). A further study reviewed the determinants of the continued use of the World Wide Web (WWW), by combining social cognitive theory and expectation disconfirmation theory. The study's findings indicated that there is a difference between acceptance and continuance (Hsu, Chiu & Ju 2004).

Earlier research in the IS stream focused on system characteristics and their impact on user satisfaction, whereas nowadays satisfaction research is centred on the disconfirmation

theory, which incorporates the Service Quality construct (Khalifa & Liu 2004). According to Aigbavboa and Thwala (2013), the expectation confirmation theory explains both satisfaction with product performance and satisfaction with the service.

The next section will review the evolution of Service Quality models.

2.7   GRÖNROOS MODEL (GM) FOLLOWED BY THE OLIVER MODEL

The first Service Quality model was the GM (see Figure 2.3), developed by Grönroos in 1982. Grönroos claimed that Service Quality is reliant on expected and perceived service, and that there are two types of Service Quality, namely technical quality and functional quality. He further stated that the quality dimensions are interrelated, meaning that technical quality is required for functional quality, and if functional quality is sufficient, poor technical quality can be overlooked (Martínez & Martínez 2010). In addition to the GM, in 1994 Rust and Oliver (1994) developed a model that built on the GM, in which they depicted technical quality under the term service product and functional quality under the term service delivery, and they added another component, namely service environment (Martínez & Martínez 2010).
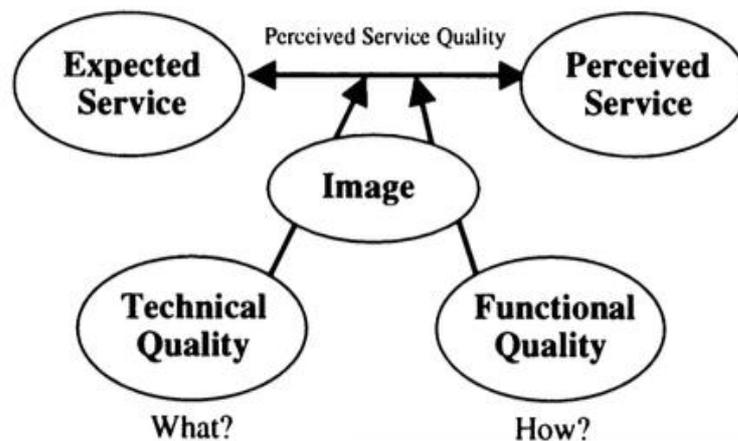
Figure 2.3: Grönroos model (Adopted from Grönroos 1984)
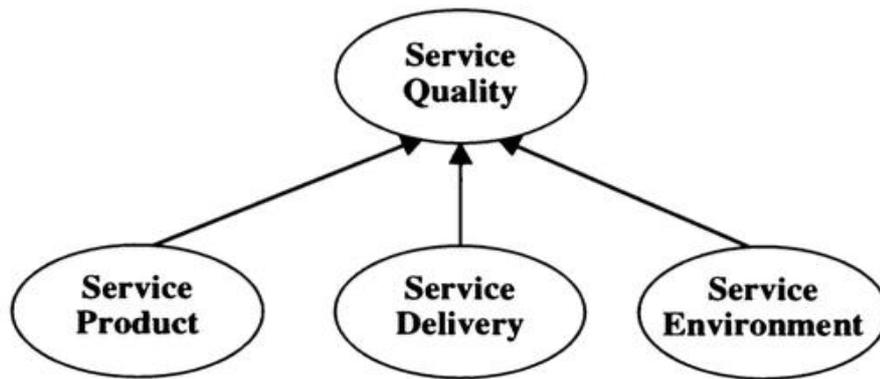
Figure 2.4: Rust and Oliver model (ROM) (Adopted from Martínez & Martínez 2010)

Thereafter, in 1985, Parasuraman et al examined a few studies, which reviewed Service Quality. Their research provided insight into the characteristics of services and quality, which later led to the development of the SERVQUAL. Parasuraman et al's (1985) work highlighted three themes, which are as follows:

- Service Quality is much more challenging to appraise than product quality.
- Perceptions are formed when customers compare their expectations with actual service performance. In addition, De Ruyter, Bloemer and Peeters (1997) claimed that customers develop expectations even before they buy the service/product, and these expectations serve as a baseline when evaluating service/product performance.
- Appraisal of Service Quality is not done in isolation; it includes the appraisal of the delivery process.

2.8 SERVQUAL

SERVQUAL is a well-known tool to measure Service Quality, and has been implemented by many researchers in various industries in various countries (Neger, Ahamed & Mahmud 2014; Nimako et al 2012). According to Parasuraman et al's (1985) initial study, insight was provided into ten dimensions, namely reliability, responsiveness, competence, communication, access, courtesy, credibility, security, understanding/knowing the customer, and tangibles. These dimensions were later revised by Parasuraman et al (1988). They developed a 22-item instrument called SERVQUAL, which was used to assess customer perceptions of Service Quality. They later combined certain dimensions, which

resulted in only five dimensions, namely tangibles, reliability, responsiveness, assurance, and empathy.

SERVQUAL has been used to measure Service Quality in various industries such as hospitality, education, rural accommodation, tourism, IT services, banking, telecommunications, public services, professional services, retailing, catering, transportation, and healthcare (Badri et al 2005; Tseng 2009). The SERVQUAL model has good reliability and validity and can be used to improve service delivery (Parasuraman et al 1988).

According to Parasuraman et al (1988), SERVQUAL does not measure satisfaction; however, Dyke, Prybutok and Kappelman (1999) disagreed by stating that SERVQUAL is an instrument that measures overall satisfaction. The revision of SERVQUAL in 1991 produced changes to the model; such that tangibles, which was one dimension in the original scale, was split into two sub-dimensions. In addition, the overlapping among dimensions was visible in the revised scale compared to the original scale (Parasuraman, Berry & Zeithaml 1991a). Later, Parasuraman et al (1991a) changed negatively worded statements into positive statements and included an item that incorporated employee knowledge. They also made some minor adjustments to a few other items. The changes were not sufficient, as Cronin and Taylor (1992) criticised the gaps on the model on both methodological and conceptual grounds (Dabholkar, Shepherd & Thorpe 2000) and later developed the SERVPERF model, which is a performance-based model (Martínez & Martínez 2010). SERVQUAL uses expectation scores, whereas SERVPERF uses performance scores. According to Parasuraman (1994), the expectation scores produce better data for management compared to performance scores (Tseng 2009); however, Cronin and Taylor (1992) disagreed.

In addition, psychometric points were identified with regard to the use of different scores and the poor reliability related to the positive correlation between expectations and perceptions, which in turn influenced the reliability (Brown, Churchill & Peter 1993; Buttle 1996). Figure 2.5 illustrates the SERVQUAL model with the five Service Quality dimensions.
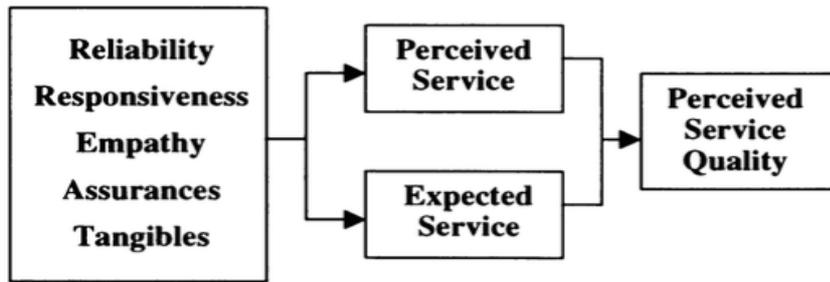
Figure 2.5: SERVQUAL model

(Parasuraman et al 1988, adopted from Brady & Cronin 2001)

In fact, Cronin and Taylor (1992) were of the opinion that their SERVPERF model provided a better measure of Service Quality from a psychometric angle when compared to SERVQUAL's measurement (Martínez & Martínez 2010). Not only did Buttle (1996) raise psychometric concerns, he also raised concerns about the theoretical and operational side of the model. Figure 2.6 illustrates the SERVPERF model.
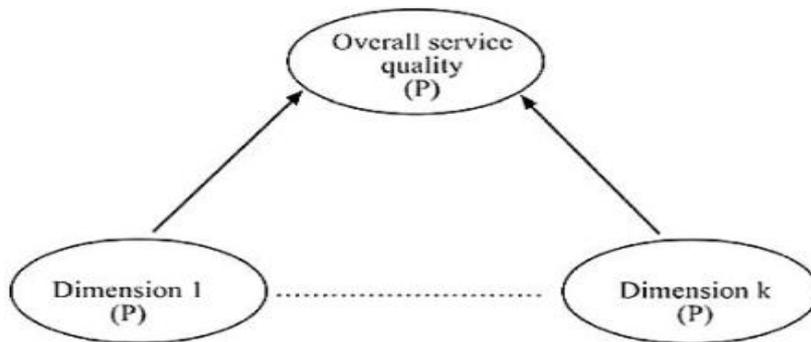
Figure 2.6: Cronin and Taylor's SERVPERF model

(Adopted from Martínez & Martínez 2010)

In addition, there have been various endeavours by academics to reach agreement on the dimensions applicable to IS quality. This led to a wave of Service Quality studies conducted on electronic Service Quality. There was certainly agreement that technology quality dimensions differ from traditional Service Quality (Nimako et al 2012).

The first IS model was developed by DeLone and McLean in 1992, and it included six categories that were used to assess IS success. Later they included a Service Quality construct in their model, and named it the DeLone and McLean IS Success Model (Nimako

et al 2012). This model is used to measure the effectiveness of IS, and although it provides an understanding of the constructs relevant to measure in the IS world, it is not sufficient to answer the research questions, which point towards the Service Quality of ISPs and not necessarily the systems they use to deliver the Service Quality to their customers.

Subsequently, several studies have been conducted on e-Service Quality and the dimensions applicable in this space. For instance, Dabholkar's (1996) study, Kim, Kim and Lennon's (2006) study, and Zeithaml, Parasuraman and Malhotra's (2002) study confirmed several dimensions applicable to e-Service Quality, such as reliability, ease of use, site design, efficiency, privacy, responsiveness, contact information, and fulfilment – among others (Nimako et al 2012).

In 2005, Parasuraman defined an E-S-QUAL model in order to measure the Service Quality of online shopping websites. Parasuraman's (2005) study was built on past studies on assessing website quality. The study assessed customers' perceptions of various criteria (information availability and content, privacy and security, reliability, ease of use or usability, graphic style, and fulfilment) when accessing a website. Parasuraman's (2005) study and other studies that confirm e-Service Quality dimensions are not relevant to this study as their focus was on assessing the Service Quality of websites and online retail services, whereas this study focuses on the overall Service Quality provided by ISPs to their customers. One could certainly make the assumption that e-services require different measurement dimensions to assess Service Quality, whereas the services provided by ISPs can be assessed through the traditional SERVQUAL. The one caveat to this approach is that the dimensions might differ in different industries and in different research settings.

2.9 CONCEPTUAL ISSUES RELATING TO SERVICE QUALITY

2.9.1 Components Versus Antecedents

Some researchers have studied Service Quality as a separate construct, whereas others have studied the components of Service Quality, and others have studied the antecedents (Dabholkar et al 2000). According to Parasuraman et al (1988), Service Quality is the sum of all its components, and the model indicates that reliability, responsiveness, assurance, empathy, and tangibles are seen as components of Service Quality.

2.9.2 Customer Satisfaction And Its Influence On Service Quality

Several studies (Dabholkar et al 2000; Iacobucci, Ostrom & Grayson 1995) have been conducted on Service Quality and its influence on customer satisfaction, and vice versa. The literature defines customer satisfaction as the discrepancy between customers' prior expectations and their perceptions regarding the purchase; whereas Service Quality is defined as the comparison of customers' expectations and the service's actual performance (Iacobucci et al 1995). It is quite evident from the definitions that the one refers to the difference between expectations and perceptions, and the other refers to expectations and actual performance. The definitions contribute to the constant debate as to whether Service Quality and customer satisfaction are two independent constructs, or whether they are one and the same (Dabholkar et al 2000; Iacobucci et al 1995). More researchers are interested in the difference between the two constructs than the similarities, and therefore the majority of previous research is centred around understanding the differences.

In addition, some researchers have gone to the extent of categorising the constructs under short-term and long-term evaluations, with satisfaction labelled as a short-term evaluation and quality as a long-term evaluation (Iacobucci et al 1995). More industries have increased their focus on customer satisfaction and Service Quality for reasons such as deregulations and competition in the marketplace (Choudhury 2008; De Ruyter et al 1997; Iacobucci et al 1995). Apart from industries analysing these two constructs, academics have also concentrated on these two constructs in order to understand customer evaluations (Iacobucci et al 1995). According to Cronin and Taylor's (1992) study, researchers have endeavoured to distinguish Service Quality from customer satisfaction. Contrary to that, there are others that use the terms "Service Quality" and "customer satisfaction" interchangeably (Iacobucci et al 1995).

Studies in the various industries produced different views; for instance, in the retail space Service Quality and customer satisfaction were either seen separately or interrelated, depending on how long the customer has been with the service provider, whereas in the banking industry, studies have revealed a significant correlation of 0.96 between the two constructs (Dabholkar et al 2000; Iacobucci et al 1995). According to Parasuraman et al's (1988) study, customer satisfaction can influence the overall appraisal of Service Quality, whereas opposing opinions view Service Quality as an antecedent to customer satisfaction (Dabholkar et al 2000).

The studies have yielded varied findings. Studies conducted at hospitals indicated the effect of Service Quality on behavioural intentions, whereas studies at banks did not show this specific effect, but retail studies highlighted the effect of customer satisfaction on Service Quality. According to Dabholkar et al's (2000) studies, healthcare, recreation, airlines, and long-distance telephone services all demonstrated the effect of customer satisfaction with Service Quality and its influence on repurchase intentions (Iacobucci et al 1995), but failed to demonstrate the fundamental causal behaviour between the two.

In Iacobucci et al's (1995) study, ten experiments highlighted timeliness and price as influencers of customer satisfaction and Service Quality. Timeliness had a larger influence on satisfaction than quality, and price had a larger influence on quality than satisfaction. The study also revealed that price, backstage operations, and expertise were causal antecedents that affected customers' impression of Service Quality; whereas timeliness, service recovery, and physical environment influenced the customers' impression of customer satisfaction. Moreover, the study went as far as referring to quality and satisfaction as being managerial and customer concerns respectively. To that point, an argument worth noting is that irrespective of how high quality is, a customer can still be dissatisfied (Iacobucci et al 1995). This point again refers to the lack of causal behaviour between the two constructs; yet, contrary to that, the studies revealed that there was no significant difference between customer satisfaction and quality as per the customers' view.

2.10   MEASUREMENT ISSUES IN SERVQUAL

There are two schools of thought regarding measuring Service Quality; some favour measuring Service Quality through perception, while others favour disconfirmation (Cronin & Taylor 1992; Parasuraman 1994). Cronin and Taylor (1992) believed that perceptions of Service Quality are strongly linked to customers' appraisal of the service, whereas Parasuraman (1994) favoured the disconfirmation approach as it allows service providers to see the gaps in the service provided. In addition, concerns were raised regarding the validity and reliability of the difference score format of the disconfirmation paradigm, as well as concerns about the disconfirmation's theoretical and conceptual grounding (Dabholkar et al 2000).

Dabholkar et al's (2000) study also compared the validity of longitudinal research design with cross-sectional research design when measuring Service Quality. A longitudinal research design measures expectations before the service is delivered and measures perceptions after the service was delivered, whereas a cross-sectional research design measures both expectations and perceptions after the service was delivered. Although it is still very unclear as to which approach provides the most valid and reliable results, the majority of the studies have utilised cross-sectional research. However, Dabholkar et al's (2000) study claimed that one can measure which type of design (longitudinal or cross-sectional) is better for the type of study, while also giving thought to cost, complexity, and time. As a result of time and resource limitations, this study followed a cross-sectional research design by measuring both expectations and perceptions after the service was experienced.

Several studies have indicated the effect of expectations on perceptions (Dabholkar et al 2000; Caruana, Ewing & Ramaseshan 2000), which in turn influences consumers' outlook on the quality of service received. Furthermore, the management of expectations is another concept worth exploring (Caruana et al 2000). It is for these reasons that some researchers would rather measure perceptions only; the other reason being the reduction in time to measure only perceptions in comparison to the time it would take to measure both expectations and perceptions (Dabholkar et al 2000).

Subsequently, some studies have utilised a single-item measure, whereas others have utilised a multi-item measure, and this in turn had an influence on the results yielded (Dabholkar et al 2000). In addition, there have been discussions on the difference scores (perceptions minus expectations) and measured disconfirmation scores, and some studies have even claimed that difference scores prove to be unreliable and contain psychometric complications (Dabholkar et al 2000; Brown et al 1993; Martínez & Martínez 2010). For instance, in some cases the results of expectations and perceptions measured before a service differed from expectations and perceptions measured after a service, as consumers do or can vary their responses (Dabholkar et al 2000).

In addition, there has been a considerable amount of subjectivity around the expectation concept. There is no agreed-upon definition of expectation, although current literature defines expectation as customer desires or wants (Caruana et al 2000). Moreover, there have been debates around the measurement of expectations. It is for this reason that

Parasuraman et al (1985) proposed a continuum scale that catered for an area of tolerance (Caruana et al 2000).

The original SERVQUAL made reference to excellent companies, and requested customers to define their expectations by giving thought to the quality of the service delivered by companies they deemed as excellent (Caruana et al 2000). The word "excellent" is very subjective and can take on many different interpretations depending on situation and time. This is one of the disadvantages of the model.

2.11 APPLICATIONS OF SERVQUAL

SERVQUAL has been used by various researchers (Abari, Yarmohammadian & Esteki 2011; Dursun, Oskaybas & Gökmen 2013; Roy et al 2012; Roslan, Wahab & Abdullah 2015; Limbourg, Giang & Cools 2016; Li et al 2015; Kitapci, Akdogan & Dortyol 2014) in a number of industries throughout the world. Some of the industries include education, logistics, health services, aviation, telecommunications, banking, and IT. Studies have attempted to customise the model for the different industries, and some researchers have gone further by investigating relationships of various constructs with the Service Quality dimensions.

2.11.1 Applications Of SERVQUAL In Education

Abari et al (2011) evaluated the quality of postgraduate studies at the Islamic Azad University in Iran. The findings highlighted the difference between the students' expectations and perceptions for Empathy, Assurance, and Tangibles dimensions. Furthermore, the two additional constructs of Guarantee and Accountability were added, which also showed a negative difference, signalling dissatisfaction.

Dursun et al (2013) measured Service Quality in distance education in Turkey as whole, rather than Service Quality in a specific university like Abari et al (2011). Dursun et al's (2013) findings revealed that students were overall dissatisfied with all five Service Quality dimensions, and the students furthermore expressed increased dissatisfaction in the Responsiveness dimension.

Contrary to the studies above, Roy et al's (2012) study chose to hone in on and evaluate the Service Quality in the library department at an educational institute in the USA. This study first defined the dimensions for measurement that are relevant to libraries, and then evaluated the Service Quality by investigating the gap between expectations and perceptions. The study's findings highlighted that the Empathy dimension, which was stated as the Affect of Service (AS) dimension, proved to be difficult to evaluate due to influencing variables such as length of service of respondent and type of respondent.

2.11.2 Applications Of SERVQUAL In Logistics

Roslan et al's (2015) study evaluated the Service Quality of a single third-party logistics company in Malaysia. The findings indicated gaps between customer satisfaction and desire. Subsequently, the study showed the relationship between the customer satisfaction construct and the Service Quality dimensions.

In contrast, Limbourg et al's (2016) study assessed the Service Quality of multiple logistics companies in the city of Da Nang in Vietnam. The findings showed gaps between customers' expectations and perceptions, which indicated dissatisfaction.

2.11.3 Applications Of SERVQUAL In Health Services

Li et al's (2015) study evaluated Service Quality at nine hospitals in China. The findings indicated that patients were overall satisfied with the Service Quality at these hospitals, and suggested two areas for improvement, namely management professionalism and quality of the treatment.

Kitapci et al's (2014) study differed from Li et al's (2015) study as it assessed the impact of Service Quality dimensions on satisfaction, word-of-mouth communications, and repurchase intentions in Turkey. Satisfaction significantly influenced word of mouth and repurchase intention.

2.11.4 Applications Of SERVQUAL In Banking

Ariff et al (2012) researched the dimensions for the e-Service Quality for Internet banking in Malaysia, and subsequently proposed a multiple-item scale for measuring Internet banking Service Quality. The study led to the development of e-Service Quality dimensions

such as efficiency for system availability, assurance fulfilment, privacy and contact, and website aesthetics.

Charles and Kumar (2014) differed from Ariff et al's (2012) study as it focused on measuring Service Quality by utilising the Data Envelopment Analysis (DEA) model, and this research subsequently resulted in the development of a suggested DEA model.

Another study performed in Malaysia was conducted by Ling et al (2016), which set out to define the factors that affect customer satisfaction in Internet banking. According to the findings, web design and content, convenience, speed, Service Quality, security, and privacy had an effect on customer satisfaction.

2.11.5 Applications Of SERVQUAL In ICT

Saraei and Amini's (2012) study applied the SERVQUAL model in rural ICT centres in Iran. Customers were not satisfied with the Service Quality at these tele-centres, and furthermore, Empathy was identified as the most important dimension; whereas Cid-López et al's (2015) study utilised the fundamentals of the SERVQUAL model as a basis for the SICTQUAL model, which was developed to assess the Service Quality in the ICT sector in Ecuador.

Jia and Reich's (2013) study in the USA investigated applicable IT Service Quality constructs. Service leadership, service evaluation, and service vision emanated as the relevant constructs for IT Service Quality. Furthermore, this study differed from other studies as it placed emphasis on the softer human side of IT service, and it empirically tested the relationship between IT service climate and its antecedents; whereas Almeida, De Medeiros and Halpern's (2015) study investigated IT Service Quality in Brazil. Internal customers were overall dissatisfied with the IT services provided, especially with regard to the communication of deadlines to customers.

Similarly, Kang and Bradley's (2002) study applied SERVQUAL to the IT industry in Australia. The study highlighted the discrepancies between customers' and suppliers' view of the Service Quality provided. Furthermore, in the Australian market only two dimensions were evident instead of the original five dimensions found in the SERVQUAL model.

Thaichon et al (2014) investigated the Service Quality dimensions for ISPs in Thailand. The study went further to investigate the impact of ISPs' Service Quality on customers' value, commitment, and trust in this industry. The Service Quality dimensions included network quality, privacy and security, and technical support. According to Thaichon et al (2014), the segmentation of the customer base is necessary in order to offer customised marketing initiatives.

Barrera, García and Moreno's (2014) study took a different angle from past studies by evaluating the effects of socio-demographics and web graphics on perceived Service Quality of electronic services in Spain. This study revealed that there was no difference in perceptions among the various groups of online customers. Furthermore, the results indicated that the Reliability dimension was most important for this group of customers.

Chen and Yang's (2015) study measured the incongruity between telecommunication service providers' perception and customers' perception of telecommunication Service Quality in Taiwan. Telecommunication service providers were of the view that the key quality indicators were aftersales support, effectiveness and efficiency, and sales services; whereas customers believed that security, accuracy, and integrity were key.

2.11.6 Applications Of SERVQUAL In Aviation

Jeeradist, Thawesaengskulthai and Sangsuwan's (2016) study investigated the factors that had an impact on the Service Quality in the airline industry in Thailand. Customers were split into three groups and surveyed. The first group felt strongly that safety was a priority, whereas the second group felt that air traffic volume capacity should be increased, and finally, the third group felt that Service Quality and safety should be improved.

Similarly, Hussain, Nasser and Hussain's (2015) study investigated the determinants of airline Service Quality in the United Arab Emirates (UAE). Furthermore, the study investigated the relationships between various factors such as customer satisfaction, Service Quality, brand loyalty, corporate image, and customers' expectations; whereas Elkhani, Soltani and Jamshidi's (2014) study explored the efficacy of the airline websites in Malaysia. The study developed a model to evaluate airline websites.

2.11.7 Summary Of Applications Of SERVQUAL

The application of SERVQUAL has been prevalent in studies performed in both developed and developing countries. The developing countries include countries such as Iran, Malaysia, China, Thailand, Vietnam, Ecuador, Turkey, and Brazil. There is certainly a lack of SERVQUAL studies performed in the continent of Africa, let alone in the country of South Africa.

Secondly, there is certainly a mix of industries in which SERVQUAL has been applied and amended; however, there is a lack of studies performed around the softer, more human side of Service Quality in the Internet industry. Thaichon et al's (2014) study is just one of recent studies performed in Thailand, and it investigates ISPs' Service Quality dimensions, and possible segmentation of the customer base in order to deliver customised service delivery.

In addition, the majority of the studies used the survey method to collect data, with the exception of Chen and Yang's (2015) study, which used face-to-face interviews and telephonic interviews to obtain responses. Furthermore, a large portion of the studies possessed sample sizes less than 300, whereas a select few had sample sizes greater than 1 000.

With regard to the data-analysis techniques, the majority of the studies above utilised Cronbach's alpha as a test for data reliability, and the majority had readings greater than 0.7, which indicates that there was data reliability. Furthermore, tests such as convergent and discriminant validity were used to confirm validity.

Furthermore, a large portion of the studies tested the applicability of the SERVQUAL model in a specific industry within a specific country, and therefore yielded different results. Some of the researchers examined the relationship of constructs such as customer loyalty, customer satisfaction, corporate image, brand loyalty, repurchase intention, and customer system disconfirmation with the Service Quality construct. After an extensive literature review, it is evident that there are limited studies that investigate the relationship between Service Quality and customers' business performance in the Internet industry, especially in the South African market. Through factor analysis, the results will highlight the Service Quality dimensions applicable to the South African Internet industry. This research will expand the body of knowledge in this space. A table with the above studies can be found in Annexure A.

2.12 CONFIRMED MODEL TO GUIDE THE RESEARCH

The literature above confirms that a key distinction exists between e-Service Quality, IS Quality, and service providers' Service Quality, and it provides insight into the different measuring techniques and methods applied in each circumstance.

Since this study focuses on the softer, human side of ISPs' Service Quality, the use of models that incorporate technical quality, such as the GM and Rust and Oliver model (ROM), is not a good fit to deliver on the objectives of this research.

The literature review of the Service Quality domain provides a view of the Service Quality models and their applications in the different industries. SERVQUAL is a commonly used and trusted model that has been utilised in almost every industry. It is evident from the literature that scholars had to modify the traditional SERVQUAL model to make it suitable to provide answers to the different research problems in the various industries. Scholars went a step further to extend the model to empirically test relationships with additional constructs, which led to many different versions of SERVQUAL. The advantage of the SERVQUAL model is that it allows researchers to build on the model, and to adapt the model to strengthen it for the industry being researched.

The researcher chose the SERVQUAL model as the underpinning foundation for this empirical research; however, the model in its original state is not sufficient, and will need to be amended and extended to meet the objectives of this research. There is a clear fit between the SERVQUAL principles and the objectives of the study. This study aims to assess the South African business customers' perceptions and expectations of the Service Quality they receive from their ISPs. In addition, this study will identify the gap between ISPs' perceptions of the Service Quality they deliver, and business customers' perception of the Service Quality they receive from their ISPs. Furthermore, in order for the researcher to empirically test the impact of ISPs' Service Quality on business customers' business performance, the model will be extended to investigate the relationship between Service Quality and business performance.

Prior to adapting the model, the researcher requested permission from the founders of the model. A copy of the permission letter is found in Annexure G, and the adapted questionnaire is attached in Annexure J.

2.13 CONCLUSION

This chapter provided the theoretical framework for this research. The chapter explored the Service Quality definitions found in literature, and the divergent characteristics of services and products. An in-depth literature review of the theories relevant to customer satisfaction and Service Quality, such as the multiple discrepancies theory, the customer-based discrepancy theory, and the expectation confirmation theory were examined. Multiple discrepancies theory focuses more on net satisfaction, especially pertaining to life satisfaction, whereas the customer-based discrepancy theory and expectation confirmation theory focus on evaluating the difference between a prior state and actual post-purchase service.

In addition, the chapter reviewed the evolution of Service Quality models, such as the GM, the ROM, the DeLone and McLean IS Success Model, SERVQUAL, SERVPERF, the E-S-QUAL model, and various other models applicable to IS quality and e-Service Quality. Based on the nature of the study, SERVQUAL was chosen as the most suitable model to guide this research. The researcher found a greater alignment between the SERVQUAL principles and the objectives of this study compared with other models. In this chapter, the researcher critically analysed the SERVQUAL model by reviewing the components versus the antecedents of the model, and the measurement issues highlighted by other researchers.

Furthermore, the researcher provided an analysis of some of the applications and amendments of SERVQUAL. Several studies have used the basis of SERVQUAL, but have amended it for the industry in which they are assessing Service Quality. Furthermore, there have been studies that have built on the model by evaluating the relationship among SERVQUAL dimensions and other missing constructs. This exercise provided the researcher with confirmation that there is certainly a gap in the literature for assessing the softer, more human side of Service Quality in the South African Internet industry; and there is a further gap in the literature regarding the relationship between Service Quality and the business performance construct.

The next chapter reviews the literature on Service Quality in the Internet industry, trends in the South African Internet industry and in other developing countries, as well as disruptive technologies and challenges experienced by the various role players in the industry.

CHAPTER 3

LITERATURE REVIEW

3.1 INTRODUCTION

The previous chapter reviewed and analysed existing theories and models relevant to this research. In addition, various Service Quality models were analysed in order to identify a gap in the literature and to select a suitable model to provide guidance for the research.

This chapter critically analyses the literature pertinent to the study. In order to provide deeper insight into the problem, the chapter begins by providing a brief history of the Internet domain, followed by the background of the South African Internet industry, and trends. This chapter explores the disruptive technologies that drive Internet penetration, and further investigates South Africa's attempts to increase Internet penetration.

In addition, this chapter provides a comparative analysis of the South African ISPs, in order to gain insight into their strategies and differentiation techniques. This chapter scrutinises Internet trends in other developing countries with the aim of providing the reader with further context around the problem sphere.

The Internet Ecosystem is made up of various actors and it is important to understand the system and ISPs' position in this system in order to measure ISPs' Service Quality. This chapter provides an overview of the various actors, and the interrelationships between the actors in this space.

In order to highlight the gap in the literature, the researcher provides a critical analysis of some of the studies conducted in the Internet space. Thereafter the researcher reviews the literature pertaining to Net Neutrality and culture as these are seen as influencers of Service Quality. Lastly, in order for the researcher to empirically test the impact of ISPs' Service Quality on customers' business performance, the researcher unpacks various business performance models.

3.2   THE CONCEPT MATRIX

Klopper and Lubbe's (2012) procedure outlined in their article "Using Matrix Analysis to Achieve Traction, Coherence, Progression and Closure in Problem-Solution Oriented Research" was followed. Content analysis was performed and key concepts were extracted from the problem statement. The key concepts were thereafter used in Klopper and Lubbe's (2012) concept matrix (see Table 3.1).

The concept matrix is a "mode of analysis that enables one to escape the tyranny of getting trapped within particular sources" (Klopper & Lubbe 2012). These concepts are used as search terms when conducting a literature review, thereby giving a researcher direction. This is a concept-centric approach to literature review, which entails that all references that appear under a particular concept will be subjected to a critical comparative analysis to establish similarities and differences among them. It is worth noting that since the concepts were extracted from the problem statement, the literature review is aligned with the problems identified in this project. The abstracts and conclusions of articles were scanned through and only literature that was relevant to the research was selected. The matrix provides guidance and direction for the researcher to solve real-world problems. The end goal of this study is for the researcher to provide solutions to the unsolved problems highlighted in Chapter 1, and to not veer off course. Problem-based research adds rigour to the research by strengthening the researcher's understanding of relevant, pertinent concepts whilst sifting through the haystack of information. The literature review forms the substance of the research, and further confirms the problem and the lack of a solution (Ellis & Levy 2008).

Table 3.1: Snapshot of a section of the concept matrix

(Adapted from Klopper & Lubbe 2012)

References	Internet adoption	Internet growth	Competition amongst ISPs	Price vs Quality	Service quality models used	SERVQUAL	Service quality theory
Count	20	19	14	13	30	27	32
Abbott & McKinney (2013)							
Ajayi et al. (2009)					1		
Amin and Razmi (2008)					1		1
Ariff et al. (2012)							
Baratt & Shade (2007)							
Barbour (2008)							
Bauer & Akhand (2002)							
Becker et al (2010)							
Beins &McCarthy (2012)							
Bienstock et al. (2007)							
Birba & Diagne (2012)	1	1					
Blery et al., (2009)				1	1	1	1
BMI (2014)	1	1	1				
Brown et al. (1993)					1	1	1
Bryman & Cramer (2011)							
Buttle (1996)					1	1	1
Caruana et al. (2000)					1	1	1

The next section provides a brief history of the Internet in South Africa, followed by a comprehensive evaluation of the Internet industry in South Africa.

3.3 A BRIEF HISTORY OF THE INTERNET IN SOUTH AFRICA

The Internet in South Africa came to life in 1991 (MyBroadband 2015b). The following milestones were achieved from 1991 to 2015 (Adapted from MyBroadband 2015b):

Pre-Internet: South African universities decide to connect their institutions, which led to network development.

1991: The first Internet Protocol (IP) packets are sent between the computing centre at Rhodes University in Grahamstown and the home of Randy Bush in Portland, Oregon, in the USA – through a link of 14.4 Kbps and a computer with a 386 processor at each end.

1993: The Internet Company of South Africa (TICSA) is formed, and the first commercial ISPs are given access to the Internet.

1995: Telkom launches Integrated Services Digital Network (ISDN) at speeds of 64 Kbps and 128 Kbps.

1996: The South African ISPA is formed.

1999: Vodacom launches General Packet Radio Service (GPRS) at a speed of 56 Kbps.

2000: The Tertiary Education and Research Network (TENET) is formed.

2002: Telkom launches 512 Kbps Asymmetric Digital Subscriber Line (ADSL).

2004: Many wireless broadband services are launched in South Africa: Vodacom 3G at 384 Kbps, Sentech MyWireless at 512 Kbps, and iBurst at 1 Mbps.

2005: The Electronic Communications Act is published.

2007: Cyberinfrastructure for Science is established with the South African National Research Network (SANReN), the Centre for High Performance Computing (CHPC), and Very Large Data Bases (VLDB).

2008: Vodacom and MTN launch 3.6 Mbps High-speed Download Packet Access (HSDPA), and Neotel enters the market with its 2.4 Mbps Code Division Multiple Access (CDMA) service.

2010: Vodacom launches 14.4 Mbps High-speed Packet Access (HSPA), Telkom launches 10 Mbps ADSL, Neotel offers uncapped Worldwide Interoperability for Microwave Access (WIMAX) 8 Mbps, and Cell C offers HSPA+ 21 Mbps.

2011: New undersea cable systems mean there are no more international bandwidth bottlenecks.

2012: Vodacom launches 100 Mbps Long-term Evolution (LTE).

2013: SA Connect is published, aimed at providing universal broadband in South Africa.

2014: Telkom launches 150 Mbps LTE Advanced and 100 Mbps Fibre to the Home (FTTH).

2015: Many new FTTH players emerge, offering speeds of up to 1 Gbps. SANReN has over 300 points of presence at universities, research institutes, colleges, libraries, and schools.

The majority of the above milestones relate to increasing Internet penetration in South Africa, whereas the future beyond the year 2016 will focus on the provision of cheaper, faster broadband, and various connections through the Internet of Things (IoT) (MyBroadband 2015b).

3.4 BACKGROUND – INTERNET TRENDS IN SOUTH AFRICA

The Internet is often viewed as one entity; however, it comprises many thousands of smaller networks, which deliver access to end users. These networks are segregated into first miles, middle miles, and last miles. The first mile is where the application hosting takes place, whereas the middle mile includes the peering and transit points, and the last mile is the access (Leighton 2009). Very often studies focus on the first and last mile; however, it is interesting to note that congestion, packet loss, and poor performance are more likely to be experienced in the middle mile. Global trends indicate that customers want access to fast connections, and there is now a greater demand for richer media. This demand puts further pressure on the network, and there is controversy as to whether the network can sustain itself to meet this demand (Leighton 2009).

In Africa, there has been a significant increase in mobile access: 720 million people have mobile phones (67 of the 720 million own smartphones), 167 million people use the Internet, which amounts to 16% Internet penetration, and the Internet contributes $18 billion to the continent's GDP (McKinsey Global Institute 2013); whereas in South Africa, mobile penetration is around 90 million, and has seen a 8.6% year-on-year growth. The mobile industry in South Africa has reached a 164% market penetration, and Internet subscription is at 8 million. To put this into perspective, it is worth noting that South Africa has a population of around 54 million, of which only 35.8 million are economically active (Business Monitor International 2016).

According to McKinsey Global Institute's (2013) research, Africa would report an increase in Internet penetration to 50%, increase its Internet users to 600 million, and increase its contribution to GDP to $300 billion by 2025. In South Africa, Internet penetration is at 52%

(InternetLiveStats 2016). This increase is attributed to innovation from entrepreneurs and large corporations. Furthermore, governments are placing emphasis on Internet growth and its contribution to GDP, and transparency to its citizens. Several countries in Africa have developed ICT strategies, which promote Internet access growth and penetration. In addition, massive ICT infrastructure plans are under way, such as investment in undersea cables, expansion of 4G (Fourth Generation) networks, and increased focus on upgrades to fibre optics (McKinsey Global Institute 2013; Business Monitor International 2016).

Table 3.2: Internet penetration and usage across the continent

(Adopted from Mckinsey Global Institute 2013)

Penetration and usage vary widely across the continent
Internet penetration and usage, 2012

	Mobile pene-tration[1] % of population	Internet pene-tration % of population	Urban internet pene-tration % of population	Face-book users Million	Online retail pene-tration %	High-speed Internet pene-tration[2] % of population	Internet use within companies Index, 0–7	Govern-ment depart-ments online %	Govern-ment infor-mation systems online %
Algeria	103	14	52	4.1	0.39	2.5	3.1	10	1
Angola	49	15	47	0.6	0.49	0.1	3.4	34	7
Cameroon	64	5	–	0.6	0.01	0	4.6	15	16
Côte d'Ivoire	96	4	–	–	–	0	3.9	32	17
Egypt	115	36	46	12.2	0.37	1.8	4.6	53	29
Ethiopia	24	1	43	0.9	0.40	0.8	3.6	20	4
Ghana	100	14	49	1.6	0.43	0.2	4.5	15	9
Kenya	72	28	72	2.0	0.73	0	5.0	24	23
Morocco	120	51	52	5.1	0.50	1.6	4.5	24	13
Mozambique	33	4	–	0.4	–	0.1	4.5	17	11
Nigeria	68	28	48	6.6	0.04	0.1	4.5	10	1
Senegal	88	18	68	0.7	0.44	0.6	5.3	18	3
South Africa	135	17	54	6.3	0.49	1.5	5.3	31	19
Tanzania	57	12	–	0.7	–	0	3.8	17	4

South Africa's Internet contribution to GDP is only 1.1%, and is lagging behind the emerging countries, which contribute 1.9%, and the developed countries that contribute 3.7% to their GDP numbers (McKinsey Global Institute 2013; Van Zyl 2015).

Furthermore, Africa contributes only 9.8% of the number of Internet users in the world, compared to Asia, which contributes 48.4%, followed by the Americas (North and South) at 21.8%, and Europe at 19% (InternetLiveStats 2016).

Although South Africa is situated on the African continent, it is perceived to be different from other African countries (Gillwald, Moyo & Stork 2012). According to research conducted by Gillwald et al (2012), South Africa meets all the criteria of both a developed and a developing country. South Africa is a mixed bag of rich and poor. Close to 25 million citizens live in poverty, yet a portion of citizens bask in the sunshine of wealth. South Africa has 54 million citizens (InternetLiveStats 2016) and has a GDP of US$357 billion; and is therefore seen as a prominent country on the African continent (Gillwald et al 2012). Only 2.1% in 2011 was contributed to the Internet economy and a further 2.5% will be contributed in 2016. These figures are lower than the expected figures of developing countries that are currently contributing 3.6% to the Internet economy, and are forecasted to contribute 4.9% of GDP in 2016 (Goldstuck 2012; Van Zyl 2015).

South Africa is considered a well-developed country compared to other countries on the African continent, and has an Internet penetration of 52%, which is higher than the other developing countries in Africa (Nigeria – 46.1%; Kenya – 45%; Egypt – 33%; Angola – 23%, Botswana – 21.4%; and Rwanda – 12.4%) (InternetLiveStats 2016). The high penetration rates in countries like Nigeria, Egypt, and Kenya are mainly attributed to high usage of mobile phones as these countries lack fixed physical infrastructure (Goldstuck 2012). Furthermore, the majority of the customers in these countries own more than one SIM card and this increases the mobile numbers exponentially. This trend is also prevalent in South Africa where the number of mobile subscriptions is 90.17 million, which is greater than the population size of 54 million (Business Monitor International 2016). In the rest of Africa, one of the factors that contribute to customers possessing more than one SIM is the large interconnect cost. The interconnect costs among service providers in the rest of Africa are higher than in South Africa, therefore customers switch between SIMs from different service providers in order to avoid these additional charges (Goldstuck 2012).

Although South Africa has low Internet penetration rates, Accenture's Communication, Media and Technology Digital Consumer Survey (Accenture 2016) revealed that the South African Internet market is dynamic. South Africans desire more devices, and they have shown an interest in wearable technologies such as smart watches and Google Glass.

In addition, South Africans want an application for everything, and are willing to share personal data through location services in exchange for a better service. This change in market dynamics is mainly attributed to South African customers being more knowledgeable, demanding, diverse, interactive, collaborative, and more nomadic. South African customers want to be able to consume content anywhere at any time; however, there are limitations in terms of Internet quality. South Africans are increasingly consuming content via mobile devices such as tablets, laptops, and smartphones. Accenture's (2016) study stated that 59% of the people surveyed accessed the Internet via mobile broadband, compared to 34% that accessed the Internet via fixed broadband at home. Fixed broadband usage is declining as a result of poor infrastructure and high costs (Business Monitor International 2016). Accenture's study (2016) further revealed that the type of content accessed is influenced by the speed and reliability of the Internet connection. It is interesting to note that ISPs can influence the content consumed by improving the Internet quality and speed. Bandwidth-intensive content requires reliable Internet quality and high Internet speed. Consumers would be able to consume more of this type of content if they were privy to better Internet connections. Increased consumption of Internet bandwidth could certainly benefit ISPs.

The telecommunications market in South Africa comprises two fixed-line operators – Telkom and Neotel – and five mobile operators, namely MTN, Vodacom, Cell C, Telkom Mobile, and Virgin Mobile, as well as many ISPs and VANS providers (Gillwald et al 2012; Business Monitor International 2014a).

The top ten ISPs in South Africa, which hold close to 80% of the Internet market share, are Internet Solutions (Division of Dimension Data), MWEB (Part of Multichoice), Altech Technology Concepts (Part of Altech), Vox Data and Vox @lantic (Part of Vox Telecoms), Web Africa, Afrihost, Axxess DSL, Imaginet, OpenWeb, and Cybersmart (Goldstuck 2012).

According to Gillwald et al (2012), the existence of two fixed-line operators (Telkom and Neotel) has created interesting dynamics in the market, from price matching to poor Service Quality to anti-competitive behaviour. In order to increase competition in the fixed-line portion of the industry, the government is reviewing Local Loop Unbundling (LLU), which means that Telkom, as the largest fixed-line operator and incumbent in South Africa, will

be required to provide other operators with access to its infrastructure (Gillwald et al 2012; Goldstuck 2012).

In 2009, international bandwidth prices in South Africa were very high because South Africa only had access to bandwidth through satellite and an undersea cable called SAT-3 (South Atlantic 3). Subsequently, bandwidth prices have dropped as a result of the availability of more undersea cables. South Africa has access to four new submarine cables, namely SEACOM, which services the eastern seaboard, EASSy (Eastern Africa Submarine Cable System), MainOne Cable, and WACS (West Africa Cable System) (Gillwald et al 2012). The introduction of the various undersea cables facilitated increased competition in the industry, as well as improved the Service Quality and lower prices (Gillwald et al 2012; Business Monitor International 2014b).

According to the 2013 MarketLine report, the South African Internet access market had grown by 12% by 2012, and will continue to grow to 54.3% in 2017. MarketLine (2013) is in line with Gillwald et al's (2012) findings, which claimed that only 34% of the adult population in South Africa has access to the Internet. According to the Business Monitor International (2014a) report, there were 24.5 million Internet users at the end of 2013. The South African Internet access market has shown a $342 million market value in 2012, and will further grow to a projected value of $528 million in 2017 (MarketLine 2013). Quality and affordability are two factors that prove to be significant regarding Internet adoption in South Africa (Gillwald et al 2012).

Another evident trend is that the majority of Internet access is gained through wireless technologies. According to a Gillwald et al (2012), 20% of South African households had access to the Internet. Out of that 20%, only 22% used fixed broadband services such as ADSL, whereas the rest used mobile technologies such as wireless modems and mobile phones to access the Internet. Gillwald et al's (2012) findings concur with Goldstuck's (2012) study, which argued that there is a lower percentage of fixed-line Internet access compared to mobile Internet access.

Table 3.3: The preference of mobile broadband over fixed broadband among South African households (Adapted from Gillwald et al 2012)

Type of Internet connection by household with Internet access	Using mobile phones	56.4%
	Mobile modem (3G)	54.8%
	Wireless Broadband	7.5%
	Modem/ISDN dial-up	4.9%
	ADSL	22%
Location for accessing the Internet in the last 12 months	Home	42.7%
	Work	35.9%
	Place of education	20.6%
	Community Internet access	9.8%
	Any place via a mobile phone	70.8%
	Any place via another mobile phone	18.2%

The figures reported by Gillwald et al (2012) and Goldstuck (2012) contrast with the Effective Measure (2013) report, which stated that fixed-line Internet access in South Africa is higher than mobile Internet access.
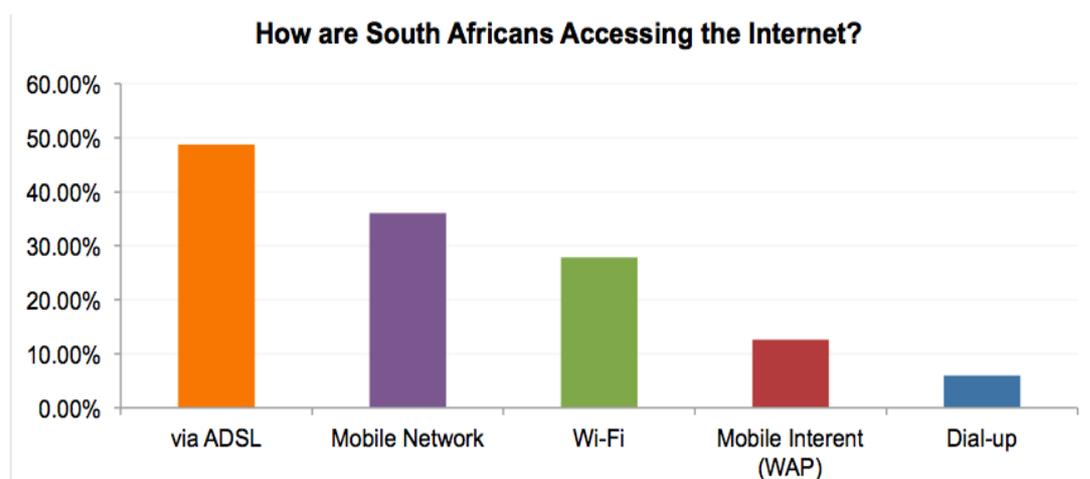
Figure 3.1: The preference for fixed Internet access among South African households (Adapted from Effective Measure 2013)

The Effective Measure report (2013) indicated that 48% of Internet access in South Africa is gained through a fixed medium such as ADSL, while mobile Internet access accounts for 36%. The difference in the studies could be the timing of the studies as Gillwald et al's and Goldstuck's studies were conducted in 2012, whereas the Effective Measure study was undertaken in 2013.

Another apparent trend in the South African Internet market is bandwidth pricing. Although the market has seen a decrease in international bandwidth prices, the domestic costs of terrestrial and IP transit prices are still high enough to influence the overall broadband price (Gillwald et al 2012). Furthermore, there is a significant difference between mobile broadband and fixed broadband prices. Fixed broadband prices are much higher than mobile broadband prices (Gillwald et al 2012). More customers prefer to access the Internet via a mobile connection than through a fixed connection like ADSL. Although the fixed broadband market has also increased as a result of ADSL price reductions by Telkom (Business Monitor International 2014b), this increase is not substantial when compared to the mobile broadband market size. The preference of mobile broadband over fixed broadband is largely attributed to the absence of recurring monthly costs and the fixed-line costs (Gillwald et al 2012). Although South Africa has seen a high growth rate in mobile Internet adoption, the rate is still low compared to the African and global norms, as cost is a factor which deters usage (Gillwald et al 2012, MyBroadband 2015a).

Furthermore, the cost of mobile devices has decreased, therefore making it more affordable to more people (Gillwald et al 2012). A large number of South Africans have access to smartphones with Internet capability (Gillwald et al 2012). According to Goldstuck (2012), 10 million cell phones are sold every year in South Africa, and a substantial amount of this number is made up of smartphones. These are just some of the reasons why mobile broadband access is the more favoured technology in South Africa, compared to fixed-line broadband (Gillwald et al 2012).

Another aspect to consider in the Internet market is the speed of the Internet access. In South Africa, speed tests were performed in the mobile and fixed-line broadband market. These tests revealed that customers were not receiving the speeds they paid for; instead they were only getting 74% of the speed, which is lower than the global standard of 85%. Furthermore, the tests revealed that mobile broadband speeds were higher than fixed broadband speeds (Gillwald et al 2012). These statistics do not necessarily mean that speed and quality are correlated. Although mobile broadband has greater speeds when compared to fixed broadband, the quality of fixed broadband is more consistent over time, and is the preferred medium for broadband customers who require a consistent quality of service (Gillwald et al 2012). Mobile broadband quality varies with time, and it is for these reasons that some customers would rather stick with fixed broadband. Furthermore, the increase in

the consumption of content and multimedia services in South Africa influences customers' decision to choose fixed over mobile mediums.
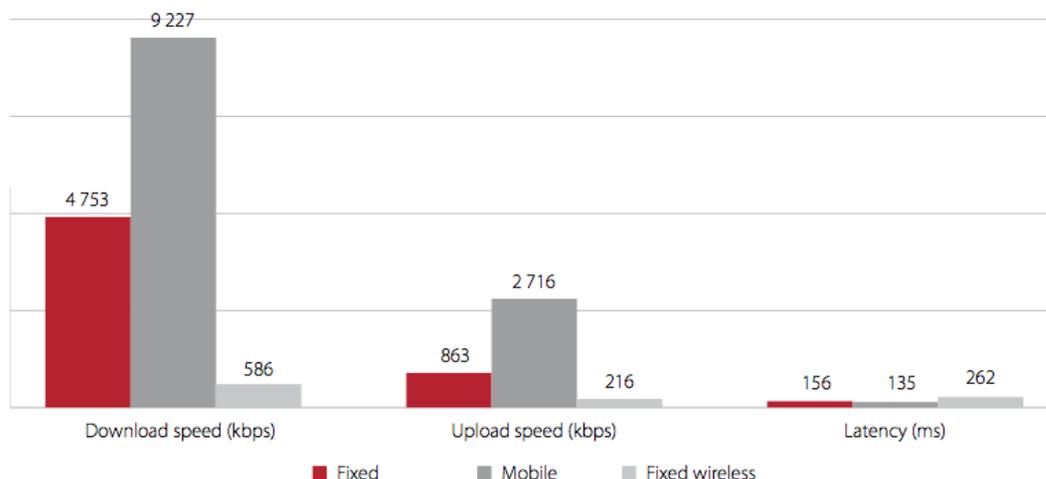
Figure 3.2: Mobile versus fixed broadband speeds in South Africa (Adapted from Gillwald et al 2012)

The fixed broadband market has seen some development, with the introduction of more advanced infrastructure such as VDSL (Very-high-bit-rate Digital Subscriber Line) and FTTH. The market has also seen a drop in fibre prices, which has increased the uptake of fibre-based products (Gillwald et al 2012; Business Monitor International 2016).

In addition, the South African market is seeing an increase in 4G and LTE Advanced services, which further stimulates and promotes growth in the mobile space (Business Monitor International 2016).

3.5 DISRUPTIVE TECHNOLOGIES THAT DRIVE INTERNET PENETRATION

A disruptive technology is one that initially underperforms when compared with established technologies in the current market, but later outperforms established technologies (Danneels 2004; Adner 2002). Danneels (2004) further stated that disruptive technologies change the performance metrics that companies use to compete. For a product or technology to be disruptive, it must meet two criteria: it must be good enough in performance, and superior in price (Markides 2013). Furthermore, products that are built to

disrupt are generally simpler, smaller, and more convenient compared to the incumbent products (Tellis 2006).

Social networks, mobile computing, and smartphones are just some of the significant influencers in today's economy (Walker 2014). In addition, wearable computers, 3D printing, context-awareness technologies, driverless cars, ultra-light materials, gene therapy, and post batteries are recognised as disruptive innovations which will influence the different technologies and change industries (Jang 2013; Wiegler 2008).

A number of industries are looking at ways to digitalise their existing business models (Walker 2014). This trend has a significant impact on the Internet industry, as the Internet is considered to be a business enabler. Online book selling, online travel agents, and online trading of financial instruments (Markides 2013) are just some examples of businesses that have extended their activities to the digital domain. Digitalisation has become so advanced in the banking industry that it is rapidly moving away from the traditional brick-and-mortar business model to a business model where some clients prefer to bank online. Singh (2004) reported that only 22.6% of his respondents banked online. In South Africa, First National Bank has broken down traditional banking by reinventing itself and by creating demand for more innovative, digital banking products. This bold move has created pressure for other banks in South Africa to invest in innovative product development.

3.5.1   The Internet Of Things (IoT)

By 2020, more than 40 billion devices will be connected to the IoT (Whitacre 2014; Popescul & Georgescu 2013; Selby 2012). In addition, the IoT market will contribute a market value of over $7 trillion by 2020 (Munk 2015). The IoT is the result of ubiquitous connectivity, an increase in data analytics, and the ability to connect almost anything nowadays (Ng 2014). The IoT is a connected network of multiple physical objects, which contain Network Embedded Devices (NEDs). These devices could either hold passive information for others to identify them on the network, or participate in active transmission of information on the network (Selby 2012). Furthermore, these devices are capable of performing one or more of five functions, such as information storage, information collection, information communication, information processing, and performing actions (Selby 2012).

Privat (2012) viewed the IoT as an extension of the telecommunications territory. The IoT will bring with it many new opportunities and possibilities in the Internet and telecommunications space, such as an increase in personal electronic devices, the possibility of energy-efficient smart homes, smart cities, devices to detect and diagnose illness, and smart vehicles (Popescul & Georgescu 2013; Selby 2012). The IoT has already started to show its influence in South Africa and Africa through the presence of connected hardware (Htxt.africa 2015; Swartbooi 2015). The IoT is paving the way for companies in South Africa to deliver their services and products in a manner that is different from traditional methods. Uber is an example of a company that redefined traditional public transport services by using mobile applications, geo-locations, and Global Positioning Systems (GPS) to deliver their services to clients (Htxt.africa 2015).

In Africa, the IoT's influence is seen in almost every type of industry, such as energy and mining sectors, the automotive industry, industrial sectors, the hospitality sector, and the retail sector (Htxt.africa 2015). The examples are endless; from the monitoring of methane levels in a mine, to connected smart meters to monitor power usage, to infrared sensors in hotel rooms that trigger an alarm when it detects no heat signals, which will notify a cleaner to clean the room. South Africa is definitely installing IoT devices faster than the rest of Africa. At the end of 2014, cellular machine-to-machine connections added up to 128 million, and could further increase to 575 million by 2020 (Htxt.africa 2015).

Although there are more than enough opportunities for further growth in the IoT space in South Africa and Africa, the Internet penetration rates will be one of the limiting factors. The Internet penetration rate in Africa is one of the lowest in the world (Htxt.africa 2015).

In addition, ethical considerations and security concerns will further inhibit the growth of the IoT (Bradley, Thibodeau & Ng 2014; Htxt.africa 2015; Swartbooi 2015), and on a wider scale there is no single industry-wide communication standard governing the IoT, which therefore makes it very difficult to connect the many networks and expand the IoT (Swartbooi 2015).

As the hunger for the IoT increases, the rise in IP addresses required will also increase. Each connected device will require its own IP address. IPv4 addresses are limited, and the usage of IPv6 addresses is being promoted. There is slow uptake from South African

providers to convert IPv4 to IPv6, which will further limit the IoT growth rates in South Africa (Manners 2013).

Furthermore, the increase in the IoT would require investments in big data analytic platforms to track and analyse information (Munk 2015), and South African companies are yet to understand the importance of data analytics to their businesses (IT Web 2013). The ability to invest and use data analytics appropriately will give companies the edge in the market, therefore allowing them to react quickly to market responses.

3.6 SOUTH AFRICAN EFFORTS TO INCREASE INTERNET PENETRATION

The South African National Broadband Forum was established to promote affordable broadband access in South Africa, and it has raised this initiative as a strategic priority in South Africa. The South African government has identified the benefits of investing in broadband. The benefits are limitless, from an increase in economic growth and development, to giving citizens the platform to share, view, and create content online (Song [sa]; Poulos 2014).

The South African government has put in place the National Broadband Policy (NBP) to achieve 90% broadband penetration by 2020, of which 50% of the 90% will have a minimum download speed of 100 Mbps (Business Monitor International 2017). The Minister of Telecommunications and Postal Services, Siyabonga Cwele, has gone so far as setting a target of 100% broadband penetration in South Africa by 2020 (Poulos 2014). Although the target does not specify the type of technology to be used to foster this growth, companies in South Africa are trying to reach this target by embarking on various initiatives through the use of Fibre, 4G, LTE and satellite solutions.

3.6.1 Open-Access Telkom Exchanges

Telkom announced in July 2015 that it will open up 200 telephone exchanges to ISPs on an open-access basis (McLeod 2015). This gesture will aid in increasing fixed broadband penetration in South Africa.

3.6.2 Ubiquitous Broadband

Several companies such as Google, Facebook, and Amazon are looking at ways to offer cheap broadband to developing countries around the world. Google's project involves the use of high-altitude balloons, whereas Facebook is using satellites and solar-powered drones, and Amazon is investing in the deployment of 4 000 satellites to aid in global Internet connectivity (Laprise 2015). The majority of the people in developing countries lack access to the Internet, and large Internet companies such as Google, Amazon, and Facebook have seen this as an opportunity to invest in Internet deployment projects to secure their share of this market (Laprise 2015).

It is worth noting that ubiquitous broadband is much more than just providing developing countries with Internet, it is also recognised as a strategy to eliminate traditional telecommunication companies from their part in the deployment of Internet (Laprise 2015). If Internet can be delivered cheaply and more efficiently through other mediums instead of traditional conduits provided by telecommunication companies, then why would an ISP require last-mile connectivity service from a telecommunications company?

3.6.3 Fifth Generation (5G)

It is still too early to give an accurate account of the influence of 5G services on the Internet industry. However, there is research that shows the possibilities of a faster Internet connection. 5G is the successor to the current 4G and 3G network services and is currently being tested (Kimery 2013). Studies have indicated 5G's data connection rate to be 10 Gbit/s, whereas others predict the possibility of a 5G network yielding speeds of up to 50 Gbit/s (Moskvitch 2015). That being mentioned, the possibilities of access to faster data speeds open up an oyster of opportunities, from the control of rapidly moving devices and industrial machinery from the comfort of the home, to the control of healthcare robots, self-driving cars, bots removing satellite debris, to drones harvesting crops (Moskvitch 2015). Furthermore, these data speeds aid in the unveiling of a concept called the tactile Internet. The term "tactile Internet" was developed by Professor Gerhard Fettweis from the Technical University of Dresden in Germany. The tactile Internet involves the sense of touch and presents the possibility for a doctor to carry out an operation in Africa while physically being in Europe, the possibility for a mechanic based in Rome to fix a car in China, and the possibility of a father to touch and physically interact with his one-year-old

baby while being miles away in another country on a work assignment. The possibilities and examples of a tactile Internet are endless.

The next section provides a comparative analysis of the ISPs in the South African Internet industry.

3.7 COMPARATIVE ANALYSIS – ISPS IN SOUTH AFRICA

As at August 2017, the ISPA had 181 members (ISPA [Sa]). There are five categories of membership, namely large, medium, small, affiliate, and honorary. Only the large, medium, and small members have voting rights. In order to be classified as a large, medium, or a small member, the company needs to be in possession of an ECS (Electronic Communications Services) or an ECNS (Electronic Communications Network Services) licence and/or be providing Internet access services. Furthermore, the members are allowed to choose their category of membership based on the type of access they require or utilise at the ISPA's Internet exchanges. The membership fees and the price to access the Internet exchanges differ according to the level of access possessed by the ISP.

3.7.1 Large-Sized ISPs In South Africa

The following 17 ISPs are listed under the large category on the ISPA's database: Africa Inx, Business Connexion, CMC Global Consulting, Cybersmart, eNetworks, iBurst, Internet Solutions, Liquid Telecommunications Operations SA, MTN Business, MWEB, Neotel, RSA WEB, SA Outsourcing Operations, Smart Village, Vox Telecom, Web Africa, and ZACR.

3.7.1.1 Summarised Comparative Analysis Of Large-Sized ISPs

The majority of the large ISPs in South Africa have the support of a larger parent company, and have a presence in South Africa and in international territories.

The large ISPs differentiate themselves through the following criteria:

Service Delivery – It is worth noting that close to 50% of the large ISPs differentiate themselves through service delivery. This response could be systemic from the notion that the service providers find it difficult to compete on costs, as they buy the core units from

the same set of suppliers, thereby making service delivery the only option they can compete on.

Extensive Network – Only three (CMC Networks, Internet Solutions, and MTN Business) of the 17 large ISPs promote their extensive network as a differentiator in the market.

Innovative Products – Only two (iBurst and Vox Telecom) of the large ISPs punt innovative products as their differentiator. This low percentage could be indicative of an industry stuck in a commoditised era, with minimum room to innovate. South Africa, with its low Internet penetration rates, lends its focus to growth and Internet penetration through basic, traditional Internet products.

Fastest ADSL in South Africa – Only one ISP (Cybersmart) is bold enough to claim that it has the fastest ADSL in South Africa. This statement is very subjective as there are various components that contribute to speed – last miles, contention rates, content caching, time of day, and type of package (capped versus uncapped).

Cost-effectiveness – Only two ISPs (Liquid Telecommunications Operations SA and SA Outsourcing Operations) differentiate themselves through the delivery of cost-effective solutions. As mentioned above, it is difficult to compete on price as the majority of the ISPs buy from the same upstream service providers.

The majority of the large ISPs offer most of the Internet access, such as DSL (Digital Subscriber Line) access, wireless access, mobile access, dial-up access, and ISDN access. Furthermore, the bulk of the larger ISPs have their own networks.

Another evident trend is that a large portion of the larger ISPs service two or more market segments.

For further in-depth details on the large-sized ISPs, please refer to Annexure B.

3.7.2 Medium-Sized ISPs In South Africa

The following 27 ISPs are listed under the medium category on the ISPA's database: Adept Internet, Altech Technology Concepts, BCS-Net, BitCo, Broadlink, Comtel Communications, Dotcoza, Dynamic Cloud Solutions, EOH Network Solutions, Faircom, First Technology, FNB Connect, Frogfoot Networks, Hymax Talking Solutions, Imagine

IPS, Info-Gro, SAT, Jireh Technologies, MacroLan, Multisource Telecoms, Neology, Posix Systems, Reflex Solutions, SAI, SITA, Switch Telecom, and XDSL Broadband.

3.7.2.1 Summarised Comparative Analysis Of Medium-Sized ISPs

According to the ISPA database, there are 27 ISPs classified under the medium category. It is interesting to note that only Altech Technology Concepts, BCS-Net, Broadlink, EOH Network Solutions, FNB Connect, and Neology belong to larger parent companies, thus giving them access to their parent companies' resources and funding.

The majority of the medium ISPs operate in South Africa only, with the exception of Broadlink, EOH Network Solutions, Neology, and Multisource Telecoms, which operate in the rest of Africa as well.

More than half of the medium ISPs own or manage their own networks, such as Adept Internet, BCS-Net, Broadlink, EOH Network Solutions, Faircom, FrogFoot Networks, Hymax Talking Solutions, Info-Gro, Jireh Technologies, MacroLan, Multisource Telecoms, Posix Systems, Reflex Solutions, and XDSL Broadband. In order to deliver services to their customers, the remainder of the medium ISPs partner with other larger ISPs and/or telecommunications companies.

The medium-sized ISPs differentiate themselves through the following:

Provision of Innovative and Diverse Products – ISPs such as Adept Internet, Altech Technology Concepts, Broadlink, and Dynamic Cloud Solutions mention innovative and diverse products as their differentiators in the market.

Strategic Partnerships – BCS-Net, Imagine IPS, Reflex Solutions, and XDSL Broadband see their strategic partnerships with larger ISPs and carriers as their competitive advantage.

Service Delivery Capability – ISPs such as BCS-Net, BitCo, Broadlink, Frogfoot Networks, iSAT, MacroLan, Reflex Solutions, and XDSL Broadband view their service delivery capability as their differentiator in the ISP market. It is interesting to note that eight of the 27 ISPs, which is close to 30% of the ISPs, see their service delivery capability as a differentiator. It is usually in markets where it is difficult to compete on costs or products that companies choose to differentiate by focusing on their service delivery to their customers, as this is one area that is within their control.

Extensive Network and Footprint – Only EOH Network Solutions, Hymax Talking Solutions, Info-Gro, Jireh Technologies, Multisource Telecoms, and Reflex Solutions see their extensive networks and footprint as differentiators. Fourteen of the 27 ISPs have their own networks, yet only six ISPs of the 14 view their networks as a differentiator in the market.

Affordable/Low-cost Products and Services – Only FNB Connect, SAI, and XDSL Broadband mentioned that they offer products and services at affordable/low prices, and they view this as their differentiation in the market. In the ISP market in South Africa, the majority of the ISPs purchase their raw material (bandwidth, local loop, and Internet access) from a handful of suppliers, thus making it difficult to compete on price. Some companies tend to make the pricing affordable and acceptable when they bundle services in order to provide value-added services.

Open-source Linux Network – Only Frogfoot Networks and Posix Systems have built networks on Linux, which uses open-source software.

For further in-depth details on the medium-sized ISPs, please refer to Annexure C.

3.7.3   Small-Sized ISPs In South Africa

According to the ISPA database, there are 109 small ISPs in South Africa. A sample of ten small ISPs was reviewed, namely Afrihost, Axxess DSL, CipherWave Storage Solutions Africa, Converged Telecoms, Directel, I-Net Bridge, FFG Connection, iONLINE, Saicom Voice Services, and WiFi Technologies.

3.7.3.1   *Summarised Comparative Analysis Of Small-Sized ISPs*

Out of the ten small ISPs reviewed (as the sample from 109 ISPs classified under the small ISP category), only one, ISP I-NET Bridge, is part of a larger parent company.

The majority of the small ISPs operate in South Africa only, with the exception of Converged Telecoms, I-Net Bridge, iONLINE, and Saicom, who operate in the rest of Africa as well. Less than half of the ISPs own or manage their own networks, namely Axxess DSL, Cipherware, Converged Telecoms, and Saicom Voice Services.

With regard to the factors that differentiate small ISPs in the market, the following themes were extracted:

Customer Service, Service Delivery, and Service Guarantees – Half the ISPs punted customer service and service delivery as their differentiators in the market. In addition, the majority of the smaller ISPs had catchy, colourful, edgy websites, targeted at consumer and small and medium enterprise (SME) clients. Personalised service delivery actually attracts clients in this space, as this is one big differentiator that contributes to the decision to choose a smaller ISP over a larger ISP.

Expertise/Skills Set – Only a small fraction of the smaller ISPs highlighted skills as their competitive advantage. It is interesting to note that the smaller ISPs offer more standard Internet access services, whereas the larger ISPs offer more complex solutions, which require certain expertise.

Partnerships with Key Suppliers – Only two of the ISPs, Directel and iONLINE, elaborated on their partnerships with key suppliers such as AVAYA, Research in Motion SA, Internet Solutions, MTN, Telkom SA, and Teraco. The majority of these smaller ISPs purchase and resell services/products from a few key suppliers. Their buying power is not large enough to warrant any preferential treatment or exclusive deals from the suppliers.

For further in-depth details on the small-sized ISPs, please refer to Annexure D.

3.8   INTERNET PENETRATION TRENDS IN DEVELOPING COUNTRIES

Several studies (James 2010; Ruxwana, Herselman & Conradie 2010; Sithole et al 2013) have yielded information on Internet trends in rural parts of developing countries. Affordability and the possession of the necessary skills contribute to the low Internet adoption rates in rural areas. James' (2010) study reviewed the various initiatives available in order to promote Internet adoption. The majority of these alternatives take into consideration low cost and easy access. Low costs and easy access to the Internet are two components that influence Internet adoption in rural areas. According to James (2010), in order to achieve low Internet costs, one would need to offer the technology in a non-synchronous way, which means that there needs to be a time delay when accessing content.

This method of achieving delayed content is a result of two types of mechanisms: close-range intermediation (through an Internet kiosk), and at-a-distance (blending).

A number of initiatives are under way in developing countries. For instance, in South Africa some rural schools are using the Wizzy Digital Courier, which was developed to transfer data between computers using a USB (Universal Serial Bus) flash drive. In this scenario, one school owns the Internet connection and other schools share it, thus lowering the Internet costs per school (James 2010). Furthermore, countries like India are also investing in alternative means to connect their citizens. Projects such as Computers on Wheels (COW) allow rural villages to be connected. This is achieved by motorcycles fitted with Internet-connected laptops which drive to the various villages, thereby allowing villagers to be connected (James 2010).

Furthermore, in India an example of technology blending is when fishermen are made aware of updated weather patterns. Weather reports are retrieved from the Internet and are broadcasted via loudspeaker to the fishermen several times a day. This method combines both modern technologies with old-style technology (James 2010). In addition, another form of blending is achieved by combining the Internet and radio. Listeners submit their queries and the radio presenter finds the answer to the query by searching the Internet. The presenter thereafter reveals the search results to the listeners, and indicates how he or she found the results. This permits Internet education to a wider audience through the radio (James 2010). In addition, India has also developed the "Hole in the wall" project, which allows for a computer to be inserted into a hole in a wall. This computer is used by many school children, and they basically teach themselves and fellow students how to access the computer and the Internet (James 2010).

All these studies show countries' attempts to increase Internet penetration in rural areas in developing countries.

3.9   UNDERSTANDING THE VARIOUS ACTORS IN THE INTERNET INDUSTRY – THE INTERNET ECOSYSTEM

There are various actors in the Internet industry, such as ISPs, equipment providers, content providers, customers, suppliers, competitors, and government agencies (Kim, Jeon & Bae 2008; Tseng 2012). In the Internet industry this is commonly known as the Internet

Ecosystem (see Figure 3.3). Studying the interaction among the actors provides valuable insight into the problems experienced, and their impact on customers' Service Quality experience.
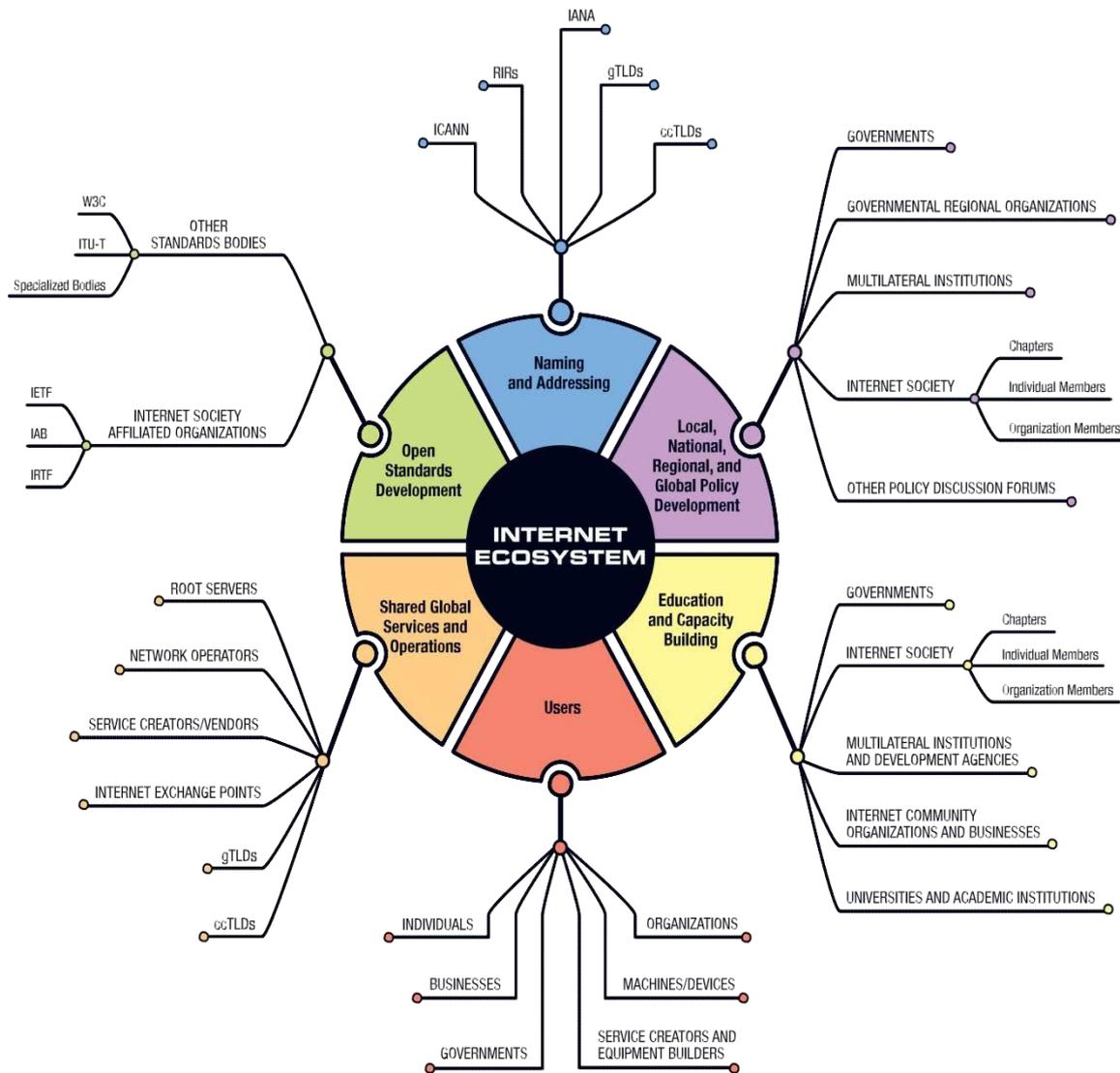
Figure 3.3: The Internet Ecosystem (Adapted from Jean-Malbuisson 2014)

Companies need to pay special attention to how and when customers interact with the rest of the actors, as this provides insight into customers' expectations. Tseng's (2012) study explored the concept of external knowledge and its influence on Service Quality. By tapping into this external knowledge, companies can improve the quality of service. In addition, Tseng's (2012) study further discussed the three types of external knowledge; namely customer knowledge, supplier knowledge, and competitor knowledge. Customer knowledge focuses on customers' inclination towards the quality of the product, the quality

of the service, and how the service is marketed and delivered; whereas supplier knowledge comprises suppliers' involvement in reducing costs, developing new products, improving existing products, and effectively distributing products; and competitor knowledge focuses on understanding and evaluating other products in the market and benchmarking products against competitors' products (Tseng 2012).

ISPs interact with various role players such as bandwidth suppliers, infrastructure suppliers, and customers. ISPs purchase raw materials such as bandwidth and infrastructure, which are then bundled together to provide Internet access to customers. Some ISPs also include various add-on services such as email, DNS (Domain Name System) services, security services, and hosting services.

In order to engage a deeper understanding of what is happening in the Internet industry in South Africa, the researcher chose to use Porter's Five Forces model. This model is an effective tool to provide information on the forces that are prevalent and dominant in the Internet industry in South Africa. According to Porter, the tool allows the user to understand where the power lies in an industry. Notably, Porter's Five Forces model displays different results when applied to different industries, and the strongest forces determine the profitability of the industry (Grigore 2014), which is one attribute used to quantify business performance.

Figure 3.4: Porter's Five Forces model (1980) (Adopted from MarketLine 2013)

According to MarketLine (2013), the suppliers are the Telecommunications operators and the ISPs in the market, and the buyers are the customers. The telecommunication operators

provide the last-mile access services, whereas the ISPs provide Internet services bundled with value-added services such as email, hosting, and security. The incumbent telecommunications operator was Telkom, and Neotel was brought in as the second telecommunications operator to stimulate innovation and competition in the market. Telkom still owns the majority of the infrastructure used by all ISPs, and the ISPs rely on this infrastructure to provide their Internet services. The quality and price of ISPs' service are to some extent influenced by the quality and price of the infrastructure provided by the telecommunications operator. The existence of only two national operators in the South African market results in the last-mile access supplier power being higher than moderate.

The buyers in the market have high switching power in the industry and are easily persuaded by the ISP's brand and its delivery capability in the market, which results in strong buying power. This strong buying power is diluted by an influx of potential customers in the market, which results in moderate buying power. In addition, the buyers in this market are more sensitive to price, and also factor in speed of access and quality as decision-making criteria (MarketLine 2013).

With regard to new ISP entrants in the market, the statistics indicate that the Internet has grown steadily in South Africa over the past few years with more and more ISPs jumping on the bandwagon. This should continue on this trajectory with the announcement of the South African Government's NBP. Previously, a few large companies dominated the market through the advertisement of low prices, whereas now, with the announcement of Openserve (Telkom's Wholesale Division) lowering its IP Connect prices (Simons 2017), this somewhat levels the playing field by allowing more smaller ISPs to offer their services at a competitive rate.

The degree of rivalry is slightly above moderate, and this is quite common in a market in the growth phase. As the market grows and more ISPs fight for territory, there will be a greater shift towards "strong" on the scale. With the current trajectory of the market, it is only a matter of time before this becomes evident.

In addition, Figure 3.3 illustrates the relatively low rate at which substitutes become available in the market. In accordance to MarketLine (2013), there are no alternatives to the Internet.

3.10   STUDIES CONDUCTED IN THE INTERNET INDUSTRY

A number of studies (Vatanparast & Qadim 2009; MarketLine 2013; Pew Research Centre 2013) have been conducted on the mobile Internet industry. The majority of the studies concentrated on mobile Internet adoption and the Service Quality of mobile Internet access. Mobile Internet is Internet that is accessed via wireless connection through mobile devices such as mobile phones or personal digital assistants (Vlachos et al 2011).

Vatanparast and Qadim (2009) conducted research on mobile Internet adoption in five different countries. They made use of the Technology Acceptance Model (TAM) to understand mobile Internet adoption, while paying special attention to the influence of culture on the dimensions within TAM.

A study conducted by Pew Research Centre (2013) analysed the adoption of mobile phones by people in various countries, whereby the component percentage of Internet access on mobile phones was analysed. Furthermore, the study provided an analysis of the various ages that possess a smartphone. The study revealed that owning a smartphone is much more common in the younger generation (18 to 29 years), and that there is a correlation between education and the ownership of a smartphone, stating that there is a higher ratio of educated people who own a smartphone when compared to the uneducated.

Ryan and Valverde's (2005) study explored Internet waiting times and explored the interesting pull between use of the Internet to save time, and the time taken to wait for the Internet. According to Ryan and Valverde (2005), waiting for the Internet can be referred to in a number of ways, such as download time, download delay, Internet latency, waiting time, worldwide wait, and feedback delay. In essence, customers actually refer to the time it takes for a web page to fully download and be visible (Ryan & Valverde 2005). Ryan and Valverde (2005) argued that it was not sufficient to assume the definition of waiting time, and therefore their research set out to define Internet waiting as perceived by the e-consumer. In addition, Ryan and Valverde (2005) researched situations in which customers wait when using the Internet. Subsequently, researchers have also examined the relationship between download speed and website quality (Ryan & Valverde 2005).

Simsim (2011) surveyed Internet connection technologies and the customers' perspective of speed, price, capacity, and quality of connection. The study showed that there was a great

demand for high-speed and better-quality Internet connections and those participants would not mind paying a little extra for those two functionalities.

Subsequently, in the Taiwanese market, according to Li et al's (2015) study, ISP management highlighted that network stability, data security, usage convenience, and personal preference variables are significant to end users.

Lee and Kim (2012) reviewed the source of most Internet problems. Past research indicated that the majority of the problems stemmed from issues in the core networks and servers. However, Lee and Kim (2012) suggested that the majority of problems occur near end users. Lee and Kim's (2012) study focused on connections made by end users and the failures experienced by end users. In addition, several studies have been conducted on the quality of Internet paths. In most of the studies there was consensus on the role of Service Quality, whereby researchers highlighted the benefits of Service Quality in aiding customer satisfaction, decision making, loyalty, and retention (Hu & Liao 2011). In addition, Li et al's (2015) study ranked Service Quality much higher than the price paid for the service, and this was evident in the Taiwanese market, where 78% of business customers rated reliability as the most important factor.

In Ajay et al's (2010) study, they stated that the goal of any quality of service mechanism is to ensure that end users perceive the service as good irrespective of the network conditions. They argued that in online transactions end users tend to measure the quality of service through performance characteristics such as response time and throughput, whereas Amin and Razmi (2009) highlighted in their study the gap in terms of a model to select and evaluate ISPs. Various supplier selection techniques were used, such as Analytic Hierarchy Process (AHP), Mixed Integer Programming (MIP), Multi-objective Programming (MOP), expert systems, DEA, Data Mining (DM), Genetic Algorithm (GA), Goal Programming (GP), Mathematical Programming (MP), Linear Weighting (LW), Quality Function Deployment (QFD), Total Cost of Ownership (TCO), the Rough Sets Theory (RST), AHP, the grey approach, Neural Network (NN), Case-based Reasoning (CBR), Cluster Analysis (CA), Activity-based Costing (ABC), Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS), and fuzzy logic.

The majority of the studies that have been published either focused on the customers' perspective or the suppliers' perspective, whereas Amin and Razmi's (2009) study

proposed a model that takes into consideration both these elements. They started by identifying criteria when selecting suppliers. Various studies have developed many criteria; however, Amin and Razmi (2009) sifted through and highlighted the most common criteria, which were quality, delivery, performance history, warrant and claim policy, production facilities and capacity, net price, and technical capabilities.

Sigala's (2004) research led to the development of a Service Quality measurement model for Application Service Providers (ASPs) in Greece. Sigala (2004) surveyed Greek companies who used ASPs to develop and maintain their websites, whereas Chang et al (2015) developed a model to assess the actual website Service Quality. Both Sigala (2004) and Chang et al (2015) adapted the SERVQUAL model. Certain constructs of the SERVQUAL model were removed and replaced with applicable constructs. In Sigala's (2004) study, the reliability dimension was modified to include constructs such as application navigation, structure, aesthetics, and interface. Sigala (2004) also included a quality impact construct which measured the integration of the outsourced application with the existing application. In addition, the assurance dimension was also modified to cater for security and privacy concerns (Sigala 2004). Both Chang et al (2015) and Sigala (2004) performed extensive literature reviews in order to obtain a list of dimensions relevant to the website and ASP markets respectively. These dimensions were thereafter included in the modified SERVQUAL model. The studies led to the development of Service Quality models that could be used to appraise website quality and ASP performance.

Another study performed in the Greek market was the use of SERVQUAL to survey Internet Service Quality and price, and their influence on customer retention in the market. The study aimed to measure customer loyalty through the measurement of repurchase retention and positive word of mouth (Blery 2009). According to Blery (2009), customer retention is important to many companies, and companies understand that it is less time consuming and less costly to maintain an existing customer than finding a new customer. Blery (2009) performed a cross-sectional study and used a Likert scale to measure the SERVQUAL dimensions. Surveys were constructed and the customers of the large ISPs in Athens in Greece were surveyed. Additional questions to measure perceived price and customer loyalty were added to the questionnaire. The findings of the research exposed the relationship between Service Quality, perceived price, and customer retention in the Greek Internet industry. The relationships between the three variables revealed the influence of

Service Quality on customers in the Greek market. In addition, the study highlighted that customers in the Greek market were price sensitive and were not willing to pay more for better Service Quality, and price could deter them from purchasing further services (Blery 2009). Similarly, Dwivedi et al's (2008) study investigated the influence of Service Quality and the secondary influence on behavioural intention to change ISPs. Advertisements, newspapers, and television were classified as secondary influence (Dwivedi et al 2008). Furthermore, in order to measure Service Quality, Dwivedi et al (2008) measured Internet connection speeds, Internet security problems, virus popup problems, and customer support. The findings of the study revealed that poor Service Quality influenced customers' behavioural intention to leave their current ISP for an alternative ISP.

Koivisto and Urbaczewski (2004) researched the relationship between Quality of Service (QOS) perceived by the customer and the service provider's network performance in the mobile Internet market. The research revealed that there was no correlation between these two variables; however, the results differed from application to application (Koivisto & Urbaczewski 2004). Koivisto and Urbaczewski (2004) defined QOS, network performance, and usability as these terms are commonly utilised when assessing Service Quality. QOS includes both subjective and objective components of a service (Koivisto & Urbaczewski 2004). In the majority of the studies, QOS was measured by assessing jitter, bandwidth, and packet loss, whereas the softer side that includes users' perceived view of QOS is rarely observed (Koivisto & Urbaczewski 2004).

The mobile Internet market presents additional challenges when compared to the fixed Internet market. These challenges include link instability, security, and restricted mobile phone battery time (Koivisto & Urbaczewski 2004). Furthermore, an agreed-upon QOS standard for mobile networks is non-existent (Koivisto & Urbaczewski 2004). Koivisto and Urbaczewski's (2004) research was performed in a laboratory that controlled the hard network performance variables such as jitter and bandwidth, while measuring the soft user perception variables of Service Quality. The study revealed that the relationship between the two variables, network performance and user-perceived QOS, varied between applications, and another apparent finding was that user stress and discomfort with the application could influence users' perception of Service Quality (Koivisto & Urbaczewski 2004). In Wang, Sun and Yang's (2012) study of QOS, they delved into the measurement of QOS in the web service industry. Wang et al's (2012) study differed from Koivisto and

Urbaczewski's (2004) study as it focused on service providers, the context of customers, and historical statistics regarding the measurement of QOS. Furthermore, Wang et al (2012) reviewed the softer side that influences QOS – variables such as price, response time, availability, and reputation. They believed that while taking into consideration these softer variables, it is very difficult to obtain correct QOS measures. In addition, Wang et al's (2012) study revealed that the service providers' service performance did not remain constant, but was affected by changes in the environment. The study led to the development of a QOS measurement model for web services which took into consideration the three variables of service providers, the context of customers, and historical statistics regarding the measurement of QOS.

Table 3.4 provides a summary of the studies conducted in the Internet industry as discussed above.

Table 3.4: Summary of studies conducted in the Internet industry

Author & Year	Industry	Aim of Research	Findings
Vatanparast & Qadim (2009)	Internet	(a) Investigate mobile Internet adoption in five countries; and (b) investigate the influence of culture on the dimensions of TAM.	Customers' attitudes towards perceived usefulness and ease of use influence customers' intention to use, and the actual usage of, the mobile Internet. In addition, various cultural factors influence mobile Internet usage.
Pew Research Centre (2013)	Internet	(a) Investigate the adoption of mobile phones by people in various countries; and (b) investigate the component of Internet access on these mobile phones.	There is a correlation between education and the ownership of smartphones.
Ryan & Valverde (2005)	Internet	(a) Investigate Internet waiting times; and (b) compare these to the time taken to use the Internet to save time.	The research showed a relationship between download speeds and website quality.
Simsim (2011)	Internet	(a) Investigate Internet connection technologies; and (b) the customers' perspective of speed, price, capacity, and quality of connection.	There is a great demand for high-speed and better-quality Internet connections, and customers do not mind paying extra for these two components.
Li et al (2007)	Internet	Investigate Internet dimensions that are important to end users.	Management is of the view that network stability, data security, usage convenience, and personal preference variables are significant to end users.
Lee & Kim (2012)	Internet	Investigate the source of most Internet problems.	Most of the problems occur near end users.
Hu & Liao (2011)	Internet	Investigate the benefits of Service Quality.	Service Quality aids in customer satisfaction, decision making, loyalty and retention.

Author & Year	Industry	Aim of Research	Findings
Li et al (2008)	Internet	Investigate the relationship between Service Quality and price.	Reliability is the most important factor in the Taiwanese market.
Ajayi et al (2010)	Internet	Investigate measure of Service Quality for online transactions.	In online transactions, end users tend to measure QOS through performance characteristics such as response time and throughput.
Amin & Razmi (2009)	Internet	Investigate a model to select and evaluate ISPs.	Various supplier selection techniques were used such as AHP, MOP, expert systems, DEA, MIP, GP, MP, LW, TCO, GA, Analytic Hierarchy Process (ANP), CBR, DM, CA, ABC, TOPSIS, RST, grey approach, NN, QFD, and fuzzy logic.
Amin & Razmi (2009)	Internet	Investigate a model that takes into consideration both suppliers' and customers' perspective when selecting suppliers.	Model developed to select suppliers. Highlighted common criteria such as quality, delivery, performance history, warrant and claim policy, production facilities and capacity, net price, and technical capabilities.
Sigala (2004)	Internet	Investigate a Service Quality tool to measure Service Quality of ASPs.	Tool developed to measure Service Quality of ASPs. Included the quality impact construct that measured the integration of the outsourced application with the existing application. The assurance dimension was modified to cater for security and privacy.
Chang et al (2015)	Internet	Investigate tool to assess actual website Service Quality.	Tool developed to measure website Service Quality. SERVQUAL was amended, and application navigation, structure, aesthetics, and interface were added to the reliability dimension.
Blery (2009)	Internet	Measure customer loyalty through the measurement of repurchase retention and positive word of mouth.	Internet Service Quality and price influence customer retention in the Greek market. Customers in this market are price sensitive and are not willing to pay more for a better service.
Dwivedi et al (2008)	Internet	Investigate the influence of Service Quality and secondary influence on behavioural intention to change ISPs.	Poor Service Quality influenced customers' behavioural intention to leave their ISP for an alternative ISP.
Koivisto & Urbaczewski (2004)	Internet	Investigate the relationship between QOS perceived by the customer and the service provider's network performance in the mobile Internet market.	The findings indicate no correlation between network performance and user-perceived QOS. Network performance and usability are variables that are used to assess Service Quality. The mobile Internet market is challenged by instability, security, and restricted battery time. There are also no QOS standards for mobile networks.

Author & Year	Industry	Aim of Research	Findings
Wang et al (2012)	Internet	Investigate the measurement of QOS in the web service industry.	Findings highlight the influence of the softer variables such as price, response times, availability, and reputation on QOS. Difficult to obtain accurate measures by looking at the softer side. Development of the QOS measurement tool for web services.

3.11 CONCLUSION OF STUDIES CONDUCTED IN THE INTERNET INDUSTRY

As mentioned earlier in the chapter, the Internet industry is made up of the tangible side of actual Internet Service Quality, and the intangible, softer side of ISPs' Service Quality. Both components influence the overall Service Quality in this industry. The majority of the studies reviewed focused on Service Quality and customer retention and customer loyalty, whereas other studies in this domain considered website quality and mobile Internet adoption. A large portion of the studies focused on the more technical side of Internet Service Quality, such as measuring QOS, jitter, and Internet connection speeds, whereas, some studies concentrated on identifying criteria to select and evaluate suppliers.

It is evident from the literature that researchers used the the SERVQUAL model to assess customers' perceptions of Internet Service Quality. It is worth noting that this model had to be amended to cater for the environment it was used in. Not only did the researchers amend the model, they had to add on to the model to test the relationship between Service Quality dimensions and other constructs.

Very few studies (Wang et al 2012) delved into the intangible side of ISPs' Service Quality. There is certainly a gap in the literature on studies conducted on ISPs' Service Quality in South Africa; more specifically on the softer human side of Service Quality. This study concentrates on closing this gap. In addition, limited studies have investigated the relationship between ISPs' Service Quality and customers' business performance. This study will examine and empirically demonstrate this relationship.

In addition, various other factors influence Service Quality in this industry, such as Net Neutrality and culture. The next two sections explore these concepts.

3.12 NET NEUTRALITY – MANIPULATION OF THE QUALITY

Various studies (Hart 2011; Barratt & Shade 2007; Meinrath & Pickard 2008; Becker, Carlton & Sider 2010) have been conducted on the still highly contested subject of Net Neutrality. Net Neutrality means that all Internet content should be treated equally, and should traverse the network at the same speed. There shall be no discrimination against content (Meinrath & Pickard 2008; Hart 2011; Jasserand 2014), whereas, according to Barratt and Shade (2007), Net Neutrality is concerned with how the Internet is built, who pays for it, and who benefits from it. Furthermore, according to Hynönen (2013), the blocking of content or prioritising of traffic for commercial benefit rather than for technological reasons is regarded as discrimination.

Discrimination of content can take many forms, such as:

- discrimination against certain types of content;
- different quality standards can be implemented on different content;
- charging high prices to some content application providers;
- discrimination against content providers who compete with the carriers' content; and
- blocking users' viewing of certain websites.

Two camps exist – those who argue for Net Neutrality (example: content application providers) and those who argue against it (infrastructure providers). The camp that argues for Net Neutrality firmly believes that this decision will allow Internet innovation to flourish, and will prevent the telephone and cable companies from abusing their power in the market (Hart 2011), whereas the other camp is of the opinion that the lack of Net Neutrality will suit large content providers and will discourage broadband infrastructure building as a result of diminished incentives (Hart 2011). Infrastructure providers are against Net Neutrality because they believe that they have invested significant capital to increase their pipes and their networks, and content providers use these pipes without paying extra (Hart 2011). Contrary to that, those who believe in Net Neutrality argue that the Internet has developed as extensively as it has due to the lack of a central control mechanism (Barratt & Shade 2007), and furthermore, those infrastructure providers who own the Internet do not have the right to control the content flowing over their networks. An interesting analogy used in Barratt and Shade's (2007) article stated that electricity

companies charge according to a usage-based model and do not discriminate against the appliance used. Electricity companies do not charge a user more per unit of electricity if a toaster consumes the electricity or if a microwave consumes it. In this model the user is charged a set amount per unit and this does not vary according to the appliance using the electricity.

The Internet is known for its packet-switching technology. Messages are broken into various packets. These packets are sent from the source through different routes to the destination, where they are assembled in order and presented. The content of packets was initially not examined, however, and it was only recently that video and voice packets were given higher priority in order to deliver on the quality (Hart 2011). In order to manage their networks, infrastructure providers were able to view the headers of packets and prioritise them accordingly. Some content providers and customers, however, were able to manipulate these headers to reflect voice and video so that the packet could get priority. This prompted infrastructure providers to employ software known as Deep Packet Inspection (DPI), which viewed headers and content in order to prevent non-video and non-voice packets from being given higher priority. Infrastructure companies thereafter took it one step further by using the software to discriminate against certain content (Hart 2011).

The debates began in the USA when competition among telephone companies and cable companies became public (Barratt & Shade 2007; Hart 2011). Both telephone and cable companies were built on the capability of selling analog-only content. It was only later that telephone companies, through the Internet, were able to transmit digital content, which opened the door for telephone companies to compete with cable companies by being able to transmit video content in digital format (Hart 2011). Furthermore, the US Telecommunications Act of 1996 encouraged competition between telephone and cable companies (Hart 2011). Both types of companies invested in broadband services. Around 2005, the USA had seen a flat line for both telephone and cable revenue, and an increase in broadband revenue (Hart 2011). Furthermore, in previous years content providers and infrastructure providers were kept separate, whereas now infrastructure providers are also content providers. In some cases infrastructure providers were found guilty of prioritising their content over other content, which resulted in discrimination (Meinrath & Pickard 2008). In addition, a similar example sparked outrage in France when a mobile operator

was found guilty of blocking Voice over Internet Protocol (VoIP) services in order to force customers to use their services only (Jasserand 2014).

Table 3.5 illustrates the pros and cons of Net Neutrality and the associated sub-issues.

Table 3.5: Pros and cons of Net Neutrality (Adopted from Hart 2011)

Subissues	Opponents	Proponents
Role of the market	Let the market do its magic	Enforce antitrust laws so the market can do its magic
Threat of discrimination	Net neutrality guarantees are unnecessary because there has been no discrimination by telephone and cable companies	Cite statement by Edward Whitacre and the Madison River case
Desirability of regulation	Undesirable (cite positive example of cable deregulation and negative example of Telecom Act of 1996)	Desirable (argue that net neutrality guarantees were in place until FCC removed them)
Need to prioritize packets	Necessary for intelligently managing future broadband networks	Not necessary or desirable because it undermines end-to-end architecture
Need to create incentives for telephone and cable companies to build future networks	Future networks cannot be paid for unless providers can charge content and application providers for prioritizing packets	Telephone and cable companies will discriminate against competitors and overcharge consumers
Need to create more competition	Best way to do this is to have telephone and cable companies compete	Best way to do this is to add wireless, municipal, and public broadband providers

According to Barratt and Shade (2007), Internet customers are now using the Internet for more bandwidth-intensive applications such as video and voice, and infrastructure providers need to invest more in their networks in order to support these types of content. It is no wonder that infrastructure providers want content providers to pay more to use their infrastructure. Infrastructure providers are even talking about transmission taxes for bandwidth-intensive applications, and some ISPs in Canada charge an additional fee to maintain a specific QOS for VoIP companies (Barratt & Shade 2007).

In South Africa, similar trends are evident. Operators such as MTN and Vodacom are appealing to the Regulator to regulate Over the Top (OTT) players such as WhatsApp and Viber. Once again the reason for such resistance is that the operators are investing large amounts of capital expenditure on infrastructure, yet they are not seeing an upside in revenue. Traditional expensive voice services are being substituted by cheaper data services, which are the result of increased usage in OTT services (Business Monitor International 2016).

In order to detect the type of content traversing the network, research has been conducted on a smart network with centralised infrastructure that is able to detect the type of content and transmit it accordingly (Meinrath & Pickard 2008). For instance, VoIP and High-

definition Television (HDTV) require low latency and low jitter in order to satisfy quality requirements, whereas email and Internet browsing do not depend on latency or jitter (Meinrath & Pickard 2008). The smart network will be able to prioritise content based on its needs, without human intervention.

Meinrath and Pickard (2008) developed a model that envisaged an open Internet. The model concentrated on ten items, namely:

- a common carrier;
- open protocol and open standards;
- open architecture and open-source driver development;
- a "dumb" network;
- protecting the privacy of individuals;
- supporting application neutrality;
- low latency is compulsory and supports first-in/first-out;
- interoperable;
- business model neutral; and
- governed by users.

Some believe that if Net Neutrality was not implemented the Internet would mainly serve the wealthy as it would include fast lanes for the wealthy, and the rest of the users would be subjected to slow, poor-quality Internet (Hart 2011; Hynönen 2013). Subsequently, studies have revealed that the Internet has never been neutral, and there are reports that prove that certain types of content are throttled by many service providers (Hynönen 2013). Throttling is a common term in the Internet industry, which refers to the slowing down of content that is bandwidth-intensive (Hynönen 2013). According to Hynönen (2013), throttling is a common practice used by 35% of mobile operators and 18% of fixed-line ISPs in the European market.

It would be worth determining whether this practice is followed by the South African ISPs, and to what extent it is carried out. In addition, this would help determine if customers are aware of such practices, and to what extent it affects their business performance. Since there are limited studies on Net Neutrality in the South African market, it would be worthwhile to investigate the absence or presence of Net Neutrality in the South African market, and its influence on Service Quality.

3.13 CULTURE AND ITS INFLUENCE ON SERVICE QUALITY

Many studies (Roycroft & Anantho 2003; Ryan & Valverde 2005; Sigala 2004; Im, Hong & Kang 2011; Vlachos et al 2011) have indicated the influence of culture on Service Quality dimensions. According to Gladwin and Hofstede (1981), culture is defined as "the collective programming of the mind that distinguishes the members of one group or category of people from another". Vlachos et al's (2011) exploratory study was conducted in three Asian countries – Japan, South Korea, and Hong Kong – and attempted the use of an e-Service Quality measurement tool to assess mobile Internet services across various countries. According to Vlachos et al's (2011) study, customers in the different countries used the same dimensions to evaluate Service Quality; the only difference is that customers in some countries may provide higher ratings to some of the Service Quality dimensions, whereas customers in other countries may provide lower ratings to the very same dimensions. Furthermore, Vlachos et al's (2011) study revealed that culture influences e-Service Quality ratings. E-Service Quality relates to the quality of a website and the manner in which purchases are conducted on the website (Vlachos et al 2011). Vlachos et al's (2011) study highlighted the cultural differences between the South Korean and Japanese culture, and its influence on the ratings of the Service Quality dimensions. For instance, South Koreans rated ease of use, usefulness issues, and uncertainty avoidance dimensions much higher than people in Hong Kong, and these ratings were linked to the economic conditions in the country (Vlachos et al 2011).

In addition to the studies conducted on cultural influences on Service Quality dimensions, studies have been conducted on cultural influences on Internet adoption in various countries. Vatanparast and Qadim (2009) argued that culture influences mobile Internet adoption, and that if service providers understood the influence, they could make the necessary changes per country to promote Internet adoption. Vatanparast and Qadim's (2009) study used the TAM to solicit information on mobile Internet adoption in various countries.

The literature once again revealed that there are a limited number of Service Quality studies that take into consideration cultural influence on the Service Quality dimension. This research takes place in the South African market, and will yield information on South

Africans' preferences regarding ISPs' Service Quality, and will further provide insight into important Service Quality dimensions for South Africans.

The next section explores various business performance models. Limited research has been conducted on the relationship between Service Quality dimensions and business performance indicators. In order to assess this relationship, the next section examines various business performance models, and selects suitable business performance indicators to utilise for this study.

3.14 BUSINESS PERFORMANCE

Companies require business performance measurement models to ensure that they are able to track their performance and to identify business areas that need further attention. This constant tracking of business performance allows companies to stay ahead of their competition and better handle the challenges faced by the business (Dutt et al 2012; Georgescu & Ciobanica 2011).

Several studies (DeBusk 2008; Dror 2008; Sharma 2016) refer to the mix of financial and non-financial measures when evaluating business performance. Robert Kaplan and David Norton developed the Balanced Score Card (BSC) in 1992 (DeBusk 2008; Iselin, Mia & Sands 2008). The BSC contained both financial and non-financial yardsticks for measuring business performance (DeBusk 2008; Sharma 2016). The BSC groups measurement criteria under four categories, namely financial measures, customer measures, business process measures, and learning and growth measures (DeBusk 2008). In the BSC, performance reporting is aligned to the company's strategic goals (Iselin et al 2008). In addition to the BSC, strategic frameworks such as the Malcolm Baldrige National Quality Award (MBNQA) and the European Foundation for Quality Management (EFQM) were developed to measure business performance (Dror 2008). The MBNQA takes into consideration leadership, results (human resources, process management, and business results) and measurements, analysis, and knowledge management (Dror 2008); whereas the EFQM was developed as a framework to assess companies' compliance to a European standard. The EFQM measures criteria such as leadership, people management, policy and strategy, resources and processes, people satisfaction, customer satisfaction, impact on society, and business results (Dror 2008; Dutt et al 2012).

Dror's (2008) study focused on the limitations of the BSC compared to other strategic framework models. Some of the limitations include the appearance of rational connections between strategic areas, rather than causal connections (Morard, Stancu & Jeannette 2013), and that customer satisfaction does not necessarily translate into financial gains (Morard et al 2013). Furthermore, the BSC does not include an area on competition, and therefore is not seen as a true strategic management tool (Morard et al 2013). Some researchers argue that the BSC is difficult to implement and is intangible (Morard et al 2013). In addition, some researchers view the BSC as a one-sided approach; a top-down approach rather than an all-inclusive approach where lower levels in the organisation are not consulted (Morard et al 2013).

In addition, there is further segregation between strategic frameworks that promote self-assessment and those that aid in business improvement (Dror 2008). The MBNQA and EFQM promote self-assessment, whereas the BSC can be used to improve business (Dror 2008).

According to Hubbard (2009), companies are aware that they have a great responsibility to all stakeholders rather than to only some shareholders, therefore they use a performance measurement matrix that tracks areas that inform the wider stakeholder audience. The BSC framework has been developed to provide feedback to stakeholders (Hubbard 2009). Table 3.6 presents an example of a BSC which tracks all areas, with the exception of the impact of organisations on the natural environment and society (Hubbard 2009).

Table 3.6: Example of a BSC of a manufacturing firm
(Adopted from Hubbard 2009)

Financial		Internal processes	
Sales growth	3%	Productivity	3.8%
Return on sales	6.8%	Labour turnover	12%
Return on assets	5.1%	Ave. unit production	4 days
Return on equity	15.5%	Working capital/sales	10%
Gearing	73%	Capacity utilization	73%
Customers/market		Learning and development	
Market share	32%	New products developed	1
No. of new customers	12,350	New markets entered	2
Product return rate	1.5%	R&D spend/sales	2.5%
Defects	2.8%	Training spend/sales	5.5%
Order cycle time	7 days	Investment/total assets	10%

The Triple Bottom Line (TBL) tool takes into account the impact of organisations on the environment and society. Table 3.7 is a snapshot of a TBL organisational performance measurement tool.

Table 3.7: TBL measurement tool (Adopted from Hubbard 2009)

	This year	Target
Economic		
Sales growth	5.3%	5.0%
Profit growth	5.8%	5.2%
Return on equity	13.6%	15.0%
Return on assets	3.0%	3.5%
Gearing	55%	55%
Social		
Lost time injury frequency	3.8	5.5
Reliability of supply (1–10 scale)	8.7	8.5
Responsiveness (1–10 scale)	7.5	7.8
Overall customer satisfaction (1–10 scale)	8.1	8.5
Sponsorship	$0.4m	$0.3m
Education	20 classes	20 classes
Environment		
EMS plants certified	19	17
Spillages	109	68
Nitrogen discharge	1500 tonnes	1400 tonnes
Suspended solids discharge	2100 tonnes	1700 tonnes
Wastewater reuse	19.7%	20.0%

Furthermore, Iselin et al's (2008) study revealed the positive relationship between the strength of the alignment of strategic goals and performance reporting with a company's organisational performance. It is therefore imperative for organisations to focus their time reporting on strategic goals, as this will be beneficial to the organisation's performance.

In addition, another performance monitoring framework that builds on the BSC is the Total Performance Scorecard (TPS), which includes the concepts that define the BSC, Total Quality Management (TQM), and Competencies Management. It is seen as a complete process management system that focuses on continuous improvement (Madalina 2008; Rampersad 2008). In addition, the process contains rudiments such as the Personal Balanced Scorecard (PBSC), Organisational Balanced Scorecard (OBSC), TQM, Competencies Management, and the Kolb learning cycle (Madalina 2008). The TPS differs from other performance measurement tools because it aligns individuals' ambitions with the company's goals in order to build a high-performance culture (Rampersad 2008). Rampersad's (2008) study indicated the correlation between employees' satisfaction and

productivity levels. Employees who are unhappy at work tend to display lower levels of productivity at work (Rampersad 2008).

In addition to the TPS, Neely, Adams, and Kennerley (2002) developed a performance measure tool called the Performance Prism. This tool focuses on the correlation between stakeholder satisfaction and organisational performance, whereby increased stakeholder satisfaction will lead to increased organisational performance (O'Boyle & Hassan 2013). Researchers have debated the similarity of the Performance Prism to the BSC; however, the Performance Prism differentiates itself by focusing on how to operate in an industry, as opposed to merely a performance assessment of an organisation (O'Boyle & Hassan 2013).

For the purpose of the study, the researcher took guidance from Ziegel, Kaplan and Norton's (1998) BSC for the business performance indicators, as it is applicable to business competiveness and incorporates both financial and non-financial metrics.

3.15   ANALYSIS OF THE LITERATURE

The researcher embarked on problem-solving research, which involved conducting a literature review of only concepts pertinent to the problem statement. A review of the history and evolution of the Internet industry provides the reader with insight into key milestones that developed and shaped this industry. The initial milestones paved the way for today's growing industry occupied by multiple ISPs. This healthy, thriving industry is at the helm of a huge base of customers.

South Africa, a developing country found on the continent of Africa, has an Internet industry that is developing at a rate faster than its neighbours. Significant trends in other African countries form waves that influence the trends in South Africa. The continent as a whole has seen considerable traction in the use of technology and use of the Internet. The presence of ICT strategies and government initiatives has further bolstered the Internet's growth, which is accessed either through mobile or fixed mediums. Apart from the medium, price, speed, and quality are also contributing factors in selecting ISPs. Customers in South Africa are certainly price sensitive, and cost is a factor that influences the decision to consume mobile mediums or fixed mediums for Internet access.

In terms of disruptive technologies in the field, the growing use of smartphones stimulates growth of applications and increased Internet usage. Readily available access to smartphones, wearable devices, tablets, and laptops cultivates a more tech-savy customer, who demand access to good-quality Internet to be able to continue to use these technologies. Internet adoption and penetration are growing at a rapid pace in both South Africa and the rest of the African continent. This increase in demand is spurring on ISPs to play in this space either through cost or service differentiation. With cost in the South African market being a factor difficult to influence, ISPs are forced to look to service differentiation and innovation to remain relevant. All of this is done in the name of attracting and retaining customers.

In a market filled with so many options, customers are spolit for choice. Service Quality in an industry, be it food, health, or other, can influence a customer's decision to remain with the service provider. For instance, a restaurant could have the best-tasting food in the city, yet if the service is bad, customers will choose not to eat there. The same analogy applies to the Internet industry. ISPs' assessment of their Service Quality will facilitate better understanding customers' needs and desires, and allows for ISPs to tailor their behaviour to attract and retain customers. Furthermore, if ISPs had insight into the impact of their Service Quality on their customers' business performance, they would be more likely to change certain aspects of their service approach.

By reviewing the literature performed around Service Quality and the Internet, it is evident that researchers focused on multiple aspects, such as Service Quality in the mobile industry; technology acceptance and its link to culture and education; the technical attributes of Internet quality; and benefits of Service Quality and customer satisfaction. The researchers attempted to analyse concepts pertinent to Service Quality in different markets. The results of these studies indicated that different cultures have different needs, and that one-size-fits-all was not an option. Models such as SERVQUAL and TAM had to be amended to cater for these differences, and additonal constructs were tested in different markets. The literature review confirmed that limited studies were performed on the intangible aspects of Service Quality in the Internet industry, specifically in South Africa. This study aims to close that gap by confirming a Service Quality model for the Internet industry in South Africa, and, in addition, confirming the relationship between ISPs' Service Quality and customers' business performance.

3.16 CONCLUSION

The principles in Klopper and Lubbe's (2012) article provided a foundation to embark on the literature review. Abstracts of articles were scanned and only articles relevant to this study were reviewed. Literature pertaining to Internet studies, Internet Service Quality, and ISP trends in South Africa and in other countries were analysed. This analysis provided a summary of Internet milestones, a background of the South African Internet industry, the competitive landscape of ISPs, and prevalent trends and customer preferences. In addition, in order to further understand the Internet domain and to solve the research problems, the researcher unpacked the Internet Ecosystem by analysing the numerous actors and the interrelationship among the actors.

The majority of the literature reviewed focused on Internet Service Quality studies performed in other countries around the globe. The researcher found that limited studies on this topic have been performed in Africa, let alone in South Africa. Furthermore, the majority of the studies were performed on the technical side of Internet Service Quality, such as Internet waiting times, Internet connection technologies, network stability, quality of Internet paths, and QOS metrics. Limited research has been conducted on the softer, more human side of ISPs' Service Quality. In addition, there is limited literature on a Service Quality tool to assess the softer side of ISPs' Service Quality in the South African Internet industry. This highlights a gap worth pursing in order to solve the sub-problems mentioned in Chapter 1. Furthermore, although quite a number of studies have been performed on Service Quality and other constructs such as customer loyalty and retention, there is insufficient research on the relationship of ISPs' Service Quality and customers' business performance. This study will examine and empirically demonstrate the relationship between these two concepts.

Subsequently, this chapter also reviewed literature on Net Neutrality and culture and their influence on ISPs' Service Quality. Past studies have confirmed the influence of culture on Service Quality, and since this study is conducted in South Africa, it would be fitting to understand the findings in the context of the cultural diversity evident in South Africa.

Furthermore, in order to understand the impact of ISPs' Service Quality on customers' business performance, the researcher analysed and reviewed various business performance

models and frameworks such as the BSC, MBNQA, EFQM, the TBL tool, TPS, TQM, PBSC, and the Performance Prism to provide background on business performance indicators. The BSC was selected to provide guidance on business performance indicators in this study.

The next chapter provides information on the research methodology employed in the study, as well as the tools used to collect data.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

The previous chapter provided a review and analysis of the literature pertaining to this study, namely a brief history of the Internet and milestones in South Africa, followed by the background of the South African Internet industry, Internet trends in South Africa and other parts of the world, a comparative analysis of the ISPs in South Africa, and studies performed in the Internet industry. In addition, the literature review confirmed the gap in existing knowledge, and helped to provide clarity on the significant contribution of this study's findings to the existing body of knowledge.

This chapter describes and justifies the selected research methodology. The chapter commences with the research design, followed by the philosophical assumptions that underpin this research. In order to develop and confirm an ISP Service Quality measurement instrument in South Africa, and to understand the impact of ISPs' Service Quality on customers' business performance, the researcher chose to use the mixed-methods approach.

This chapter describes both Phases 1 and 2 of the research, which comprise qualitative research and quantitative research respectively. Furthermore, this chapter elaborates on the research process, including the sampling technique, data collection, data analysis, data and design quality, and ethical considerations of each phase.

4.2 RESEARCH DESIGN

According to Sachdeva (2009), there are many definitions of research design, and there is no single definition that captures all the elements of what a research design should encompass. A research design should be seen as a blueprint for the collection, measurement, and analysis of data (Sachdeva 2009). This definition is in line with Kothari (2009) and Phophalia (2010), as both agreed that the research design is seen as a theoretical framework that shows how the research process will be managed by the researcher. In addition, the research design allows for evidence to be collected at an optimal level,

meaning that the data-collection process will be streamlined, cost effective, and efficient for the researcher (Kothari 2009; Phophalia 2010). Lastly, the research design process should serve to provide answers to the research questions (Singh 2006), which is a critical component to ensuring success.

This research design addresses the underlying philosophical assumptions that support the research. In this chapter, the researcher unpacks the ontological and epistemological assumptions.

To achieve the objectives of the study and to answer the research questions, the researcher chose to follow a mixed-methods approach by utilising both qualitative and quantitative research methods. The qualitative side of this research aids in providing a deeper understanding of the identified problem, whereas the quantitative side provides a more general understanding of the problem (Creswell, Clark & Clark 2010). Furthermore, both qualitative research and quantitative research methods have limitations; therefore it makes sense to incorporate elements of both methods in order to provide a comprehensive understanding of the problem (Creswell et al 2010), and in turn allow the weakness of one method to be complemented by the strengths of the other method (Weathington, Cunningham & Pittenger 2012). In addition, this approach allows the researcher to achieve triangulation, thereby increasing the validity of the study.

4.3   PHILOSOPHICAL ASSUMPTIONS

All researchers bring their own beliefs and philosophical assumptions into their research and it is therefore crucial to pay attention to the philosophy chosen in the research. This provides an indication of the way the researcher views the world. The choice of philosophy influences a researcher's research strategy and the research methods used (Saunders et al 2007; Ponte 2014). There are various research philosophies, but the researcher must select one that is relevant to the type of research being conducted, and one that will successfully achieve the objectives of the research.

Philosophy is the study of man, the universe, and experience. Philosophical research is used to ascertain truth or reality (Singh 2006). There are two schools of thought regarding philosophy, namely Ontology and Epistemology. Ontology is concerned with the assumptions researchers may have about the workings of the world, whereas Epistemology

relates to the theory of knowledge and is concerned with what knowledge is suitable for a specific field of study (Saunders et al 2007; Ponte 2014). There are two characteristics of Ontology; the first being objectivism – how social entities exist when they are detached from social actors – and secondly, subjectivism, which is of the view that social actors create social phenomena as a result of their perceptions and actions (Saunders et al 2007).

Theoretical development and empirical research distinguish Epistemology from Ontology (De Gialdino 2009). Qualitative research is concerned with understanding how the world is comprehended, people's behaviours, and how people interact. Furthermore, qualitative studies are interpretive and inductive (Mason 2002; Creswell 2007; De Gialdino 2009); the research questions, models, and theories are formed during the research rather than prior to the research. In this study, Interpretivism relates to the use of the SERVQUAL model to guide and constrain the research. In addition, the results of the research will contribute to the overall refinement of the a Service Quality model for the Internet industry.

On the other hand, quantitative research aims to explain phenomena by gathering numerical data and analysing those data through the use of statistics (Muijs 2004). Furthermore, this method is associated with the Realist view, which the researcher follows in this study. According to the Realist view, the truth exists "out there" and it is the role of the researcher to find the truth; therefore, in this study, Realism relates to the real perception of the customer regarding ISPs' Service Quality.

4.4   METHODOLOGY

In line with Klopper's (2012) problem-solving approach, the researcher chose the survey-based research approach. The alignment of the research questions to the research problem is critical to ensure that the researcher always remains focused and solves what was initially set out to solve. In order to develop and confirm a Service Quality measurement instrument for the Internet industry in South Africa, and to understand the impact of ISPs' Service Quality on customers' business performance, this research aims to answer the following questions:

- How do customers appraise ISPs' Service Quality in the South African market?
- What is the impact of South African ISPs' Service Quality on business

performance?

- What are the challenges experienced by ISPs in South Africa?
- What is the impact of these challenges on their ability to deliver the Service Quality South African business customers require?
- What is the gap between ISPs management's perception of the Service Quality they provide, and business customers' perception of the Service Quality they receive?

Table 4.1 links the research questions to the methods, thereby allowing the researcher to remain focused on solving the identified problem.

Table 4.1: The link between the research questions and research methods
(Adapted from Mason 2002)

Research Question	Data Sources and Methods	Justification
How do customers appraise ISPs' Service Quality in the South African market?	Business customers of ISPs in South Africa; Questionnaires.	A large amount of data can be collected from a large number of ISP customers over a short period. Furthermore, questionnaires can be quantified quickly through SPSS software, and data can be analysed scientifically.
What is the impact of South African ISPs' Service Quality on business performance?	Business customers of ISPs in South Africa; Questionnaires / ISP management; Interviews.	A large amount of data can be collected from a large number of ISP customers over a short period. Furthermore, questionnaires can be quantified quickly through SPSS software, and data can be analysed scientifically. / Interviews can be used to obtain further detailed information from ISP management.
What are the challenges experienced by ISPs in South Africa, and the impact of these challenges on their ability to deliver the Service Quality South African business customers require?	ISP Management; Interviews / Business customers of ISPs in South Africa; Questionnaires.	A large amount of data can be collected from a large number of ISP customers over a short period. Furthermore, questionnaires can be quantified quickly through SPSS software, and data can be analysed scientifically. / Interviews can be used to obtain further detailed information from ISP management.
What is the gap between ISPs managements' perception of the Service Quality they provide, and business customers' perception of the Service Quality they receive?	ISP Management; Interviews / Business customers of ISPs in South Africa; Questionnaires.	A large amount of data can be collected from a large number of ISP customers over a short period. Furthermore, questionnaires can be quantified quickly through SPSS software, and data can be analysed scientifically. / Interviews can be used to obtain further detailed information from ISP management.

A mixed-methods approach offers several advantages such as increased validity, a variety of perspectives, and reduces the weakness of one method while complementing the strengths of another method (Creswell et al 2010).

Furthermore, a mixed-methods approach allows for triangulation through the combination of both qualitative and quantitative research methods (Creswell 2007). In this study, data triangulation was achieved through the combination of different sources of data, such as interviews and questionnaires.

The researcher followed Creswell's (2007) Sequential Design, as illustrated in Figure 4.1.
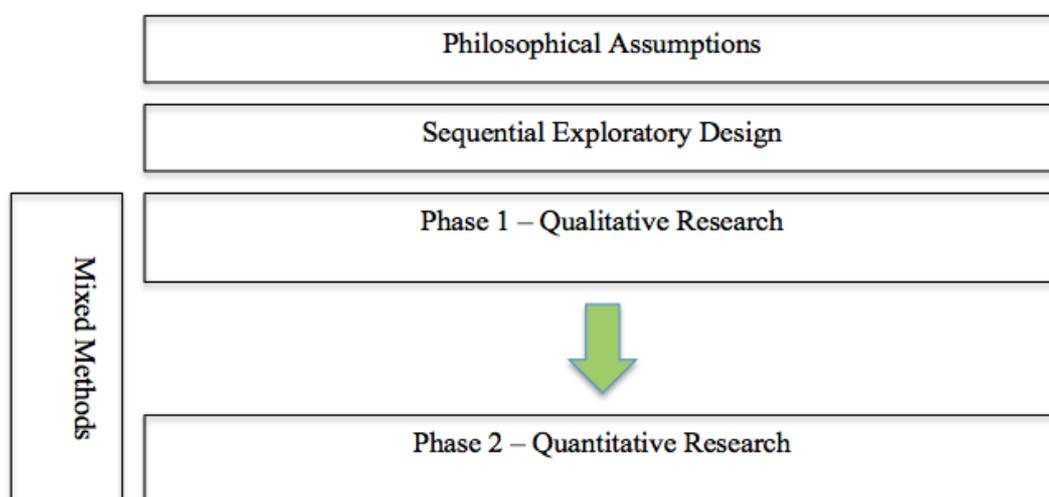
Figure 4.1: Mixed-methods methodology incorporating Creswell's (2007) Sequential Design

The researcher conducted the research in two phases. In Phase 1 the researcher conducted in-depth interviews with ISPs' top management to obtain an overview of the South African Internet market, the challenges experienced by ISPs, and their view on the Service Quality they deliver to their customers. The researcher thereafter utilised the results of Phase 1 as input for the development of the questionnaire for use in Phase 2. The questionnaire was utilised to elicit information on customers' expectations and perceptions of ISPs' Service Quality. The researcher followed a systematic, sequential process by first completing Phase 1 before starting Phase 2. This method is generally used in the development and testing of a research instrument (Biddix 2009).

4.4.1 Overview Of Alternative Methods

It is important to note that the researcher reviewed other research strategies such as the case study, action research, and experiments; however, they were not appropriate to address the research questions and to conclude the findings. Furthermore, there were factors that steered the researcher away from using these strategies. Some of these factors included the engagement approach with the individuals, the extended time it would require to gather information in a constantly evolving industry, the increased costs the research would incur, and ethical considerations.

4.5 MIXED-METHODS RESEARCH

As stated above, the research was conducted in two phases. This research followed a sequential mixed-methods approach. The first phase addressed the qualitative section of the research, which was followed by the second phase, which was the quantitative section.

4.5.1 Phase 1: Qualitative Research

In order to gather data on the impact of ISPs' Service Quality on customers' business performance, the challenges experienced by ISPs in South Africa, and the gap between ISP managers' views and customers' views of Service Quality, the researcher chose to interview top management at ISPs in South Africa. The researcher chose an observational approach by conducting in-depth interviews with these managers. This approach allowed the researcher to obtain a deeper, richer understanding of ISP challenges in the South African Internet industry.

The one-on-one interaction made the managers feel at ease, and allowed them to open up regarding sensitive information. The researcher was able to probe and to verify responses where necessary. This type of approach was appropriate to gather the data required, as it proved to be more personal and customised versus the use of a survey. Furthermore, managers in these positions preferred to engage in conversation around trends and challenges, as compared to jotting down responses or selecting options on a questionnaire. A questionnaire would not have done justice in this instance, as it would have been the incorrect tool to provide the intensity and complexity of data required.

Every method has a downside, and this approach was no different. Firstly, the researcher found it very challenging to arrange interviews. In the majority of the instances the researcher had to engage several times with the gatekeepers, which in this case were the managers' secretaries or personal assistants, in order to arrange the interviews. Secondly, the busy schedules of these managers resulted in meetings being rescheduled numerous times due to more pressing tasks in the managers' schedule taking precedence. Thirdly, this approach was a costly exercise as the researcher had to travel far and wide to conduct these interviews at the managers' business premises. Not only was this approach costly, it was also a time-consuming exercise for the researcher.

4.5.1.1   The Process

Figure 4.2 outlines the high-level process of the qualitative side of the research. The researcher began by applying the research questions as a foundation for the definition of the initial interview schedule. Furthermore, industry experts reviewed this interview schedule and provided constructive feedback, which was utilised to revise and refine the interview schedule. Thereafter, the researcher conducted pilot interviews with a few managers to test for inconsistency and incongruence. Subsequently, the researcher performed the final interview with the ISPs' top managers. The interviews were transcribed, and coding and content analysis were performed. This output of this process generated the input for Phase 2.
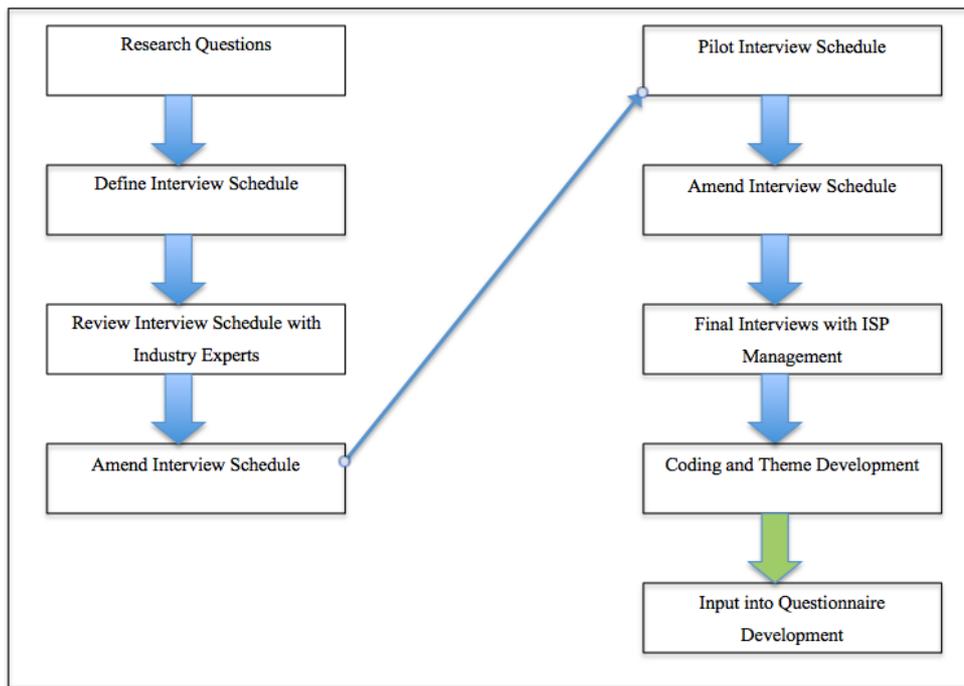
Figure 4.2: Qualitative research process

Interviews were conducted with ISPs' top management officials (Chief Executive Officers [CEOs], Managing Directors [MDs], Chief Technical Officers [CTOs], and senior managers) (Davis & Useem 2001) in order to collect data on the challenges experienced by ISPs in delivering Internet services to customers. Furthermore, the interviews provided insight into ISPs' management's perception of the Service Quality they provide to their customers.

The majority of the participants were interviewed at their offices, with the exception of a few who requested to be interviewed at alternative venues. The interviews were conducted on a one-on-one basis with minimal distractions from the interviewees' day-to-day business. Choosing a venue that made the participants comfortable was of paramount importance to ensure the participants felt at ease and were able to express how they truly felt.

Interviewing top ISP managers certainly had its challenges. One of the major challenges incurred was the setting up of the appointments. It proved to be a difficult and time-consuming exercise to find time in the senior managers' demanding diaries. On average it took anything from two to four interactions with the senior managers' personal assistants in an effort to agree on the date and time. In addition, the interviews were conducted at the

end of the year, and at this time the majority of the companies were focusing on achieving the remaining company goals, therefore making it challenging to schedule appointments.

4.5.1.2   *Sampling*

Random sampling is commonly utilised in research studies as it allows researchers to display rigour, and at the same time it allows the research results to be generalised. However, this approach is not applicable to qualitative studies, as the aim is not to generalise the results but rather to provide a deeper, richer understanding of the problem (Marshall 1996). It is for these reasons that the sample sizes are small in qualitative research. In qualitative research, the sample size is not determined upfront, but rather is based on the researcher reaching a point of data saturation (Kumar 2014).

In order to obtain a deeper, richer understanding of the challenges experienced by ISPs, the researcher selected a non-probability sampling type, which was purposive sampling (Tongco 2007), based on variables such as the size of the ISP, location, and top management. The researcher was interested in acquiring input from top management officials employed at large, medium, and small ISPs (as classified by the ISPA) based in Johannesburg in South Africa. At the end of each interview, the researcher asked the participants to refer another participant; this method is known as snowball sampling and follows on from purposive sampling (Tongco 2007). One of the reasons the researcher chose this approach was that it proved easier to obtain an interview with a top manager if there was a referral, as compared to the traditional cold-calling method of randomly calling managers.

The researcher initially selected three top managers from small, medium, and large ISPs to initiate the interview process, and thereafter resorted to snowball sampling through participants' referrals (Atkinson & Flint 2001). The researcher continued on this path until data saturation was achieved, whereby no new information surfaced and the same concepts and thoughts recurred. It was at this point that the researcher embarked on transcription, coding, and content analysis.

4.5.1.3   *The Role Of The Researcher*

The participants who were interviewed were key individuals; referred to as the top management in their organisations, therefore it was critical that the researcher was cognisant of their time. The researcher had to ensure that appointments were arranged with the individuals in advance. Furthermore, the researcher had to arrive on time for the appointment, and have in possession the recording instrument, the interview schedule, and a notepad.

The researcher started each interview by explaining the purpose of the research, the role of the participant, the time it would take to complete the interview, and the benefits and risks of the research. In addition, the researcher explained the confidentiality clauses and acquired oral consent from the participants (Mack et al 2005). The confidentiality and transparency of the research are significant when engaging in conversations of this nature. The managers had to be put at ease that the researcher was in control of all aspects of confidentiality, and was able to protect their identity and reputation in the industry by not divulging information or linking them to thoughts that could tarnish their brands. For these reasons, the researcher could not single out or name any of the participants in the findings section, but rather recorded aggregated, consolidated findings. In addition, the researcher took care to anonymise the transcripts to protect the participants' identity.

During the interviews, the researcher paid extra attention to asking the questions in a neutral manner, taking care not to cloud the participants' responses with her own opinions and thoughts. This proved to be difficult as the researcher is also based in the industry, and is programmed with her own perspectives, beliefs, and experience of the Internet industry in South Africa.

After each interview, the researcher thanked the participants for their contribution to the study, and thereafter asked the participants to refer another participant who they felt would contribute further to the study.

4.5.1.4   *Data Collection*

The researcher collected the data through in-depth face-to-face interviews with key individuals in the industry in order to gain valuable insight into their perspectives, beliefs, and extensive experience regarding the challenges ISPs face in delivering the service to

their customers. For further details on the interview schedule, a copy of the interview schedule is provided in Annexures I and J.

4.5.1.5   *Data-Analysis Procedures*

The researcher audio recorded the interviews and later had them transcribed. The researcher reviewed the transcribed responses by examining the participants' responses on a question-by-question basis. This systematic approach made it easy for the researcher to compare responses and to determine trends. The trends were categorised into codes. The researcher performed content analysis on the codes in order to establish the key themes (Weathington et al 2012). Various themes emerged from the in-depth interviews. These themes will be discussed further in the Findings chapter.

As indicated, in order for the researcher to compare ISP managers' perceptions of their Service Quality to business customers' perceptions, the researcher used the findings from the management interviews to develop the questionnaire intended for the business customers.

4.5.1.6   *Data And Design Quality In Qualitative Research*

Credibility, dependability, confirmability, transferability, and authenticity are important factors to consider when performing qualitative research and to ensure rigour in research (Mertens 2005).

Credibility

Subject matter experts such as managers in the industry and product management and development experts reviewed the interview schedule to ensure the questions were suitable for the target audience and were appropriate to achieve the desired outcome, which in this case was to provide a deeper understanding of the identified problem.

Dependability

This research followed a research design that clearly described how the research was conducted. The data-gathering, -analysis, and -interpretation steps are clearly articulated. By following a research design and clearly defining the steps, the researcher made it easier

for others to replicate the study to achieve similar results, and furthermore to allow future researchers to build on the study.

Confirmability

Confirmation measures aid the credibility of a study (Krefting 1991). In order to eliminate researcher bias and to indicate that the findings were not influenced by the researcher's individual tendencies, the in-depth interviews were analysed through a rigorous, systematic coding process by the researcher, and in parallel was coded by the transcriber who was an independent resource in another industry. Several iterations of the codes were conducted before a final set was agreed upon.

Transferability

Transferability refers to the ability of the study to be generalised or transferred to other contexts (Kaminski & Pitney 2004). The researcher clearly defined the process, which can be replicated by other researchers in other countries, as well as the limitations of the research. Furthermore, the research findings can possibly be used in other research settings and in other countries in the world. This study can be replicated in either individual companies, or across a multitude of companies across various industries in other countries.

Authenticity

Authenticity refers to measuring the trustworthiness and fairness of research (Krefting 1991; Given 2008). In order to minimise researcher bias, the interviews were recorded and transcribed so that the participants' responses could be fairly and accurately described. Furthermore, to ensure the reliability and accuracy of the codes, coding was performed and compared by both the researcher and an independent resource.

4.5.1.7   *Ethical Considerations In Qualitative Research*

Research ethics is a significant component of any research, as it involves the interaction between the researcher and the individuals being studied. Past mistakes made by other researchers initiated this focus on research ethics, which constitutes trust between the researcher and the individuals being studied (Mack et al 2005). After an extensive review,

the University's Ethical Clearance Committee approved the researcher's Ethical Clearance application. The approval letter is attached in Annexure H.

The following sections show the factors that were addressed by the researcher in the qualitative section of the research.

Informed Consent

Informed consent is essential to ensure that the individuals being studied are well aware of what the research entails, as well as their involvement in the study. Prior to the interviews, the researcher ensured that the participants were well aware of the purpose of the research, what was expected of them, the approximate time it would take to complete the interview, and the risks and benefits of the research (Mack et al 2005).

In addition, the researcher informed the participants that the interviews were voluntary, and that the participants could opt out at any point. Furthermore, the researcher requested permission to audio record the interview so that the participants' responses could be accurately documented and described.

No Harm

According to the researcher, there is no known harm that could occur as a result of anonymous participation in this research.

Privacy And Anonymity

At the beginning of the interview, the researcher informed each participant that their details would be kept confidential. The researcher would only provide summarised, aggregated results in the study, and would in no way link a participant to a particular response, thereby protecting the identity of the participants. In addition, the researcher anonymised the transcriptions by removing all content that could identify the participants.

Data Interpretation

The researcher is based in the industry; therefore it was absolutely critical that the researcher did not allow bias to influence the interpretation of the data. In order to prevent

researcher bias when interpreting the data, the researcher followed a systematic coding process. Furthermore, to ensure that the codes were consistent and valid, the researcher requested the transcriber, who is an independent individual in another industry, to code the data. The researcher then compared both sets of codes to isolate the non-matching codes. These non-matching codes were further scrutinised by the researcher and the transcriber to obtain a set of final, agreed-upon codes. During this rigorous process, the researcher and the other coder performed several iterations before they arrived at the set of final codes. These codes were then translated into key themes, which were examined and expanded upon in the Findings chapter.

4.5.2 Phase 2: Quantitative Research

In this section of the research, the researcher solicited responses through questionnaires from a sizeable number of ISP customers from all parts of the country. This approach proved to be cost effective for the researcher as it eliminated travel and the associated costs. The researcher was able to send the questionnaire to a wider audience in a short space of time (Check & Schutt 2011). Secondly, it allowed the researcher to generalise the results by gathering responses from a sizeable group (Dawson 2002). Thirdly, this approach proved to be a more reliable method as a standard set of questions was distributed to the customers. This research approach was in line with previous research in this domain; the only difference was that instead of traditional paper-based questionnaires, the researcher chose to distribute the questionnaires through an online survey tool. This method allowed the participants to respond at a time convenient to them. Furthermore, the researcher could analyse the data as objectively as possible with limited interference from bias.

As mentioned, every approach has a set of disadvantages associated with it. One of the challenges of questionnaires is that the researcher had to ensure that all the questions were easy to understand and not open for interpretation. The researcher addressed this shortcoming by piloting the questionnaire and performing several iterations of the questions before establishing the final questionnaire. Secondly, respondents could easily select any option just in an attempt to complete the questionnaire as swiftly as possible. Unfortunately, there is no way of tracking if respondents' responses were truthful, or if they gave sufficient thought to the questions posed.

Quantitative research aims to explain phenomena by gathering numerical data, and analysing those data through the use of statistics (Muijs 2004). This method warrants a scientific analysis with minimum researcher bias (Popper 1963).

The online questionnaire collated the responses from multiple respondents, and allowed for the integration of the raw data into a statistical tool called Statistical Package for the Social Sciences (SPSS) for analysis.

4.5.2.1   *Process*

Figure 4.3 outlines the high-level quantitative research process. The research questions, the input from the interviews, and the literature review contributed to the development of a draft questionnaire. This questionnaire was pre-tested with industry experts and piloted with a small sample set of customers. Several iterations were made, and eventually the final questionnaire was sent out. Data from the questionnaire were analysed through the statistical tool, SPSS.
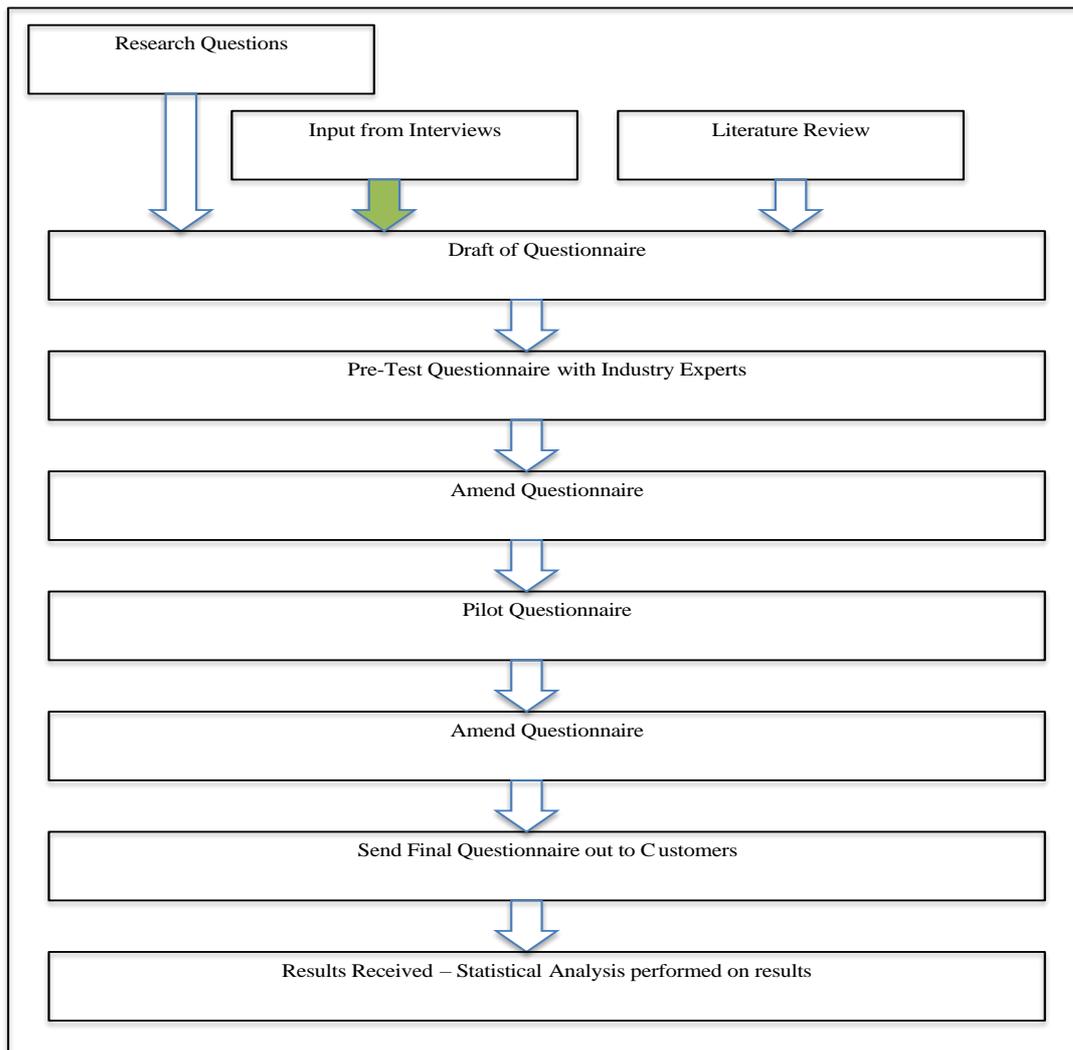
Figure 4.3: Quantitative research process (Researcher 2016)

This method allowed the researcher to obtain a view of South African customers' expectations and perceptions of ISPs' Service Quality, and the impact of this Service Quality on the customers' business performance. Furthermore, the questionnaire provided information regarding which components of ISPs' Service Quality were lacking, and which Service Quality dimensions were important to South African business customers. In addition, this method allowed the researcher to provide clarity on the relationship between ISPs' Service Quality and customers' business performance.

4.5.2.2   *Sampling*

A population is deemed as all the people a research study is meant to represent in order to generalise the results, whereas a sample is the actual portion of the population that has been selected to represent the population (Jackson 2010). According to Singh (2006), a population is seen as the parent group from which the researcher draws a sample. In this section of the research, the population comprises all the business customers of all ISPs. The actual number of Internet business customers in South Africa is unknown. The number of Internet business customers is regarded as strategic intelligence; therefore ISP companies are not willing to release this information. Furthermore, limited studies exist which can confirm the number of Internet business customers in South Africa. The statistics from Business Monitor International (2014a) indicate there are 477 012 business customers in South Africa. According to Sulaiman (2013), 60% of Internet traffic comprises businesses in South Africa. One could assume that 60% of the 477 012 business customers access the Internet, which equates to 286 207 customers as the population size. According to Krejcie and Morgan's (1970) sample size indicator, the sample size for the population of 286 207 business customers is 384.

The researcher initially requested the ISPA to send out an email containing the Uniform Resource Locator (URL) of the online survey to the gatekeepers of all the ISPs on its database. The ISPs were in turn requested to send the questionnaire out randomly to 30 or more of their business customers. This initial approach did not generate sufficient responses; therefore the researcher resorted to another method to increase the responses. The researcher followed a simple random sampling technique to select 100 companies from the Johannesburg Stock Exchange's (JSE) top 200 companies (JSE [sa]). The researcher emailed the questionnaires to 100 JSE-listed companies. In addition, the researcher posted the email and URL of the questionnaire on the MyBroadband website. The MyBroadband website contains up-to-date information on upcoming and existing technologies and solutions in the ICT and telecommunications space. This website is visited by various professionals and business customers. In addition, the researcher added a clause on the email that requested participants to send the questionnaire to others to complete (purposive, snowball sampling). In the end, the researcher received 323 responses.

4.5.2.3   Data Collection

This section addresses the data-collection instrument, the research procedure, and the structure of the research instrument. The researcher selected the questionnaire to gather and store the necessary information required to answer the research questions, and to satisfy the objectives of the research.

The Data-Collection Instrument

According to Abbott and McKinney (2013), questionnaires can be viewed as the written version of an interview. Questionnaires contain a list of questions that participants can either answer in text or select an answer from a list of responses in order to answer the question. Questionnaires are able to survey a wider audience with the least amount of time and money, and can contribute positively towards the validity and representation of the sample (Singh 2006). There are, however, also disadvantages to using a questionnaire; some being that the participants can easily misinterpret the questions and the response rates are low (Singh 2006).

According to Dawson (2002), there are three types of questionnaires: open-ended questionnaires, closed-ended questionnaires, and a combination of both. Closed-ended questionnaires are the most common, and allow participants to select answers from a list of options (Dawson 2002), whereas open-ended questionnaires allow participants to write their own answers. These are a little more difficult to code and group (Beins & McCarthy 2011). In this research, the questionnaire was in the form of an online survey which was sent to the business customers of ISPs. This survey contained closed-ended questions from SERVQUAL, which were amended to ensure compatibility and suitability for the Internet industry. Furthermore, the researcher added additional closed-ended questions to collect data to examine the relationship between Service Quality and business performance. Customers were able to select options by clicking on the appropriate radio buttons.

Since the research aims to test the impact of ISPs' Service Quality on business performance, the requirements were that the research sample should be computer literate and should have access to the Internet. It is therefore fitting that the questionnaire was presented in the form of an online survey. The questionnaires were administered in English. According to Beins and McCarthy (2011), web-based research has benefits and disadvantages. One benefit is

that the researcher does not need to schedule meetings with the participants, whereas the disadvantage is that the participants cannot ask for assistance if they do not understand a question or if they require further information (Beins & McCarthy 2011). An online survey allows the researcher to gain access to a wider geographic reach of participants, with reduced costs (Abbott & McKinney 2013).

In order to measure customers' evaluation of ISPs' Service Quality, and the impact of this Service Quality on customers' business performance, the researcher used a Likert scale to measure ISP customers' assessment of the five Service Quality dimensions; namely tangibility, reliability, responsiveness, assurance, and empathy. Furthermore, the researcher applied the same scale for the business performance questions. This decision was taken by the researcher and the statistician to warrant consistency, and to ensure that statistical analysis was performed effortlessly and data were comparable.

As mentioned in Chapter 2, SERVQUAL is an existing, well-established Service Quality instrument used by many researchers in various industries to assess Service Quality. After several engagements with industry experts in South Africa, the researcher had to modify certain questions in order to render them suitable for the South African Internet industry. This practice is not uncommon, as the literature revealed that various other researchers have also amended the original SERVQUAL to make it appropriate and relevant to their targeted audience and domain. Furthermore, the amended SERVQUAL was not sufficient to answer all the research questions, therefore the researcher had to add a section with supplementary questions to collect additional data.

The survey was created online using a web-based survey-creation program called SurveyMonkey. The researcher found SurveyMonkey easy to use, and navigation through the tool was fairly straightforward and self-explanatory. The researcher purchased an advanced version of SurveyMonkey, which allowed customisation of the layout and the questioning style, and more importantly, it accommodated integration into the statistical software package, SPSS.

The Structure Of The Questionnaires

In order to achieve the objectives of the research, the researcher developed a questionnaire with the following layout:

- Section 1 – Demographic information
- Section 2 – Expectations
- Section 3 – Perceptions
- Section 4 – Weighing of Service Quality dimensions
- Section 5 – Perceived business performance and Service Quality dimensions

The researcher developed Sections 1 and 5 of the questionnaire, whereas Sections 2, 3, and 4 were originally developed by Parasuraman et al (1985) and was modified by the researcher for the Internet industry.

As indicated earlier, the researcher employed a seven-point Likert scale in Sections 1, 2, and 3 of the questionnaire, whereas in Sections 4 and 5 the researcher utilised a five-point Likert scale. The researcher selected the Likert scale as previous literature provided empirical evidence that confirmed that the Likert scale is a prime measurement scale for the measurement of opinions, attitudes, and beliefs (LaMarca 2011). Opinions, attitudes, and beliefs vary across a wide continuum (Johns 2010), and therefore it was fitting to use this type of scale for research of this nature. Furthermore, the scale is universally understood, which is evident in the use of this scale in SERVQUAL studies around the world. In addition, the results can be effortlessly quantified statistically.

A copy of the questionnaire can be found in Annexure J of this document.

4.5.2.4   *Data-Analysis Procedures*

This section explains the various techniques the researcher utilised to analyse the data collected by this study.

SERVQUAL Data Analysis

For Sections 2, 3, and 4 of the research instrument, the researcher indicated that an modified version of SERVQUAL model was used. SERVQUAL has its own set of techniques to analyse data. As mentioned in Chapter 2, the SERVQUAL model consists of 22 statements. These 22 statements are grouped under five Service Quality dimensions, namely tangibility, reliability, responsiveness, assurance, and empathy. The 22 statements were repeated but were modified slightly to measure both expectations and perceptions, and to allow for comparisons. The first set of 22 statements was used to measure expectations (E), whereas

the second set of 22 statements was used to measure perceptions (P). In both instances the researcher used a seven-point Likert scale, which ranged from "Strongly disagree" to "Strongly agree" to measure the participants' responses. Thereafter the researcher could measure the gap between expectations and perceptions by subtracting the expectation score from the perception score (P – E) for each of the 22 statements. The value of the gap can be any value between -6 and +6. A negative score indicates that the customer's expectation is higher than the level of Service Quality currently experienced, whereas a positive score indicates that the level of Service Quality is much higher than what the customer expected.

In addition, Parasuraman, Berry and Zeithaml (1991b) concluded that each of these dimensions carries different levels of importance to different individuals, and based on this concept, they requested that participants give each dimension a weighting by dividing 100 points between the various dimensions. The participants should assign more points to dimensions that they view as important, and fewer points to dimensions they view as less important. The online tool lacked the capability and the mechanisms to allocate 100 points among the five dimensions, and also lacked the ability to sum up the allocated points. It is for these reasons that the researcher had to resort to ranking the importance of each dimension through the use of Likert scales. This approach reduces errors by preventing participants from inserting allocations that do not add up to 100, especially for tools that lack the functionality to automatically add up the allocations and display error messages should allocations add up to a number higher or lower than 100. The researcher presents the various dimensions and their importance rankings in the Findings chapter.

In the Findings section, data for expectations (E), perceptions (P), average unweighted gap score (P – E), and weighted score are displayed for each of the Service Quality dimensions.

Table 4.2 is an example of a table that was used to summarise data from customers of ISPs for each of the dimensions. The table demonstrates the information for the tangibility dimension. This table was replicated for each dimension (tangibility, reliability, responsiveness, empathy, and assurance).

Table 4.2: Example of a table for the tangibility dimension results (Researcher 2016)

Tangibility Statements	Expectations (E)	Perceptions (P)	Average unweighted Gap score (P-E)	Weighted Score

Additional Analysis

The researcher performed factor analysis on the perception statements, and low-loading and cross-loading factors were eliminated. Furthermore, regression analysis wase performed on the remaining factors and the business performance indicators to investigate causality.

Satisfaction Thresholds

Various researchers (Ferdous 2008; Sharma 2016) have used an 80% threshold in order to measure minimum customer satisfaction in each dimension of the SERVQUAL model. As previously indicated, the researcher used a seven-point Likert scale for Sections 2 and 4, and therefore the 80% threshold equates to a score of 5.6 out of 7 for each of the Service Quality dimensions. For example, the SERVQUAL dimension of reliability must achieve a minimum score of 5.6 out of 7 in order for the researcher to qualify it as satisfactory for that dimension, and any score lower than 5.6 is classified it as unsatisfactory for that dimension.

Quantitative Data-Analysis Tests

The researcher devised the lists of statistical tests that were required to be conducted for this research, and used the services of a qualified statistician to conduct the statistical tests through the SPSS tool to ensure accuracy. This is common practice for doctorate researchers as statistics is often not their area of expertise. However, the researcher analysed the results of the statistical tests in order to provide the interpretation in the data analysis chapter. Various descriptive statistical tests (means, standard deviations, frequencies, and percentages), Chi-square goodness-of-fit tests, Analysis of variance (ANOVA), binomial

tests, factor analysis, regression analysis, and one sample t-tests were performed. The researcher used the findings of the statistical tests to analyse and interpret the data.

4.5.2.5   *Data And Design Quality For Quantitative Research*

In research, it is absolutely critical for researchers to ensure that the research design has good reliability and validity. Reliability is when the research instrument produces the same results every time it is used, whereas validity tests whether the research instrument measures what it is supposed to measure (Abbott & McKinney 2013).

The Internal Validity Of The Research Design

This research intends to show the causal relationship between the two variables, ISPs' Service Quality and customers' business performance. If the results of the research indicate that the changes in the dependent variable (business performance) were due to the manipulation of the independent variable (ISPs' Service Quality), the research is deemed valid (Beins & McCarthy 2011).

The External Validity Of The Research Design

External validity is about how useful the findings are to more than one sample (Singh 2006; Beins & McCarthy 2011), which is seen as generalisability. The online questionnaire was sent randomly to customers from different backgrounds, varying demographic profiles, and from different industries. This diverse representation makes it possible for the research results to be generalised.

The Reliability Of The Data-Gathering Instrument

The statistician checked the questionnaire against the problems to be solved in order to ensure that there was progression and that there were no gaps and overlaps. In addition, the researcher pre-tested the questionnaire on several industry experts, including the research supervisor. The questionnaire was pre-tested to highlight grammatical errors, inconsistent content, incorrect interpretation of questions, and possible repetitions and limitations (Czaja 1998). After a rigorous pre-testing process, the questionnaire was further piloted among a small sample set of customers.

The Validity Of The Data-Gathering Instrument

Validity is measured by checking if an instrument actually measures what it claims to measure (Jackson 2010). Subject matter experts in the field and an ISPA representative verified the content validity by ensuring that the questionnaire could be completed in the allotted time, and that the directions were clear, concise, and not open to interpretation. Furthermore, Sections 2, 3, and 4 were part of an already established and tested model, SERVQUAL; however, after the modifications, the researcher had to confirm the validity through various statistical tests. In addition, the questionnaire was pre-tested and piloted in order to verify if the instrument collected the required data.

4.5.2.6 Ethical Considerations In Quantitative Research

It is of utmost importance that researchers abide by the code of ethics of the institution they are associated with. The researcher of this study had to be familiar with the Code of Ethics prescribed by the University of South Africa (UNISA), and had to ensure that the ethics policies and procedures were adhered to during the research (UNISA 2013). Ethics is concerned with the wellbeing of participants in research, and the impact of the research on them. Doctoral research students are required to perform their research honestly and with integrity. Confidentiality, anonymity, informed consent, and disclosure are some of the issues that need to be addressed as part of the research process (Jackson 2010; UNISA 2013).

The researcher completed an Ethical Clearance document and submitted it to the University Ethics Committee. The Ethical Clearance document reviewed the risk attached to the research project, the project details, the proposal summary, and ethical considerations. The Ethical Clearance document asks for proof of consent from participants, gatekeepers, and other institutional bodies involved in the research.

Institutional Approval

The researcher requested permission from the various bodies indicated below, and all the permission letters were attached to the Ethical Clearance document.

- The ISPA;
- Gatekeepers at ISPs; and

- Parasuraman, Zeithaml and Berry as the founders of the SERVQUAL model.

Copies of the permission letters can be found in the Annexure section of this thesis.

Informed Consent

According to Jackson (2010), informed consent is when participants give their permission to participate in a research study. The researcher ensured that consent was obtained prior to the participants completing the questionnaires. The questionnaires included a section at the beginning that asked the participants for their consent to use the data in this research. In addition, the letter to participants clearly indicated that participation in the research was voluntary and that the respondent could opt out at any time. Furthermore, the letter included information on the purpose of the research, and assured the participants that they would not incur any risks or costs by participating in this research.

Confidentiality And Anonymity

Confidentiality is when a researcher ensures participants that their information will not be disclosed directly to third parties, and anonymity ensures that the information in the results will not be traced back to the participants (Dawson 2002).

In the letter to the participants, the researcher assured the participants that their responses would be kept confidential, and the responses would not be linked back to individual participants. Furthermore, to prevent the questionnaires from falling into the wrong hands, all the responses of the questionnaires were stored online, to which only the researcher and statistician had access. The survey tool can only be accessed through a secure username and password. In addition, non-disclosure documents were signed by the statistician to ensure that the data remained confidential and the identities of the participants were kept confidential.

To ensure anonymity, the results do not name any ISP or customer. The results are presented in aggregated and summarised form through tables, text, and graphs, and do not single out any ISP or customer. The personal details found in the consent form were not and will not be revealed or made available to anyone other than the researcher and the statistician.

Compensation

Compensation is when a researcher offers participants either cash or in-kind compensation in exchange for participation in a study (Abbott & McKinney 2013). In some cases, if participants incur costs by participating in research, researchers are permitted to reimburse the participants. The participants did not incur any costs by participating in this research. The surveys were hosted online and therefore no postage or travel were required. Furthermore, for ethical reasons, participation in this study was not compensated. The researcher added this clause to the beginning of all the questionnaires.

4.6 CONCLUSION

This chapter started by uncovering the philosophical assumptions underpinning the research. In order to address the research questions and to solve the research problem, the researcher chose a mixed-methods research methodology. This study followed a sequential design, which commenced with Phase 1, which is the qualitative part of the research which provided input to Phase 2, the quantitative part of the research.

This chapter provided details on both the qualitative research phase and quantitative research phase. The chapter focused on the research process, sampling, data collection, data analysis, and data and design quality, as well as the ethical considerations of each phase. The details provided for each of these sections act as the foundation for other researchers to replicate and expand on this research.

The researcher conducted in-depth interviews with top managers of ISPs. The interviews were transcribed and coded. The researcher thereafter performed content analysis, which led to the identification of several themes. The researcher used these themes as input to guide and develop the questionnaire, The questionnaire was placed on an online tool called SurveyMonkey and was targeted at customers of ISPs. The tool allowed for the integration of data into SPSS. A thorough analysis of the questionnaire data was performed in SPSS.

The next chapter presents the findings of each phase, as well as a discussion of the findings.

CHAPTER 5

RESEARCH DATA ANALYSIS AND FINDINGS

5.1 INTRODUCTION

The aim of this chapter is to present the data analysis and research findings in order to provide valuable insight into the impact of South African ISPs' Service Quality on corporate customers' business performance. Furthermore, this research will lead to the development of a Service Quality measurement tool for the Internet industry in South Africa.

This chapter presents the data analysis and findings in three phases. Phase 1 provides the findings of the interviews; followed by Phase 2, which presents the findings of the surveys; and Phase 3 discusses the findings from both Phases 1 and 2.

In order to remain focused on the problem being solved, the researcher used the research questions as the basis for following the specific approach. The research questions are as follows:

- How do customers appraise ISPs' Service Quality in the South African market?
- What is the impact of South African ISPs' Service Quality on customers' business performance?
- What are the challenges experienced by ISPs in South Africa?
- What is the impact of these challenges on their ability to deliver the Service Quality South African business customers require?
- What is the gap between the ISP managers' perception of the Service Quality they provide, and business customers' perception of the Service Quality they receive?

Table 5.1 links the research questions to the data sources to give the reader insight into which data sources were consulted to answer the research questions.

Table 5.1: Link between research questions and data sources (Researcher 2016)

Research Questions	Data Source
How do customers appraise ISPs' Service Quality in the South African market?	Questionnaires
What is the impact of South African ISPs' Service Quality on business performance?	Interviews and Questionnaires
What are the challenges experienced by ISPs in South Africa, and what is the impact of these challenges on their ability to deliver the Service Quality South African business customers require?	Interviews and Questionnaires
What is the gap between the ISP management's perception of the Service Quality they provide, and business customers' perception of the Service Quality they receive?	Interviews and Questionnaires

5.2 PHASE 1: PRESENTATION OF QUALITATIVE RESEARCH FINDINGS

The researcher highlighted in Chapter 4 that all the interviews were audio recorded and transcribed. The transcribed content was subjected to rigorous coding, which resulted in the themes below being highlighted.

5.2.1 The Coding Process

The researcher used a Microsoft Excel spreadsheet to start the lengthy coding process (see Annexures K and L). Each question in the interview was assigned a unique number and was used as a column heading in the Excel spreadsheet. Thereafter the researcher copied the answers from each participant's transcript and displayed it under the relevant question. This allowed the researcher to compare all the answers from all the participants for a specific question, which permitted the researcher to quickly sift out common information and trends. Below is a snapshot of a section of the coding template, indicating only the first five participants (see Table 5.2).

Table 5.2: Snapshot of a section of the coding template (Researcher 2016)

Interviewee Identifier	C19 Perform traffic shaping when customers utilise bandwidth intensive applications	C20 Notify customers when traffic shaping is applied	C21 Challenges experienced when delivering Internet Services	C22 3rd Party suppliers' impact on Internet Service Quality	C23 Local Loop providers' impact on Internet Service Quality	C24 Peering and Transit providers' impact on Internet Service Quality
Participant A	No	N/A	Delivering of the physical last mile. Challenge to find the right medium, which is future proof and scalable, and implementing it in the right time frame.	3rd party suppliers are not able to address the urgency and level of quality	Availbility of their network and service delivery has an impact on service. Fibre breaks, or fibres being dug up increasing the downtime	Lack of peering from providers, thereby resulting in ISPs routing traffic through longer routes- Financial and technical ineffiencies
Participant B	No	N/A	Industry is growing exponentially, and its becoming difficult to keep up with clients demands. Difficulty dealing with other companies in this space.	Yes, reliability of the 3rd party suppliers infrastructure is not good.	Loop loop providers has the single biggest impact on clients. Expensive and unreliable	Peering was a challenge previously, however there has been some improvements. Companies are now offering full peering. Has huge impact on clients.
Participant C	No	N/A	Delivery capabilities and timeframes of 3rd parties	Delivery capabilities and timeframes of 3rd parties	Uptime of local loop providers' network. They face issues around dispute resolution- whose network is a the problem - The customer is affected in the end.	South Africa does not have a lot of content. South African's consume 80% International content. Choice of peering partners and location is important as it affects the quality of service. Peering correctly keeps the costs down and improves quality. The interconnects at peering points are running at an acceptable usage model. If the peering points are saturated then Internet performance is affected.
Participant D	Yes	Yes, they have acceptible usage policies that is agreed with client upfront.	Turnaround times of Fibre and Microwave last miles. Munipality turnaround times for wayleaves.	Company relies heavily on 3rd party suppliers- local loop turnaround timeframes and delivery impact the company	Local loop is irrelevant. Contention happens on the Internet breakout component which affects the quality of Internet. Majority of the service they provide is ADSL. If exchanges are down, then clients are affected.	There are more peering points in South Africa, and its a lot easy to peer. Clients are getting a better service.
Participant E	Yes	Yes, they get notifed at time when capacity is scare. Only uncapped customers are affected.	Challenges in getting the right network, right size of network, and throughput. Challenges- Timeframes to install last mile infrastructure. Commodised service therefore there are price	Yes, business depends on 3rd party suppliers		Peering correctly marginally improves speed, it is more cost optimisation exercise

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The data were categorised and only common concepts were grouped together and inserted into a code book. To eliminate bias, these concepts were then cross-checked and refined with an independent coder, and only themes that were common to both the researcher and the independent coder were used in the findings section. This technique is commonly used in qualitative research studies. Below is a snapshot of a section of the code book.

Column M – 2B11

Internet Service Quality provided by your company to your customers

1 = Good / Good because company owns the entire underlying infrastructure / Network is solid and performs well.

2 = Company utilises technologies and infrastructure that is not their own therefore full quality is not in their control./ Companies quality is dependent on the quality received by the backend providers

3 = Turnaround times to provision fixed last miles are longer

4 = Neutral

5 = Company able to sustain superior size and speeds / Fast

6 = Excellent / Best in South Africa if not the world

Figure 5.1: Snapshot of a section of the code book (Researcher 2016)

The interviews comprised four sections. The next section will present the data findings in the order of the sections.

5.2.2 Section 1 – General Demographic Information

The demographic information that follows provides insight into the general characteristics of the interviewees of this research study.

Under the demographic section of the interviews, the researcher asked questions pertaining to the time employed in the ICT industry, the time employed by the current company, the size of the business in turnover, the size of the business with regard to staff count, the size of the business in terms of amount of physical locations, and the number of customers.

As mentioned in Chapter 4, the top managers of ISPs were interviewed. The researcher observed that the interviewees were predominately male, and were between the ages of 35 and 60 years old.

Furthermore, a large portion of the interviewees belonged to the category that worked more than 11 years in the ICT industry (see Figure 5.2), whereas the majority of the top managers were fairly new in their current companies, which was less than five years (see Figure 5.3). According to the Deloitte (2015) Global Human Capital Trends Report, leadership is treated irregularly in organisations and development opportunities are only given to some managers. The problems that top managers need to resolve are proving to be much more complex than previously, and managers possibly lack the skills and experience to handle problems of this nature. This could provide insight as to why managers from large organisations leave to work for smaller organisations with less complexity, and why there are more managers moving between organisations in the industry.
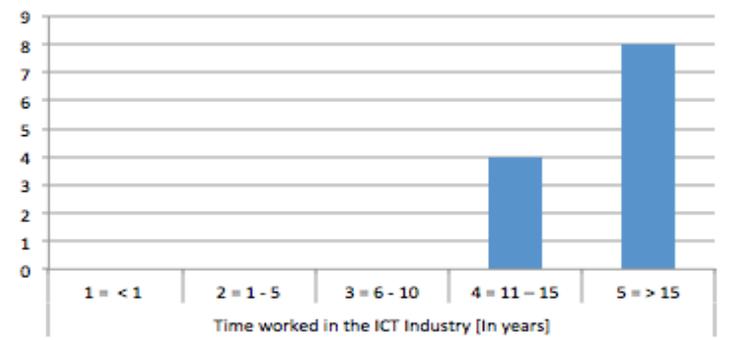
Figure 5.2: Time worked in the ICT industry (in years)

Figure 5.3 illustrates the number of years managers work for their current company.
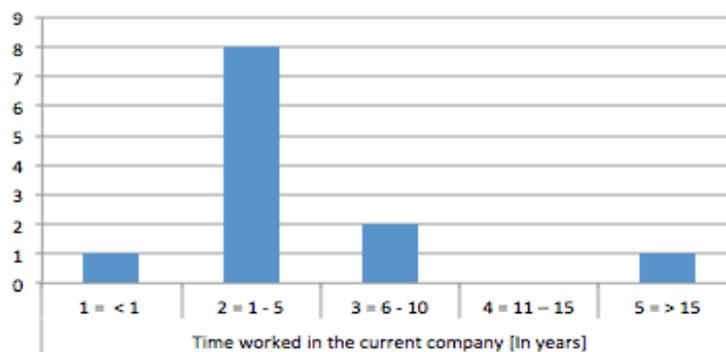
Figure 5.3: Time worked in current company (in years)

With regard to the statistics on the size of the business, the researcher chose to ask questions pertaining to the turnover amount, staff count, and the number of physical locations. In terms of the turnover, the researcher noticed that the interviewees belonged to ISPs that ranged in size – from ISPs that generated turnover figures lower than R100 million to those that generated more than R1 billion (see Figure 5.4). There was a fairly good representation of managers who belonged to small, medium, and large ISPs.
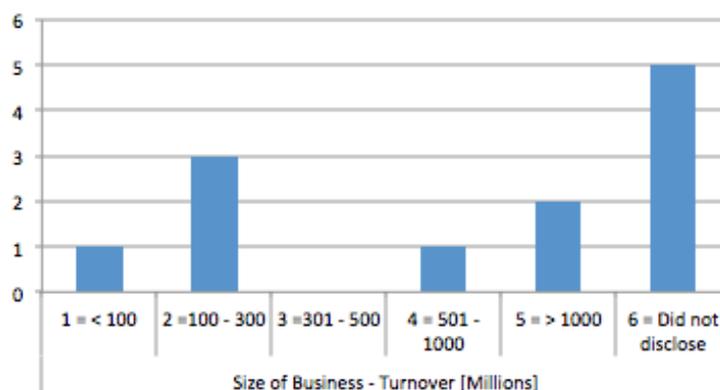
Figure 5.4: Size of business – Turnover (in millions)

Furthermore, the majority of the ISPs had less than 1 000 staff members, and had physical locations in all the metropolitan areas in South Africa, namely Durban, Johannesburg, Cape Town, Port Elizabeth, and Bloemfontein. In addition, some of the ISPs had offices in other parts of Africa such as Zambia, Zimbabwe, the Democratic Republic of the Congo (DRC), Rwanda, Uganda, Mozambique, and Tanzania.

5.2.3   Section 2 – ISPs' Perception Of Internet Service Quality

This section of the interview gathered information on ISP managers' perceptions of Internet Service Quality in South Africa as compared to Internet Service Quality in Europe, the USA, and in the rest of Africa.

5.2.3.1   *South African Internet Service Quality Versus Internet Service Quality In Europe And The USA*

There was an overall consensus that South African Internet Service Quality is poorer, slower, and more expensive compared to Europe and the USA, but there was a handful of

interviewees who felt that South African Internet quality was on par with Europe and the USA, and some even stated that it was "fantastic".

5.2.3.2 South African Internet Service Quality Versus Internet Service Quality In The Rest of Africa

The majority of the managers perceived South African Internet Service Quality to be superior and ahead of the rest of Africa. In addition, another theme that emerged quite prominently was that South Africa had far better Internet penetration rates and access to superior infrastructure than other countries in Africa. Internet penetration rates could be linked to costs and access to infrastructure. Some of the managers were of the opinion that South African Internet costs were cheaper than in other parts of Africa.

5.2.3.3 Excellent Internet Service Quality And Excellent ISPs – Perceptions Of South African ISPs

The ability to consume an application immediately is one of the fundamental themes that emerged. In addition, the speed of the connection and the stability of the link also played a significant role in ensuring excellent Internet Service Quality.

In response to the question on excellent ISPs, the majority of the ISP respondents shared their sentiments on customer centricity and understanding customers' needs better. It is interesting to note that the majority of the comments pointed towards service delivery and customer centricity. Furthermore, the majority of the managers believed that they offered good service to their customers, as they operated in an environment that provided fairly commoditised solutions.

Furthermore, some managers expressed concern that they did not own the full end-to-end value chain, and therefore their Service Quality was dependent on other parties' performance in the chain.

5.2.3.4 Service Quality Measurement Benchmarks In The Internet Industry

There was an equal allocation between the ISP managers who measured their Service Quality against benchmarks and those that did not. It is worth pointing out that there is a lack of formal global benchmark measurements in this space. The ISP managers who

measured their service against benchmarks utilised technical metrics as a basis for measurement. Furthermore, these technical metrics were not standardised, and therefore there was no single, standardised tool to perform these measurements.

5.2.4 Section 3 – The Impact Of Service Quality Dimensions On Customers' Business Performance

This section provides insight into ISP managers' perception of ISPs' influence on the Service Quality dimensions, and the impact of this influence on their customers' business performance. The Service Quality dimensions utilised were tangibles, reliability, responsiveness, assurance, and empathy.

5.2.4.1 *The Impact of Companies' Tangibles On Customers' Business Performance*

The majority of the managers believed that their companies' access to and ownership of infrastructure, their physical locations, and other assets had a largely positive impact on their customers' business performance, whereas a few managers were unsure of the impact.

5.2.4.2 *The Impact Of Companies' Reliability On Customers' Business Performance*

The majority of the managers were of the opinion that their companies' reliability had an overall positive influence on their customers' business performance, whereas only one manager felt that his/her company's reliability hindered the customers' business performance.

5.2.4.3 *The Impact Of Companies' Responsiveness On Customers' Business Performance*

The majority of the managers were of the opinion that their companies' responsiveness had a positive impact on their customers' business performance, whereas a few managers were unsure of the impact.

5.2.4.4 The Impact Of Companies' Assurance On Customers' Business Performance

The majority of the manager believed that their companies' assurance had a positive impact on their customers' business performance, whereas one manager was unsure of the impact.

5.2.4.5 The Impact Of Companies' Empathy On Customers' Business Performance

The majority of the managers believed that their companies' empathy had a positive impact on their customers' business performance, whereas 25% of the managers responded that their companies' empathy negatively influenced their customers' business performance.

5.2.4.6 The Most Important Service Quality Dimension As Indicated By ISPs

The majority of the ISPs were of the belief that reliability was the most important Service Quality dimension for the customer.

5.2.4.7 Traffic Shaping

There was an almost even distribution of ISPs that performed traffic shaping, and those that did not. Furthermore, the ISPs that provided traffic shaping informed their customers prior to performing traffic shaping.

5.2.5 Section 4 – Challenges Experienced By ISPs

Various themes emerged in this section, such as access to infrastructure, dependence on third parties, price pressures, regulatory pressures, customers' appetite to try new products and solutions, and tightly coupled responsibility among parties.

5.2.5.1 Access To Infrastructure

ISPs displayed their frustration with the challenges they experience in this space. In most cases, the last-mile component of the service was purchased from another provider, and therefore the quality of the installations and the implementation times were out of the ISPs' control. Furthermore, ISPs found it challenging to get the desired coverage for the customer,

which means that the ISP has to monitor and manage relationships with various providers, as no one provider is able to offer full coverage.

5.2.5.2   Dependence On Third Parties

In the Internet industry, ISPs are very dependent on third parties to deliver a full service. ISPs have to purchase various components such as hardware, software, last-mile infrastructure, licences, and wayleaves, which are permissions to trench and lay infrastructure. ISPs' delivery capabilities are only as good as their suppliers' capabilities. ISPs expressed their challenge in managing various providers. Furthermore, ISPs raised concerns regarding the lack of empathy and honesty from these suppliers, as well as the suppliers' lack of ability to deliver on promises, which directly affected the ISPs' delivery to their customers.

5.2.5.3   Price Pressures

Apart from the third-party delivery capabilities, price was another component that influenced ISPs' purchasing decisions. The price to the customer increases as the margins are stacked as components pass from one supplier to another. This margin stacking puts further price pressure on the ISPs. In addition, expensive transit costs and the shortage of peer providers further contribute to this pressure.

5.2.5.4   Regulatory Pressures

The ISPs expressed their concern with the South African regulatory body's inability to make decisions quickly, which affected ISPs' ability to deliver services. The findings indicate that there are a number of open issues that ISPs want resolved, which have a direct impact on their ability to deliver. Some ISPs even went as far as questioning the role and the benefit of the regulator in the South African Internet ecosystem.

5.2.5.5   Customers' Appetite To Try New Products And Solutions

The Internet industry in South Africa is growing at an exponential rate, and customers are not really open to new services. ISPs find it difficult to motivate customers to try out new services at a cost, which often leads to the ISPs making massive up-front financial

investments to stimulate customer demand. ISPs with deeper pockets are able to sustain their innovativeness, whereas smaller ISPs that lack financial backing are limited in providing innovative products and solutions, and in some cases are excluded from competing in this space with the larger companies.

5.2.5.6   Tightly Coupled Responsibility Among Parties

It was evident from the findings that ISPs were only responsible for the delivery of certain components of the solutions, and customers were not aware of where the responsibility started and ended, which sometimes proved to be a grey area. ISPs are generally the last point to interact with the customer, and therefore appeared to carry the responsibility of owning the full end-to-end service, which is made up of tasks conducted by various other service providers.

5.2.5.7   Impact Of Peering And Transit Providers On Internet Service Quality

There is a lack of peering providers in South Africa, which has resulted in ISPs having to incur additional costs and which led to technical inefficiencies. ISPs have seen a definite increase in peering points over the last couple of years; however, this is still insufficient to cater to the growing demand. The shortage of peering providers has a direct influence on latency and speed, which affect Service Quality.

5.2.5.8   Impact of Undersea Cable Capacity On Internet Service Quality

Over the past few years the South African Internet industry has benefited from the increase in undersea cables. The benefits include increased Internet speeds, improved service delivery, better customer experience when accessing international content, increased options for redundancy, an increase in content investment in Africa, and reduced costs.

5.2.5.9   Acceptable Contention Ratio

There is still an intense debate on contention ratios in the industry. The majority of the ISPs preferred no contention; however, some ISPs were of the opinion that it did not make business or financial sense to offer no contention. The South African Internet market is split into various categories of people, each of which wants services that meet their needs.

Some customers are willing to pay a premium to access an uncontended service, whereas others prefer a lower cost for a premium service. It is interesting to note that ISPs pointed out that in general they offered an uncontended service, but are forced to contend during peak times or times when the network capacity was under strain. ISPs were also researching and investing in other technologies to address contention and improve customer experience.

5.2.5.10   ISPs' Suggestions To Improve Service Quality

The ISPs highlighted various suggestions to improve Internet Service Quality in South Africa, among which:

- Improvement of the regulatory landscape, either through enforcing of quicker turn-around times on pending issues from the in-country regulator, or complete deregulation. In addition, some ISPs favoured the regulation of how the wholesale price is passed on to the customer as this would promote fair pricing and transparency in the market.

- Furthermore, the regulator needs to enforce a use-it-or-lose-it strategy for spectrum access. Very often large entities with deep pockets can afford to buy spectrum access, but are not able to deploy services in a timely manner. Time periods to hold on to the spectrum access should be controlled and monitored. If deployment is not achieved as initially promised, the regulator should have the right to take back the spectrum and resell it to the next provider.

- In addition, South Africa should promote rapid deployment of fibre in the country to increase coverage and to improve quality. Entrepreneurs should be incentivised to assist the government in accelerating deployments in under-serviced areas.

- ISPs should stop seeing bandwidth as the primary source of income, and rather invest in other value-adds that they can monetise. The cost of bandwidth is declining at a swift pace, and ISPs are struggling to retain existing revenue while balancing their investment in innovation.

- Furthermore, ISPs should look into selling spare capacity at reduced rates, or investigate swopping spare capacity with other providers to facilitate capacity and coverage demands.

- In line with the capacity swops, ISPs were of the opinion that unbundling the local loop would encourage further growth in Internet penetration and access; and would assist ISPs in reducing their costs.

5.3 PHASE 2: PRESENTATION OF QUANTITATIVE RESEARCH FINDINGS

This section presents the findings of the questionnaire. The researcher utilised SPSS to perform various statistical tests. The following tests were performed:

- Descriptive statistics: Means, standard deviations, frequencies, and percentages.
- Chi-square goodness-of-fit test: A univariate test used on categorical variables to test whether any of the response options were selected significantly more or less often than others.
- Binomial test: Tests whether a significant proportion of respondents selected one of two possible responses. This can be extended when data with more than two response options are split into two distinct groups.
- Factor analysis: This is used to explore relationships between variables in order to categorise and group them.
- Regression analysis: Used to determine the relationship between one or more variables to determine causality.
- One sample t-test: Tests whether a mean score is significantly different from a scalar value.

The questionnaire comprised five sections:

- Section 1 – Demographics
- Section 2 – Expectations
- Section 3 – Perceptions
- Section 4 – Weighting of Service Quality dimensions
- Section 5 – Perceived business performance and Service Quality dimensions

The data findings of the questionnaires are presented under the relevant sections as above.

5.3.1 Section 1 – Demographics

The purpose of this section is to provide an overview of the general characteristics of the participants to provide information for the reader regarding the respondents who participated in this survey. This section presents the frequency and percentages of the age, gender, time employed at the current company, type of position, and the size of the business. In addition, this section provides the findings of the binomial test performed on the "regular use of tasks performed using the Internet at work".

5.3.1.1 Age

The figure that follows presents the results of the participants' age groups.
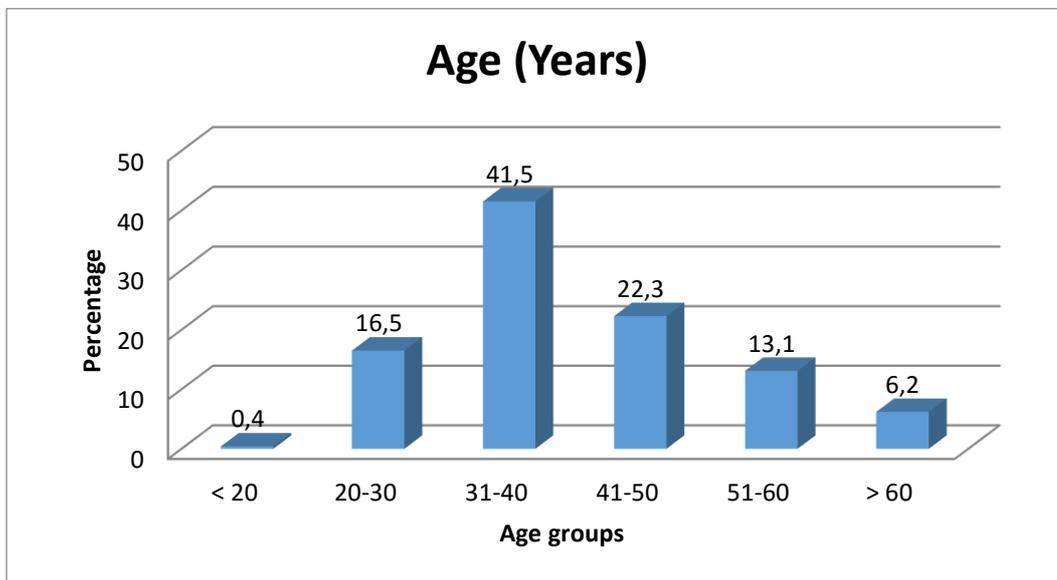
Figure 5.5: Age and percentage categories

Figure 5.5 illustrates that a large portion of the respondents were between 31 and 50 years of age.

5.3.1.2 Gender

The graph that follows presents the results of the participants' gender. There were significantly more male participants than female participants.
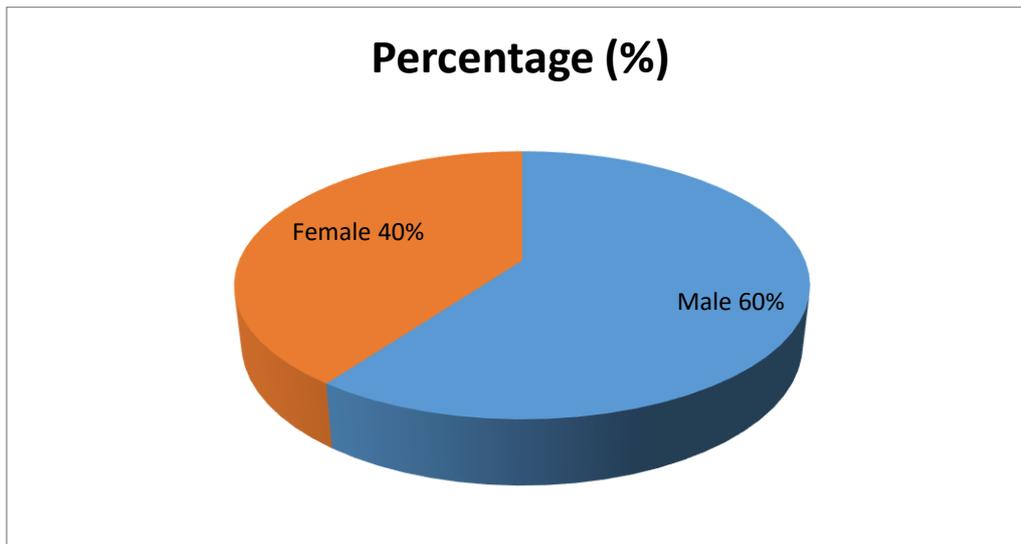
Figure 5.6: Gender percentage split

The graph illustrates that 60% of the respondents were male and 40% were female.

5.3.1.3   *Time Employed By Current Company*

The graph that follows indicates the results of the time employed by the respondent's current company.
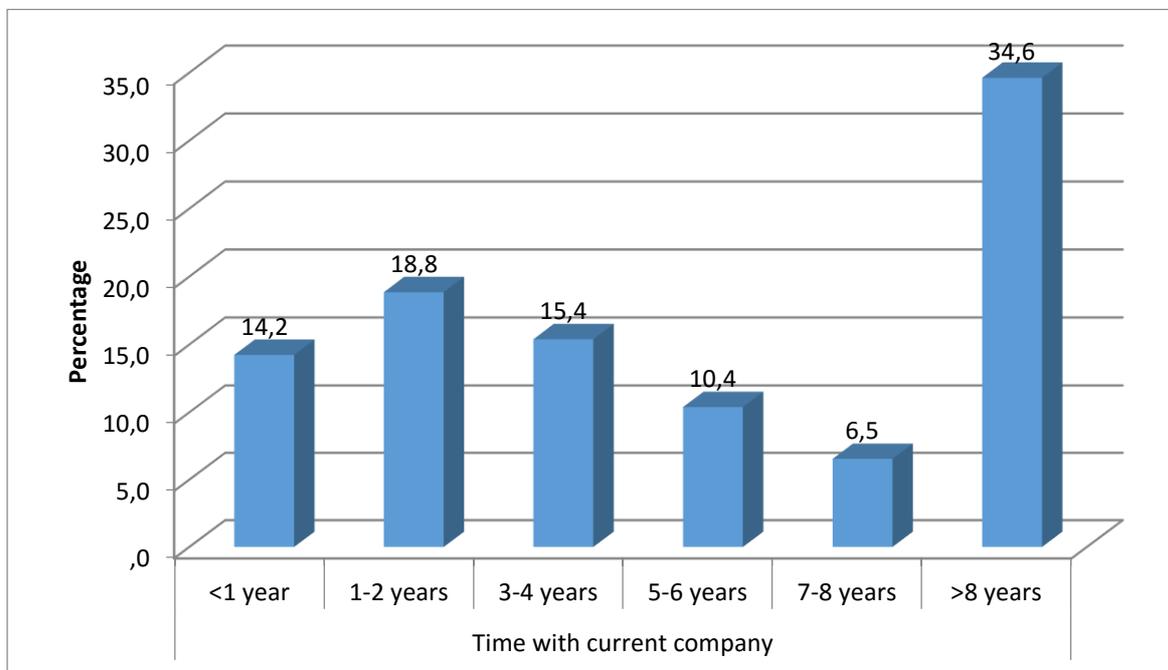
Figure 5.7: Time employed by current company

Approximately 34% of the respondents had been employed for more than eight years by their current company, whereas close to 48% had been employed less than four years by the current company.

5.3.1.4   Type Of Position

The table that follows presents the results of the type of position held by the participant. The majority of the participants were in managerial positions.

Table 5.3: Type of position and frequency

Type of Position	Frequency (F)	Percentage (%)
Managerial	174	66.9
Non-managerial	86	33.1
Total	260	100.00

According to Table 5.3, 66.9% of the respondents were managers, whereas 33.1% were non-managers.

5.3.1.5   The Size Of The Business

The graph that follows shows the results of the size of the business. The majority of the participants belonged to large organisations with turnover greater than R50 million.
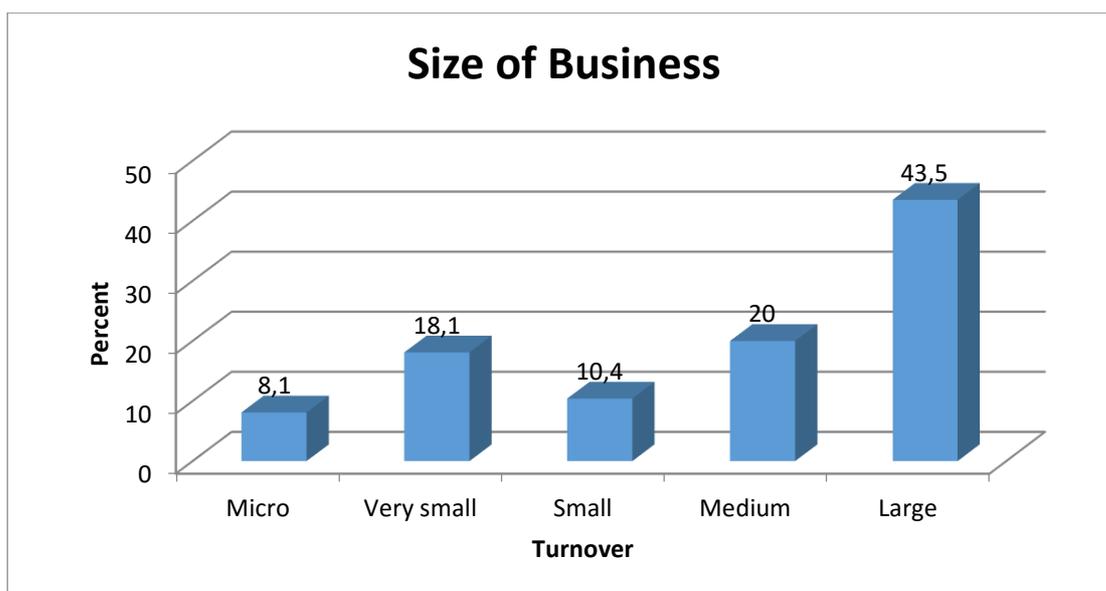
Figure 5.8: The size of the business: Split

Figure 5.8 indicates that the majority of the participants worked for large organisations, whereas a small portion of 8.1% of the participants worked for micro organisations with turnovers less than R150 000. In addition, Figure 5.8 illustrates that there was representation from all sizes of organisations.

5.3.1.6 *Regularity Of Use At Work*

Figure 5.9 displays the results of regular tasks performed at work using the Internet.
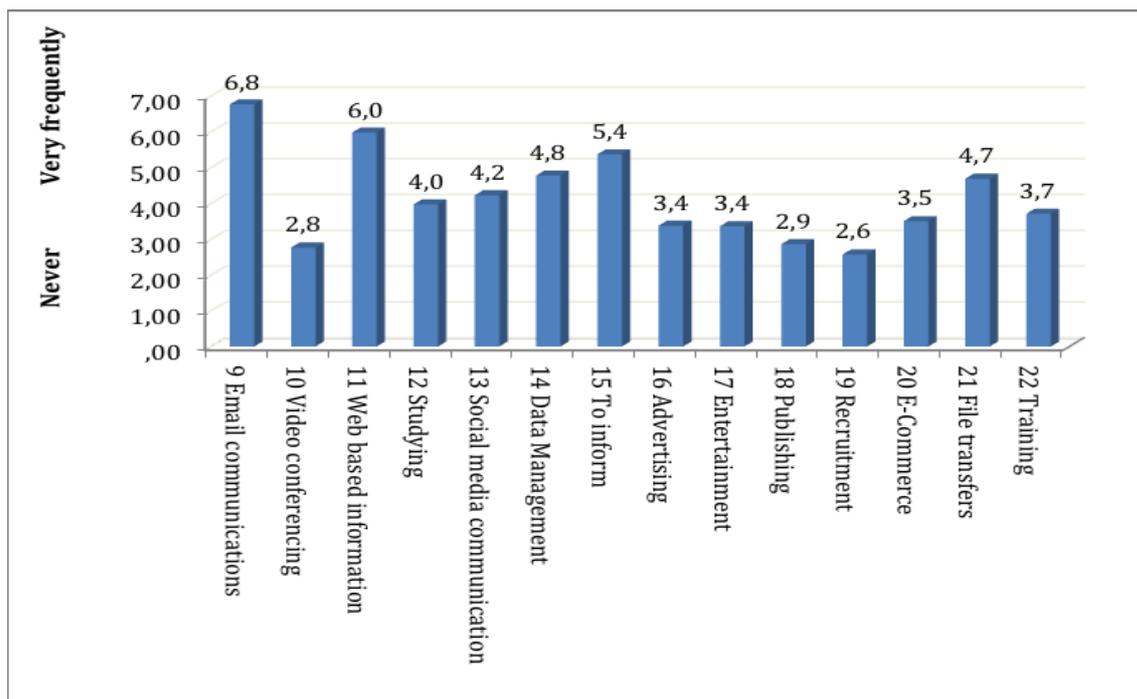
Figure 5.9: Tasks performed using the Internet

Each task above was split into two groups. The first group contained responses from 0 to 5, and the second group contained responses from 6 to 7. These two groups were compared, and only tasks which showed a significant number of responses in Group 2 were reported on. The binomial test results showed that there was a significantly high usage of email and web-based information searches. A significant proportion of the respondents indicated high usage for emails (94%, p<.0005) and web-based information searches (71%, p<.0005).

5.3.2 Section 2 – Expectations

This section presents the findings of the Expectations section of the questionnaire. The findings are displayed against the five SERVQUAL dimensions (tangibles, reliability,

responsiveness, assurance, and empathy), which are subdivided into statements under each dimension. These statements were used to determine South African business customers' expectations of ISPs' Service Quality.

Frequencies and percentages are displayed for each statement of the Expectations section. The average scores are also displayed. Table 5.4 illustrates the SERVQUAL dimensions and the associated Expectation statement numbers.

Table 5.4: Expectations statements linked to SERVQUAL dimensions

SERVQUAL Dimension	Expectations
Tangibles	E1, E2, E3, E4
Reliability	E5, E6, E7, E8, E9
Responsiveness	E10, E11, E12, E13
Assurance	E14, E15, E16, E17
Empathy	E18, E19, E20, E21, E22

The following tables show the Expectation statement numbers, and their associated statement definition. There are 22 Expectation statements. This information is provided to provide insight into the relevant statements utilised, and to make it simpler to understand the statistical information provided further in the chapter.

Table 5.5: Expectations statements (1-11)

Expectations	Statements
E1	Excellent ISPs use the latest technology.
E2	Excellent ISPs use superior infrastructure.
E3	Call centre employees at excellent ISPs appear to be competent and consistent in their interaction with customers.
E4	Materials associated with the service (product collateral and other documentation) are visually appealing at an excellent ISP.
E5	When excellent ISPs promise to do something by a certain time, they do so.
E6	When a customer has a problem, excellent ISPs will show a sincere interest in solving it.
E7	Excellent ISPs perform the service right the first time.
E8	Excellent ISPs provide the service at the time they promised to do so.
E9	Excellent ISPs insist on error-free records.

Expectations	Statements
E10	Employees of excellent ISPs tell customers exactly when services will be performed.
E11	Employees of excellent ISPs give prompt service to customers.

Table 5.6: Expectations statements (12-22)

Expectations	Statements
E12	Employees of excellent ISPs are always be willing to help customers.
E13	Employees of excellent ISPs are never be too busy to respond to customers' requests.
E14	The behaviour of employees of excellent ISPs instils confidence in customers.
E15	Customers of excellent ISPs feel safe in transactions.
E16	Employees of excellent ISPs are consistently courteous with customers.
E17	*Note: Missing from questionnaire and therefore excluded.*
E18	Excellent ISPs give customers individual attention.
E19	Excellent ISPs have operating hours convenient to all their customers.
E20	Excellent ISPs have employees who give customers personal attention.
E21	Excellent ISPs have customers' best interest at heart.
E22	The employees of excellent ISPs understand the specific needs of their customers.

Figure 5.10 displays the results of South African business customers' expectations of ISPs' Service Quality. The majority of the responses were greater than 6 for each of the Expectation statements, which indicates that South African customers expect a lot from the ISPs for each of these statements. However, with Statements E4 and E20 the responses were less than 6, which indicates that customers have much lower expectations on these two statements. Statement E4 refers to materials associated with the service being visually appealing, and Statement E20 refers to ISPs having employees who give personal attention to customers.
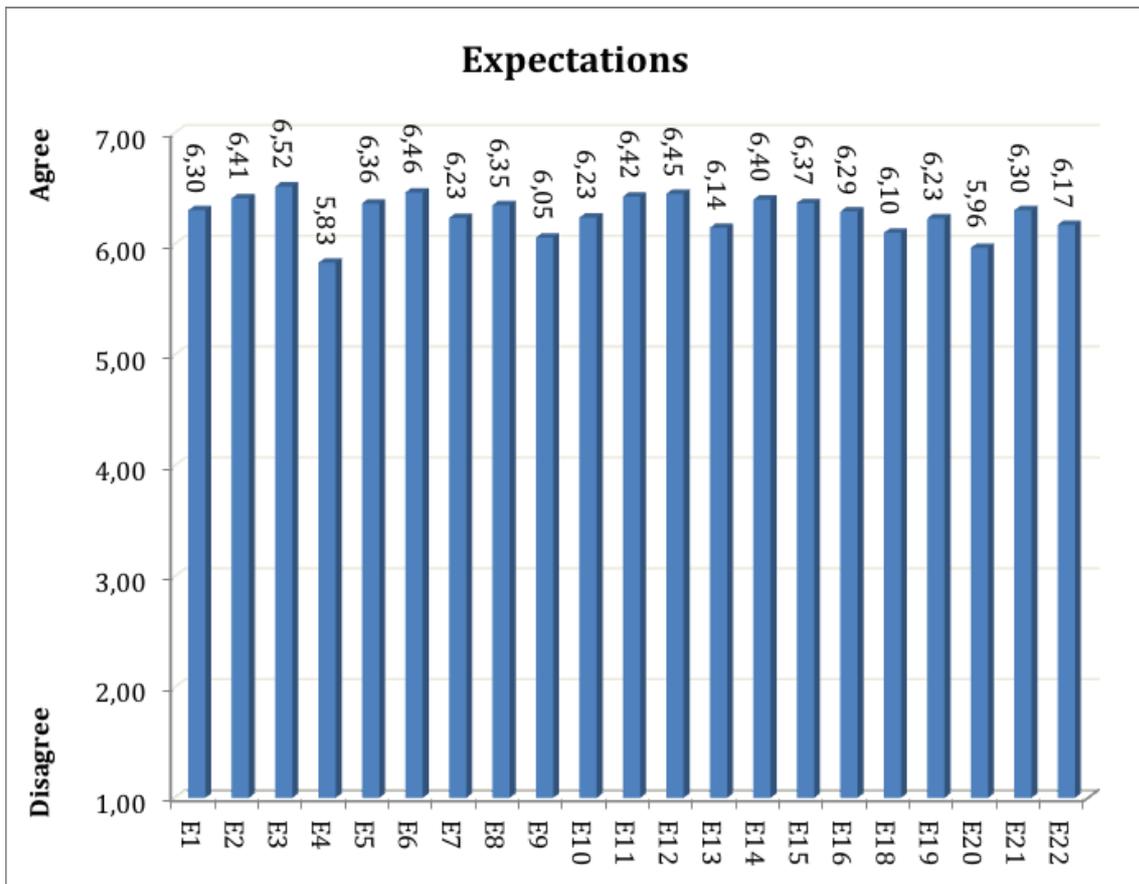
Figure 5.10: South African business customers' expectations of excellent ISPs

The one sample t-test revealed that there was significant agreement to all these expectations, with $p<.0005$ in each case.

5.3.3 Section 3 – Perceptions

This section provides the findings of the Perceptions section of the questionnaire. The findings are displayed against the five SERVQUAL dimensions (tangibles, reliability, responsiveness, assurance, and empathy), which are subdivided into statements under each dimension. These statements were used to determine South African business customers' perceptions of ISPs' Service Quality.

Frequencies and percentages are displayed for each statement of the Perceptions section. The average scores are also displayed.

Table 5.7 illustrates the SERVQUAL dimensions and the associated Perception statement numbers.

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Table 5.7: Perceptions statements linked to SERVQUAL dimensions

SERVQUAL Dimension	Perceptions
Tangibles	P1, P2, P3, P4
Reliability	P5, P6, P7, P8, P9
Responsiveness	P10, P11, P12, P13
Assurance	P14, P15, P16, P17
Empathy	P18, P19, P20, P21, P22

The following tables show the Perception statement numbers, and their associated statement definition. There are 22 Perception statements. This information is provided to provide insight into the relevant statements utilised, and to make it simpler to understand the statistical information provided further in the chapter.

Table 5.8: Perceptions statements (1-18)

Perceptions	Statements
P1	Your ISP uses the latest technology.
P2	Your ISP has superior infrastructure.
P3	The call centre employees at your ISP appear to be competent and consistent in their interaction with you.
P4	Materials associated with the service (such as product collateral and other documentation) are visually appealing at your ISP.
P5	When your ISP promises to do something by a certain time, they do so.
P6	When you have a problem, your ISP shows a sincere interest in solving it.
P7	Your ISP performs the service right the first time.
P8	Your ISP provides its services at the time it promised to do so.
P9	Your ISP insists on error-free records.
P10	Employees at your ISP tell you exactly when services will be performed.
P11	Employees at your ISP give you prompt service.
P12	Employees at your ISP are always willing to help you.
P13	Employees at your ISP are never too busy to respond to your requests.
P14	The behaviour of employees at your ISP instils confidence in you.
P15	You feel safe in your transactions with your ISP.
P16	Employees at your ISP are consistently courteous to you.
P17	Employees at your ISP have the knowledge to answer your questions.
P18	Your ISP gives you individual attention.

Table 5.9: Perceptions statements (19-22)

Perceptions	Statements
P19	Your ISP has operating hours convenient to all its customers.
P20	Your ISP has employees who give you personal attention.
P21	Your ISP has your best interests at heart.
P22	The employees of your ISP understands your specific needs.

Figure 5.11 displays the results of South African business customers' perceptions of ISPs' Service Quality. South African customer participants had a perception value higher than 5 for the majority of the Perception statements, which indicates that they perceived the ISPs' Service Quality to be above satisfactory. Only P9 was slightly lower than 5, which referred to ISPs insisting on error-free records.
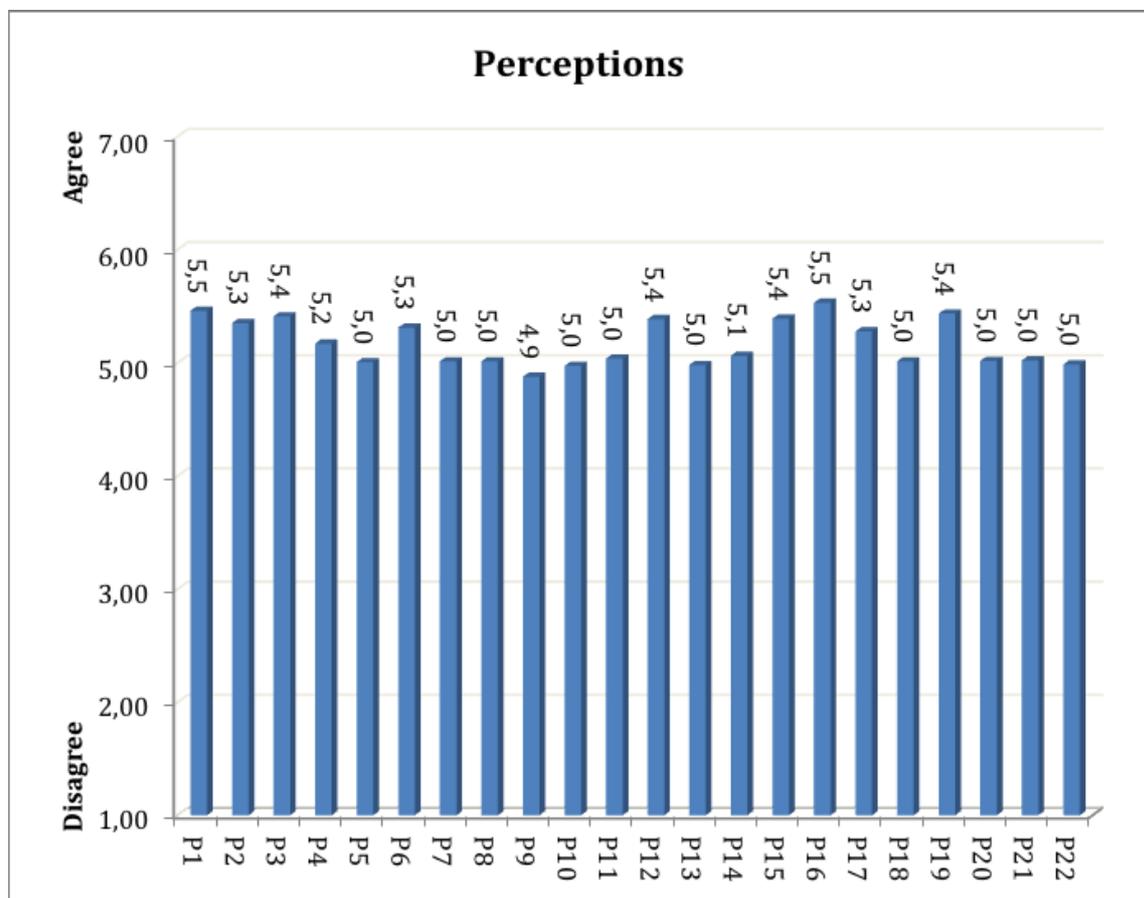

Figure 5.11: South African business customers' perceptions of their ISPs

The one sample t-test revealed that there was significant agreement to all of these perceptions, with p<.0005 in each case.

5.3.3.1 Expectations Versus Perceptions

Figure 5.12 shows the plotting of Expectations against Perceptions for each dimension. For each of the dimensions, the graph illustrates that Expectations were higher than Perceptions.
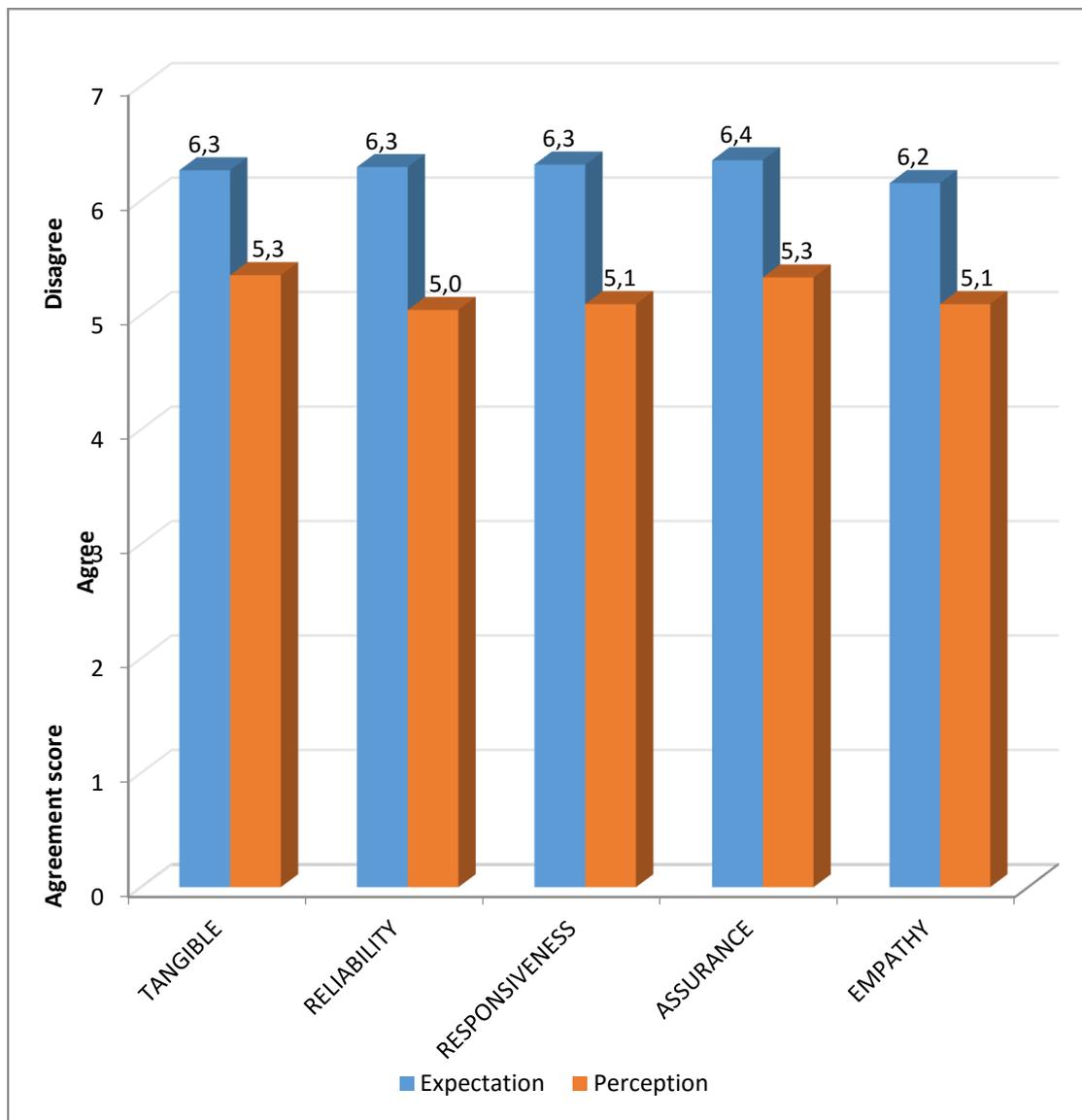
Figure 5.12: Expectations versus Perceptions

5.3.3.2 Gap Scores

A gap score is the difference between the values for Expectations and the values for Perceptions, and is calculated as follows:

Gap = Perceptions – Expectations

Please note that there is no gap score for Statement 17 since the Expectations statement (E17) was omitted in error from the questionnaire.

Table 5.10: Gaps = Perceptions – Expectations

Gaps	Gap = Perceptions (P) – Expectations (E)
Gap 1	P1 – E1
Gap 2	P2 – E2
Gap 3	P3 – E3
Gap 4	P4 – E4
Gap 5	P5 – E5
Gap 6	P6 – E6
Gap 7	P7 – E7
Gap 8	P8 – E8
Gap 9	P9 – E9
Gap 10	P10 – E10
Gap 11	P11 – E11
Gap 12	P12 – E12
Gap 13	P13 – E13
Gap 14	P14 – E14
Gap 15	P15 – E15
Gap 16	P16 – E16
Gap 18	P18 – E18
Gap 19	P19 – E19
Gap 20	P20 – E20
Gap 21	P21 – E21
Gap 22	P22 – E22

The findings revealed that the gap scores of all the statements were negative, which indicates that Expectations were higher than Perceptions in each case. Furthermore, the one sample t-test shows that for all 21 questions (excluding Statement 17), Expectations were significantly different from Perceptions, with $p<.0005$ in each case.

The magnitude of the gaps can be used for comparative purposes and for making recommendations. The larger negative score indicates a larger gap than a smaller negative score. Table 5.11 provides the order of the gaps from the biggest gap to the smallest gap.

According to the table, the top three gaps are Gaps 11, 5, and 8, where the difference between the Expectations statement and the Perceptions statements is significant.

Table 5.11: Gaps listed in ascending order

Gaps	Difference
Gap 11	-1.38
Gap 5	-1.35
Gap 8	-1.33
Gap 14	-1.33
Gap 21	-1.29
Gap 10	-1.25
Gap 7	-1.23
Gap 22	-1.19
Gap 9	-1.17
Gap 13	-1.17
Gap 6	-1.15
Gap 3	-1.10
Gap 18	-1.08
Gap 12	-1.06
Gap 2	-1.06
Gap 15	-.96
Gap 20	-.95
Gap 1	-.84
Gap 19	-.79
Gap 16	-.76
Gap 4	-.66
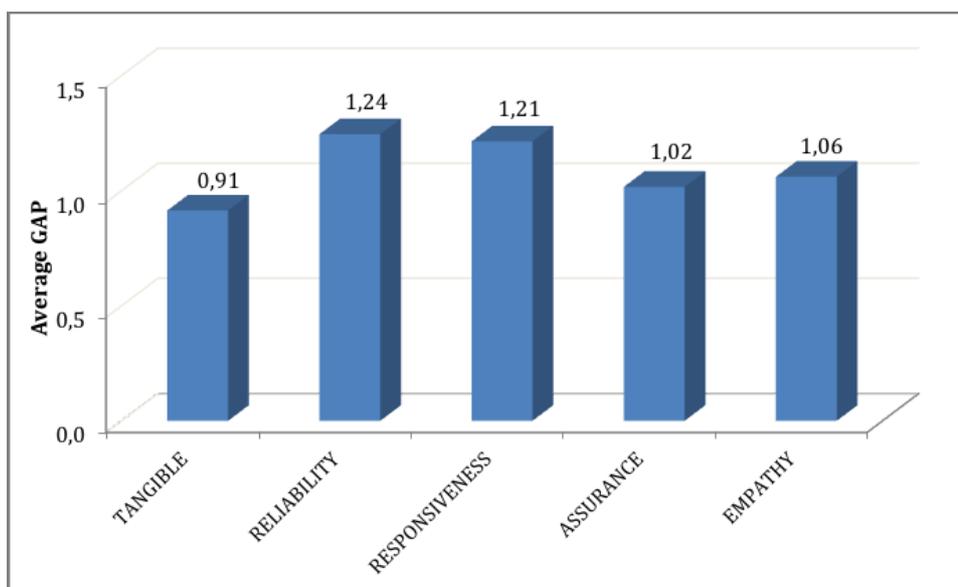
Figure 5.13: Average gaps listed in the positive

Figure 5.13 illustrates the average gaps listed in the positive. The larger the gap, the more the Service Quality of the ISPs fell below Expectations. The graph uses the positive values, therefore making it easy to interpret. The results indicate that reliability and responsiveness had the highest gaps.

5.3.3.3 *Reliability Of The Five SERVQUAL Dimensions*

In order to test the dimensions for consistency, Cronbach's alpha coefficient was used to test the Expectations, Perceptions, and gaps of the group of statements for each dimension.

Table 5.12 displays the alpha values for each of the measures.

Table 5.12: Reliability test – Cronbach's alpha for each dimension

Dimension	Questions Included	Expectation	Perception	Gap
Tangibles	1-4	0.754	0.826	0.783
Reliability	5-9	0.903	0.946	0.923
Responsiveness	10-13	0.885	0.934	0.913
Assurance	14-16	0.856	0.917	0.881
Empathy	18-22	0.889	0.937	0.919

The findings indicated that all these measures were reliable as the values were greater than 0.7.

Bivariate Analysis

The following section presents the results of the gender, size of business, and type of position comparisons.

Gender Comparisons

Further tests were conducted to test the differences between Expectations and Perceptions across gender. Independent one-sample t-tests were conducted. Under the Expectations comparison, the results showed that significant differences were found in E4 and E5, whereas in the Perceptions comparisons, there were no significant differences.

For E4 – Females (M=6.00) agreed significantly more than males (M=5.71) that materials associated with the service are visually appealing at an excellent ISP (t(236.216)= -2.052, p=.041).

For E5 – Males (M=6.50) agreed significantly more than females (M=6.15) that when excellent ISPs promise to do something by a certain time, they do so (t(185.137)= 2.568, p=.011).

Size of Business Comparisons

Further testing was conducted to test the differences between the responses across the size of the business, and customers' Expectations and Perceptions.

Table 5.13: Robust tests of equality of means

E2 Excellent Internet Service Providers will use superior infrastructure

	Statistic[a]	df1	df2	Sig.
Welch	2.584	4	74.474	.044

a. Asymptotically F distributed.

Under Expectations, there was a significant difference in agreement across the size of the business (Welch (4, 74.474) = 2.584, p=044). Large business customers (M=6.58) agreed

more than very small business customers (M=6.06) that excellent ISPs use superior infrastructure, whereas there were no significant differences under Perceptions.

Type of Position Comparisons

Managerial staff (M=6.4) scored significantly higher on Expectations of reliability than non-managerial staff (M=6.1), t(126.213)=2.815 , p=.006.

5.3.4   Section 4 – Weighting Of SERVQUAL Dimensions

This section provides the results of the unweighted SERVQUAL scores, discusses the importance of the SERVQUAL dimensions, and presents the analysis of the importance of each dimension.

5.3.4.1   Unweighted SERVQUAL Scores

In order to calculate the unweighted SERVQUAL scores, the average of all the gap scores were calculated. The overall average unweighted SERVQUAL score for all dimensions was 1.0898 (see Table 5.14).

Table 5.14: Average unweighted SERVQUAL scores

Gap	N	Minimum	Maximum	Mean	Std. Deviation
GAP_Tangibles	249	-6.00	2.00	-0.9137	1.16768
GAP_Reliability	249	-6.00	2.20	-1.2450	1.50726
GAP-_Responsiveness	249	-6.00	2.25	-1.2139	1.52423
GAP_Assurance	249	-6.00	2.00	-1.0161	1.42831
GAP_Empathy	249	-6.00	2.00	-1.0602	1.47290

Average unweighted SERVQUAL score	N	Minimum	Maximum	Mean	Std. Deviation
	249	-5.70	2.09	-1.0898	1.29756

5.3.4.2   The Importance Of The Service Quality Dimensions – Weights

Table 5.15 indicates the results of the importance weight against each dimension. The larger the weight, the more important the dimension.

Table 5.15: Dimensions and weights

Dimensions	Importance weight
Tangibles	3.3360
Reliability	3.5951
Responsiveness	3.4818
Assurance	3.1700
Empathy	3.6275

The results indicate that empathy was the most important dimension for ISPs' South African business customers.

5.3.4.3   Analysis Of The Importance Of Each Dimension

In order to analyse the importance of each dimension, the Chi-square goodness of fit was utilised to determine if any of the importance response options was selected significantly more often than others:

- A significant number indicated that tangibles was at least rather important (χ^2 (4) = 241.684, p<.0005).

- A significant number indicated that reliability was at least rather important (χ^2 (4) = 405.045, p<.0005).

- A significant number indicated that responsiveness was at least rather important (χ^2 (4) = 312.615, p<.0005).

- A significant number indicated that assurance was at least rather important (χ^2 (4) = 175.328, p<.0005).

- A significant number indicated that empathy was at least rather important (χ^2 (4) = 448.040, p<.0005).

5.3.5 Section 5 – Perceived Business Performance and Service Quality Dimensions

This section presents the results of the impact of the Service Quality dimensions on South African corporate customers' business performance. Participants had to rate the importance of ISPs' Service Quality dimensions on their company's business performance.

The results indicate that:

- ISPs' tangibles had a significant positive impact on business performance (t (240) = 18.489, p<.0005.
- ISPs' reliability had a significant positive impact on business performance (t (240) = 17.604, p<.0005.
- ISPs' responsiveness had a significant positive impact on business performance (t (240) = 15.358, p<.0005.
- ISPs' assurance had a significant positive impact on business performance (t (240) = 17.192, p<.0005.
- ISPs' empathy had a significant positive impact on business performance (t (240) = 14.276, p<.0005.
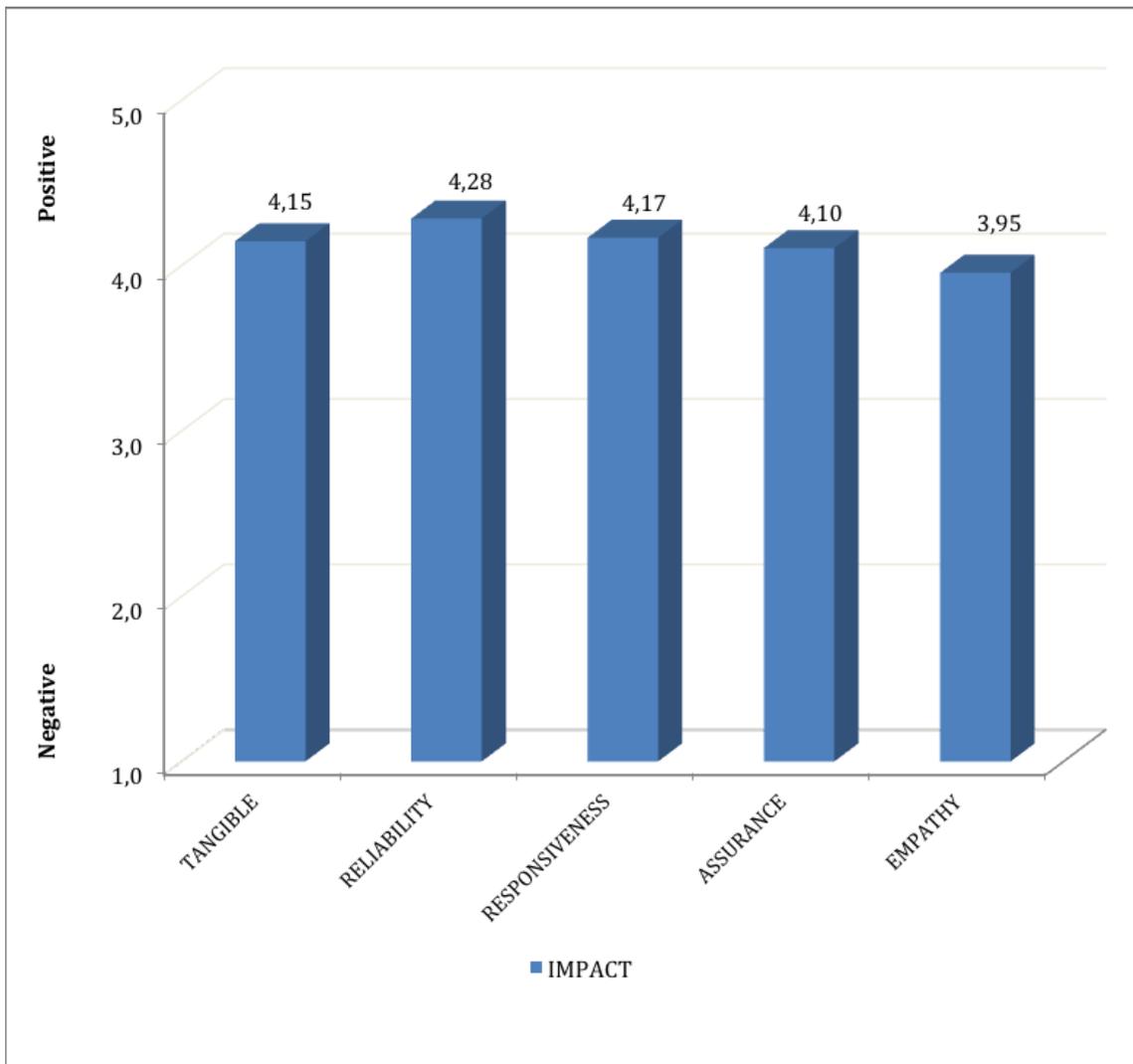
Figure 5.14: Impact of ISPs' Service Quality on customers' business performance

Figure 5.14 illustrates that South African corporate customers are of the opinion that the Service Quality received from their ISP positively impacted their companies' business performance. The majority of the Service Quality dimensions scored a rating above 4, with reliability being slightly higher than the rest. Only empathy scored a lower rating, which indicates that empathy impacted business performance less positively than the other Service Quality dimensions.

5.3.5.1 *The Impact Of ISPs' Service Quality On Business Performance Indicators*

Figure 5.15 illustrates the results of the impact of ISPs' Service Quality on South African corporate customers' key business performance indicators.
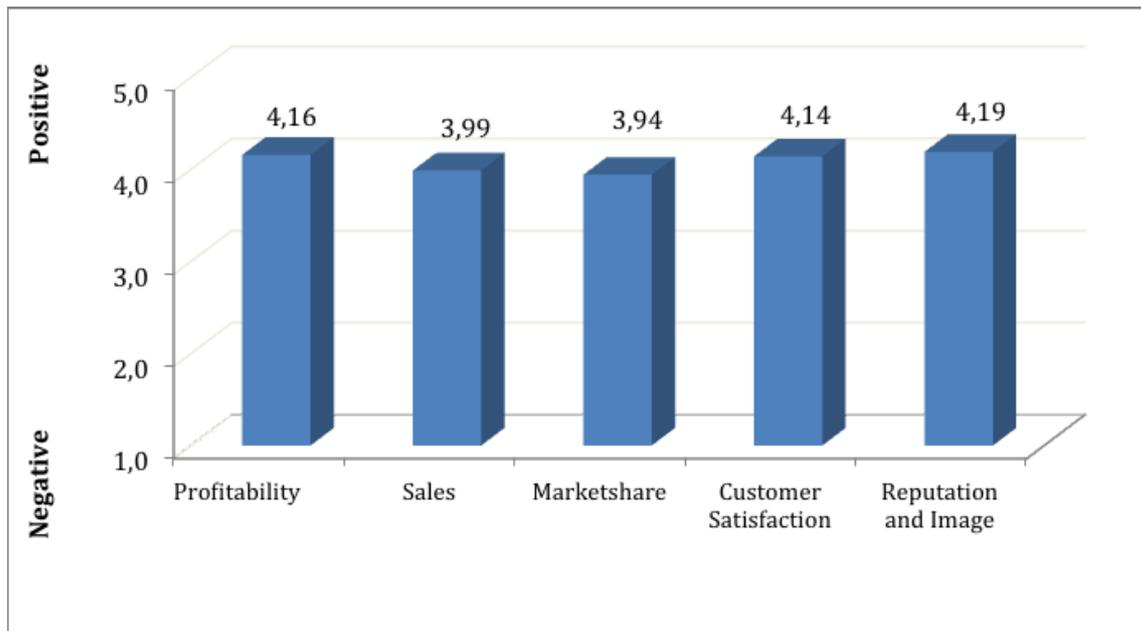
Figure 5.15: ISPs' Service Quality and its impact on customers' business performance

The results show that ISPs' Service Quality positively impacted all the business performance indicators. The majority of the ratings were above 4, whereas ratings for sales and market share were slightly below 4.

The results of the one-sample t-test indicate the following:

- The ISPs' Service Quality had a significant positive impact on the customers' profitability (t (240) = 17.679, p<.0005.
- The ISPs' Service Quality had a significant positive impact on the customers' sales (t (240) = 15.835, p<.0005.
- The ISPs' Service Quality had a significant positive impact on the customers' market share (t (240) = 16.051, p<.0005.
- The ISPs' Service Quality had a significant positive impact on the companies' customer satisfaction (t (240) = 17.670, p<.0005.
- The ISPs' Service Quality had a significant positive impact on the companies' reputation and image (t (240) = 19.000, p<.0005.

Factor Analysis And Regression Analysis

Factor analysis is used to categorise data in order to identify relationships and groupings. It gives the researcher a view of the minimum number of factors required to display the

relationships among variables (Yong & Pearce 2013). The research conducted factor analysis on the Expectation statements, followed by factor analysis on the Perceptions statements. Prior to performing a factor analysis, a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was conducted to determine the suitability of the sample for factor analysis. A value lower than 0.5 indicates that one should not perform factor analysis on the sample, whereas <0.6 is regarded as Miserable for factor analysis, and <0.69 is Mediocre, <0.79 is Middling, <0.89 is Meritorious, and between 0.90 and 1.00 is Marvelous (Friel 2010). The next section displays the results of the factor analysis.

Results Of Factor Analysis For Expectation Statements

During the data-checking process, outliers and out-of-range values were removed, and only data necessary for factor analysis remained. Statement E3 was excluded, as it did not measure "Innovative". Statement E13 was excluded because it loaded onto more than one factor, and E17 was removed as it was not included originally. The KMO measure of sampling adequacy was .951, which is well above the advocated value of .6. The Bartlett's test of sphericity was $\chi_2 (171) = 3847.89$, $p < .0005$. The results of the KMO and Bartlett's test prompted the researcher to proceed with factor analysis.

Principal component analysis (PCA) with promax rotation was conducted. The number of factors was decided by the number of eigenvalues >1. This is the default option that is automatically used to find the structure of data when there are no preconceived notions. The four factors contributed to a cumulative variance percentage of 66.34.

Table 5.16: Factor loadings for Expectations – PCA with promax rotation

Expectation Statements	Reliable	Customer Centric	Innovative	Trustworthy
E1 Excellent ISPs use the latest technology.			.821	
E2 Excellent ISPs use superior infrastructure.			.583	
E4 Materials associated with the service (product collateral and other documentation) will be visually appealing at an excellent ISP.			.432	
E5 When excellent ISPs promise to do something by a certain time, they do.	.885			
E6 When a customer has a problem, excellent ISPs show a sincere interest in solving it.	.752			
E7 Excellent ISPs perform the service right the first time.	.406			
E8 Excellent ISPs provide the service at the time they promise to do so.	.619			
E9 Excellent ISPs insist on error-free records.				
E10 Employees of excellent ISPs tell customers exactly when services will be performed.				.613
E11 Employees of excellent ISPs give prompt service to customers.				.570

Expectation Statements	Reliable	Customer Centric	Innovative	Trustworthy
E12 Employees of excellent ISPs are always willing to help customers.				.597
E14 The behaviour of employees in excellent ISPs instil confidence in customers.				.504
E15 Customers of excellent ISPs feel safe in transactions.				.647
E16 Employees of excellent ISPs are consistently courteous with customers.				.574
E18 Excellent ISPs give customers indivdual attention.		.713		
E19 Excellent ISPs have operating hours convenient to all their customers.		.537		
E20 Excellent ISPs have employees who give customers personal attention.		.954		
E21 Excellent ISPs have customers' best interests at heart.		.534		
E22 The employees of excellent ISPs understand the specific needs of their customers.		.447		

To verify internal consistency, Cronbach's alpha was conducted for each factor, with Innovative scoring .711, Reliable at .901, Trustworthy at .936, and Customer Centric at .864. The Cronbach's alpha values were all >.7, which is good.

Results Of Factor Analysis For Perception Statements

During the data-checking process, outliers and out-of-range values were removed, and only data necessary for factor analysis remained. Statement P3 was excluded as it did not measure "Innovative". Statements P9, P10, P11, P12, and P13 were discarded as a result of cross-loading. These statements previously belonged to the Responsiveness factor. The KMO measure of sampling adequacy was .945, which is well above the advocated value of .6 (Friel 2010). The Bartlett's test of sphericity was $\chi_2(91) = 3731.88$, $p < .0005$. The results of the KMO and Bartlett's test prompted the researcher to proceed with factor analysis.

PCA with promax rotation was conducted. The number of factors was decided by the number of eigenvalues >1. This is the default option that is automatically used to find the structure of data when there are no preconceived notions. The four factors contributed to a cumulative variance percentage of 85.08.

Table 5:17: Factor loadings for Perceptions: PCA with promax rotation

Perception Statements	Reliable	Customer Centric	Innovative	Trustworthy
P1 Your ISP uses the latest technology.			.902	
P2 Your ISP has superior infrastructure.			.777	
P4 Materials associated with the service (such as product Collateral and other documentation) are visually appealing at your ISP.			.397	
P5 When your ISP promises to do something by a certain time, they do so.	.822			
P6 When you have a problem, your ISP shows a sincere interest in solving it.	.759			
P7 Your ISP performs the service right the first time.	.706			
P8 Your ISP provides its service at the time it promises to do so.	.779			
P14 The behaviour of employees at your ISP instils confidence in you.	.349			.368
P15 You feel safe in your transactions with your ISP.				.760
P16 Employees at your ISP are consistently courteous to you.		.333		.453
P18 Your ISP gives you individual attention.		.694		
P19 Your ISP has operating hours convenient to all its customers.		.584		
P20 Your ISP has employees who give you personal attention.		.818		
P22 The employees of your ISP understands your specific needs.		.517		

To verify internal consistency, Cronbach's alpha was conducted for each factor, with Innovative scoring .835, Reliable at .950, Trustworthy at .917, and Customer Centric at .921. Cronbach's alpha values were are all >.83, which is very good.

After careful examination of the items under the factors and after consultation with industry experts, the factors were renamed to Reliable, Customer Centric, Innovative, and Trustworthy, which differ from the original names of the factors in SERVQUAL.

Customer Centric: This label in general terms means placing the customer at the centre. This obviously can be interpreted in many ways by different companies. The one common attribute is understanding the customers' needs and providing customer experience. The customer experience needs to be slick and easy. Understanding customer needs through the provision of personalised, individual attention, and providing a convenient, flexible service contribute to this customer experience (De Clerck 2016; McIntosh 2004). ISPs need to evaluate various parts of the business such as processes, systems, and resources that have an impact on customer centricity, and fine tune these areas to ensure that they optimally deliver excellent customer experience.

Innovative: This label encapsulates items such as the latest technology, superior infrastructure, and visually appealing product collateral. Staying abreast with the latest trends and technologies, and in turn developing innovative products, is absolutely fundamental for organisations to remain relevant and competitive (Parsons & Rose 2007). This is more applicable for companies that deliver technology, such as ISPs. ISPs need to invest in Innovation in order to deliver cutting-edge solutions to their clients.

Reliable: This label includes items such as promising to deliver a service on time, and actually doing so. It also includes performing the service right the first time, and sincere interest in solving the customer's problem. Futhermore, the actions of employees of ISPs need to provide the customer with a level of confidence. After careful scrutiny, it is evident that these items are necessary to assess the reliability of ISPs in delivering a service to their customers, and certainly has a bearing on the overall Service Quality.

Trustworthy: This label holds items such as ISP employees displaying behaviours that appear to be consistent and courteous to the customer, which in turn makes the customer feel safe in transactions with the ISP. Various studies have attempted to define trustworthy behaviours (Russel 1991) and trust undoubtedly influences a number of elements such as innovation, business results, and stakeholder confidence (Russel 1991).

Regression Analysis

Regression analysis is used in research to measure the relationship between two or more variables in order to depict the causal relationship between them (Gallo 2015).

Regression analysis was performed on the Perception statements in order to assess the causal relationship between the independent variables and the dependent variables.

Regression Analysis Between Independent Variables (Factors From Perception) And Dependent Variables (Profitability, Sales, Market Share, Customer Satisfaction, And Reputation And Image)

Multiple regression with all four independent variables was attempted; however, this was not successful as some of the independent variables were strongly correlated. This caused

multicollinearity, which means that a condition is violated, therefore simple linear regression was conducted.

The independent variables are the four factors taken separately, and the dependent variables are profitability, sales, market share, customer satisfaction, and reputation and image.

Independent Variable (Innovative) And Dependent Variable (Profitability, Sales, Market Share, Customer Satisfaction, And Reputation And Image)

Innovative accounts for 18.1% ($R^2 = .181$) of the variability in Profitability, $F(1, 239) = 52.852$, $p<.0005$). This independent variable is a significant predictor of profitability ($\beta = .379$, $p<.0005$).

Innovative accounts for 12.3% ($R^2 = .123$) of the variability in Sales, $F(1, 239) = 33.496$, $p<.0005$). This independent variable is a significant predictor of Sales ($\beta = .297$, $p<.0005$).

Innovative accounts for 9.7% ($R^2 = .097$) of the variability in Market Share, $F(1, 239) = 25.761$, $p<.0005$). This independent variable is a significant predictor of Market Share ($\beta = .249$, $p<.0005$).

Innovative accounts for 21.7% ($R^2 = .217$) of the variability in Customer Satisfaction, $F(1, 239) = 66.051$, $p<.0005$). This independent variable is a significant predictor of Customer Satisfaction ($\beta = .409$, $p<.0005$).

Innovative accounts for 14.8% ($R^2 = .148$) of the variability in Reputation and Image, $F(1, 239) = 41.570$, $p<.0005$). This independent variable is a significant predictor of Reputation and Image ($\beta = .328$, $p<.0005$).
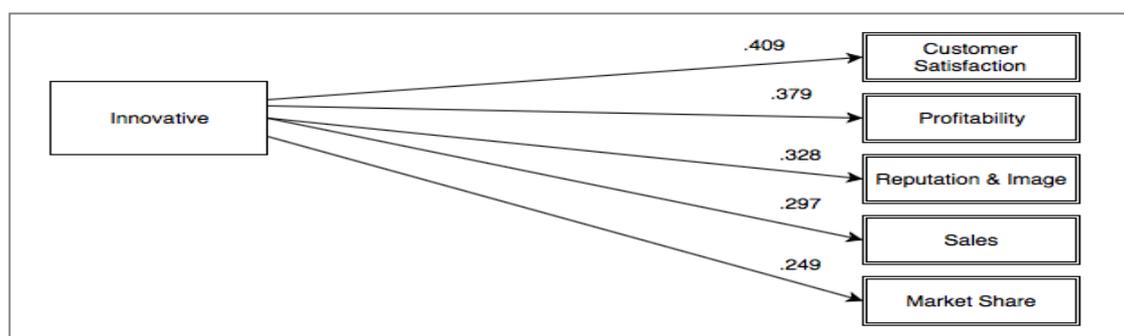
Figure 5.16: Independent variable (Innovative) and dependent variables

According to the order of ranking in Figure 5.16, Innovative is a significant predictor of Customer Satisfaction (.409), followed by Profitability (.379), Reputation and Image (.328), Sales (.297), and Market Share (.249).

Independent Variable (Reliable) And Dependent Variable (Profitability, Sales, Market Share, Customer Satisfaction, And Reputation And Image)

Reliable accounts for 15.3% (R^2 = .153) of the variability in Profitability, F (1, 239) = 43.253, p<.0005). This independent variable is a significant predictor of profitability (β = .263, p<.0005).

Reliable accounts for 11.2% (R^2 = .112) of the variability in Sales, F (1, 239) = 30.054, p<.0005). This independent variable is a significant predictor of Sales (β = .214, p<.0005).

Reliable accounts for 8.0% (R^2 = .080) of the variability in Market Share, F (1, 239) = 20.811, p<.0005). This independent variable is a significant predictor of Market Share (β = .170, p<.0005).

Reliable accounts for 15.0% (R^2 = .150) of the variability in Customer Satisfaction, F (1, 239) = 42.164, p<.0005). This independent variable is a significant predictor of Customer Satisfaction (β = .256, p<.0005).

Reliable accounts for 13.0% (R^2 = .130) of the variability in Reputation and Image, F (1, 239) = 35.842, p<.0005). This independent variable is a significant predictor of Reputation and Image (β = .232, p<.0005).
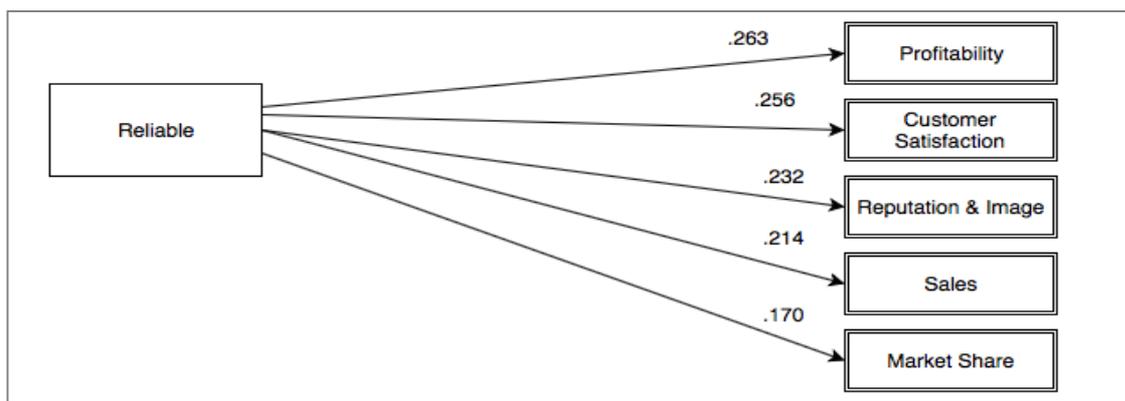
Figure 5.17: Independent variable (Reliable) and dependent variables

According to the order of ranking in Figure 5.17, Reliable is significant predictor of Profitability (.263), followed by Customer Satisfaction (.256), Reputation and Image (.232), Sales (.214), and Market Share (.170).

Independent Variable (Trustworthy) And Dependent Variable (Profitability, Sales, Market Share, Customer Satisfaction, And Reputation And Image)

Trustworthy accounts for 16.3% (R^2 = .163) of the variability in Profitability, $F (1, 239)$ = 46.628, $p<.0005$). This independent variable is a significant predictor of profitability (β = .298, $p<.0005$).

Trustworthy accounts for 13.1% (R^2 = .131) of the variability in Sales, $F (1, 239)$ = 35.951, $p<.0005$). This independent variable is a significant predictor of Sales (β = .254, $p<.0005$).

Trustworthy accounts for 7.3% (R^2 = .073) of the variability in Market Share, $F (1, 239)$ = 18.720, $p<.0005$). This independent variable is a significant predictor of Market Share (β = .178, $p<.0005$).

Trustworthy accounts for 15.9% (R^2 = .159) of the variability in Customer Satisfaction, $F (1, 239)$ = 45.074, $p<.0005$). This independent variable is a significant predictor of Customer Satisfaction (β = .289, $p<.0005$).

Trustworthy accounts for 14.1% (R^2 = .141) of the variability in Reputation and Image, $F (1, 239)$ = 39.152, $p<.0005$). This independent variable is a significant predictor of Reputation and Image (β = .265, $p<.0005$).
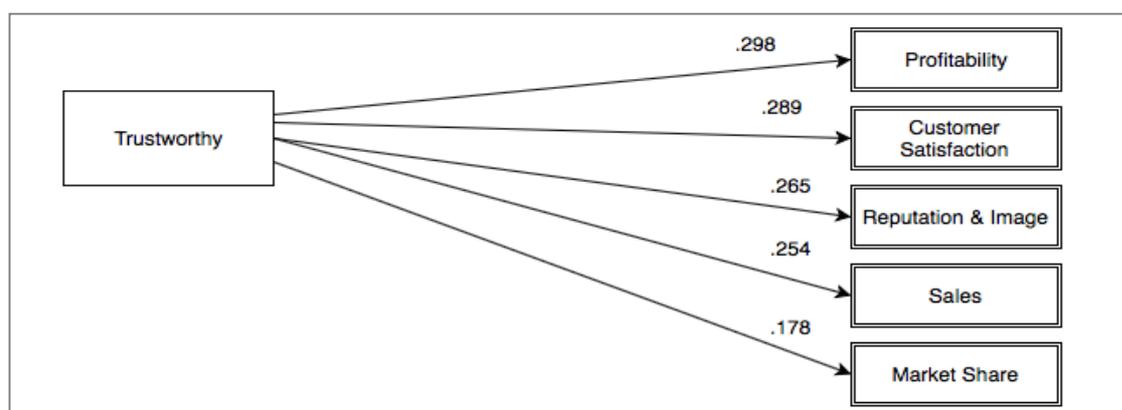

Figure 5.18: Independent variable (Trustworthy) and dependent variables

According to the order of ranking in Figure 5.18, Trustworthy is significant predictor of Profitability (.298), followed by Customer Satisfaction (.289), Reputation and Image (.265), Sales (.254), and Market Share (.178).

Independent Variable (Customer Centric) And Dependent Variable (Profitability, Sales, Market Share, Customer Satisfaction, And Reputation And Image)

Customer Centric accounts for 17.6% (R^2 = .176) of the variability in Profitability, F (1, 239) = 43.590, p<.0005). This independent variable is a significant predictor of profitability (β = .302, p<.0005).

Customer Centric accounts for 13.2% (R^2 = .132) of the variability in Sales, F (1, 239) = 36.429, p<.0005). This independent variable is a significant predictor of Sales (β = .249, p<.0005).

Customer Centric accounts for 9.2% (R^2 = .092) of the variability in Market Share, F (1, 239) = 24.301, p<.0005). This independent variable is a significant predictor of Market Share (β = .196, p<.0005).

Customer Centric accounts for 17.2% (R^2 = .172) of the variability in Customer Satisfaction, F (1, 239) = 49.761, p<.0005). This independent variable is a significant predictor of Customer Satisfaction (β = .295, p<.0005).

Customer Centric accounts for 15.1% (R^2 = .151) of the variability in Reputation and Image, F (1, 239) = 42.368, p<.0005). This independent variable is a significant predictor of Reputation and Image (β = .268, p<.0005).
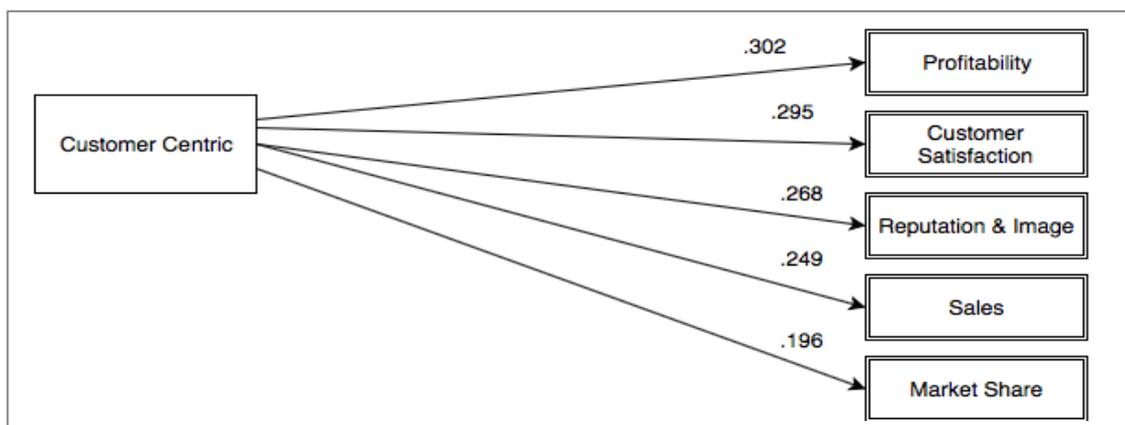

Figure 5.19: Independent variable (Customer Centric) and dependent variables

According to the order of ranking in Figure 5.19, Customer Centric is a significant predictor of Profitability (.302), followed by Customer Satisfaction (.295), Reputation and Image (.268), Sales (.249), and Market Share (.196).

It is worth noting that the majority of the independent variables are a significant predictor of Profitability and Customer Satisfaction, which are the top two ranked dependent variables.

Validity And Reliability Of The Findings

The researcher used triangulation of data and methods in order to achieve validity and reliability of the data.

Face validity of the questionnaire was conducted by allowing industry experts to scrutinise the statements to ensure that they were relevant for the Internet industry.

Furthermore, following the factor analysis, construct validity was presented through the neat clear loadings of the items under the various factors.

Moreover, Cronbach's alpha coefficient was used to test the items for internal consistency. The alpha values were all >0.7, which indicated a reliable measure.

5.3.6 Phase 3: Discussion Of The Research Findings

Phases 1 and 2 presented the research findings of the qualitative and quantitative portions of the research. This section discusses the research findings from Phases 1 and 2. The findings are discussed under the relevant research questions. The research questions were defined in Chapter 1, and are linked directly to the problem statement.

5.3.6.1 *Research Question 1 – How do customers appraise ISPs' Service Quality in the South African market?*

In order to provide a better understanding of how customers assess their ISPs' Service Quality, the demographics were presented to provide the reader with insight into the characteristics of the participants. The majority of the customers were between 20 and 50 years of age, and there was a 40/60 split in gender, with female business customer respondents representing 40% and male business customer respondents 60% of the sample.

Among the respondents, 67% held managerial positions. In addtion, the majority of the customer respondents had been employed by the same company for more than eight years, and close to half the respondents worked for large companies with turnover greater than R50 million.

South African business customers have high expectations. The majority of the statements were rated 6 and higher. This finding is in line with other Service Quality studies performed in the Internet industry in other countries (Spiller, Vlasic & Yetton 2007; Cheng, Lai & Yeung 2008; Thaichon et al 2014). It is worth highlighting that the perception of the Service Quality South African business customers received from their ISPs was also high, with the majority of the statements ranked 5 or greater. This highlights that South African business customers are overall satisfied with the Service Quality they receive from South African ISPs.

In addition, the results also indicated that female South African business customers expected materials associated with the service to be visually appealing, whereas male customers expected that when ISPs promise to do something by a certain time, they do so. These were two expectations that showed a significant difference, and is worth noting in the recommendations.

Furthermore, it was prevalent in the results that there was a significant difference in the expectations of customers from the different-sized companies. Customers of larger companies expected more than customers of very small businesses. This finding is on par with studies conducted in Thailand, where segmenting customers in this space enabled ISPs to drive customised marketing strategies (Thaichon et al 2014).

The gap scores of all statements were negative, which signifies that Expectations were higher than Perceptions. In the South African Internet industry, the largest overall gap was noted in the Reliability dimension, followed by the Responsiveness dimension. As indicated in the Findings section, the top three gaps were Gaps 11, 5, and 8. Gap 11 referred to the Responsiveness dimension; which indicates that customers expect prompt service from their ISPs. Gap 5 referred to the Reliability dimension, where there is a significant gap between the expectations of the ISPs promising to do something by a certain time, and the perception of the time it takes for them to deliver on the promise. In addition, Gap 8 also referred to the Reliability dimension, where a gap exists between ISPs promising the service

they would provide, and the perception of providing the service they promised. These gaps should be investigated further in order to improve ISPs' Service Quality.

Furthermore, the empathy dimension was highlighted as the most important dimension among South African business customers. This result differs from other studies conducted. For instance, in the Australian Internet industry, reliability was deemed as the most important dimension for Australian customers (Spiller et al 2007). After factor analysis, the items of this dimension loaded under Customer Centric. One could make the assumption that developing countries view being customer centric much more important than the other dimensions, whereas developed countries see Reliability as an important dimension. Further studies can be conducted to investigate if this is applicable, and why.

Furthermore, the results of the factor analysis indicated that only four factors were interpretable by South African customers in the Internet industry, namely Innovative, Customer Centric, Reliable, and Trustworthy. This result differs from other studies in the field; however, a similar trend was highlighted by Kang and Bradley (2002). According to Kang and Bradley (2002), only two factors were evident in the IT Industry in Australia.

5.3.6.2 *Research Question 2 – What is the impact of South African ISPs' Service Quality on business performance?*

Both ISPs and customers believed that ISPs' Service Quality positively impacted customers' business performance. These results tie in with the survey results, which indicated that South African business customers were satisfied with their ISPs' Service Quality. There is certainly a relationship between the ISPs' Service Quality and the customers' business performance indicators. As ISPs' Service Quality increases or decreases, one would expect to see a change in impact on customers' business performance. Figure 5.20 illustrates the linkage between the Service Quality dimensions and the business performance indicators.
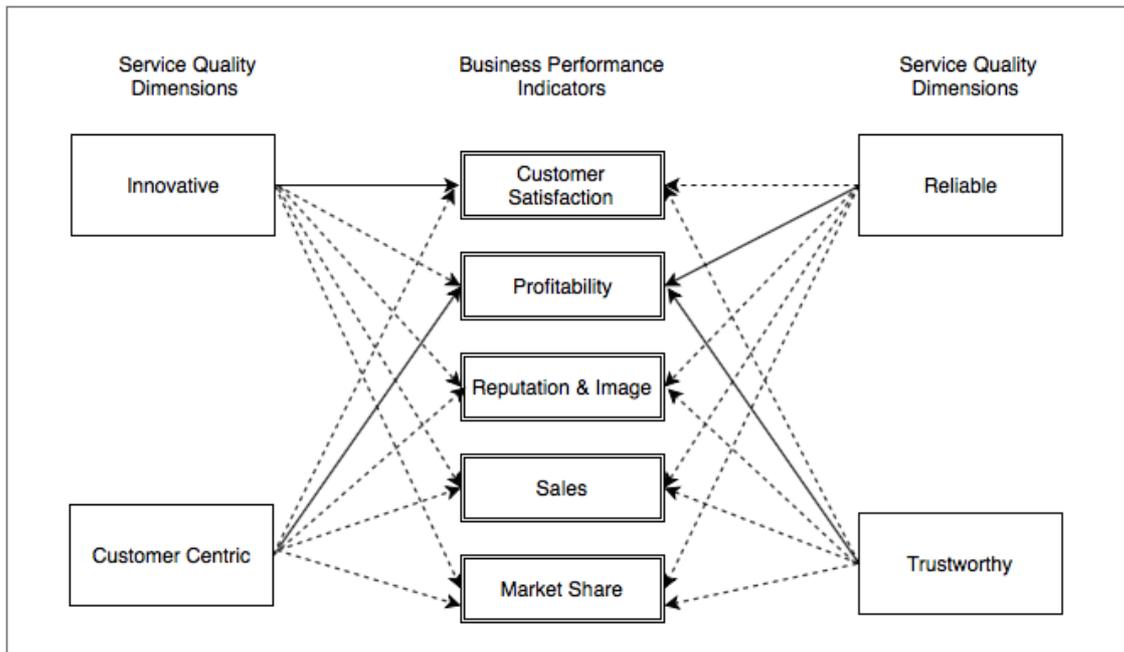
Figure 5.20: The relationship between Service Quality dimensions and their impact on business performance

The regression analysis provided valuable confirmation of the causal relationship between each of the factors (Innovative, Customer Centric, Reliable, and Trustworthy) and each of the business performance indicators (Customer Satisfaction, Profitability, Reputation and Image, Sales, and Market Share). Factors such as Customer Centric (.302), Reliable (.263), and Trustworthy (.263) had a significantly higher causal relationship with Profitability; whereas Innovative (.409) had a significantly higher causal relationship with Customer Satisfaction. This significantly higher causal relationship is depicted by solid lines in Figure 5.20. From this one can interpret that South African business customers require their ISPs to pay special attention to factors (Customer Centric, Reliable, and Trustworthy) that have a causal relationship with the customers' business profitability.

It is worth highlighting that the ISPs' ability to contribute to the Innovative factor significantly influences the customers' customer satisfaction. The ISPs' ability to keep abreast with the latest trends and technologies provides their customers with the edge to deliver further competitive services back to their customers, and in turn improve their customer satisfaction.

Furthermore, ISPs' focus on aspects that touch on Customer Centricity, Reliability, and Trustworthiness have a significant influence on their customers' profitability. Under the

Customer Centric dimension, ISPs should pay special attention to understanding their customers' needs and behaviours, and provide a more personalised service. In addition, ISPs' prompt, timely, predictable response to customer needs has a ripple effect on the services their business customers provide to their customers. Furthermore, factors such as trust have a bearing on ISPs' customers' ability to conduct their business confidently, and certainly influence customers' business results (Russell 1991).

5.3.6.3   *Research Question 3 – What are the challenges experienced by ISPs in South Africa, and what is the impact of these challenges on their ability to deliver the Service Quality South African business customers require?*

The findings indicated that South African business customers expect more than they perceive to receive from their ISPs. The two gaps highlighted from the customer responses were reliability and responsiveness. These gaps aligned with the challenges mentioned by ISPs, such as the control of the full end-to-end value chain, access to infrastructure, dependence on third parties, and tightly coupled responsibilities among the parties, which make it difficult to separate responsibilities among service providers.

ISPs do not own the full value chain, and are dependent on third parties to respond and provide services in a timely manner. ISPs use both upstream and downstream providers to procure and deploy services. The management of these providers is absolutely critical as it has a direct impact on the ISPs' responsiveness and reliability. This could be one of the reasons there is consolidation in the market, where ISPs are looking at striking partnerships with telecommunications companies and with infrastructure companies, and vice versa. This approach is a way of gaining more control of the value chain. Furthermore, the number of providers, such as peering and transit providers and undersea cable system providers, has increased, therefore increasing capacity and alleviating the reliance on one such provider in this space.

In addition, the slow-moving regulatory landscape further hampers ISPs' responsiveness and reliability. ISPs require licences and wayleaves to deploy some of their services, and the application process is slow and tedious, which often adds to the ISPs' time to deploy the service. The results are in line with industry experts who also highlighted this as an impeding problem (Gillwald et al 2012).

5.3.6.4 Research Question 4 – What is the gap between the ISP managers' perception of the Service Quality they provide, and business customers' perception of the Service Quality they receive?

The majority of the ISP management respondents echoed the sentiment that they offered a good service to their customers, while operating in a highly commoditised environment. In an environment of this nature, service delivery is fundamental. This was evident in the ISP analysis section in Chapter 3, where the majority of the ISPs indicated that they differentiated themselves through service delivery. This is in line with the customers' rating of their perceptions, where the majority of the customers rated their ISP a 5 or greater for most of the Perception statements, which indicates that they were satisfied with their ISPs' Service Quality. It is refreshing to see the alignment of ISPs' responses with customers' responses. This is definitely a sign that South African ISPs are aware of their business customers' needs.

Although there is a close alignment with the ISPs' responses and the customers' responses, there is still a gap in ISPs' ability to be reliable and to be responsive. The gaps that stand out are the ISPs promising to do something by a certain time and actually keeping to that promise, and the ability of ISPs to provide prompt service.

Both ISP management and their customers were of the opinion that ISPs' ability to deliver against the Service Quality factors has a positive impact on customers' business performance.

The one disconnect, or difference, in opinion between ISP management and customers is the selection of the most important dimension for business customers. ISP management selected reliability, whereas customers selected empathy. It is interesting to note that South African customers value empathy more than reliability, whereas studies conducted in developed countries found reliability to be the most important dimension (Spiller et al 2007; Barrera et al 2014; Li et al 2015). This evidence provides valuable insight into preferences in developing countries versus developed countries, and could certainly be an area of focus for South African ISPs to improve their overall Service Quality.

5.4   FINDINGS ENTWINED WITH THEORY

In Chapter 2, the researcher unpacked various theories relevant to this research; theories that focus on customer satisfaction and Service Quality. The customer-based discrepancy theory is a cognitive theory which measures satisfaction by comparing customers' expectations of a service or product to the actual experience (Churchill & Surprenant 1982); whereas the expectation confirmation theory (see Figure 2.2) stood out as the most appropriate theory to steer the research, as it is a cognitive theory that rationalises customers' satisfaction as a result of the disparity between expectations and perceived performance, which is known as disconfirmation (Oliver 1981).

Following on from expectation confirmation theory, and after critical analysis of the existing Service Quality models of e-Service Quality, IS quality, and service provider Service Quality, the researcher selected SERVQUAL as the most appropriate model to provide guidance in solving the research problem.

The model in its original state was not sufficient to answer the research questions. After consultation with industry experts, the statements were modified to make them suitable for the Internet industry. The results indicated that South African business customers were satisfied with the services offered by their ISPs. The only caveat to this was that the factors loaded contrarily to what was initially stated by the original founders. Although the SERVQUAL founders empirically tested and defended the clear separation between the dimensions; studies such as by Kang and Bradley (2002), and this study, disagree with this notion. Factor analysis was performed on the items, and the results indicated the presence of only four factors. After careful scrutiny of the items that loaded under the factors, industry experts and the researcher renamed the factors to Customer Centric, Innovative, Reliable, and Trustworthy. Obtaining a view of the ISPs' Service Quality is only the initial part of solving the research problem.

In addition to achieving an assessment of the Service Quality provided by ISPs, the researcher had to provide empirical evidence of the impact of this Service Quality on customers' business performance. A linear regression analysis was performed on the data, and this provided evidence of the significant predictor of the independent variables (the factors) on the dependent variables (business performance indicators). Furthermore, the

ranking of the dependent variables in relation to the relevant independent variables provided evidence of significant relationships, where some variables ranked higher than others.

5.5 THE EXTENT TO WHICH THE EMPIRICAL RESULTS ENABLED THE RESEARCHER TO ANSWER THE RESEARCH QUESTIONS

Service Quality is an important construct, and companies have started to monitor and measure Service Quality in order to improve competitive advantage and to alleviate competitive pressure (Hussain et al 2015). In a market where competing on price is not sufficient, several companies have looked to alternative forms of differentiation; one of which is service differentiation. At the beginning of Chapter 1, the researcher set out to find the answers to the four research questions.

The first question aimed to find answers to South African customers' assessment of the Service Quality they receive from ISPs. This question was answered through responses from the survey. The results confirmed that South African business customers are overall satisfied with the Service Quality provided by their ISPs. Furthermore, empathy was regarded as the most important dimension for South African business customers. Later, factor analysis was performed on the statements, and it was clear that only four factors stood out in the South African Internet industry; namely Customer Centric, Reliable, Innovative, and Trustworthy.

The second question aimed to answer the impact of ISPs' Service Quality on business performance. This question was answered through the survey findings. The researcher included a section in the survey that measured the impact of the Service Quality on business performance indicators. The findings provided signficant evidence of the impact of ISPs' service on business performance indicators. Simple linear regression analysis was performed, which clearly denoted the relationship between the four factors Customer Centric, Innovative, Reliable, and Trustworthy on Profitability, Sales, Market Share, Customer Satisfaction, and Reputation and Image.This was illustrated in Figure 5.18.

The third question aimed to provide insight into the challenges that South African ISPs face, and the impact of these challenges on their ability to deliver the Service Quality South African business customers require. This question was answered through the interview findings. The researcher performed extensive coding and critical content analysis in order

to reveal key themes. The research process is discussed in detail in Chapter 4, and the findings of the challenges are presented in this chapter.

Lastly, the fourth question was on the gap between ISPs' perception of the Service Quality they provide, and customers' perception of the Service Quality they receive. This question was answered through the findings from both the interviews and the surveys.

In summary, the primary aim of the research was to close the research gap regarding the assessment of ISPs' Service Quality in South Africa, and to understand the impact of this Service Quality on business performance. Furthermore, the study aimed to develop a model to assess the Service Quality in the Internet industry in South Africa. This was achieved through the empirical research conducted in this study.

5.6 RESULTS VERIFIED BY AN EXPERT GROUP

The results were discussed with industry experts. The industry experts included a few senior employees from ISPs and customers in the industry.

Table 5.18: Expert characteristics

Job Title	Work Experience (Years)	Gender (M/F)
Product Manager	5	M
Head: Product Development	8	M
Senior Manager	15	M
Manager	10	M
Senior Product Manager	11	M
Business Manager	12	M
Operations Manager	10	M

With regard to the findings of Objective 1, the majority of the experts were surprised that South African customers were overall satisfied with the ISPs' Service Quality, as there appears to be much more negative press around ISPs' Service Quality in the South African market than positive coverage. After the discussion, the group concurred with these findings. The study certainly empirically demonstrates the extent of customer satisfaction in the Internet industry in South Africa.

There was consensus on the findings of Objective 2, which illustrates the relationship between ISPs' Service Quality and business performance. However, the ranking of the relationships provided further clarity on the strength of the impact, which was unknown to the experts and therefore provided them with new insight. The experts concurred with the factors that emanated from the factor analysis, and viewed them as crucial in assessing the softer, more human side of ISPs' Service Quality.

With regard to Objective 3, there was absolute agreement with the findings. The expert group expressed their challenges in this space, and provided examples of how the regulatory shortcomings affected them.

The expert group was taken back by the findings of Objective 4, which indicated that South African customers view Empathy as a more important dimension than Reliability, although after discussion they were in agreement with the findings. Furthermore, after the factor analysis, the items of this dimension, among other items, loaded under the factor Customer Centric. The expert group acknowledged the importance of ISPs paying attention to customer centricity, especially since this is a differentiating factor in a highly commoditised industry.

5.7   CONCLUSION

In today's commoditised market, ISPs have to differentiate themselves through the Service Quality they deliver to their customers. The ISPs' Service Quality has a direct influence and impact on corporate customers' business performance. The results provided empirical evidence on South African business customers' perceptions of the Service Quality they receive from their ISPs, and the impact of this Service Quality on their business performance.

Furthermore, the findings developed and confirmed an ISP Service Quality measurement model for the Internet industry in South Africa, which took into consideration the impact of ISPs' Service Quality on corporate customers' business performance. The findings further depicted a relationship between ISPs' Service Quality and customers' business performance. This study's results provided evidence that South African ISPs' Service Quality positively impacted their corporate customers' business performance. The findings confirmed that the factors Customer Centric, Innovative, Reliable, and Trustworthy

signficantly influenced business customers' Profitability, Sales, Market Share, Customer Satisfaction, and Reputation and Image. This study provided new knowledge of the South African Internet industry through business customers' assessment of the Service Quality of ISPs.

The assessment of ISPs' Service Quality provided robust corroboration of South African customers being satisfied with the Service Quality of their ISPs; and empathy stood out as the most important dimension for South African business customers.

Although South African customers are satisfied with ISPs' Service Quality, the study revealed that there was a greater gap in the reliability and responsiveness dimensions; and the challenges experienced by ISPs hamper their ability to deliver in these areas. The challenges included, but were not limited to, the lack of ownership of the full end-to-end value chain and the sluggish regulatory landscape in South Africa.

Furthermore, this research provided affirmation that ISP management structures are on par with their customers' Service Quality requirements, and are therefore able to provide a satisfactory service. The only disparity is that ISPs were of the opinion that reliability was the most important dimension for their customers, whereas customers selected empathy as the most important dimension. In addition, further evident gaps include the gaps presented in the reliability and responsiveness dimensions.

Furthemore, the findings of the research were presented to a group of industry experts to ensure the credibility of the results. The group acknowledged and provided consensus on the findings, and furthermore provided examples of how some of the findings directly impacted them.

In summary, this research met the research aim and provided answers to the research questions initially set out. Furthermore, this research made findings that could be beneficial to ISPs wanting to improve their Service Quality, and to academics interested in furthering their studies in the Service Quality domain in the Internet industry in South Africa.

The next chapter provides recommendations, a discussion on the study's contribution to the existing body of knowledge, the limitations of the study, and suggestions for future research.

CHAPTER 6

RECOMMENDATIONS

6.1   INTRODUCTION

Chapter 5 presented the data analysis and the research findings. This chapter provides the study's recommendations, the study's contribution to the existing body of knowledge, the limitations of the study, and suggestions for further research.

The aim of this research was to understand the impact of South African ISPs' Service Quality on customers' business performance, and to develop and confirm an ISP Service Quality measurement model for the Internet industry in South Africa.

6.2   RECOMMENDATIONS

The findings of this research assisted in exposing areas in this domain which require improvement. This section provides recommendations for managers to improve ISPs' Service Quality, and in turn improve the service customers receive.

The findings in Chapter 5 highlighted that customers from different-sized companies differ in their requirements. ISPs should investigate segmenting their customer base in order to provide customised operations and support. This approach will tailor service delivery to customers' requirements, and will make it much easier to address Service Quality gaps. The segmentation can be done according to the size of the company, industry type, demographics, and/or buying behaviour.

In addition, this study highlighted that South African business customers require their ISP to display trustworthiness in their interaction with them. In fact, they rank this higher than ISPs' ability to be reliable. This softer side is often neglected in service delivery, yet it was pointed out as being important. ISPs must examine areas within their service delivery chain which influences this, and investigate ways to improve this aspect. Implementing programmes or initiatives that survey customers through various parts of the value chain will allow ISPs to easily highlight the areas that require improvement. As technology advances and automation increases, companies lose the human element of service. Certain customer interactions in the service chain are replaced by automated responses.

Automating characteristics such as empathy and trustworthiness are difficult. Customers want the best of both worlds: consistency through scale, and a personalised service. A more personalised approach to service delivery should be considered as this plays a role in service differentiation.

Furthermore, this research also discovered that there was a gap in ISPs' ability to keep promises, deliver on time, perform the service right the first time, and show a willingness to assist. These are certainly some areas for improvement. ISPs should investigate their quality and time it takes to deliver various services in the industry, and should benchmark their delivery against these times. This initial form of measurement could result in further suggested improvements. Displaying the results to customers also opens the path for conversation around further improvement, as well as advice on what works and what does not.

Subsequently, this study should be conducted annually in order to obtain an indication of whether Service Quality has improved or deteriorated. Furthermore, instead of completing the research with customers from different ISPs, individual ISPs can rather survey only their customers. This approach will allow ISPs to customise the model for their companies, and will allow ISPs to follow through on focused service improvement plans that address gaps.

Another area where Service Quality could be improved in this industry is for ISPs to manage the performance of their suppliers more tightly. ISPs should conduct regular, stringent performance reviews of suppliers which influence their ability to deliver, and enforce punitive measures for non-delivery or non-conformance. Again displaying results among suppliers that offer similar services/products encourages and promotes behaviours that are acceptable for doing business with the particular ISP. This process is also a good way to remove non-performing or poor-performing suppliers.

Since the regulatory landscape is moving at a slow pace and not considering Service Quality *per se*, it might be quicker for an industry body such as the ISPA to propose Service Quality benchmarks for the ISPs in the industry to follow. This has never been done before, and should this be implemented, it would be a first for South Africa. The majority of the ISPs are members of the ISPA, and it might prove easy to achieve consensus on some standards for the South African market. These standards could possibly govern both the soft side of

Service Quality and the more difficult, technical side of Service Quality such as jitter, latency, and contention.

The findings and literature review revealed that in the Internet industry there is undoubtedly a lack of a formal technical and non-technical benchmarking tools for customers to measure ISPs' Service Quality. The ISPA should request active members to contribute to proposals for a standard benchmarking tool to measure ISPs' Service Quality.

6.3   CONTRIBUTION TO THE EXISTING BODY OF KNOWLEDGE

Limited Service Quality research has been conducted in the Internet industry, let alone in South Africa; therefore this research provided an extension to the existing body of knowledge. The study contributed to confirming the factors relevant for assessing ISPs' Service Quality in the South African Internet industry.

Furthermore, the study provided empirical evidence of how South African business customers perceive South African ISPs' Service Quality, as well as the impact of ISPs' Service Quality on corporate customers' business performance. In addition, the study highlighted that South African customers value trustworthiness as the most important Service Quality dimension. This differs from studies conducted in other countries. One can further investigate the link between culture and environment on the results.

The research confirmed a non-technical Service Quality measurement model for the Internet industry, which confirmed the causal relationship between Service Quality factors (Customer Centric, Reliable, Trustworthy, and Innovative) and business performance indicators (Sales, Profitability, Market Share, Customer Satisfaction, and Reputation and Image).

6.4   THE LIMITATIONS OF THE STUDY

As with every research study, this study faced limitations. It is fitting for a researcher to acknowledge the limitations so that future researchers can address them (Labaree 2009). The first limitation is that the study was conducted at a specific point in time. Studies of this nature should be frequently repeated with the same customers in order to gain a sense of whether the Service Quality has improved or deteriorated. Perceptions can change as

expectations for the same service change over time. This study provided the first view of the South African Internet market, as there is currently nothing to compare it to. The findings revealed that South African business customers are satisfied with ISPs' Service Quality at this point in time.

Furthermore, there has been a lack of prior research in the South African market on the softer side of Service Quality in the Internet industry, and although this was highlighted as a gap and a problem worth solving, it gave the researcher a foundation to build on.

This study was limited to responses from South Africa, and although the results may not necessarily be a reflection of all developing countries, it is still applicable for all ISPs to assess and improve their Service Quality.

Moreover, the limitation of the method of data collection had an impact on the number of respondents. Traditional paper-based surveys would have yielded a greater response, and this is a factor future researchers should consider when conducting research of this nature.

6.5 SUGGESTIONS FOR FUTURE RESEARCH

Based on the literature review and the findings of this study, the researcher makes the following recommendations for further research that can be undertaken:

- This study should be conducted annually in order to obtain an indication of whether the Service Quality has improved or has deteriorated. Furthermore, instead of conducting the research among customers from different ISPs, individual ISPs can rather focus on their customers only. This approach will allow ISPs to customise the model for their companies, and will allow ISPs to follow through on focused service improvement plans that address the gaps.
- This research developed and confirmed a model that only addressed assessing the softer side of ISPs' Service Quality. Further studies should investigate incorporating a technical measurement portion to accompany this non-technical Service Quality measurement model.
- This research only investigated customers' assessment of ISPs' Service Quality. Further studies can investigate the Service Quality upstream service providers offer to ISPs.

- The findings of the research highlighted that culture and the environment influenced the results. Further studies should investigate the relationship of culture and environment as an extension of this model.
- This research provides the foundation for other academics to explore Service Quality studies in the Internet industry in South Africa.

6.6 CONCLUSION

This chapter provided recommendations for ISP managers, discussed the study's contribution to the existing body of knowledge and the limitations of the study, and made suggestions for further research.

This study contributed to the body of knowledge by providing empirical evidence on the assessment of ISPs' Service Quality in the South African Internet industry, and revealed findings on the impact of ISPs' Service Quality on business performance. Furthermore, this research highlighted that South African customers view trustworthiness as the most important Service Quality dimension. Furthermore, this study extended the Service Quality measurement model by exploring the relationship between the Service Quality constructs Customer Centric, Innovative, Reliable and Trustworthy, and the business performance indicators, which led to the confirmation of a non-technical measurement model for customers to measure ISPs' Service Quality and to give insight into the impact of ISPs' Service Quality on customers' business performance.

The limitations of the study, such as the timing of this study, lack of prior research in the South African Internet industry, limitations of participation, and the limitations of the data-collection tool were discussed.

Moreover, this research can serve as a foundation for other researchers who want to conduct research in this space. In addition, targeting different sections of the supply chain, as well as customisation of this model for individual ISPs, can expand on this research. In addition, future research can investigate the expansion of the model to incorporate the technical side of Service Quality in the Internet industry.

In summary, this research is beneficial to managers and customers of ISPs in South Africa, as well as to academics who wish to contribute to this arena.

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ANNEXURES

ANNEXURE A – APPLICATIONS OF SERVQUAL

Table A1: Applications of SERVQUAL

Author, Year	Industry	Country of Study	Developed/ Developing Country	Aim of Research	Population Size	Sample Size	Method of Data Collection	Findings	Data Analysis	Validity
Abari et al (2011)	Education	Iran	Developing	To assess the quality of postgraduate studies at the Islamic Azad University.	1 200	92	Surveys	There was a significant negative difference between students' expectations and perceptions for guarantee, accountability, empathy, assurance, and tangibles.		
Chatzoglou et al (2014)	Post	Greece	Developed	(a) To measure the current level of services provided by Hellenic Post; (b) to evaluate the satisfaction of its customers.	1 500	406 customers, 86 managers	Surveys	Significant difference between the actual perceptions of customers and the managers. There is a negative perception of the services offered by Hellenic Post.		
Saraei & Amini (2012)	Telecentres	Iran	Developing	(a) To find out how suitable the SERVQUAL model is for rural ICT centres; (b) to find out how satisfied clients are with the services offered by these telecentres in Iran.		24 centres, 238 subjects	Surveys	Empathy was the most important dimension. Customers perceived Service Quality poorly, and customers were not satisfied with some of the Service Quality dimensions.	Cronbach's alpha was >70, therefore questionnaires are reliable and valid.	Convergent validity was applied. Structural equation modeling (SEM) Level 5%
Roslan et al (2015)	Logistics	Malaysia	Developing	To review the logistics Service Quality provided by a third party, Iskandar Malaysia logistics company.	80 000		Surveys	There are relationships between customers' satisfaction and dimensions of Service Quality, and there are positive gaps between expectations and perceptions of Service Quality provided by Iskandar Malaysia service providers.		

Author, Year	Industry	Country of Study	Developed/ Developing Country	Aim of Research	Population Size	Sample Size	Method of Data Collection	Findings	Data Analysis	Validity
Li et al (2015)	Health services	China	Developing	To investigate patients' perception of Service Quality at hospitals in China, and to propose improvements.		3 201	Surveys	Patients' overall perceptions of the hospitals' Service Quality was satisfactory. Suggested: improve the quality of the treatment, and improve the professionalism of hospital management.	Cronbach's alpha = 0.978, therefore questionnaire is reliable and valid. KMO measure of sampling adequacy was 0.979.	
Jeeradist et al (2016)	Aviation	Thailand	Developing	To identify the factors that influence Service Quality in the airline industry.	130		Surveys, focus groups, and interviews	Service Quality and safety impact the airline's image. In Case study 1, safety was a priority and passengers were not satisfied with the Service Quality. In Case study 2, increase air traffic volume capacity. In Case study 3, improve Service Quality and safety.		
Limbourg et al (2016)	Logistics	Vietnam	Developing	To examine the logistics Service Quality using SERVQUAL.		200		Difference between customers' expectations and perceptions of Service Quality dimensions. Customers are not satisfied with the Service Quality provided by logistic providers.		
Cid-López et al (2015)	Telecommunications	Ecuador	Developing	To define an assessment standard for the quality of service in the ICT sector.		544 users for surveys	Case study, surveys	New model SICTQUAL proposed.		
Elkhani et al (2014)	Aviation	Malaysia	Developing	To build an integrated model for evaluating the effectiveness of airline's websites.		357	Surveys	Customer system disconfirmation has a positive direct impact on satisfaction levels. Customer e-satisfaction from multiple disconfirmations positively influences e-loyalty.	Cronbach's alpha >0.70, and factor loading was 0.737 and higher, therefore internal consistency was met.	Convergent and discriminant validity was used to assess the construct validity of the instrument.

Author, Year	Industry	Country of Study	Developed/ Developing Country	Aim of Research	Population Size	Sample Size	Method of Data Collection	Findings	Data Analysis	Validity
Dursun et al (2013)	Education	Turkey	Developing	To measure the quality of service of the distance education, and to help increase the quality of higher education.		463	Surveys	Expectations were not met for all five dimensions of Service Quality. Students were not satisfied with the Service Quality. Students were not happy with responsiveness received from their universities.	Cronbach's alpha above 0.70, indicating internal consistency.	
Tseng & Hung (2013)	Environmental	Taiwan		To develop a green product instrument to measure the gaps between expectations and perceptions.		1 000	Surveys	Customers have high expectations of environmental performance of green products, and high expectations of functional performance and appearance. An instrument for measuring the gaps between expectations and perceptions was proposed.	Cronbach's alpha = 0.711 to 0.870.	Confirmatory factor analysis (CFA) was used to test the reliability and validity of the instrument.
Ariff et al (2012)	Banking	Malaysia	Developing	(a) To determine the dimensions of e-Service Quality for Internet banking in Malaysia; and (b) to propose a multiple-item scale for measuring e-Service Quality for Internet banking.		256	Surveys	A conceptual model was developed to measure e-Service Quality for Internet banking. The e-Service Quality dimensions for Internet banking are assurance-fulfilment, efficiency, system availability, privacy, contact-responsiveness, and website aesthetics and guide.	Cronbach's alpha was greater than 0.70.	CFA was used. The Bartlett's test of sphericity value was less than 0.05, indicating that analysis was significant.
Jia & Reich (2013)	IT	USA	Developed	(a) To determine the IT service climate constructs; and (b) to empirically test the linkage between IT service climate and antecedents.		230 for IT survey, 122 for client survey	Surveys	The IT service climate construct is made up of three dimensions, namely service leadership, service vision and service evaluation. The antecedents of IT service climate is supervisory support, team support, and ancillary support. The model tests the linkage between IT service climate, antecedents and outcome variables. Findings indicate that managers play a very important role in IT service provision.	Cronbach's alpha is 0.81 for service leadership, 0.85 for service vision and 0.68 for service evaluation.	Convergent validity was met.

Author, Year	Industry	Country of Study	Developed/ Developing Country	Aim of Research	Population Size	Sample Size	Method of Data Collection	Findings	Data Analysis	Validity
Kitapci et al (2014)	Health services	Turkey	Developing	(a) To investigate the effect of Service Quality dimensions on satisfaction; (b) to identify the effect of satisfaction on word-of-mouth communication, and repurchase intentions; and (c) to investigate if a relationship exists between word-of-mouth communication and repurchase intentions.		369	Surveys	Empathy and assurance are positively related to customer satisfaction. Customer satisfaction has a significant impact on word of mouth and repurchase intention.		
Thaichon et al (2014)	IT	Thailand	Developing	(a) To identify the Service Quality dimensions for an ISP; (b) to investigate the effects of ISPs' Service Quality on their customers' value, trust and commitment in high-tech Internet services; and (c) to investigate service perceptions of different market segments.		1 507	Surveys	Network quality, customer service, and technical support, information quality, privacy, and security have different influences on perceived value, trust, and commitment. Furthermore, network quality, which is measured through strength and stability, was the strongest predictor of perceived value. Managers should look into a privacy protection policy. In addition, ISPs should look at segmenting their customers to customise their marketing strategies accordingly. Privacy and security had the strongest influence on costs.	Cronbach's alpha > 0.70	Discriminant validity was confirmed. Composite reliability was satisfactory.
Hussain et al (2015)	Aviation	UAE		(a) To identify the determinants of airline Service Quality; and (b) to measure customer satisfaction, and in turn brand loyalty.		253	Surveys	The study results revealed the dimensions of Service Quality in the airline industry. In addition, the study suggested improvements in this space. Furthermore, the study led to the development of a model that shows the linkage between corporate image, customer expectations, Service Quality, perceived value, customer satisfaction, and brand loyalty.		

Author, Year	Industry	Country of Study	Developed/ Developing Country	Aim of Research	Population Size	Sample Size	Method of Data Collection	Findings	Data Analysis	Validity
Charles & Kumar (2014)	Banking	Malaysia	Developing	(a) To measure the Service Quality of Malaysian banks through DEA; and (b) to develop a DEA model.		688	Surveys	The results are compared against peers to allow management to make performance adjustments. DEA model proposed.		
Barrera et al (2014)	IT	Spain		To determine if the perceived quality of electronic services varies on the socio-demographic and web graphics characteristics of the online consumer.		267	Surveys	The reliability dimension is best valued. In addition, the perceived quality of service is homogenous between the different groups of online buyers, and there is measurement variance of the measurements. Privacy is necessary to evaluate online Service Quality. Worst performance found in the recovery dimension.		Convergent validity achieved on each construct's items. Good internal consistency ranging from 0.789 to 0.923.
Roses, Hoppen & Henrique (2009)	IT	Brazil	Developing	To assess the applicability of SERVPERF in IT service.		228	Surveys	SERVPERF is a valid instrument. Only tangibles gap was close to zero, indicating that perceptions were very close to expectations empathy had the largest gap.	Cronbach's alpha >0.7; CFA.	
Almeida et al (2015)	IT	Brazil		(a) To determine whether clients were dissatisfied with the IT services provided to them; and (b) to determine the main reasons for the satisfaction/ dissatisfaction.		169	Surveys	There is a general dissatisfaction with IT services, and the main reasons for the dissatisfaction are around the communication between IT employees and internal clients regarding deadlines.	Cronbach's alpha >0.9	
Ling et al (2016)	Banking	Malaysia	Developing	To determine and examine the factors that influence customer satisfaction towards Internet banking.		200	Surveys	The top three factors, web design, content, convenience and speed are closely linked to customer satisfaction of Internet banking. Web design, content, convenience, and speed had a relationship with customer satisfaction.	Cronbach's alpha all >0.7	

Author, Year	Industry	Country of Study	Developed/ Developing Country	Aim of Research	Population Size	Sample Size	Method of Data Collection	Findings	Data Analysis	Validity
Chen & Yang (2015)	Telecommunications (TS)	Taiwan		To determine a model measuring perception discrepancy regarding Telecommunications Services.		75	Face-to-face interviews and telephone responses.	There is a significant difference between TS providers' perception of TS quality and customers' perception of TS quality. Providers' key TS quality indicators – After-sales service, technique support, effectiveness, and efficiency. Customers' key TS indicators – Integrity, accuracy, and security.	Exploratory factor analysis (EFA) used to reduce the number of variables, Cronbach's alpha used to ensure internal consistency.	
Kang & Bradley (2002)	IT	Australia	Developed	To assess the applicability of the IT industry, and to identify gaps between the customer and supplier IT Service Quality.		106	Surveys	The study showed that instead of the four dimensions found in the original SERVQUAL model, only two service dimensions exist in the IT setting. The three format SERVQUAL model was applicable to the IT service setting.		
Roy et al (2012)	Education	USA	Developed	(a) To determine the dimensions of library Service Quality that is important to measure; and (b) To investigate the different user perceptions on library Service Quality.		103 students, 98 faculty users	Surveys	AS dimension, which is similar to empathy, is difficult to assess. The length of service of the respondents and the type of respondents (students/faculty users) influence the evaluation of AS.		
Purcărea, Gheorghe & Petrescu (2013)	Health services	Romania	Developing	To determine the applicability of the original SERVQUAL tool in the health industry in Romania.		263	Surveys	SERVQUAL is applicable in this industry. The findings of this study indicate that the dimension tangibles has the highest gap, followed by responsiveness and reliability.	KMO index and Bartlett's test was used to test if items are inter-correlated. Items are inter-correlated. Factor analysis was performed thereafter.	To test internal validity the overall Cronbach's alpha was 0.67.

Author, Year	Industry	Country of Study	Developed/ Developing Country	Aim of Research	Population Size	Sample Size	Method of Data Collection	Findings	Data Analysis	Validity
Spiller et al (2007)	IT	Australia	Developed	To determine if the needs of service continuers and service discontinuers are different in the Internet industry in Australia.		196	Phone surveys	Reliability of service and quick response to queries and payment options affected customers' decision to continue or discontinue the service. In addition, reliability, price, speed, and easy access to support were raised as important.	Chi-squared methodology was used to test the hypothesis.	
Cheng et al (2008)	IT	Hong Kong		To develop and test a model to examine the antecedents of customer loyalty towards ISPs in Hong Kong.		737	Surveys	Customer satisfaction, switching cost, and price perception are antecedents that lead to customer loyalty. There was no direct relationship between Service Quality and customer loyalty. Reliability, assurance, and empathy were significant predictors of customer satisfaction.	SEM, Cronbach's alpha.	

The table above indicates that the majority of the studies took place in both developing and developed countries, and were performed after the year 2010. The developing countries include Iran, Malaysia, China, Thailand, Vietnam, Ecuador, Turkey, and Brazil. There is a lack of SERVQUAL studies performed in the continent of Africa, let alone in South Africa.

ANNEXURE B – DESCRIPTION OF LARGE ISPS IN SOUTH AFRICA

The information below was collated from the ISPA's website and from the suppliers' websites.

Africa INX

Africa INX is part of EOH Holdings, which provides consulting, technology, and outsourcing services to enterprise clients in all industry verticals in South Africa, Africa, and the UK. Africa INX chooses to differentiate itself through excellent service delivery.

Africa INX's Internet offerings include DSL access, wireless access, and leased line services. Furthermore, they have built a new Next Generation Network, thereby allowing them to add new technologies to their network (EOH Network Solutions 2015).

Business Connexion

Business Connexion provides business intelligence, business consulting and data centre services to enterprise clients in South Africa, Africa, the UK, and in Dubai. It chooses to differentiate itself through service delivery, dependability, and performance.

The Internet is interwoven into the various solutions it presents as part of the product suite. Furthermore, Business Connexion has a network that spans across South Africa, Africa, the UK, and in Dubai (Business Connexion 2015).

CMC Global Consulting

CMC Networks is a part of CMC Global Consulting, which provides Multiprotocol Label Switching (MPLS) technologies to global carriers in South Africa, Africa, and in the UK. CMC Networks differentiates itself by placing emphasis on its extensive network, which spans throughout Africa (CMC Networks 2015).

CMC Networks' Internet offerings include DSL access, wireless access, leased line, mobile access, dial-up, and ISDN access. Furthermore, CMC Networks has access to multiple

undersea cable systems, and many Points of Presence (POPs) throughout Africa, South Africa, and internationally (CMC Networks 2015).

Cybersmart

Cybersmart provides DSL access, leased line, dial-up and ISDN access to the consumer market in South Africa only. It differentiates itself by stating that it provides the fastest ADSL in South Africa.

Cybersmart attracts customers through catchy marketing specials on their website (Cybersmart 2013).

eNetworks

eNetworks provides Internet access, security, and e-mail systems to enterprise and SME customers in South Africa and in sub-Saharan Africa. It differentiates itself through the provision of fast, reliable Internet services. Its capabilities include building and managing of large Local Area Networks (LAN).

eNetworks' Internet offerings include leased line access (dedicated 64k+), DSL access, wireless access, mobile access, dial-up, and ISDN access (eNetworks 2015).

iBurst

iBurst is part of WBS Holdings, and is the exclusive service provider company to wireless Business Solutions, and to consumer and SME clients in South Africa. iBurst differentiates itself through customer service and innovative product offerings. Furthermore, iBurst states that it offers the speed of DSL in the mobile environment. In addition, its technology is portable and therefore allows customers to move freely amongst base stations. Furthermore, its technology is built on an IP base, therefore making it easier and cheaper to build networks.

iBurst's Internet offerings include DSL access, wireless access, and mobile access (iBurst 2015).

Internet Solutions

Internet Solutions is part of Dimension Data, which provides technology solutions to enterprise, consumer, global carrier, and SME customers in South Africa, Africa, and internationally. Internet Solutions differentiates itself through service delivery and its extensive network. Internet Solutions states that it is Africa's largest managed network services provider to global carriers and multinationals. In addition, Internet Solutions has the largest network of Wi-Fi hotspots. Furthermore, Internet Solutions has over 20 years' experience in delivering connectivity type services in Africa (Internet Solutions 2015).

Internet Solutions owns 60 POPs in 14 African countries, and has access to 210+ Gbps of bandwidth through investments in various undersea cable systems. Internet Solutions' Internet offerings include DSL access, wireless access, mobile access, leased line, dial-up, and ISDN access (Internet Solutions 2015).

Liquid Telecommunications Operations SA

Liquid Telecommunications Operations SA is part of the Liquid Telecom Group, and is an independent data, voice, and Internet service provider which provides wholesale fibre, satellite, and international carrier services to mobile and fixed telecommunication operators, ISPs, and other customers in developing countries in eastern, central, and Southern Africa. Liquid Telecom has offices in Botswana, the DRC, Kenya, Lesotho, Nigeria, Rwanda, South Africa, Uganda, Zambia, Zimbabwe, and the UK. Liquid Telecom differentiates itself through its reliable, cost-effective infrastructure.

Liquid Telecom provides services to 50 global wholesale carriers operating in Eastern, Central, and Southern Africa, Europe, North America, and Asia Pacific (Liquid Telecom 2015).

MTN Business

MTN Business is part of the MTN Group, which provides Internet and email solutions, network solutions, data centre services, calling and messaging services, security solutions, and business applications to enterprise, SME, and multinational customers in South Africa and in Africa. MTN Business differentiates itself through its African footprint, and is seen

as a one-stop shop for ICT services, which includes an extensive range of mobile and Internet-based communications solutions.

MTN Business' Internet service offerings include leased line access (dedicated 64k+), DSL access, wireless access, and mobile access. Furthermore, the MTN Group's global footprint spans across 23 countries in the Middle East and Africa (MTN Business 2009).

MWEB

MWEB is part of Multichoice South Africa Holdings, which is a Naspers Limited subsidiary. MWEB provides Internet access services (fibre, ADSL, 3G, LTE, and Wi-Fi solutions) to consumer, SME, and enterprise customers in South Africa. MWEB differentiates itself through its extensive Internet access offerings, differentiated tools and services, best-of-breed technology guarantee, and internationally sourced research and development.

MWEB's Internet service offerings include leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access (MWEB 2015).

Neotel

Neotel is South Africa's first alternative infrastructure-based telecoms provider, which provides a wide variety of fixed and wireless data telecoms services to wholesale, enterprise, and consumer customers in South Africa and internationally. Neotel is made up of shareholders from TATA communications, Nexus Connexion, and Communitel. Both TATA communications and Communitel offer the company exposure to best practice and the latest technology outside of South Africa. Neotel differentiates itself through service delivery and being able to tap into the knowledge and experience of its shareholder, TATA Communications, who is a pioneer in offering new technologies and services across India. Furthermore, Neotel states that it is the only operator in South Africa to offer full cable diversity in the country.

Neotel's offerings include NeoBroadband, managed links, and virtual private networks (VPNs), Internet peering, global transit, National Long Distance network services, and fibre and wireless access services. Neotel has access to capacity of five undersea cables, thereby allowing for redundancy and protection (Neotel 2014).

RSA WEB

RSA WEB provides hosting and connectivity services such as dedicated servers, web hosting, cloud servers, colocation, ADSL, and data centre services to enterprise and consumer customers in South Africa and internationally. RSA WEB differentiates itself through customer service and in-depth technical understanding.

RSA WEB's Internet service offerings include leased line access (dedicated 64k+), DSL access, wireless access, mobile access, dial-up access, and ISDN access services. RSA WEB has invested in infrastructure in South Africa and internationally. RSA WEB has data centres in Johannesburg and Cape Town, and POPs in London, Europe, and the USA (RSA WEB [sa]).

SA Outsourcing Operations

SA Outsourcing Operations is the South African portion of Enterprise Outsourcing, which provides IT and data-processing solutions to enterprise customers. Enterprise Outsourcing operates National Area Networks and Local Area Networks that provide hosted applications and IT services for enterprise customers and service providers. The company differentiates itself through the provision of quality, cost-effective IT and data processing solutions.

SA Outsourcing Operations' Internet service offerings include leased line access (dedicated 64+), DSL access, wireless access, mobile access, dial-up access, and ISDN access (Enterprise Outsourcing 2015).

Smart Village

Smart Village is a Next Generation Network and infrastructure solutions provider, which provides fully integrated multimedia, telecommunications, and security solutions to enterprise customers and consumers. Smart Village differentiates itself through its diverse and technical capable network, which forms the platform for core and value-added services. Furthermore, Multichoice acquired a controlling stake in Smart Village in order to utilise Smart Village's platform to continue the rollout of its core DStv DVB to IP offerings.

Smart Village's Internet service offerings include lease line access (dedicated 64k+), DSL access, wireless access, mobile access, dial-up access, and ISDN access. Smart Village has

a national footprint through the connection of 6 000 homes and businesses (Smart Village 2014).

Vox Telecom

Vox Telecom is a telecoms operator which provides voice, data, and collaboration services to enterprise, SME, and consumer customers in South Africa. Vox differentiates itself by being one of the largest black-owned telecommunications companies in South Africa. In addition, Vox Telecom differentiates itself through its service delivery, technical expertise, and innovation (Vox Telecom 2014).

Vox Telecom's Internet service offerings include leased line (dedicated 64k+), DSL access, wireless access, mobile access, dial-up access, and ISDN access.

Vox Telecom's national footprint spans across 30 agencies, and has 13 POPs around South Africa. Furthermore, it has access to undersea cables on the East and West Coast to offer full redundancy, and has two POPs in London (Vox Telecom 2014).

Web Africa

Web Africa provides broadband Internet access and hosting solutions to consumer customers in South Africa and internationally. Web Africa differentiates itself through its service delivery.

Web Africa's Internet services include DSL access, dial-up, and ISDN access. Furthermore, Web Africa operates multiple hosting clusters in South Africa and in Atlanta in the USA (Web Africa Networks 2015).

ZACR

ZACR is the registry operator for the co.za Internet Domain Name Space, and is responsible for administering the co.za domain name space (ZA Central Registry NPC 2015). ZACR does not offer Internet access services.

Table A2: Summary of large ISPs in South Africa (Researcher's own data)

ISPA Classified Size	ISP Name	Parent Company	Differentiator	Presence	Type of Internet Access Services delivered	Deliver Service to	Own Network
Large ISP	Africa INX	EOH Holding	Service delivery	South Africa, Africa, UK	DSL access, Wireless access & Leased Line services	Enterprise customers	Yes
Large ISP	Business Connexion		Service delivery	South Africa, Africa, UK & Dubai	Internet access is interwoven into the solutions they provide	Enterprise customers	Yes
Large ISP	CMC Networks	CMC Global Consulting	Extensive Network	South Africa, Africa & various POPs International	DSL access, Wireless access, Leased Line services, Mobile access, Dial-up and ISDN access	Global Carriers	Yes
Large ISP	Cybersmart		They claim they have the Fastest ADSL in South Africa	South Africa	DSL access, Leased Line services, Dial-up & ISDN access	Consumer customers	
Large ISP	eNetworks		Service delivery	South Africa & Sub-saharan Africa	DSL access, Wireless access, Mobile access, Dial-up and ISDN access	Enterprise & SME customers	Yes
Large ISP	iBurst	WBS Holdings	Service delivery & Innovative product offerings	South Africa		Consumer & SME customers	Yes
Large ISP	Internet Solutions	Dimension Data Group, which is part of NTT	Service delivery & Extensive Network	South Africa, Africa, UK and various POPs International	DSL access, Wireless access, Mobile access, Leased line, Dial-up & ISDN access	Enterprise, Consumer, Global Carriers & SME customers	Yes
Large ISP	Liquid Telecommunications Operations SA	Liquid Telecom Group	Reliable, cost effective infrastructure	South Africa, Africa & UK	DSL access & Wireless access	Enterprise, SME & Global Carriers	Yes
Large ISP	MTN Business	MTN Group	African Footprint	South Africa, Africa & International	DSL access, Wireless access & Mobile access	Enterprise, SME & Multinational customers	Yes
Large ISP	MWEB	Part of Multichoice South Africa Holidings, which is part of Naspers Limited	Extensive Internet offerings, tools and services, technology, and International sourced research and development	South Africa	DSL access, Wireless access, Mobile access, Dial-up access & ISDN access	Enterprise, Consumer & SME customers	Yes
Large ISP	Neotel	Shareholding from TATA communications, Nexus Connexion and Communitel	Service delivery, and the ability to tap into knowledge and experience from their shareholder TATA communications. Neotel claims they are the only operator to offer full cable diversity.	South Africa & International	DSL access & Wireless access	Enterprise, Consumer, Global Carriers & SME customers	Yes
Large ISP	RSAWEB		Service delivery and in-depth technical understanding	South Africa & International	DSL access, Wireless access, Mobile access, Dial-up access & ISDN access	Enterprise & Consumer	Yes
Large ISP	SA Outsourcing Operations	Enterprise Outsourcing	Provision of Quality, Cost effective IT and data processing solutions	South Africa & International	DSL access, Wireless access, Mobile access, Dial-up access & ISDN access	Enterprise customers	Yes
Large ISP	Smart Village	Mulitchoice acquired a controlling stake	Diverse and technical capable network	South Africa	DSL access, Wireless access, Mobile access, Dial-up access & ISDN access	Enterprise & Consumer customers	Yes
Large ISP	Vox Telecom		Service delivery, technical expertise and Innovation	South Africa & International	DSL access, Wireless access, Mobile access, Dial-up access & ISDN access	Enterprise, SME & Consumer customers	Yes
Large ISP	Web Africa		Service delivery	South Africa	DSL access, Dial-up & ISDN access	Consumer customers	
Large ISP	ZACR			South Africa	Does not offer Internet access services, however ZACR is responsible to administer the CO.ZA domain name space		

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ANNEXURE C – DESCRIPTION OF MEDIUM ISPS IN SOUTH AFRICA

The information below was collated from the ISPA's website and from the suppliers' websites.

Adept Internet

Adept Internet is a South African-based company that provides innovative Internet services and network solutions to enterprise, consumer, and SME clients in South Africa. Adept Internet differentiates itself through its innovative Internet services product set.

Adept Internet provides leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN Internet access services. Furthermore, Adept Internet operates its own infrastructure, and has four Network Operation Centres (NOCs) (Adept [sa]).

Altech Technology Concepts

Altech Technology Concepts is part of Allied Technologies Limited, which provides Internet access, IT Infrastructure, and web development to enterprise, consumer, and SME clients in South Africa. Altech differentiates itself through the provision of high-quality, innovative Internet-driven solutions. Altech claims it is one of the top telecommunications companies in South Africa, and one of the leaders in convergence technologies.

Altech's Internet offerings include leased line access, DSL access, and wireless access (Autopage 2012).

BCS-Net

BCS-Net is a subsidiary of the BCS Group, which provides ICT infrastructure and support services to enterprise, consumer, and SME customers in South Africa. BCS-Net differentiates itself through its strategic partnerships, reliable service delivery, and is a preferred supplier of international bandwidth on the SEACOM cable (BCS Group 2011).

BCS-Net's Internet offerings include leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access. In addition, BCS-Net has multiple POPs in Gauteng, Western Cape, and KwaZulu-Natal (BCS Group 2011).

BitCo

BitCo provides VoIP telephony solutions to enterprise, SME, and consumer customers in South Africa. BitCo differentiates itself through service delivery, by providing 99% service guarantee.

BitCo's Internet offerings include leased line access and wireless access (BitCo 2015).

Broadlink

Broadlink is a subsidiary of wireless Business Solutions, which provides carrier-grade, end-to-end connectivity solutions to enterprise, consumer, global carrier, and SME clients in South Africa and in Africa. Broadlink differentiates itself through its diverse product offerings, and service delivery which includes a Service Level Agreement (SLA).

Broadlink's Internet offerings include leased line access, DSL access, and wireless access. In addition, Broadlink operates and monitors its network (Broadlink 2014).

Comtel Communications

Comtel Communications provides voice, data, security, access control, and IPTV solutions to multi-tenant developments such as office blocks, business parks, shopping malls, and residential estates, to enterprise, SME, and consumer customers in South Africa. Comtel Communications differentiates itself through its service offerings.

Comtel's Internet offerings include leased line access and wireless access (Comtel 2015).

Dotcoza

Dotcoza provides Internet services and access to its enterprise and consumer customers in South Africa. There is limited information on Dotcoza's differentiating value proposition in the market.

Dotcoza's Internet offerings include DSL access, wireless access, leased line access, and dial-up access (Dotcoza 2015).

Dynamic Cloud Solutions

Dynamic Cloud Solutions is an infrastructure and platform service provider, which provides cloud, rack, and tower hosting services to enterprise and SME clients in South Africa. Dynamic Cloud Solutions differentiates itself through the design and implementation of its cloud computing models, and tailor-made virtual solutions. Furthermore, it continues to distinguish itself as the first provider in the market to offer Infrastructure as a Service (IaaS) to South African clients (Dyncloud 2013).

Its website and the ISPA website make no mention of Internet access services.

EOH Network Solutions

EOH Network Solutions is part of EOH Mthombo (Pty) Ltd, which provides consulting, technology, and outsourcing services to enterprise, SME, and consumer clients in South Africa, Africa, and in the UK. EOH differentiates itself through its footprint, and its knowledge and skills in consulting, technology, and outsourcing (EOH Network Solutions 2015).

EOH has presence in 134 locations in South Africa, in 29 African countries, and internationally. EOH's Internet offerings are incorporated into their consulting, technology and outsourcing services (EOH Network Solutions 2015).

Faircom

Faircom is an Internet, communications, and technology company that provides high-speed wireless Internet, VoIP, and hosting services to SME and consumer clients in South Africa. Apart from Faircom providing solutions to business parks, residential cluster developments, and apartment blocks, there is limited information around Faircom's differentiation in the market.

Faircom's Internet offerings include leased line access and wireless access. In addition, Faircom owns and operates a network in the Cape Town Metro area (Faircom [Sa]).

First Technology

First Technology is a value-added ISP and IT company, which provides Internet connectivity to consumer and SME clients in South Africa. First Technology is an accredited partner of Internet Solutions.

First Technology's Internet offerings include leased line access, DSL access, and wireless access (FirstNet 2015).

FNB Connect

FNB Connect is part of FirstRand Bank Limited, which offers telecommunications value-added services to FNB's existing range of banking products. Services are offered to a range of enterprise, SME, and consumer clients in South Africa. FNB Connect differentiates itself through its simple, affordable voice and data solutions.

FNB Connect's Internet offerings include DSL access and VoIP services. FNB Connect partners with FNB, DStv, Google, Internet Solutions, Vodacom, and MTN to provide services to its existing client base (FNB Connect [sa]).

Frogfoot Networks

Frogfoot Networks provides Internet services to enterprise, SME, and consumer clients in South Africa. Frogfoot Networks differentiates itself through its service delivery, through the provision of dynamic, friendly, and accessible services. Furthermore, Frogfoot Networks has been built on Linux, therefore using open standards and open-source software.

Frogfoot Network's Internet offerings include leased line access, DSL access, wireless access, and mobile access. Frogfoot Network's core network infrastructure is in Cape Town (Frogfoot 2015).

Hymax Talking Solutions

Hymax is a telecommunications provider that provides ICT services to SME clients in South Africa. Hymax differentiates itself through its Next Generation Network, which is capable of accommodating the latest voice and data technologies.

Hymax's Internet offerings include leased line access and DSL access. Hymax's network is interconnected regionally to all the major telecommunication operators in South Africa. Furthermore, Hymax has POPs in all major cities (Hymax 2015).

Imagine IPS

Imagine IPS offers IP-based solutions to ISPs and voice carriers. In addition, Imagine IPS offers colocate/server hosting and website hosting, uncapped ADSL, private leased line circuits such as Diginet, Neolink, and Metronet to consumer and SME clients in South Africa. Imagine IPS partners with Internet Solutions and Vodacom Business in order to offer clients the best possible solution.

Imagine IPS's Internet offerings include leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access (Imagine 2013).

Info-Gro

Info-Gro was initially part of the Internal IT division of the MgK Group, and thereafter separated from the MgK Group. After the separation, Info-Gro continued to provide services to the Mgk Group, as well as external enterprise, consumer, and SME clients in South Africa. Info-Gro distinguishes itself through the ownership of its microwave network.

Info-Gro's Internet offerings include leased line access, wireless access, and mobile access. Furthermore, Info-Gro has one of the largest privately owned microwave networks in the Bojanala District, which comprises 13 high sites, and covers an approximately 7 000 m² (Info-Gro [sa]).

Internet Services & Technologies (iSAT)

iSAT regards itself as a premier medium-sized Internet service provider, which provides Internet services to consumer clients in South Africa. iSAT differentiates itself through its service delivery.

iSAT Internet's offerings include DSL access, dial-up access, and ISDN access (iSAT 2016).

Jireh Technologies

Jireh Technologies offers wireless communication solutions to consumer and SME clients in South Africa. Jireh Technologies differentiates itself by owning and managing the high sites that make up its network.

Jireh Technologies' Internet offering include leased line access, DSL access, and wireless access. Furthermore, Jireh Technologies has its own managed network, which is made up of 200 high sites nationally (Jireh Tech [sa]).

MacroLan

MacroLan provides Internet services to enterprise, consumer, and SME clients in South Africa. MacroLan differentiates itself through its service delivery, and its ownership of dedicated portions of two undersea fibre cables (MacroLan 2015).

MacroLan's Internet offerings include leased line access, DSL access, wireless access, dial-up access, and ISDN access. Furthermore, MacroLan's network constitutes POPs in Mowbray, Teraco Rondebosch, Cape Town Central, and Camps Bay beach front. In addition, MacroLan is in the process of expanding its network reach to Somerset West and Stellenbosch. In addition, it owns a data centre in Cape Town, and collocate in Durban, Johannesburg, and London. Furthermore, MacroLan's high-speed network offers speeds of 10 Gbps with an average latency of less than 2 Mbps (MacroLan 2015).

Multisource Telecoms (Pty) Ltd

Multisource Telecoms is a Global Convergence Technology company, which provides integrated, end-to-end solutions, products, and services to enterprise and SME clients in South Africa and Africa. Multisource Telecoms differentiates itself through the design, building, and operation of next wave networks, which incorporate radio, wireless, video, voice, and IP technologies into a single network. Furthermore, Multisource spends a great deal of time investigating the latest technologies and trends in the market.

Multisource's Internet offerings include leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access (Multisource [sa]).

Neology

Neology has been acquired by Multisource Telecoms. Neology provides billing, radius, and software services to enterprise, SME, and consumer clients in South Africa and Africa. Neology differentiates itself through its software solutions, managed services, and design specialists.

Neology's Internet offerings include leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access (Neology [sa]).

Posix Systems

Posix Systems provides Internet services to consumer and SME clients in South Africa. Posix Systems differentiates itself by being the first Internet service provider to exclusively operate on Linux and open source.

Posix Systems' Internet service offerings include leased line access, DSL access, dial-up access, and ISDN access (Posix 2009).

Reflex Solutions

Reflex Solutions provides IT, networking, and communications solutions to enterprise and SME clients in South Africa. Reflex Solutions differentiates itself through its in-house skills, end-to-end solutions, service delivery, strong partnerships, and national footprint.

Reflex Solutions' Internet offerings include leased line access, DSL access, and wireless access (Reflex 2015).

SAI

SAI provides Internet services and access to SME clients in South Africa. SAI differentiates itself though its superior product quality, skilled resources, and ability to offer competitive SME prices.

SAI's Internet offerings include leased line access, DSL access, wireless access, dial-up access, and ISDN access. Furthermore, SAI has offices in Durban, Cape Town, and Pietermaritzburg (SAI 2015).

SITA

SITA has been formed to consolidate and coordinate the state's IT resources. In addition, SITA manages the procurement and delivery of IT projects in order to achieve economies of scale and cost efficiencies for the state (SITA 2014).

Switch Telecom

Switch Telecom provides telecommunication services to consumer, enterprise, and wholesale clients in South Africa. Switch Telecom differentiates itself by its ability to offer affordable and reliable services. Furthermore, Switch Telecom has a portal where customers can monitor their usage. In addition, Switch Telecom claims that it has skilled resources, and the ability to offer services without tying customers down with lengthy contract terms.

Switch Telecom's Internet offerings are bundled with its VoIP offerings (Switch Telecom 2013).

XDSL Broadband

XDSL Broadband is an ISP which offers dynamic Internet solutions to enterprise, global carrier, and SME clients in South Africa. XDSL differentiates itself by its strong relationship with selective vendors and Tier 1 carriers, and its ability to offer affordable solutions. Furthermore, XDSL Broadband refers to its extensive skills set and excellent service delivery (XDSL [sa]).

XDSL Broadband's Internet offerings include leased line access, DSL access, and mobile access. In addition, XDSL Broadband has an extensive national backbone by having POPs in nine data centres across the country. Furthermore, it has capacity on WACS, SAT 3, and SEACOM undersea cables (XDSL [sa]).

Table A3: Summary of medium ISPs in South Africa (Researcher's own data)

ISPA Classified Size	ISP Name	Parent Company	Differentiator	Presence	Type of Internet Access Services delivered	Deliver Service to	Own Network
Medium ISP	Adept Internet		Innovative products	South Africa	Leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access	Enterprise, consumer, and SME customers	Yes
Medium ISP	Altech Technology Concepts	Allied Technologies Limited	Leader in convergence technologies	South Africa	Leased line access, DSL access, and wireless access	Enterprise, consumer, and SME customers	
Medium ISP	BCS-Net	BCS Group	Strategic partnerships, service delivery, and is a preferred supplier of International bandwidth on the SEACOM cable	South Africa	Leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access	Enterprise, consumer, and SME customers	Yes
Medium ISP	BitCo		Service delivery, and service guarantees	South Africa	Leased line access and wireless access	Enterprise, consumer, and SME customers	
Medium ISP	Broadlink	Wireless Business Solutions (WBS)	Diverse Product offerings, Service delivery and service guarantees	South Africa & Africa	Leased line access, DSL access, and wireless access	Enterprise, consumer, global carriers, and SME customers	Yes
Medium ISP	Comtel Communications		Service offerings	South Africa	Leased line access and wireless access	Enterprise, consumer, and SME customers	
Medium ISP	Dotcoza			South Africa	Leased line access, DSL access, wireless access, and dial-up access	Enterprise, consumer, and SME customers	
Medium ISP	Dynamic Cloud Solutions		Differentiated design and implementation of their cloud computing models, and tailor made virtual solutions	South Africa		Enterprise and SME customers	
Medium ISP	EOH Network Solutions	EOH Mthombo	EOH has presence in 134 locations in South Africa, in 29 African countries and Internationally. Knowledge and skills in Consulting, Technology and Outsourcing.	South Africa, Africa and UK		Enterprise, consumer, and SME customers	Yes
Medium ISP	Faircom			South Africa	Leased line access and wireless access	Consumer and SME customers	Yes
Medium ISP	First Technology			South Africa	Leased line access, DSL access, and wireless access	Consumer and SME customers	
Medium ISP	FNB Connect	FirstRand Bank Limited	Simple, affordable voice and data solutions	South Africa	DSL access	Enterprise, consumer, and SME customers	
Medium ISP	Frogfoot Networks		Service delivery. Furthermore, their network has been built on Linux and uses open source software.	South Africa	Leased line access, DSL access, wireless access, and mobile access	Enterprise, consumer, and SME customers	Yes
Medium ISP	Hymax Talking Solutions		Next Generation Network, which is capable of accomodating the latest voice and data technologies	South Africa	Leased line access and DSL access	SME customers	Yes
Medium ISP	Imagine IPS		Partnerships with Larger ISPs such as Internet Soltuions and Vodacom Business	South Africa	Leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access	Consumer and SME customers	
Medium ISP	Info-Gro		Ownership of a large privately owned Microwave network	South Africa	Leased line access, wireless access, and mobile access	Enterprise, consumer, and SME customers	Yes
Medium ISP	iSAT		Service delivery	South Africa	DSL access, dial-up access, and ISDN access	Consumer customers	
Medium ISP	Jireh Technologies		Own and manage 200 high sites nationally	South Africa	Leased line access, DSL access, and wireless access	Consumer and SME customers	Yes
Medium ISP	MacroLan		Service delivery, and they own dedicated portions of two undersea fibre cables	South Africa	Leased line access, DSL access, wireless access, dial-up access, and ISDN access	Enterprise, consumer, and SME customers	Yes
Medium ISP	Multisource Telecoms		Ability to design, build and operate next wave networks, which incorporate radio, wireless, video, voice and IP technologies. They also invest in research in the latest technologies and trends in the market.	South Africa & Africa	Leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access	Enterprise and SME customers	Yes
Medium ISP	Neology	Multisource Telecoms	Software Solutions, Managed services and Design Specialists	South Africa & Africa	Leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access	Enterprise, consumer, and SME customers	
Medium ISP	Posix Systems		Operates exclusively on Linux and Open source	South Africa	Leased line access, DSL access, dial-up access, and ISDN access	Consumer and SME customers	Yes
Medium ISP	Reflex Solutions		In house skills, end to end solutions, service delivery, strong partnerships and their national footprint	South Africa	Leased line access, DSL access, and wireless access	Enterprise and SME customers	Yes
Medium ISP	SAI		Superior product quality, skilled resources, and competitive SME prices	South Africa	Leased line access, DSL access, wireless access, dial-up access, and ISDN access	SME customers	
Medium ISP	SITA			South Africa			
Medium ISP	Switch Telecom		Affordable, reliable services. Customer portal to monitor usage. Skilled resources	South Africa		Enterprise, consumer, and wholesale customers	
Medium ISP	XDSL Broadband		Strong relationships with selective vendors and Tier 1 Carriers. Affordable solutions. Skills and Service delivery	South Africa	Leased line access, DSL access, and mobile access.	Enterprise, SME, and global carriers	Yes

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ANNEXURE D – DESCRIPTION OF SMALL ISPS IN SOUTH AFRICA

The information below was collated from the ISPA website and from the suppliers' websites.

Afrihost

Afrihost provides Internet services and access to SME and consumer clients in South Africa. Afrihost differentiates itself through its partnership with MTN, its passion for service delivery, service guarantees, and its large DSL network. Furthermore, it chooses to compete on price on certain services (Afrihost 2015).

Afrihost's Internet offerings include DSL access and wireless access. Afrihost's partnership with MTN allows it to offer multi-Gbps connections on WACS and EASSy undersea cables. In addition, its national infrastructure is made up of bi-directional high-speed fibre links between Johannesburg and Cape Town, Johannesburg and Durban, and Cape Town and Port Elizabeth (Afrihost 2015).

Axxess DSL

Axxess DSL provides simple and affordable ADSL Internet services to SME and consumer clients in South Africa. Axxess DSL differentiates itself through the innovative, simple, and affordable products it delivers. In addition, Axxess DSL was the first to offer pre-paid Internet vouchers.

Axxess's Internet offerings include DSL access and wireless access. Axxess DSL has its own network, but there is insufficient information regarding this network on its website (Axxess [sa]).

CipherWave Storage Solutions Africa

CipherWave provides data centre, cloud, backup, voice, and hosting services to enterprise, consumer, and SME clients in South Africa and the rest of Africa. CipherWave differentiates itself through its customer-centric approach, and its high-end servers and

infrastructure. Furthermore, CipherWave is the only company to offer a Category 5 Data Vault (CipherWave 2015).

CipherWave's Internet offerings include leased line access, DSL access, and wireless access. In addition, CipherWave has its own network, with data centres in Cape Town, Isando, Port Elizabeth, Durban, and Johannesburg (CipherWave 2015).

Converged Telecoms

Converged Telecoms is a Tier 1 telecommunications operator that provides telephony services, connectivity, VoIP, and ISP services to enterprise and SME clients in South Africa and the rest of Africa. Converged Telecoms differentiates itself through its niche expertise in voice communication, its professional and personalised services, and its provision of cost-competitive services. Furthermore, it is proud to showcase its association with the Mitel-Aastra brand (Converged Group [sa]).

Converged Telecoms' Internet offerings include leased line access, DSL access, and wireless access. Furthermore, Converged Telecoms owns and operates a Next Generation redundant network (Converged Group [sa]).

Directel

Directel provides end-to-end communications solutions to SME clients in South Africa. Directel differentiates itself through its customer services and its exclusive partnership with AVAYA.

Directel's Internet offerings include leased lines access, DSL access, and wireless access (Directel 2012).

I-Net Bridge

I-Net Bridge was bought over by Naspers in 2013. McGregor BFA and I-Net Bridge together form INET BFA, which provides capital market solutions, research solutions, and data feeds to enterprise and SME clients in South Africa, the rest of Africa, and internationally. I-Net Bridge differentiates itself by the provision of expertise on capital market solutions in the financial industry.

I-Net Bridge's Internet offerings include leased line access, DSL access, wireless access, and mobile access (INET BFA 2015).

FFG Connection

FFG Connection provides Internet Solutions to SME clients in South Africa. It seems to differentiate itself through the provision of low-cost bundled solutions.

FFG Connection's Internet offerings include leased line access, DSL access, and dial-up or ISDN access (FFG 2015).

iONLINE

iONLINE provides Internet, cellular, and IT solutions to enterprise, consumer, and SME clients in South Africa and the rest of Africa. iONLINE differentiates itself through personalised, reputable customer service, and its partnership with suppliers such as Research in Motion South Africa, Internet Solutions, MTN, Telkom SA, and Teraco.

iONLINE's Internet offerings include leased line access, DSL access, wireless access, mobile access, and dial-up or ISDN access (iONLINE 2013).

Saicom Voice Services

Saicom Voice Services provides telecommunication and VoIP services to enterprise and global carriers in South Africa and internationally. Saicom differentiates itself by being one of the largest VoIP providers in South Africa, by maintaining its expertise in the VoIP market, as well as its ability to provide support by being the one point of contact and accountability for the complex telecoms solutions it sells.

Saicom's Internet offerings include leased line access, DSL access, and wireless access. Furthermore, Saicom owns and manages the entire network, for both voice and data services. Saicom specialises in Mesh, MPLS and VPN services, Point-to-Point links on fibre optic, diginet and wireless, broadband services, and hosting (Saicom Voice 2015)

WiFi-Technologies

WiFi-Technologies provides wireless technology solutions to consumer and SME clients in Gauteng, South Africa. WiFi-Technologies differentiates itself through low prices, and excellent client support (WiFi-Technologies 2015).

WiFi- Technologies' Internet offerings include DSL access and wireless access.

Table A4: Summary of a select few small ISPs in South Africa

ISPA Classified Size	ISP Name	Parent Company	Differentiator	Presence	Type of Internet Access Services delivered	Deliver Service to	Own Network
Small ISP	Afrihost		Service delivery and service guarantees	South Africa	DSL access and wireless access	Consumer and SME customers	No
Small ISP	Axxess DSL		Innovative, simple, affordable products	South Africa	DSL access and wireless access	Consumer and SME customers	Yes
Small ISP	CipherWave		Customer-centric approach, high-end servers, and infrastructure. In addition they own and operate a Category 5 Data Vault	South Africa	DSL access and wireless access	Enterprise, consumer, and SME customers	Yes
Small ISP	Converged Telecoms		Niche expertise in voice communication. Provision of professional, personalised, cost competitive services.	South Africa & Africa	Leased line access, DSL access, and wireless access	Enterprise and SME customers	Yes
Small ISP	Directel		Customer services, and exclusive partnership with AVAYA	South Africa	Leased line access, DSL access, and wireless access	SME customers	No
Small ISP	I-Net Bridge	Naspers	Financial Industry expertise on Capital market solutions	South Africa & Africa	Leased line access, DSL access, wireless access, and mobile access	Enterprise and SME customers	No
Small ISP	FFG Connection		Low-cost bundled solutions	South Africa	Leased line access, DSL access, dial-up access, and ISDN access	SME customers	No
Small ISP	iONLINE		Personalised, reputable customer service. Partnership with suppliers such as Research in Motion SA, Internet Solutions, MTN, Telkom SA and Teraco	South Africa & Africa	Leased line access, DSL access, wireless access, mobile access, dial-up access, and ISDN access	Enterprise, consumer, and SME customers	No
Small ISP	Saicom Voice Services		Largest VoIP provider in the market, Expertise in VoIP, and is a one-stop shop for complex telecom solutions.	South Africa & International	Leased line access, DSL access, and wireless access	Enterprise and global carriers	Yes
Small ISP	Wifi-Technologies		Low-cost products and excellent client support	South Africa	DSL access and wireless access	Consumer and SME customers	No

ANNEXURE E – LETTER TO GATEKEEPERS AT ISPS

Internet Service Providers (ISPs)

Dear Sir/Madam

RE: Research in the Internet Industry in South Africa

I am a doctoral student at UNISA's School of Business Leadership (SBL) under the supervision of Professor Rembrandt Klopper and Professor Sam Lubbe.

I am researching Internet Service Providers' service quality in South Africa, and its impact on customers' business performance. The purpose of the study is to give insight around the service quality provided by Internet Service Providers (ISPs) to their customers, and the impact of this service quality on customers' business performance.

This study will help identify potential gaps between *expected* service quality and the *perceived* service quality delivered, which will help ISPs to improve service quality. The research will lead to development of a tool that customers can use to appraise their ISP.

If you wish to participate in this research, please forward the email, which contains a link to a survey to 50 or more of your business customers. The survey is made up of 5 sections and will take 20 minutes to complete.

Due to ethical reasons the identity of participants will be kept confidential and the responses will not be linked back to participants. Results will be displayed in a summarised, aggregated form in tables, text or graphs, and no ISP or customer will be identified by name. Participation in the Survey is voluntary and the customer can withdraw at any stage of the Survey. There are no identified risks in participating in this study. The data collected from the study will be kept for 5 years, and will not be accessible to anyone other than the supervisors, statistician and the Webmaster who have signed non-disclosure agreements. This will protect the confidentiality of the participants and will ensure that ethical requirements are adhered to.

The results of the study will be made available to Internet Service Providers' Association (ISPA). If you would like a copy of the results, please contact ISPA or email mmelanie.naidoo@gmail.com. In addition, you can also request from me your company's individual results. The individual results will give you an indication of how your customers perceive your service quality, and will highlight areas for improvement.

Thanking you in advance.

Yours Sincerely,
Melanie Naidoo

Participant's Letter - Customers of ISPs

Dear Participant

RE: Research in the Internet Industry in South Africa

I am a doctoral student at UNISA's School of Business Leadership (SBL) under the supervision of Professor Rembrandt Klopper and Professor Sam Lubbe.

I am researching Internet Service Providers' service quality in South Africa, and its impact on customers' business performance. The purpose of the study is to give insight around the service quality provided by South African Internet Service Providers (ISPs) to their customers, and the impact of this service quality on customers' business performance.

This research will help identify potential gaps between *expected* service quality and the *perceived* service quality delivered, which will help ISPs to improve their service quality. Furthermore, the research will possibly lead to the development of a tool that customers can use to appraise their ISP.

If you wish to participate in this research please complete this online survey. Due to ethical reasons the identity of participants will be kept confidential and the responses will not be linked back to participants. Participation in the Survey is voluntary and you can withdraw at any stage of the Survey. There are no identified risks in participating in this study.

The Survey is made up of 5 sections and will take approximately 20 minutes to complete. For ethical reasons participation in such surveys will not be compensated in any way.

The data collected from the study will be kept for 5 years on an online portal, and will not be accessible to anyone other than the Supervisors and the Webmaster. This will protect the confidentiality of the participants and will ensure that ethical requirements are met.

The results of the study will be made available to Internet Service Providers' Association (ISPA). If you would like a copy of the results, please contact ISPA or email mmelanie.naidoo@gmail.com.

Thanking you in advance.

Yours Sincerely,

Melanie Naidoo

28 June 2014

Dear Leonard Berry

RE: Permission to adapt SERVQUAL

I am a doctoral student at UNISA's School of Business Leadership (SBL) under the supervision of Professor Rembrandt Klopper and Professor Sam Lubbe.

I am researching Internet service quality in South Africa and its impact on business performance. The purpose of the study is to give insight around the Internet service quality provided by Internet Service Providers (ISPs) to their customers, and the impact of this service quality on customers' business performance. The study will help identify potential gaps between expected service quality and perceived service quality, which will aid ISPs to improve service quality. The research will possibly result in the development of a tool that customers can use to appraise their ISP.

After careful researching I have selected SERVQUAL as a basis to elicit information around expected and perceived Internet service quality in South Africa. In addition I will include a section in the questionnaire to elicit information around the impact of Internet service quality on business performance.

I therefore would like to humbly request your permission to adapt SERVQUAL. I am also more than happy to give you a call to explain further.

Thanking you in advance.

Yours Sincerely,

Melanie Naidoo

Melanie Naidoo <mmelanie.naidoo@gmail.com>

Permission to adapt SERVQUAL

Dear Melanie,

Thank you for your request for permission to use SERVQUAL in your PhD research as outlined in the letter you attached. On behalf of my co-authors, Drs. Parasuraman and Zeithaml, and myself, I am pleased to grant you that permission with the understanding that you will appropriately cite our work in all written and oral presentations of your findings.

Best wishes for success with your research study.

Len Berry

Leonard L. Berry

University Distinguished Professor, Regents Professor,

M.B. Zale Chair in Retailing and Marketing Leadership,

and Presidential Professor for Teaching Excellence

Department of Marketing

Mays Business School

Texas A&M University

4112 TAMU

College Station, TX 77843-4112

U.S.A.

TEL: 979-845-0804

FAX: 979-458-4183

E-mail: BERRYLE@TAMU.EDU

Co-author of *Management Lessons from Mayo Clinic* (McGraw-Hill, 2008)

From: Melanie Naidoo [mailto:mmelanie.naidoo@gmail.com]
Sent: Friday, June 27, 2014 10:41 PM
To: berryle@tamu.edu

Subject: Permission to adapt SERVQUAL

[Quoted text hidden]

70488606_DBL_Permission to use SERVQUAL 28062014.pdf
156K

ANNEXURE H – ETHICAL CLEARANCE APPROVAL

SCHOOL OF BUSINESS LEADERSHIP
RESEARCH ETHICS REVIEW COMMITTEE (GSBL CRERC)

24 July 2015

Ref #: 2015_SBL/DBL_004_FA

Name of applicant: Ms M Naidoo

Student #: 70488606

Dear Ms Naidoo

Decision: Ethics Approval

Student: Ms M Naidoo, mmelanie.naidoo@gmail.com, 083 711 2117.

Supervisor: Prof R Klopper, rembrandklopper@icloud.com, 084 446 6662.

Project Title: The effect of South African Internet Service Providers' Service Quality on Corporate End-users' Business Performance.

Qualification: Doctorate in Business Leadership (DBL)

Thank you for applying for research ethics clearance, SBL Research Ethics Review Committee reviewed your application in compliance with the Unisa Policy on Research Ethics.

Outcome of the SBL Research Committee:
Approval is granted for the duration of the Project

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the SBL Research Ethics Review Committee on the 24/07/2015.

The proposed research may now commence with the proviso that:
1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the SBL Research Ethics Review Committee.

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UNISA
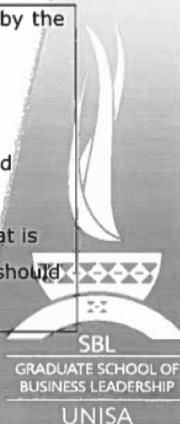
ANNEXURE I – INTERVIEW SCHEDULE FOR ISP MANAGEMENT

- Interview schedule
- The effect of South African Internet Service Providers' (ISPs) Service Quality on corporate end users' business performance
- Supervisors: Professor Rembrandt Klopper and Professor Sam Lubbe

Opening

A. Good morning/Good afternoon, my name is Melanie Naidoo. I am currently conducting research on Internet Service Quality in South Africa, and its impact on business performance.

B. The purpose of this interview is to get your insight on the effect of South African ISPs' Service Quality on corporate end users' business performance.

C. This interview will be confidential, and you or your company will not be identified or mentioned in the results. Only aggregated, summarised results will be displayed.

D. This interview should take 25 minutes. Participation in this interview is voluntary and you can choose to end the interview at any stage.

E. I would like to get your permission to record the interview in order to ensure that I capture your information correctly.

A.   General Demographic Information

1.   How long have you worked in the ICT industry?

2.   How long have you been working at Company .....?

3.   What is the size of the business (in terms of turnover, staff complement, physical locations)?

4.   How many customers do you have?

B.   The next section enquires about your perception of Internet Service Quality

1.   Have you travelled to the USA, Europe, and/or Africa? How would you describe the Internet Service Quality in South Africa, when compared to the Internet Service Quality in Europe and the USA?

2.   How would you describe the Internet Service Quality in South Africa, as compared to Internet Service Quality in the rest of Africa?

3.   What words would you use to describe **excellent** Internet Service Quality?

4.   How would you describe an **excellent** ISP?

5.   How would you describe the Internet Service Quality provided by your company to your customers?

6.   Does your company measure Internet Service Quality against any benchmarks targets? If yes, please describe how your company measures Internet Service Quality, and what tools your company uses to assess Internet Service Quality?

C.   The next section enquires about your perception of the impact of ISPs' Service Quality on your customers' business performance. I will call out five Service Quality dimensions, and ask your perception of these dimensions and their impact on your customers' business performance.

TANGIBLES – Your company's infrastructure, equipment, and physical facilities. How does your company's infrastructure, equipment, facilities, and other assets impact your customers' business performance? If you had to rate the impact by choosing an option between 1 and 5, where 1 is a large negative impact and 5 is a large positive impact, what would you choose?

RELIABILITY – Your company's ability to provide a promised service on time and accurately. How does your company's reliability impact your customers' business

performance? If you had to rate the impact by choosing an option between 1 and 5, where 1 is a large negative impact and 5 is a large positive impact, what would you choose?

RESPONSIVENESS – Your company's ability to provide a service promptly. How does your company's responsiveness impact your customers' business performance? If you had to rate the impact by choosing an option between 1 and 5, where 1 is a large negative impact and 5 is a large positive impact, what would you choose?

ASSURANCE – The knowledge of your company's personnel, and their ability to instil trust and confidence. How does your company's assurance impact your customers' business performance? If you had to rate the impact by choosing an option between 1 and 5, where 1 is a large negative impact and 5 is a large positive impact, what would you choose?

EMPATHY – The ability of your company's personnel to provide caring, individualised attention. How does your company's ability to dISPlay empathy impact your customers' business performance? If you had to rate the impact by choosing an option between 1 and 5, where 1 is a large negative impact and 5 is a large positive impact, what would you choose?

1. I mentioned the five Service Quality dimensions, which are Tangibles, Reliability, Responsiveness, Assurance, and Empathy. Which of these dimensions do you think are most important for your customers?
2. Does your company alter customers' Internet quality by performing traffic shaping when your customer utilises bandwidth-intensive applications?
3. If yes to Question 12, does your company notify customers when it alters Internet quality?
4. What are some of the challenges experienced by your company when delivering Internet services?
5. Do third-party suppliers impact the Internet Service Quality you provide to your customer? If yes, please state how.
6. Do Local Loop providers have an impact on the Internet Service Quality you deliver to your customer? If yes, please describe how your Local Loop

provider influences the quality of the Internet service that you provide to your customer.

7. Describe the impact of peering and transit providers on the Internet Service Quality you provide.

8. How do the availability and capacity of undersea cables impact the Internet Service Quality you provide to your customers?

9. Describe the impact of peering, transit, and undersea cable capacity on the latency your company provides.

10. What is your perception of contention ratios and their impact on Internet Service Quality, and what contention ratios would be acceptable to provide superior Internet Service Quality?

11. Do you have any suggestions on how to improve the Internet Service Quality in South Africa?

Closing

I would like to sincerely thank you for your time. Is there any more information you would like to share, or is there anything that I have not covered in the interview that you would like to chat about?

Do you know of any other individuals in the industry who would be suitable to contribute to this study?

Thank you once again for your contribution towards my research, I really do appreciate it.

Institution: UNISA, School of Business Leadership (SBL)

Researcher: Melanie Naidoo (70488606)

Supervisors: Professor Rembrandt Klopper and Professor Sam Lubbe

Degree: Doctorate in Business Leadership (DBL)

The purpose of this survey is to understand the effect of South African Internet Service Providers' (ISPs) Service Quality on corporate end users' business performance. Your responses will kept anonymous and will not be linked to you personally. Participation in this survey is voluntary and you can choose to withdraw at any stage of the survey. In order for your responses to be used in this research, we require your consent.

1. Please enter your name

* 2. Please enter the date

DD   MM   YYYY

By completing this survey, I understand the purpose of this study. My participation in this study is voluntary and I can withdraw at any stage. I give full consent to use my responses in the research, provided that my personal details are kept confidential.

* 3. Please indicate your ISP.

Section 1 – Demographics

For Questions 4 to 8 please select only one option.

* 4. Your age

  <20

  20-30

  31-40

  41-50

  51-60

  >60

* 5. Your gender

  Male

  Female

* 6. How long have you been working at your current company? (in years)

  <1

  1-2

  3-4

  5-6

  7-8

  >8

* 7. What type of position do you hold?

  Managerial

  Non-managerial

* 8. Size of business

  Micro (Turnover < R150 k)

  Very small (Turnover b/w R151k-R2m)

  Small (Turnover b/w R2.1 m-R4.5 m)

  Medium (Turnover b/w 4.6m-R50 m)

  Large (Turnover> R50 m)

For each of the following tasks below, please rate the regularity of use at work from 0 to 7, where 0 = Never and 7 = Very frequently

* 9. Email communications

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

* 10. Video conferencing

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

* 11. Web-based information searches

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

* 12. Studying

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

* 13. Social media communication

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

* 14. Data management

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

* 15. To inform

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

* 16. Advertising

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

* 17. Entertainment

0	1	2	3	4	5	6	7

* 18. Publishing

0	1	2	3	4	5	6	7

* 19. Recruitment

0	1	2	3	4	5	6	7

* 20. E-commerce

0	1	2	3	4	5	6	7

* 21. File transfers

0	1	2	3	4	5	6	7

* 22. Training

0	1	2	3	4	5	6	7

Section 2 – Expectations

The following statements relate to your **Expectations** of an excellent ISP.

Excellent – The quality of being outstanding or extremely good [Oxford Dictionary].

Indicate your agreement with the following statements relating to your **Expectations** of an excellent ISP.

* 23. Excellent ISPs use the latest technology

1

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 24. Excellent ISPs use superior infrastructure

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 25. Call centre employees at excellent ISPs are competent and consistent in their interaction with customers

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 26. Materials associated with the service (product collateral and other documentation) are visually appealing at an excellent ISP

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 27. When excellent ISPs promise to do something by a certain time, they do.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 28. When a customer has a problem, excellent ISPs show a sincere interest in solving it.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 29. Excellent ISPs perform the service right the first time.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 30. Excellent ISPs provide the service at the time they promise to do so.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 31. Excellent ISPs insist on error-free records.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 32. Employees of excellent ISPs tell customers exactly when services will be performed

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 33. Employees of excellent ISPs provide prompt service to customers.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 34. Employees of excellent ISPs are always be willing to help customers

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 35. Employees of excellent ISPs are never too busy to respond to customers' requests.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 36. The behaviour of employees in excellent ISPs instils confidence in customers.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 37. Customers of excellent ISPs feel safe in transactions with ISP employees.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 38. Employees of excellent ISPs are consistently courteous with customers.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 39. Excellent ISPs give customers individual attention.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 40. Excellent ISPs have operating hours convenient to all their customers.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 41. Excellent ISPs have employees who give customers personal attention.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 42. Excellent ISPs have customers' best interest at heart.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 43. The employees of excellent ISPs understand the specific needs of their customers.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

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Section 3 – Perceptions

The following statements relate to your perception of your current ISP. Indicate your agreement with the following statements.

* 44. Your ISP uses the latest technology.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 45. Your ISP has superior infrastructure.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 46. The call centre employees at your ISP are competent and consistent in their interaction with you.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 47. Materials associated with the service (such as product collateral and other documentation) are visually appealing at your ISP.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 48. When your ISP promises to do something by a certain time, they do so.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 49. When you have a problem, your ISP shows a sincere interest in solving it.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 50. Your ISP performs the service right the first time.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 51. Your ISP provides its service at the time it promises to do so.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 52. Your ISP insists on error-free records.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 53. Employees at your ISP tell you exactly when services will be performed.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 54. Employees at your ISP give you prompt service.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 55. Employees at your ISP are always willing to help you.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 56. Employees at your ISP are never too busy to respond to your request.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 57. The behaviour of employees at your ISP instils confidence in you.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 58. You feel safe in your transactions with your ISP.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 59. Employees at your ISP are consistently courteous to you.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 60. Employees at your ISP have the knowledge to answer your questions.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 61. Your ISP gives you individual attention.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 62. Your ISP has operating hours convenient to all its customers.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 63. Your ISP has employees who give you personal attention.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 64. Your ISP has your best interests at heart.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

* 65. The employees of your ISP understand your specific needs.

Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)

Section 4 – Weighting of Service Quality Dimensions

Indicate the importance of the following five features relating to ISPs and the service they offer.

* 66. The ISP's use of the latest technology, superior infrastructure, and competent, consistent call centre experience, and appearance of communication material.

Not at all Important (1)	Slightly Important (2)	Important (3)	Rather Important (4)	Very Important (5)

* 67. The ISP's willingness to help customers and provide prompt service.

Not at all Important (1)	Slightly Important (2)	Important (3)	Rather Important (4)	Very Important (5)

* 68. The knowledge and courtesy of the ISP's employees and their ability to convey trust and confidence.

Not at all Important (1)	Slightly Important (2)	Important (3)	Rather Important (4)	Very Important (5)

* 69. The caring individual attention the ISP provides to its customers.

Not at all Important (1)	Slightly Important (2)	Important (3)	Rather Important (4)	Very Important (5)

* 70. The ISP's ability to perform the promised service dependably and accurately.

Not at all Important (1)	Slightly Important (2)	Important (3)	Rather Important (4)	Very Important (5)

Section 5 – Perceived business performance and Service Quality dimensions

Tangibles – Infrastructure, equipment and physical facilities.

Reliability – Ability to provide a promised service on time and accurately.

Responsiveness – Ability to provide a service promptly.

Assurance – Knowledge of personnel, and their ability to instil trust and confidence.

Empathy – The ability of personnel to provide caring, individualised attention.

Please select an option that best describes the impact that the following have on your business performance.

* 71. Your ISP's tangibles:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

* 72. Your ISP's reliability:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

* 73. Your ISP's responsiveness:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

* 74. Your ISP's assurance:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

* 75. Your ISP's empathy for your business:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

Please select an option that best describes the **impact** that **ISPs' Service Quality** has on the following:

* 76. My company's profitability:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

* 77. My company's sales growth:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

* 78. My company's market share:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

* 79. My company's customer satisfaction:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

* 80. My company's reputation and image:

Large negative impact (1)	Small negative impact (2)	No impact (3)	Small positive impact (4)	Large positive impact (5)

Please choose an option between 1 and 5 where 1 means "Never" and 5 means "Always".

* 81. Your ISP throttles/slows down your Internet when you utilise bandwidth intensive applications:

1	2	3	4	5
◯	◯	◯	◯	◯

* 82. Your ISP notifies you when they throttle/slow down your Internet:

1	2	3	4	5
◯	◯	◯	◯	◯

ANNEXURE K – INTERVIEW CODING TEMPLATE

	2A3	2A4	2A51	2A52	2A53	2A6	2B7	2B71	2B8	2B9	2B10	2B11	2B12	2B121
Interviewee Identifier	Time worked in the ICT Industry	Time worked in the current Company	Size of Business - Turnover	Size of Business - Staff	Size of Business - Physical Locations	Number of customers	Travelled to US, Europe & Africa	Internet Service Quality in South Africa compared to Internet Service Quality in Europe and the US	Internet Service Quality in South Africa compared to Internet Service Quality in the rest of Africa	Words to describe Excellent Internet Service Quality	Description of Excellent Internet Service Provider	Internet Service Quality provided by your company to your customers	Internet Service Quality is measured against benchmarks	Tools used to measure Internet Service Quality
Participant A	20 years	5 years	300 million	100	JHB, CPT	400	yes	Internet in South Africa is horrendous	SA has performed better than other African countries. SA is a leader	There when you need it, and fast	No answer	Good, however service is becoming commoditised and everyone is providing a satisfactory service	No, only at network level. Basic metrics to measure network performance	No tools, they measure customer feedback
Participant B	17 years	16 years	1.6 billion	950	JHB, CPT, DBN	180 00 consumer customers, 18 000 corporate customers, 300 top corporate customers	yes	Internet Service Quality in South Africa is lacking. Challenge is teledensity is either sparsely aggregated or vastly aggregated over the country due to Government not investing enough into infrastructure.	SA is ahead of the curve. Quality is far better in SA compared to RoA. However Kenya is a lot better than SA, and Madagascar has good infrastructure.	Fast, reliable	Service the customers, and assist them to get connected to the Internet at any point in time.	Good, however they utilise technologies and infrastructure that is not their own therefore full quality is not in their control.	Yes, benchmark against Europe. They benchmark average speed delivered to end users.	Akamai
Participant C	16 years	3,5 years	Did not disclose	150	SA, Mozambique, Tanzania, Uganda & Kenya	Did not disclose	yes	Europe and US have better Internet access than South Africa and Africa due to content being developed and hosted there. Physical distance impacts quality.	Internet Service Quality in East Africa is better than SA, however in West Africa it is stagnant due to regulations and lack of an open market..	Low latency	One that remembers that at the end of the day they are serving a customer.	Missing answer	Yes, they measure packet loss, low latency and jitter	They use in-house tools, or off the shelf tools that measure throughput, latency, packet loss or time up. Tools like CAPSA that measure throughput or SmokePing that measure latency or packet loss; and Arbor that measure trending so can determine where to peer tp get better performance.
Participant D	12 years	5 years	80 million	100	JHB, CPT, DBN, PE and Bloem	Did not disclose	yes	South African Internet service quality is extremely poor. Bandwidth is an issue. Also monopoly in the telecoms indsutry in South Africa impacts the service.	Internet Service Quality is better than East and West Africa. The reason being is we have a lot of fibre connections whereas they have microwave and VSAT connections which results in high latency.	Just consume application immediately without a lot of buffering.	One that focuses on service delivery, and understands the customers business end to end.	Company's quality is dependent on the quality received by the backend providers. Service delivery is the only differentiator as bandwidth is a commoditised asset.	Yes, They measure service providers throughput, latency, packet loss, performance and experience. They use the US and Europe stats as benchmarks.	They use in-house tools, and software that runs on Linux and Windows platforms. They test trace roots, do pings and other tests.

Participant														
Participant E	14 years	4 years	750 million	330	JHB, PE	Did not disclose	yes	South African Internet quality is good if not better than US and Europe.	South Africa's Internet quality is better.	10Mbps or higher, quality of service that is good enough, not throttled or congested bandwidth.	Someone that actually provides what you are paying for, and cares for the clients.	Last year Internet service quality was poor, whereas after the network upgrade it is good.	Yes, they employ an indepdent company that does tests across all different networks. They monitor forums to check clients reaction.	
Participant F	15 years	2 years	Did not disclose	600	JHB, CPT, DBN, PE, East London and Bloem	20000	No	Internet is slower in SA compared to the US and Europe.	SA's Internet is much better, faster with better coverage.	Reliable and fast	Client centric, reliable and fast	Company's Internet service is very good, network is solid and performs well. Reliable and fast. They had some issues around client experience and billing issues.	No actual benchmarking, they just compare their product specifications to their competitors products.	
Participant G	35 years	2 years	Did not disclose	28	JHB	1000	Yes	Abysmal Internet Service Quality in South Africa, 98-99% of South Africans donot have access to broadband- a connection > than 25 Mbps. This will rule out ADSL and 3G customers.	Superior services exist in Kenya, Egypt. Although SA has the resources, they are not positioned where they should be.	Stability, truly uncapped, and symmetrical. No throttling, no abuse of fair usage policies, no shaping.	Ability to rollout with speed, deliver what the promise to deliver, ability to support their own client base.	Best in South Africa, if not the world. Truly uncapped, truly unshaped, truly symmetrical.	No external benchmarks to work against, the company has created their own in terms of level of service and delivery excellence. Company upgrades backbone and breakout capacity if they see recurring breaches of 80% of threshold.	In house tools
Participant H	20 years	2 years	Did not disclose	1000	JHB, Zimbabwe, Zambia, DRC, Ruanda, Uganda, Kenya	Did not disclose	Yes	South African Internet Service quality compares/matches up to Europe. Legacy copper was used in SA. Now fibre penetration increases speed and availability.	South Africa Internet service quality is slightly below that of other African countries.	Fast, provides satisfactory user experience, and availability.	Provider that focuses on service delivery.	Company provides good quality service, the turnaround times to provision is longer due to company provisioning fixed last miles such as fibre.	Yes, they measure availability, and speeds to certain nodes on the network.	
Participant I	20 years	10 months	4 billion	300	Across SA	380	Yes	In the corporate space, the South African Internet Service Quality is on par with other countries, however on pricing there is a difference. Certain sectors are affected by content providers being international- eg. Broadcasting and Media. Also cost of bandwidth is high in SA, so sectors that are bandwidth intensive are prejudiced.	South African Internet Service Quality is much superior due to the higher rate of penetration. This is a result of access to undersea cables.	Excellent Internet Service quality should be like breathing, you shouldn't have to think about it.	A provider that has the ability to accommodate the bursting nature of Internet traffic.	Good, because company owns most of the underlying infrastructure thereby making it easy to increase and decrease the bandwidth.	Donot measure against any International benchmark targets. They measure Round Trip Times and Latency.	In-house tools.

Participant														
Participant J	14 years	3,5 years	Did not disclose	Did not disclose	Did not disclose	250	Yes	Europe Internet is a lot better- they guarantee 1 Gbps min, with lots of content to choose from. Whereas in America the service is dependent on location. SA Internet has improved due to more peering.	Africa Internet quality is poor. Certain countries in Africa still have a telecoms Monopoly which stifles the market. One can see the difference in a market controlled by monopoly vs one deregulated.	Access any content without any delays.	A provider that makes sure that service is always up and available. Competitive, open to the market and unshaped.	Neutral	No	
Participant K	41 years	9 years	140 million	37	JHB, CPT, DBN	70	Yes	South African Internet is no where near as good as Europe and US. SA internet is overpriced.	South Africa is way better than the rest of Africa. Ahead of the curve.	The ability of a user to stream a full HD video with no packet loss.	Provider that can provide uncapped services at a minimum of 10Mbps.	They provide service Internally and have a large financial injection in order to sustain superior size and speeds.	Yes, the general counters such as packet loss. They don't over subscribe, they over provide.	In-house graphing tool
Participant L	20 years	6 years	200 million	25	JHB	2000	No	South African Internet service is much more expensive (4 times) than Europe or US yet we are getting much lower speeds. SA internet quality is fantastic.	South Africa's Internet is cheaper and better quality.	Must be able to achieve the speed you pay for. Must be routed on the most efficient path. Must be supported well.	A provider that delivers and supports what you have purchased, and that gives you a fair price.	Excellent service	yes we do against service level agreements.	Off the shelf monitoring tool

Interviewee Identifier	Impact of Company's Tangibles on Customers' Business performance	Impact of Company's Reliability on Customers' Business performance	Impact of Company's Responsiveness on Customers' Business performance	Impact of Company's Assurance on Customers' Business performance	Impact of Company's Empathy on Customers' Business performance	Most important Service Quality Dimension for the customer
	C13	C14	C15	C16	C17	C18
Participant A	5	5	5	5	4	Reliability
Participant B	3.5	4	4	3.5	3	Responsiveness
Participant C	5	5	5	5	5	Responsiveness
Participant D	3	3	4	5	4	Reliability
Participant E	5	5	5	5	5	Reliability
Participant F	3	4.5	3	4	2	Reliability
Participant G	5	4	4	5	5	Empathy
Participant H	5	4	4	5	4	Reliability
Participant I	5	2	3	3	1	Assurance
Participant J	5	5	5	5	5	Reliability
Participant K	4	4	3	4	5	Reliability
Participant L	3	4	4	5	3	Reliability

Interviewee Identifier	C19 Perform traffic shaping when customers utilise bandwidth intensive applications	C20 Notify customers when traffic shaping is applied	C21 Challenges experienced when delivering Internet Services	C22 3rd Party suppliers' impact on Internet Service Quality	C23 Local Loop providers' impact on Internet Service Quality	C24 Peering and Transit providers' impact on Internet Service Quality	C25 Availability and Capacity of undersea cables on Internet Service Quality	C26 Impact of Peering, Transit and Undersea cable capacity on the latency	C27 Perception of Contention ratios	C271 Acceptable Contention ratio to provide superior Internet Service Quality
Participant A	No	N/A	Delivering of the physical last mile. Challenge to find the right medium, which is future proof and scalable, and implementing it in the right time frame.	3rd party suppliers are not able to address the urgency and level of quality	Availbility of their network and service delivery has an impact on service. Fibre breaks, or fibres being dug up increasing the downtime	Lack of peering from providers, thereby resulting in ISPs routing traffic through longer routes- Financial and technical inneffiencies	Increase in capacity, and increase in competition has lowered price in the market. 95% decrease in price, Increase in speed.	Lack of peering increases latency and increasing costs. Most of application South African's consume come from Europe and US, so latency is an issue. In addtion, applications are becoming latency intensive.	No Contention	No contention.
Participant B	No	N/A	Industry is growing exponentially, and its becoming difficult to keep up with clients demands. Difficulty dealing with other companies in this space.	Yes, reliability of the 3rd party suppliers infrastructure is not good.	Loop loop providers has the single biggest impact on clients. Expensive and unreliable	Peering was a challenge previously, however there has been some improvements. Companies are now offering full peering. Has huge impact on clients.	There has been an increase in capacity, which has improved service delivery, and price to the customer	SA is at the bottom of Africa, so the latency is high. There has been an improvement in the latency.	Contention ratios are irrelevant, it is more about the capacity you have on your network.	10 to 1
Participant C	No	N/A	Delivery capabilities and timeframes of 3rd parties	Delivery capabilities and timeframes of 3rd parties	Uptime of local loop providers' network. They face issues around dispute resolution- whose network is a the problem - The customer is affected in the end.	South Africa does not have a lot of content. South African's consume 80% International content. Choice of peering partners and location is important as it affects the quality of service. Peering correctly keeps the costs down and improves quality.	Yes, 90% of content consumed in Africa comes from outside of Africa so the submarine cables are important.	Bandwidth only affects latency if there is no congestion. Latency affects Video, and websites whose content is not local. They are partnering with CDN providers, and extending their CDN infrastructure into Africa in order to reduce latency.	No contention	No contention.

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Participant										
Participant D	Yes	Yes, they have acceptible usage policies that is agreed with client upfront.	Turnaround times of Fibre and Microwave last miles. Munipality turnaround times for wayleaves.	Company relies heavily on 3rd party suppliers- local loop turnaround timeframes and delivery impact the company	Local loop is irrelevant.Contention happens on the Internet breakout component which affects the quality of Internet.	The interconnects at peering points are running at an acceptable usage model. If the peering points are saturated then Internet performance is affected.	Links must not reach more than 50-60% utiliisation as it impacts availability and performance.	Latency is not impacted as majority of the customers access local content/applications.	Content ratios are horrendous. Some providers run 50 to 1 or 80 to 1. Contention is necessary however it need to be at acceptable levels.	4 to 1
Participant E	Yes	Yes, they get notifed at time when capacity is scare. Only uncapped customers are affected.	Challenges in getting the right network, right size of network, and throughput.	Yes, business depends on 3rd party suppliers	Majority of the service they provide is ADSL. If exchanges are down, then clients are affected.	There are more peering points in South Africa, and its a lot easy to peer. Clients are getting a better service.	Abundance of undersea cable capacity has improved service.	Good latency is required for gamers accessing content from international servers.	Company does not like to contend, however they resort to contenting when uncapped users run out of bandwidth, or when they are upgrading the network, or at peak times.	below 20 to 1
Participant F	No	Yes, customers are notified upfront on how the traffic is shaped.	Challenges- Timeframes to install last mile infrastructure. Commodised service therefore there are price pressures, and margin pressures - diffifult to sell it a premium.	Company depends on other providers for the last mile.	Availability is an issue, and Mean time to repair is a concern.	Peering correctly marginally improves speed, it is more cost optimisation exercise because the providers don't have to build duplicate infrastructure.	Not much impact as majority of the business traffic is local, whereas only social media traffic such a Youtube and Facebook go overseas	Not a huge impact	Contention ratios are misunderstood. Generally users are experiencing a 1:1 ratio for 90% of the time because not all users use the Internet at the same time. Also Tier 1 providers don't drop packets intentionally.	Providers must provide different service levels, and clients must choose the option they prefer.
Participant G	Yes	Consumer network is shaped when clients use bandwidth intensive applications such as bit torrents.	Challenges are municipality incompetence regarding wayleaves. ICASA's inability to auction spectrum. Inability of people to commit on new investments	Reliability of the 3rd party suppliers, as well demand is higher than supply resulting in challenges.	Company put selected local loop providers through a stringent evaluation process. Transparent local loop to the end-users. No bottlenecking, no packet dropping.	Impact of peering is hugely advantageous, provides cost efficiencies to the end users.	Lots of additional capacity, therefore it becomes cheaper. Also capacity on different cables allows for redundancy, and assists availability.	International latency sits around the 260 ms mark. If you want improved latency then you need to be a tier 1 carrier. Tier 1 providers donot transit. Only Neotel is a tier 1 provider, because they belong to TATA. No transit, means that latency is reduced, and you donot pay for capacity, you own it.	Current contention ratios in SA is 50 to 1. ISPs are not transparent about the true contention ratios. Companies are investing in GPON technologies to split usage based on different packages. It is different from contention.	Did not disclose

Participant H	Yes	Yes, notify the customers as a apart of their PR.	Challenges with the municipalities for wayleave approvals.	Yes, depend on 3rd parties to reach locations where the company does not have presence or infrastructure. Using 3rd parties impact the overall SLA to the customer.	Does not impact the business	Not involved in peering as they are a wholesaler. Company provides the platform for ISPs and resellers to easily peer on.	Not much impact as they utilise all 4 undersea cables, and the unavailability of one or two does not impact the business.	Has a minimal impact.	Contention ratios are good for service providers	< 50 to 1
Participant I	No	N/A	Challenge is to educate customers on where the company's responsibility starts and ends because they get blamed for everything.	Yes, impacted by 3rd parties turnaround times and reliability.	Not at the moment, however as the fibre market grows this could pose as an impact. Quality of work by fibre providers is an issue.	Close relationships with key peering partners which needs to be reviewed. Transit prices are too high. Also the overbooking ratios between service providers are high. Quality of service providers also differ and this is an issue.	No impact as company buys capacity on 3 undersea cables. If they lose one or two there is not issue.	Latency is affected for International traffic. Due to lack of peering relationships in some location, the RTT is affected.	One to one contention will be the best answer however it is not economically viable.	3 or 4 to 1
Participant J	No	N/A	No Answer	No impact	No impact	The existence of the largest Internet exchange in Africa NapAfrica is key to the peering industry. Reliability is key.	The increase in capacity and the affordabilty of undersea cables allows for the increase in content investment in Africa.	Peering assists in the reduction in latency	Would like zero contention	No contention

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Participant K	No	N/A	Challenge with last mile pricing.	Yes, impact on performance and delivery standards	Impact - Costs of local loop including maintenance, and bad service levels received from local loop providers thus affecting clients.	Peering reduces cost of end service. Peering points are of highest quality so no impact on quality of service.	Huge impact to the service delivered to the client.	Latency is not affected as majority of the traffic is moved between CPT and JHB. Furthermore they have Akaimai and google caches on the network, however other international traffic is affected by latency.	Company does not provide a contented service.	2 to 1
Participant L	yes	yes	Challenge to find decent coverage for clients in remote locations.	Yes, company buys services from multiple 3rd parties. Challenges with delivering ontime, reliability, empathy, honesty, delivering on promises.	Issues such as delivering ontime, reliability, empathy, honesty, delivering on promises.	Peering is fantastic, improves the quality of service. If we didn't have it, we need to purchase additional capacity, we will have worse speeds thus affecting client experience.	Impacts International traffic and experience if not available.	Company buys the right undersea cables inorder to minimise the impact. Also if cables are not performing well, this will affect the client experience.	We need contention as it makes the service affordable. Provide contention to those that buy it, and don't contend those that pay a premium.	Did not disclose

Interviewee Identifier	Suggestions to improve Internet Service Quality in South Africa
Participant A	Stronger Regulatory body to enforce peering, which will affect quality and costs
Participant B	Improve the last mile eg. Deploy more Fibre based services
Participant C	Sell the spare fibre capacity at reduced rates rather than only selling the fibre capacity at a specific price point. South African Providers should stop looking at bandwidth as a primary source of income. Customers don't want to buy bandwidth, rather they want the things bandwidth can offer them. In East Africa both Government and Private entrepreneurs are pitching in.
Participant D	Need a competitive landscape with an open market. Too many suppliers therefore require a consolidated market. People need to see bandwidth as a commodity, and not as a way of generating revenue. Companies to focus on cloud based services, value-added services.
Participant E	Open up - naked DSL component to allow for affordable Internet. IPC is too expensive on the DSL component.
Participant F	Additional fibre rollouts - FTTH growth is important, as well as the LTE rollout acceleration.
Participant G	Remove ICASA. Create a use-it or lose it strategy for spectrum. Only 4% of spectrum that has been bought is being used. Spectrum is bought by the rich and kept. The price of spectrum is over-priced thus making services inaffordable. Without broadband, the cloud is dead. Companies need to be in the cloud evironment, and they need access to good spectrum in order to do that.
Participant H	Seamless Internet service, access to various modes of Internet service. Ability to roam across data networks without worrying about the type of Internet service. Eg. Mobile verge network providers.
Participant I	Increase peering in the country. Regulate how the wholesale price gets passed onto the end user. Resellers are adding on too much margin thereby making the service too costly. Expose wholesale prices to the market.
Participant J	Increase peering in SA. Open up the Internet as much as possible to encourage content providers to invest in South Africa, Africa. Also do more in terms of Infrastructure sharing rather than having multiple data centres, multiple fibre rollouts. Also look at the impact of the slow IPv4 rollout and it impact on peering and other investments.
Participant K	Symmetrical last miles is the key to all FTTH and business. Also if more International companies invest in actual nodes in South Africa eg Mircosoft, Google.
Participant L	Continue price cuts, and continue bringing fibre services closer to the client.

ANNEXURE L – INTERVIEW CODING BOOK

UNISA School of Business Leadership

Doctorate in Business Leadership

The Effect of South African Internet Service Providers' Service Quality on Corporate End Users' Business Performance

Supervisors: Professor Rembrandt Klopper and Professor Sam Lubbe

Interview Coding Book

Researcher: Melanie Naidoo

Column A

Interviewee Identifier from A – L (12 Interviews)

Column B – 2A3

Time worked in the ICT Industry [In years]

1 = < 1

2 = 1 - 5

3 = 6 - 10

4 = 11 – 15

5 = > 15

Column C – 2A4

Time worked in the current company [In years]

1 = < 1

2 = 1 - 5

3 = 6 - 10

4 = 11 – 15

5 = > 15

Column D – 2A51

Size of Business - Turnover [Millions]

1 = < 100

2 =100 - 300

3 =301 - 500

4 = 501 - 1000

5 = > 1000

6 = Did not disclose

Column E – 2A52

Size of Business – Staff

1 = < 100

2 =100 - 500

3 =501 - 1000

4 = 1001 - 1500

5 = > 1500

6 = Did not disclose

Column F – 2A53

Size of Business – Physical Locations

1 = JHB

2 = JHB, CPT

3 = JHB, CPT, DBN

4 = JHB, CPT, DBN, PE and Bloemfontein

5 = JHB, CPT, DBN, PE, East London and Bloemfontein

6 = South Africa, Mozambique, Tanzania, Uganda, Kenya

7 = JHB, Zimbabwe, Zambia, DRC, Ruanda, Uganda, Kenya

8 = Did not disclose

9 = JHB, PE

Column G – 2A6

Number of customers

1 = < 1000

2 = 1000 – 5000

3 = 5001 – 10000

4 = 10001 – 20000

5 = > 20000

6 = Did not disclose

Column H – 2B7

Travelled to the US, Europe and Africa

1 = Yes

2 = No

Column I – 2B71

Internet Quality in South Africa compared to Internet Service Quality in Europe and the US

1 = Horrendous /Lacking /Poor / Abysmal

2 = Bandwidth is an issue/ Slow

3 = Good /Fantastic

4 = Poor Broadband penetration rates

5 = Compares / on par / Matches Europe's Internet

6 = Cost of bandwidth is high / Sectors which are bandwidth intensive are prejudiced.

7 = Improved due to more peering

Column J – 2B8

Internet Service Quality in South Africa compared to Internet Service Quality in the rest of Africa.

1 = Better / Ahead of the curve / Better coverage / Superior due to higher penetration and access to undersea cables

2 = Kenya is a lot better / Madagascar has good infrastructure / Superior services exist in Kenya and Egypt

3 = Faster

4 = Cheaper

5 = Slightly below

Column K –2B9

Words to describe "Excellent " Internet Service Quality

1 = Fast / 10Mpbs or higher

2 = Reliable /Stable

3 = Available

4 = Low Latency/ Minimum Buffering/ Consume application immediately/ No packet loss /No congestion

7 = Truly uncapped

8 = Symmetrical

9 = No shaping / No abuse of fair usage policies /No throttling

10 = Satisfactory user experience / Supported well

11 = Proper Routing

Column L – 2B10

Description of Excellent Internet Service Provider (ISP)

1 = Remembers they are serving a customer / Understands customers business / Cares for the clients/ Client Centric

2 = Focuses on service delivery

3 = Provides what you are paying for / Deliver what they promise to deliver / Reliable

4 = Provides a Fast service / Minimum of 10 Mbps

5 = Support their own client base

6 = Accommodate the bursting nature of Internet traffic

7 = Service is always up and available / Uncapped

8 = Competitive, Open to the market / Fair pricing

9 = No answer

Column M – 2B11

Internet Service Quality provided by your company to your customers

1 = Good / Good because company owns the entire underlying infrastructure / Network is solid and performs well/ Superior size and speeds

2 = Company utilises technologies and infrastructure that is not their own therefore full quality is not in their control/ Companies quality is dependent on the quality received by the backend providers/ Turnaround times

3 = Neutral

4 = Excellent / Best in South Africa if not the world

5 = Commoditised service / Service delivery is the only differentiator

6 = Reliable

7 = Issues around client experience and billing

8 = Truly uncapped, truly unshaped, truly symmetrical

9 = Not as it should be / Lacking soft skills

10 = No answer

Column N – 2B12

Internet Service Quality is measured against benchmarks

1 = No

2 = Yes / Benchmark basic metrics to measure network performance, Average speeds, Availability, Packet loss, Latency, Round Trip Times and Jitter / Benchmark against US and Europe statistics / Monitor forums / Compare product specifications to their competitors products / React to recurring breaches of 80% threshold / Against Service Level Agreements.

Column O – 2B121

Tools used to measure Internet Service quality

1 = Monitor customer feedback

2 = In-house tools

3 = Off the shelf tools/ Akamai / SmokePing / CAPSA / Arbor

4 = Free Internet based tools

5 = Independent Testing company

6 = No answer given / no tools mentioned

Column B – C13

Impact of Company's Tangibles on Customers' Business Performance

1 = 5

2 = 4

3 = 3,5

4 = 3

Column C – C14

Impact of Company's Reliability on Customers' Business Performance

1 = 5

2 = 4,5

3 = 4

4 = 3

5 = 2

Column D – C15

Impact of Company's Responsiveness on Customers' Business Performance

1 = 5

2 = 4

3 = 3

Column E – C16

Impact of Company's Assurance on Customers' Business Performance

1 = 5

2 = 4

3 = 3,5

4 = 3

Column F – C17

Impact of Company's Empathy on Customers' Business Performance

1 = 5

2 = 4

3 = 3,5

4 = 3

5 = 2

6 = 1

Column G – C18

Most important Service Quality Dimension for the customer

1 = Reliability

2 = Responsiveness

3 = Empathy

4 = Assurance

Column B – C19

Perform traffic shaping when customers utilise bandwidth intensive applications

1 = No

2 = Yes

3 = Depends on the customer or network type

4 = Not applicable to the company

Column C – C20

Notify customers when traffic shaping is applied

1 = Not applicable

2 = Yes / Acceptable usage policies are defined up front with customer / Notified when capacity is scare / When customers use bandwidth intensive applications / Notified apart of PR

Column D – C21

Challenges experienced when delivering Internet Services

1 = Delivering of the physical last mile / Finding the right medium / Implementing it at the right time frame / Turn around times /Challenge finding decent coverage for clients in remote location

2 = Industry is growing exponentially, and its difficult to keep up with clients demands.

3 = Delivery capabilities and timeframes of 3rd parties / Municipality turn around times for wayleaves /Difficulty dealing with other companies

4 = Challenges in getting the right network, right size of network and throughput

5 = Price pressures and Margin pressures

6 = ICASA's inability to auction spectrum

7 = Client lethargy

8 = Challenge to educate customers on where the company's responsibility starts and ends.

9 = Question not asked

Column E – C22

3rd Party suppliers' impact on Internet Service Quality

1 = Reliability of 3rd Parties

2 = Availability of service

3 = Delivery capabilities and time frames / Demand is higher than supply/ Urgency and Quality of work

4 = Dependent on 3rd parties to reach locations where provider does not have presence

5 = Impacts overall Service Level Agreement with customer / Impacts performance

6 = Challenges with empathy and honesty

7 = No impact on company

Column F – C23

Local Loop providers' impact on Internet Service Quality

1 = Availability of their network / Fibre breaks

2 = Service delivery / Unreliable / Mean time to repair / Bad service levels/ Delivering on promises / Issue around dispute resolution

3 = Single biggest impact on clients

4 = Expensive

5 = Empathy and honesty

6 = Coverage may be limited

7 = No impact on quality

Column G- C24

Peering and Transit providers' impact on Internet Service Quality

1 = Lack of Peering Providers resulting in financial and technical inefficacies/ Monopoly

2 = Improvement in Peering. Some companies offering full peering / Clients are getting better service / More peering points in South Africa. /Peering points are of highest quality/Fantastic

3 = Choice of Peering partners and location is important as if affects quality and speed / Reliability

4 = Saturated peering points affect Internet performance/ Overbooking ratios between service providers are high

5 = Peering has minimal impact

6 = Peering has a huge impact on clients

7 = Transit prices are too high

8 = Quality of service providers differ

9 = Africa's largest Internet exchange NAPAfrica is key to the peering industry

Column H – C25

Availability and Capacity of undersea cables on Internet Service Quality

1 = Increased capacity and increased competition has reduced pricing / 95% decrease in price

2 = Increased capacity increases speed

3 = Increased capacity improves service delivery

4 = Increased capacity allows for redundancy

5 = Increased capacity allows for an increase in content investment in Africa

6 = 90% of the content is International

256

7 = Utilisation percentages on cables affect availability and performance

8 = No impact / Majority of traffic is local / Unavailability of one or two cables does not impact the business

9 = Huge impact / Impacts International traffic and experience

Column I – C26

Impact of Peering, Transit and Undersea cable capacity on the latency

1 = Lack of peering increases costs and increases latency

2 = Majority of the content is located Internationally therefore latency is an issue / SA is at the bottom therefore Latency is high

3 = Latency has improved

4 = Partnering with CDN Providers helps reduce latency / Akamai and Google caches on the network

5 = Majority of the content is local therefore there is no impact on latency

6 = If you want improved latency then you need to be a Tier 1 carrier

7 = Buying the right cables minimises the impact

8 = No answer given

Column J – C27

Perception of Contention ratios

1 = Contention ratios are irrelevant, capacity on the network matters

2 = No contention

3 = Contention ratios are horrendous

4 = Contention ratios are misunderstood / ISPs are not transparent about the contention ratios

5 = Current contention ratios in South Africa are 50: 1

6 = Companies are investing in GPON technologies which is a different form of contention

7 = Contention ratios are good for service providers / 1:1 is the best but not economically viable / Contend only when uncapped users run out of bandwidth, or when they are upgrading, or peak times

8 = Do not contend those that pay a premium

Column K – C271

Acceptable Contention ratio to provide superior Internet Service Quality

1 = No contention/ 1:1

2 = < 5:1

3 = ≤ 10:1

4 = ≤ 20:1

5 = ≤ 50:1

6 = Provide clients with different service levels and let them choose

7 = No ratio suggested

Column B – C28

Suggestions to improve Internet Service Quality in South Africa

1 = Stronger regulatory body to enforce peering /Remove ICASA

2 = Improve the last mile / Additional Fibre rollouts / Symmetrical last miles

3 = Sell spare capacity at reduced rates / Stop looking at bandwidth as a primary source of income

4 = Governments and private entrepreneurs must work together

5 = Open up DSL / Local Loop unbundling

6 = Define a use-it or lose it strategy for spectrum

7 = Decrease price of spectrum / Continue price cuts of bandwidth

8 = Allow for seamless Internet service, by allowing access to various modes of Internet access.

9 = Increase Peering

10 = Regulate how the wholesale price gets passed onto the end-user

11 = Encourage Infrastructure sharing

12 = Review IPv4 rollout