# Strategies of fibre network operators to address increasing competition and decreasing investment output in the South African fibre to the home market.

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**A research project submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration**

**Johannesburg, [2023]**

**Protocol number:** WBS/BA2492259/707

V2 June 2023

# DECLARATION

I, Molefe Donald Tsoana, declare that this research project is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Molefe Donald Tsoana

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(Full Names)

Signed at: Potchefstroom, Baillie Park, North West

On the 28th day of February 2023

# DEDICATIONS

I dedicate successful completion of this study to the Lord God Almighty, for His love and faithfulness to me to have resilience and persistence in undertaking this MBA study successfully, regardless of the Global Covid-19 pandemic challenges.

Further dedication to my wife, 'Masentle Felicity Tsoana, my two lovely sons; Sentle H. Tsoana & Tlotliso Letlotlo A. Tsoana, for their support, patience and understanding while I was pursuing my studies. And also, to both my nuclear family and my wife's, who continually kept supporting me through this journey.

One of the family anchoring Bible scriptures that we help upon is; *"For I know the plans I have for you, declares the LORD, plans to prosper you and not to harm you, plans to give you hope and a future."* – (New International Version Bible, 1978/2011, Jeremiah 29:11)

# ACKNOWLEDGEMENTS

Firstly, I would like to pass my sincere gratitude to my supervisor Professor Zunaid Bulbulia for the support and guidance through the research project; I am grateful for his timely reviews and progressive feedback on my research project.

Secondly, I would like to appreciate the impeccable support, encouragement, and motivation from my current employer Metrofibre Metworx (MFN), all my senior work leaders especially Hendrik Opperman to whom I am currently reporting to for their inspirational leadership and encouragement towards my career advancement. I also like to give vote of thanks to my colleagues who have been very understanding and supportive as well.

Thirdly, I would acknowledge the impeccable support I received from all my family members, my friends, and my academic peers from Wits Business School and beyond.

Lastly, I would like to pass my sincere thanks and absolute gratitude to all participating South African Fibre Network Operators (FNOs) and their employees (participants) who had an interest to offer their valuable time for my research project interviews.

I wish to take this opportunity to encourage them to continue doing the small acts of goodness to others. *"The cumulative impact of thousands of Small acts of goodness can be bigger than we imagine."* (Elizabeth II, 2016, 15:15 GMT).

# SUPPLEMENTARY INFORMATION

| | |
|---|---|
| Supervisor: | Professor Zunaid Bulbulia |
| Word count †: | 12 845 words for Chapter 1-6 |
| Supplementary files: | Data Collection Interview Questionnaire Template |
| | Interview guide and consent form for participation in MBA research project |
| | Confirmation of Ethics Clearance |

# EXECUTIVE SUMMARY

The deployment of high-speed networks and connectivity technologies has evolved quickly from the past. From Copper infrastructure, Digital Subscriber Line ("x"DSL) technologies, namely; Asymmetric Digital Subscriber Line (ADSL), Very-high-bit-rate Digital Subscriber Line (VDSL), and High-speed Digital Subscriber Line (HDSL) (Jenkinson, 2000). The "x"DSL face out started in about 2007 when Telkom South Africa (SA) started rolling out optical fibre distribution network (ODN) in SA. Passive Optical Network (PON) infrastructure is the most popular and adopted optical distribution network, globally. It is through this technology that the household broadband connectivity, fibre-to-the-home (FTTH) is enabled (Keiser, 2006).

While there is still an existing concern of the considerable digital divide in SA. The FTTH connectivity is one of the basic utility needs for most families. It is considered a potential driver for micro and macro-economic growth in Africa. As this seems an opportunity for infrastructure investment, the number of FNOs in the SA FTTH market has recently risen to over 38 while the cream of the crop areas are almost fibre saturated, making the FTTH market share competition very stiff.

The motivation for this research from an academic perspective, is to add on to the existing body of knowledge regarding FTTH broadband service in SA. To study strategies of FNOs to address increasing competition and decreasing investment output in the SA FTTH market. This research also aims to study the; value-added services, customer value propositions (CVPs) and innovations implemented by these FNOs to stay competitive and sustainable, as well as to better their FTTH investment output. The evolution of the FTTH service is SA has proven to be challenging to most FNOs, and it has been evident post Covid-19 pandemic that pricing can never be a dependable differentiator thus the need for innovative offerings in order to combat an increasing market competition, to better their investment output.

For this study, the realistic data from the different FNOs, whom some also have their internal Internet service providers (ISPs), was collected through a qualitative

research approach to investigate, find out, discuss and analyse the feedback from conducted interviews. Totals of six FNOs were involved, with two participants each, one being a senior management representative for expert sampling and another being a junior management level or non-management representative covering the bottom of the organisation. The sampling for this research was strictly drawn from the only active SA based FNOs offering the FTTH service.

The research findings indicate that the FTTH market is getting very highly competitive in SA as the number of FNOs keeps increasing but there is still a big green-field opportunity in the low and middle earning areas which are still underserved with access to fibre network. Findings indicate that some of the strategic competitive edge differentiators FNOs are pursuing are; customer centricity, better customer support and improved network uptime. Further findings suggest that for FNOs to improve their investment outputs in this competitive FTTH market they are considering not to engage in overbuilds anymore, they are rather shifting their focus to the low and middle earning market segment, they are focussing more on converting the homes passed to homes connected. All these strategic plans are happening in conjunction with introduction of value-added service offerings and innovations to transform the traditional FTTH offering. Such services and innovations included but not limited to; content, automation, digitisation, sufficient back-up power for both customer premises equipment (CPE) and FNOs' central offices, triple play, home security systems, smart home solutions, cloud-based solutions, IoT solutions, analytics, wi-fi range extenders and meshing, customer loyalty rewards, and 5G technology, in order to meet current and future FTTH market trends and customer needs. However, there are still some market challenges and limitations within the FTTH environment, such as price for backhaul to remote areas, service affordability in underserviced areas, wayleave approvals, community forums involvements and lack of regulatory bodies involvement.

Keywords: FNOs, FTTH, Market competition, Investment output, Innovation, Differentiator, Valued-added services, Competitive edge, Competitive advantage

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# ABBREVIATIONS AND ACRONYMS

ADSL - Asymmetric Digital Subscriber Line

AI - Artificial Intelligence

AR - Augmented Reality

CAC - Competition Appeal Court

CCTV - Closed-Circuit Television

CO - Central Office

CSIR - Council for Scientific and Industrial Research

CPE - Customer Premises Equipment

CVP - Customer Value Propositions

DSL - Digital Subscriber Line

DSTv - Digital Satellite Television

ECNS - Electronic Communications Network Service

EDD - Economic Development Department

e.g - exempli gratia (Latin phrase meaning "for example")

etc - et cetera

HDTV - High-Definition Television

FNO - Fibre Network Operators

FTTB - Fibre-to-the-business.

FTTH - Fibre-to-the-home

GPON - Gigabit Passive Optical Network

HDSL - High-speed Digital Subscriber Line

ICASA - Independent Communications Authority of South Africa

ICT - Information and Communication Technology

IoT - Internet of Things

ISP - Internal Internet Service Providers

LTE - Long Term Evolution

MBA - Masters of Business Administration

MFN – Metrofibre Networx

MM - Multimode

MTN - Mobile Telecommunications Network

NLD - National Long Distance

NOC - Network Operations Centre

ODN - Optical Fibre Distribution Network

OLT - Optical Line Terminal

ONT - Optical Network Terminal

P1 - Proposition 1

P2 - Proposition 2

PON - Passive Optical Network

POPIA - Protection of Personal Information Act

R&D - Research and Development

SA - South Africa

SM - Single Mode

UPS - Uninterruptible Power Supplies

VOIP - Voice Over Internet Protocol

VDSL - Very-high-bit-rate Digital Subscriber Line

WBS – Wits Business School

WISP - Wireless Internet Service Provider

# 1. CHAPTER ONE: INTRODUCTION

In this chapter an introduction to this research project is provided. The chapter first provides the background on the development of Fibre-to-the-home (FTTH) as broadband internet service in South Africa (SA). Secondly, it describes the; research problem statement and motivation for the study. It then outlines the research objectives, research propositions and sets out the key questions that this research is addressing. Then, an outline of the scope of this research follows. Finally, the chapter summary is provided.

## 1.1. RESEARCH PROBLEM STATEMENT

The number of FNOs in South Africa has risen to 38 while the cream of the crop areas of services are almost saturated with fibre, making the FTTH market competition very stiff because customers now have a variety of FNO choices. But the concept of open access, where FNOs can use each other's fibre infrastructure to deliver their own services is also perpetuating this competitiveness problem faced by FNOs as they can no longer rely on coverage as a strategic differentiator. In this circumstance, it becomes vital that each FNO stay relevant and futuristic in their FTTH service offering to become the customers' preferred provider. Furthermore, this increase in the number of FNOs in South Africa has aggressively increased the FTTH market competitiveness. According to Joseph Schumpeter's Innovation Theory of Profit, an increase in market competition leads to a reduced innovation/ investment output (Aghion et al., 2015). This research is studying the strategies of fibre network operators to address increasing competition and decreasing investment output in the South African fibre to the home market. The study further recommends the value-added services that FNOs can implement in order to stay competitive and sustainable to better their investment output.

## 1.2. BACKGROUND OF THE STUDY

About seven to eight years ago, there was a very limited number of Fibre Network Providers (FNOs) providing broadband internet services in South African households, known as fibre-to-the-home (FTTH). While the leader in largest fibre infrastructure footprint, Telkom SA, has been rolling out their fibre as far back early 2007, a pivotal year for FTTH was 2014 when Vumatel, now the second position holder on largest number of home past by fibre, lit up their first fibre network in Parkhurst (Labuschagne, 2021). Since then, there have been a number of new FNOs introduced in the market and competing for market share. The top six leading FTTH providers today are Openserve (The Telkom's wholesale division), Vumatel, Frogfoot, Metrofibre, Octotel and Vodacom. There is currently a total of thirty-eight FNOs in South Africa providing FTTH service (Illidge, 2022).

These FNOs have kept South Africa's fibre network footprint and connectivity expanding from metro cities, and their respective suburbs to the more medium and small subsided cities and towns. The competitive FTTH market and increased fibre infrastructure accessibility has forced the FTTH pricing packages to drastically drop, with the Covid-19 pandemic being the main price change driver in 2020. Some FNOs doubled their customers' FTTH line speeds for no extra charge as an initiative to assist customers working and schooling from home. For most FNOs this initiative became permanent as working and schooling from home started becoming a norm. To put this in to context, the cheapest FTTH symmetric 50 Mbps uncapped line from Vumatel network was sold at R3, 298 by Cool Ideas Internet Service Provider (ISP) in 2014 (Labuschagne, 2021), while in 2022 the same Vumatel line speed package is offer by same ISP at R929, a price reduction of 72%.

In this fiercely competitive FTTH market, it is evident that competing only on price for market share is a clear race to the bottom and can cause the corporate casualties. This brings about a concern of whether the investors for the South African FNOs still have the high appetite to invest in this FTTH market. Moreover, if these FNOs can continue to realise profitable investment outputs for their investors.

## 1.3. RESEARCH MOTIVATION, OBJECTIVES AND PROPOSITIONS

The motivation for this research from an academic perspective, is to add on to the existing literature regarding FTTH broadband service in South Africa, the strategies of FNOs to address increasing competition and decreasing investment output in the South African fibre to the home market. This research further recommends the value-added services that FNOs can implement in order to stay competitive and sustainable to better their investment output. Often, the suppliers do not know or understand the problems and needs of the customers clearly, thus end up offering services that do not entirely solve the immediate problems or meet the desired needs of their customers, therefore this research also builds on body of knowledge for FNOs, ISPs, and Academics regarding ways to improve their competitiveness for better investment outputs.

This research was conducted through two research approaches. Firstly, the research explored the current extensive literature already available. Secondly, a qualitative study followed. The specific objectives include:

i. To study the strategies of South African FNOs to address increasing competition and decreasing investment output in the South African FTTH market.
ii. To study the South African FTTH connectivity trends and the value-added services that FNOs can implement in order to stay competitive and sustainable to better their investment output.

The validity of this research study was evaluated on the criteria of the following set propositions:

***Proposition 1 (P1)*** – An increase in FNO's competition in South African FTTH Market causes a decrease in investment outputs.

***Proposition 2 (P2)*** – There are some innovative value-added services that South African FTTH FNOs can foster in order to stay competitive and sustainable to better their investment output.

## 1.4. RESEARCH KEY QUESTIONS

Further to the above listed objective of the research, the study attempted to answer the following formulated research key questions associated with propositions (P1 and P2):

***Proposition 1 (P1) -*** An increase in FNO's competition in South African FTTH Market causes a decrease in investment outputs.

i. What are your strategic differentiators to still stay sustainable in this “shrinking FTTH market share” in South Africa?
ii. How are the investment yields/ returns (market share, margins, e.t.c) affected by an increasing FTTH FNOs market competition?
iii. Do the returns on an investment meet investors’ expectations and targets? Is the increasing FTTH FNOs market competition reducing the Investors’ appetite?

***Proposition 2 (P2) -*** There are some innovative value-added services that South African FTTH FNOs can foster in order to stay competitive and sustainable to better their investment output.

iv. The home internet connection is becoming one of the basic needs for most families. Which products can be value adding to the traditional FTTH services to meet the emerging FTTH trends for home users?
v. Are you investing in research and development (R&D) to innovate the FTTH service offering for a better competitive edge, advantage and to stay sustainable for the future market needs?
vi. Which innovations must be offered and which ones are becoming irrelevant to the SA FTTH market?

## 1.5. RESEARCH SCOPE AND OUTLINE

The focus of this research was based on interviewing the total of six South African FNOs regarding their strategies to address increasing competition and decreasing investment output in the South African fibre to the home market. At least two of these FNOs were the top leading player, two were middle players and two were smaller, new entry players. The study focused only on Gigabit Passive Optical Network (GPON) for FTTH Market, one of the prominent markets in the Information and communication technology (ICT) industry.

The study also focused on the South African FTTH connectivity trends and possible value-added services that FNOs can offer their FTTH customers as the means to improve their customers' stickiness in order to stay competitive and sustainable in an aggressive market. Customers in this research refer to both, consumers and users. Although Rice, (1997) distinguished ‘consumers’ from ‘users’, it is acknowledged that they both influence the change drivers for technological trends and wish for different CVPs. Rice, (1997) described consumers as those who subscribe and pay for the services while users as those who only use the services while not paying. In the household setting, a father would be considered a consumer if he is the one paying for the FTTH service subscription and the other family members including the wife and kids were be regarded as users because they are only using the FTTH service without paying subscription. Therefore, only the literature concerning the above scope was reviewed, and the proposed research methodology was modelled to yield the findings that addressed the above scope and objectives.

## 1.6. RESEARCH ASSUMPTIONS

The research is conducted and reported under the following assumptions:

- The feedback from the population of the sampled FNOs is the representation of the rest of other nonparticipating FNOs.

- The feedback and inputs from the interviewed participants are true and authentic.
- The feedback and inputs collected from each FNO would be similar if it was collected from a different participant of the same FNO but based in a different regional office anywhere in South Africa.
- The value adding services and innovations referred to in this research are all Innovation economically beneficial to the; community, environment, FNOs and Investors.

# 2. CHAPTER TWO: LITERATURE REVIEW

## 2.1. INTRODUCTION

In this chapter, an adequate literature regarding broadband internet is provided to give the perspective of the South African state of fibre network compared to the rest of the world. This perspective also helped to provide the background information regarding the objectives and research key questions.

The literature review starts by discussing the development of broadband technologies in South Africa to reflect how far the technology has developed. The review then continues to examine the current trends, emerging trends and opportunities in broadband technologies as already explored by Africa and the rest of the world. This is to review the digital gap that needs to be bridged by innovation and digital transformation in the competitive FTTH market of South Africa. The theoretical relationship of competition and innovation was reviewed in respect to the FTTH market. Finally, the socio-economic factors affecting the FTTH market and competition was reviewed before summarising the chapter.

## 2.2. DEVELOPMENT OF BROADBAND TECHNOLOGIES IN SOUTH AFRICA

### *2.2.1. Various Digital Subscriber Line (xDSL) broadband network*

There is a variety of Digital Subscriber Line (xDSL) broadband network technologies, namely; Asymmetric Digital Subscriber Line (ADSL), Very-high-bit-rate Digital Subscriber Line (VDSL), and High-speed Digital Subscriber Line (HDSL) (Jenkinson, 2000). These various DSL broadband network technologies are commonly referred to as xDSL in the telecommunication industry. In South Africa, Telkom widely deployed and was the main provider of ADSL and VDSL before the introduction of fibre networks. The advantage of the xDSL network is that it utilises existing telephone copper lines as the medium and passive infrastructure (Lee et al., 2007). The main shortfalls of xDSL technology were slow speed and smaller coverage distance from the customer end to the central office, capable of delivering the maximum of 50 Mbps bandwidth. In some deployments, providers have used copper infrastructure combined with the Passive Optical Network (PON) infrastructure to try better the speed and coverage performance at the lower cost, but the outcome was still not optimised.

### *2.2.2. Fibre Optic broadband network*

Unlike in xDSL broadband networks where copper is the underlying transmitting medium, the Fibre Optics broadband network uses fibre, which is capable of carrying infinite bandwidth depending on the transmitting active equipment used. The Optical Distribution Network (ODN) normally consists of fibre cables, distribution boxes, splicing boxes, terminal joints, optical power splitters, etc.

PON is the most popular and adopted optical distribution network, in South Africa and the rest of the worldwide. It is the technology used to supply broadband connectivity to the homes, and it is called fibre-to-the-x (FTTx) (Keiser, 2006). The letter x in “FTTx” refers to how far the fibre terminates from the central office; could be at the; Business (b) Node (n), Cabinet (c), or Home (h). For the fibre terminating

at home, the technology is called FTTH. The basic topology of the FTTH architecture technology as shown in figure 2.1 uses an Optical Line Terminal (OLT) as a network transmitter hosted in the central office. And an optical network terminal (ONTs) at each end user. The data and voice services are usually transmitted through the 1490nm wavelength from the central office downstream to the end user, and reflated back through 1310nm wavelength from the end user home upstream to the central office (Sharma et al., 2022).

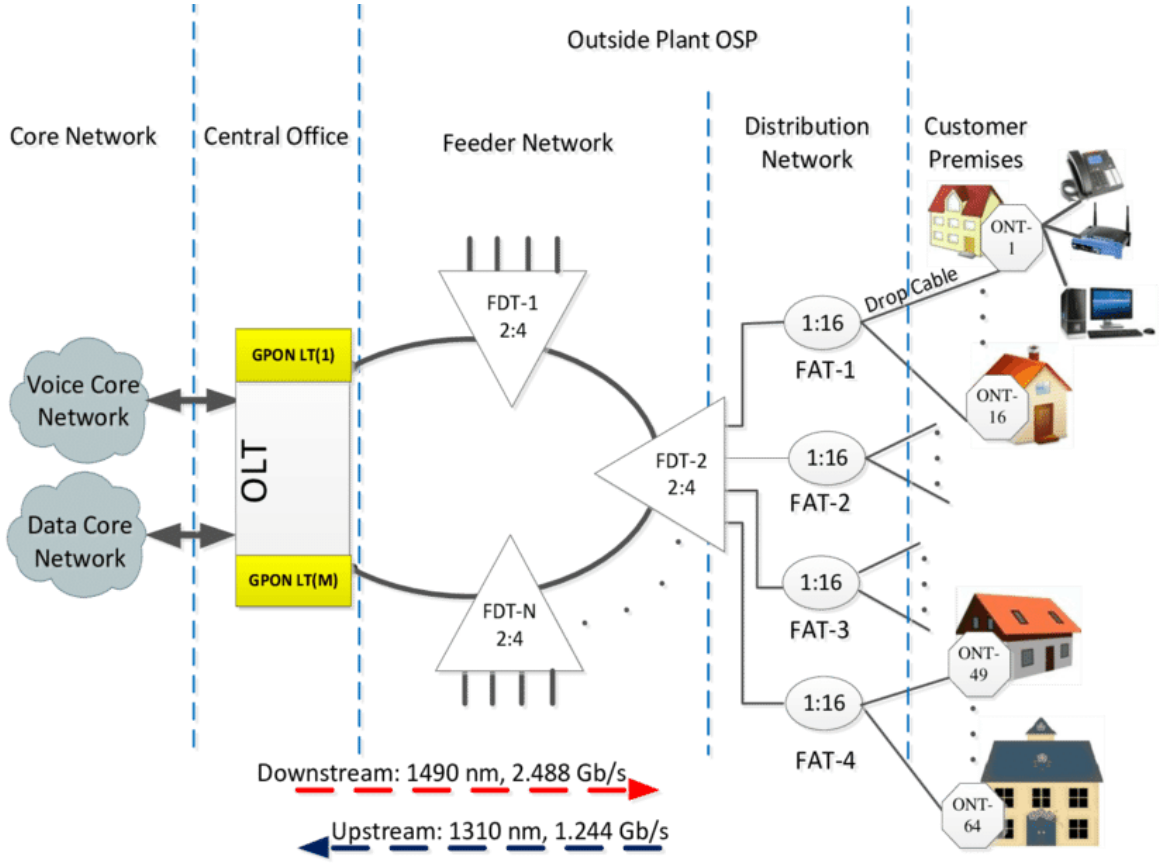


**Figure 2-1: The basic GPON FTTH network architecture (Al-Quzwini.M, 2014)**

### *2.2.3. Advantages of Fibre Optic broadband network*

The Fibre Optic broadband network has more advantages than the xDSL and wireless networks. The optical fibre has increased information carrying capacity

because of its high signal bandwidth. The acceptable bandwidth capacities on the multimode (MM) fibres range between 200 MHz-km and 600MHz-km, while for single mode (SM) fibres the bandwidth capacity is anything greater than 10 GHz-km. The optical fibres have immunity characteristics to the electromagnetic interference and do not emit radiation.

Decreased cost, size, and weight: In comparison with the copper conductor which similar signal carrying capacity in xDSL network, optic fibre cables have lesser weight thus making the fibre floating and installation much easier, requires less storage and transportation costs, require less installation duct/ sleeve space, and also weigh more than 10 times lesser and costs about 15 times lesser than copper of the similar installation length (Fourie & de Bijl, 2018).

For similar coverage, optical fibre offers lesser loss of signal intensity, technically referred, compared to wireless (air) and copper (xDSL). Network elements along the optical fibre link, such as splitters, connectors, repeaters, and the length of the link can affect its attenuation to the worst if not well engineered.

For the network implementation where there is the risk of explosive gas or flammable environments, the fibre optic is best suited than copper because fibre does not emit sparks or create short circuits. The fact that fibre optic cables are not made with any metal conductors, they are safe to work with and pose no danger of the shock hazards. Still on the safety factor, fibre optics do not emit any radio/ microwave frequency signals (Abdellaoui et al., 2021).

## 2.3. FTTH TRENDS AND OPPORTUNITIES IN BROADBAND TECHNOLOGIES

### *2.3.1. Current FTTH connectivity trends*

Currently there is a requirement for high bandwidth capacity and speed for broadband internet. The use varies from home to home (Abdellaoui et al., 2021). Due to hiking rates for TV licences and DSTv in South Africa, customers are

desperate for stable internet connections to use for High-Definition Television (HDTV) to access home entertainment such as Netflix, Showmax, Disney+, Prime Video, VIU, etc. There is a lot of uncaptured value of FTTH networks (Forzati, 2011). The digital divide, where richer suburbs are saturated with fibre while the townships are marginalised (Yuguchi, K. 2008), emerges as an open market and opportunity for South African FNOs to explore.

Since covid-19 most companies have adopted the working-from-home for most of the departments and the hybrid for some departments. This means employees no longer have landline access to connect and communicate with clients, contractors, and suppliers. The Voice Over Internet Protocol (VOIP) is thus an opportunity for the current market leading to the proposed FTTH broadband access network capable of ensuring reasonable costs for these triple play services (Abdellaoui et al., 2021).

### *2.3.2. Emerging FTTH connectivity trends*

The requirement of stable and high bandwidth, capacity and speed for broadband internet is increasing with time. With the emerging global markets such as; Metaverse, Blockchain, Big data and analytics, 5G and Internet of things (IoT), Artificial Intelligence (AI) and Machine learning, Augmented Reality (AR), Cloud Based Solutions, Online schooling, and Hybrid work mode, the traditional FTTH market needs to innovatively transform to capture customers for these emerging trends.

The 5G is the 5IR technology for mobile access networks, is characterised by high data speeds, low latency, improved availability, and network bandwidth. The 5G technology has potential to capacitate interesting innovations in the IoT domain such as; AR, AI, drone technology, remote healthcare, and Hyper-automation, which is the automation of businesses and processes to improve the operations and investment outputs (Iyappan et al., 2022). All these briefly discussed trends must be drivers for FNOs to go through digital transformation and become innovative in delivering the FTTH with the CVPs.

## 2.4. THE INTEGRATE THEORY: COMPETITION VS INVESTMENT RELATIONSHIP

The FNOs invest innovatively in their fibre network infrastructure to improve and provide better product range with some customer value propositions (CVPs) to battle the competition against other rival FNOs (Fourie & de Bijl, 2018) therefore, in this research paper, the investment was interpreted as innovation. There are various economic theories, some suggesting that there is no linear relationship between competition and innovation output, and some suggesting a linear relationship.

This research focused only on Schumpeterian growth theory which is based on the following core ideas; (i) Innovation results in Long-run growth; (ii) entrepreneurial investments resulting from innovation and prospects of monopoly; and (iii) new market innovations are destructive and can cannibalise the old innovations. Schumpeterian growth model suggests that there is a non-linear relationship between competition and innovation (Aghion et al., 2015). In fact, Aghion et al., (2005) modelled the relationship between competition and innovation output based on this Schumpeterian growth framework, and came up with the hypothesis of the "inverted-U relationship" between competition and innovation, shown in figure 2.2 below. This inverted-U relationship graph presents that, although there is a positive relationship in the initial investment and innovation phase, there will be diminishing incentives for innovation as the competition intensity increases. This will continue to an optimum level where innovation starts to yield reducing incentives for innovation because of the increasing intensity of competition.

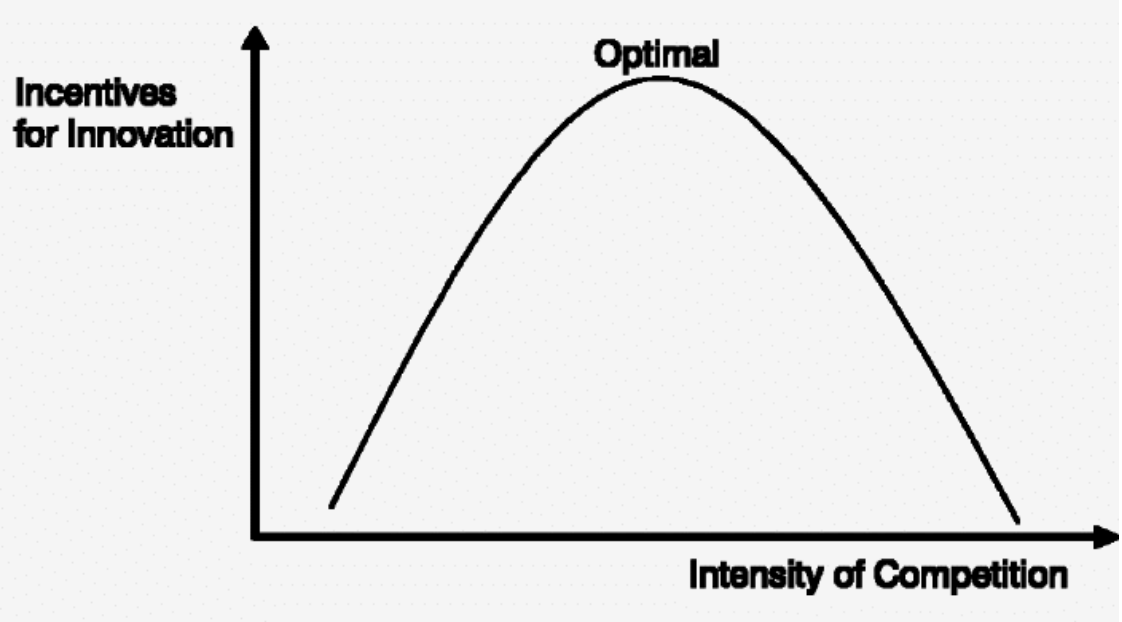


**Figure 2-2: Inverted-U relationship between competition and innovation.**

Aghion et al., (2005) further argued that the results from the model reconciles the views from both Schumpeter and other authors arguing that Competition and Innovation have a negative relationship. They explained this with the support that the innovation in organisations could be inspired by two opposite forces, that they named; a Schumpeterian' effect and an escape competition' effect. Organisations can incentivise their investments by developing the innovations that will outcompete their competitors in any growing competitive market. This is what is referred to as an 'escape competition' by (Aghion et al., 2005). This view was supported by (Tang, 2006) arguing that an increasing market competition has good potential to promote and foster innovation within organisations. Innovation adds the competitive advantage over the mark rivals in the stiff markets. The organisations that have financially healthy investors even have better opportunities to develop innovations than the smaller organisations that have lesser funding from investors and this ultimately gives them a competitive edge in competitive markets (Tang, 2006). The innovative organisations often get an incentive of staying sustainable and reputable in the markets (Audretsch et al., 2001).

In conclusion, from his modelling, Aghion et al. (2005) consolidated the 'Schumpeterian effect' with the 'escape competition effect' to conclude the

nonlinear relationship between market competition and incentive for innovation, and presented it as an inverted-U relationship reflected in figure 2.3 below. He further concluded that an increased competition has potential to increase incentives and profit because of the initially triggered innovations to "escape competition effect", but insisted that competition intensity increases, the outputs, and incentives of such an innovation get reduced.

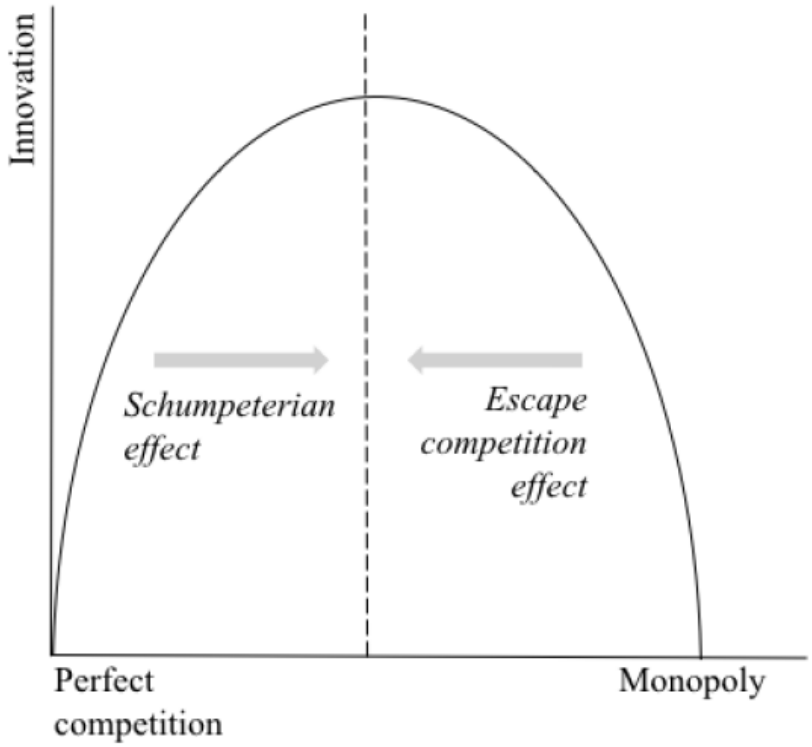


**Figure 2-3: 'Schumpeterian effect' with the 'escape competition effect' on competition and innovation.**

## 2.5. SOCIO-ECONOMIC FACTORS AFFECTING THE FTTH MARKET COMPETITION AND INNOVATION

Besides the economics theories and models concluding that intense competition affects the outputs of innovation, these needs for innovation for some markets can cause the change in the market structure, thus triggering more investment into further innovation to counter the changed market structure (Katz & Shelanski, 2005). This confirms that the relationship between competition intensity and

investment outputs are also affected by their respective market dynamics, technological trends, and even the regulatory bodies. This is also true in the FTTH market in Telecommunication industry where The Independent Communications Authority of South Africa (ICASA) was established in 2000 as an independent regulatory body of the South African government to regulate the telecommunications industry and broadcasting sectors, for the interest of the public. There is also the Competition Commission of South Africa which is one of three independent statutory bodies established in terms of the Competition Act, No. 89 of 1998 to function as a regulatory body for competition between firms in any South African market. It investigates and prosecutes organisations in the competition regime. The other two bodies are the Competition Appeal Court (CAC) and Competition Tribunal. The Competition Tribunal is the court for investigation and prosecutions of organisations by the Competition Commission while the CAC reviews and files the appeals from the court decisions concluded by the Tribunal. These three regulatory bodies operate independent of each other, the Competition Commission and Tribunal are both part of Economic Development Department (EDD) of South Africa, and the CAC forms part of the judiciary (The Competition Commission, n.d.).

The strategic mergers in any market normally creates the challenge for regulatory bodies to control competition and manage consumer welfare. The focus of controlling mergers is normally to maximise the welfare of the consumers under an assumption that well controlled competition keeps a good market allocative efficiency. While mergers kill competition and affect the consumers welfare, the consumer welfare will always stay an essential driver for innovation in the long run for sustainability of business (Audretsch et al., 2001).

Competition in this broadband market (FTTH) is taken at two distinct levels, layer 1, which is the passive fibre infrastructure invested in the ground per FNO, and layer 2, which is service level delivered by FNOs. This competition is called facility-based competition, as it is the competition between independent networks of various FNOs. Peitz & Valletti, (2015) and de Bijl & Peitz, (2005) argued that the fast growth in fibre penetration in many markets of different countries may be related to an

impact of innovation in technology and intention to outcompete DSL technology. They further argued that after the establishment of the European telecommunications sector back in the 1990s, mandatory access to broadband policy was an essential tool that encouraged competition in the broadband market.

## 2.6. CHAPTER SUMMARY

In this chapter the development of broadband technology in South Africa was given. The FTTH trends and opportunities in broadband technologies were also explored, reviewing the current and emerging FTTH digital trends. The chapter further reviewed the theoretical relationship of competition and innovation with respect to the FTTH market, and studied the socio-economic factors affecting these FTTH market innovation and competition. The theoretical model confirms that there is a positive relationship between an increasing competition intensity and innovation outputs, but to a certain optimal point where higher intensity in competition leads to reducing innovation outputs. The review of the emerging digital trends affirms that FTTH technology FNOs need transformation and development of value-added services to stay competitive and sustainable in this competitive FTTH market. The next chapter discusses the data collection and analysis methodology that was used in this research.

# 3. CHAPTER THREE: RESEARCH METHODOLOGY

## 3.1. INTRODUCTION

This chapter describes the methodology that was taken to conduct the research. It also explains and motivates the research approach and the tools that were used in the process.

## 3.2. RESEARCH DESIGN APPROACH

This study adopts a **qualitative research** design by reviewing the qualitative data collected, to answer the research key question and fulfil the research objectives. The focus of this research is based on interviewing the total of six SA FNOs regarding their strategic plans to address increasing competition and decreasing investment output in the SA FTTH market. At least three of these FNOs were the top leading FTTH market players, two were middle players and one was the smaller, new entry players. From each of these six FNOs, two semi-structured interviews were conducted, 1 respondent for expert sampling and the other for focus group discussion of the junior management or non-management bottom level. The semi-structured interviews were conducted in accordance with the approved questionnaire attached in Appendix 1. The expert sampling is considered to investigate and yield informative form of expert information and knowledge as the respondents are regarded as sources of factual information from the top management in their respective organisations and industry wise. The focus group discussions sampling is considered to cover the information and knowledge bases from the bottom hierarchy of the organisation.

It was important to adopt the deductive approach as well, to evaluate the adopted theoretical model, against the empirical data collected from this qualitative research approach above. Furthermore, it was important to set the semi-structured interviews as they are regarded to have flexibility to allow the interviewees to divulge more in their technical expertise as well as diverging their feedback to more of their social

and personal perspective (DiCicco-Bloom & Crabtree, 2006). The semi-structured interviews indeed allowed the interviewees opportunities to discuss their individual opinions of what strategic ways can organisations implement to thrive the increasing FTTH market-share competition to better their investment outputs. Some further argued from the perspective of Internet service provider (ISP), SA market landscape, market demand e.t.c.

As Opdenakker, (2006) argued, that due to its synchronous communication of time and place, the face-to-face interviews give extra information and more value from social cues such as; body language, voice tone, and intonation. It was therefore set as the interview requirement to have all the interviews either face-to-face at the convenient time and place of participants or, if impossible, the Virtual meeting via Microsoft teams, with the video-on was important while collecting the research empirical data. The quantitative research methodology is argued to be able in providing comprehensive knowledge of the sampled participants'; involvement, experience, understanding, opinions and history within their active environment (Spencer et al., 2003).

## 3.3. RESEARCH METHOD AND DATA SOURCE ANALYSIS

The face-to-face or virtual video meeting via Microsoft teams interviews following the qualitative approach were scheduled and carried out with a total of six SA FNOs to study their strategies to address increasing competition and decreasing investment output in the SA FTTH market. The research results collected from these interviews were compiled into patterns and structures that fit the analysis framework. The method of data source analysis that was used is the combination of; Narrative Analysis and Content Analysis.

After the research data results discussion, the qualitative analysis of the research findings was done and compared with the findings proposed by the theoretical literature review. Since the literature review was not restricted to only SA markets, some socio-economic, cultural and demographic factors were considered to ensure the research is distinctly fit for the SA landscape. Refer to Appendix 1 for the data

collection interview questionnaire pertaining to the FTTH market competition intensity vs investment outputs. The interview questionnaire was the preferred data collection method for this section of the study because it is easier to administrate and because the sample size is relatively small. These interviews were administered for both expert sampling and focus group level in order to allow the researcher to gather views and opinions of a wide variety of organisation's representatives who may have diverse opinions, possess different beliefs and preferences, regarding the study of interest (Navarro-Rivera & Kosmin, 2015).

## 3.4. RESEARCH POPULATION AND SAMPLING APPROACH

For this qualitative study, the population size is limited to only twelve interviews, for participants from the six SA FNOs playing in the FTTH market. This population of 12 interviews was not restricted nor discriminative of the size of the FNO. But however, the preferential reservation was concluded to tap into all levels of competition in the market; there three interviewed FNOs are the top leading FTTH market players, two are middle players and one is the smaller, new entry players. The high population count was preferred for market leaders because often the processes, procedures, innovations and trends within each market are set by the market leaders. Although the market followers can rarely come with different offerings, often they turn to only innovate on what market leaders already implemented.

Also, this population size of twelve out of the thirty-eight identified SA FNOs was decided upon because this research is only focussed on a single product, which is the FTTH service and all the thirty-eight FNOs operate in the same market space meaning more interviews than twelve would not necessarily result in obtaining additional perspectives or information on the study, justified by the theory of diminishing returns. Six expert respondent's feedback, each from all the sampled SA FTTH FNOs was sufficient to validate the set propositions, which formed part of the analysis framework. It was requested and recommended that such a participant was well informed and involved in investments and rollout of the FTTH projects

within their respective organisation in order to leverage their in-depth expert knowledge. Similarly, from each of these six SA FTTH FNOs, the second representative was requested and recommended from the junior management or non-management level to cover the focus group discussions at the bottom hierarchy of the organisation. Therefore, there were a total of two interviewees per organisation making the total of twelve interviews for the research.

Representativity is important to qualitative research as it allows the researcher to apply the findings from the collected data to a larger unreached population (Marczyk et al., 2010). Hence the population of at least 12 interviews was essential.

## 3.5. DATA COLLECTION ETHICS

The interview questionnaires first went through the review and approval by the research supervisor and the Wits Business School Ethics Committee before they get sent out to participants. Refer to Appendix 3 for the attached Ethics Form as provided by Wits Business School (WBS).

Prior to interview schedules, the interview consent forms, as attached in Appendix 4, were submitted to all the potential participants of this research for them to review, understand, acknowledge their agreeability to the research and sign. This also included a consent to sharing of their information and ensured that the Protection of Personal Information Act (POPIA) is not violated. The interviewees were guaranteed that all the sensitive and confidential financial status of the organisation would not not be requested from the interviews or would be kept confidential as such information is not of interest to the study focus. They were further guaranteed that the collected data would stay confidential in a secured storage until the agreed period to destroy.

Further research controls that were put in place were;

- The participant's personal information was not collected, disclosed, nor published. Each participant had a pseudonym (e.g., Participant 1A), which

was used to refer to a participant and relevant organisation in the research. Where A represents the anonymous organisation name.

- The organisation identity was not disclosed nor published. Each organisation had a pseudonym (e.g., FNO A), which was used to refer to your organisation in the research.
- No confidential and/or company financial information was requested from the participant in this research. Each participant had a leverage to answer the questionnaire to the level of their comfort.
- The collected data is solely being used for the research study only. This research data is only being accessed by myself as the researcher, it is safely stored in the secured repository for a minimum period of 18 months post submission and will be destroyed thereafter.
- The data and results of the study was be used for academic purposes only, through thesis and may be anonymously published in at most 3 academic journals if participants are granted such further consent.

During the interview the permission to record the interview, scribe the discussion and record the minutes was requested. The aim of interview recordings was to allow accurate first-person data collection and to minimise biased interpretation of the interview content. The interview sessions were chaired in such a way that they made a provision to the interviewees to raise any questions, clarity, or queries to make the interview more interactive, and to maximise the interviews' outcomes.

The interview questionnaire, data collection sheet, and consent form for the participants were submitted and approved by Wits University's ethical committee before being granted the ethical clearance. Only after receiving the ethical clearance did the researcher start conducting the interviews. Approval to participate was received through the signatures of the consent forms from all the participants.

## 3.6. DATA ANALYSIS

The qualitative data analysis methodology was used where the narrative data received from the semi-structured interviews was recorded and scribed on Virtual

meeting via Microsoft teams, or scribed on Microsoft word if it was the telephonic interview. The data was then later arranged in patterns and themes that allowed contrast, comparison, analysis and conclusions. The data was populated and rearranged in a Microsoft Excel spreadsheet in order to produce the visual presentation with bar-charts per theme.

The analysis of the populated data was then done through the determination of patterns, similarities, trends and repetitiveness of participants' responses in order to evaluate and interpret their associations.

## 3.7. VALIDITY, RELIABILITY AND TRIANGULATION

As discussed by Maxwell (1992), validity and reliability in qualitative research mean different things, it is thus important to check both. In qualitative research, validity means the verification of consistency of the research and the accuracy with other researchers of similar themes. In this research, the validity was checked as follows;

The interview transcripts were reviewed to identify and fix any misinterpretations that were coded during the transcription. The validation was done through re-listening carefully the recorded interview audios/ videos. All the reviewed participants' transcripts were then tested against each other to confirm the reliability, and validity coded responses from various participants. The researcher also tested the validity by calling back or emailing some participants to confirm that what was scribed and coded is aligned with the original response during the interview.

On the other hand, Maxwell (1992) also discussed triangulation, which is another qualitative research strategy used for testing the validity of different data collected from different sources in order to analyse the research finding as well as substantiating the themes and trends.

After all the senior and experts' respondents with experience of over 15 years in the ICT industry were interviewed using the set questionnaire, they were also asked to provide their personal perspective of the potential findings based on their industrial experience in general. Since their responses of this part of the interview were not

focused on their respective organisation their personal views were thus accepted as the validation of some of their counter respondents from other FNOs. Furthermore, the researchers asked two of his Executive Senior leaders with expert knowledge in Fibre technology to provide the views and inputs on the potential research findings. These two testing methods are taken to have justified the validity of the research data and analysis.

## 3.8. CHAPTER SUMMARY

This chapter introduced and explained the research design, and the main research method that was used in this research. It further discussed the ethics considerations for data collection as well as describing the population and sampling process used in this research. A brief discussion of the ethics considerations, data analysis process, reliability and validity check were also presented.

# 4. CHAPTER THREE: RESEARCH DATA RESULTS

## 4.1. INTRODUCTION

This chapter discusses the collected data of the research from all scheduled semi-structured interviews with participants from the six sampled FNOs. The results of the research, based on the set questionnaire, are presented below.

## 4.2. OVERVIEW OF FIBRE NETWORK PROVIDERS

In this study, a total of six FNOs who agreed to participate in the research were interviewed. All these FNOs provide FTTH as their business offering. Two participants from each FNO were interviewed as discussed **in Chapter 3.4**.

**Table 4-1: The overview of FNOs that participated in the research.**

| Fibre Network Operator (FNO) Identify | Business Operation (FNO or ISP Business units) | Both |
|---|---|---|
| **A** | FNO - Yes | YES |
| | ISP - Yes | |
| **B** | FNO - Yes | YES |
| | ISP - Yes | |
| **C** | FNO - Yes | YES |
| | ISP - Yes | |
| **D** | FNO - Yes | YES |
| | ISP - Yes | |
| **E** | FNO - Yes | NO |
| | ISP - No | |
| **F** | FNO - Yes | YES |
| | ISP - Yes | |

## 4.3. PARTICIPANTS PROFILING

A total of eleven FNOs were invited to participate with their suitably preferred; expert and junior employees on this study, but only six FNOs granted consent, giving the total of twelve participants. All the twelve participants from all FNOs were full-time employed by their respective FNOs. The participants were not localised to one province - they were presenting their different regional offices. The average years' experience for all the interviewed expert participants across the six FNOs was over 21 years, while the average years' experience for all the interviewed junior managers and non-managers' participants across the six FNOs was 6 years.

All these participants are currently and actively working in FTTH technology on a full-time and permanent basis. They have been verified as being well informed about the FTTH technology and market in South Africa. The expert participants are all in Executive or Senior roles of their respective organisations, and thus have extensive experience and exposure in challenges brought forth by increasing market share competition, investment returns output, as well as some strategic plans and innovations that can be employed to overcome these challenges. Refer to the table below for the detailed profile summary of the interviewed participants.

**Table 4-2: The profile information of the Participants from respective FNOs.**

| Fibre Network Provider (FNO) Identify | Participant's Identity | Experience | Participant's Role Level | Number of years of experience |
|---|---|---|---|---|
| **A** | A1 | Expert | Executive, Network Architecture and Modelling | 30 years |
| | A2 | Junior | Junior Manager | 6 years |
| **B** | B1 | Expert | Senior Manager | 20 years |
| | B2 | Junior | Network Planner | 8 years |

| | | | | |
|---|---|---|---|---|
| **C** | C1 | Expert | Executive, Chief Business Development Officer | 23 years |
| | C2 | Junior | Junior FTTH manager | 5 years |
| **D** | D1 | Expert | Senior Manager, Head of Emerging FTTH Market | 21 years |
| | D2 | Junior | Operation Network Engineer | 6 years |
| **E** | E1 | Expert | Executive, Chief Executive Office | 16 years |
| | E2 | Junior | Junior Project Manager | 3 years |
| **F** | F1 | Expert | Executive, Head of Product Management Business Unit | 15 years |
| | F2 | Junior | Quality Assurance Officer | 7 years |

## 4.4. RESEARCH RESULTS AND FINDINGS

This section discussed the results and findings from the data collected through the semi-structured interviews with the twelve participants profiled in section 4.3 above. The results and findings are graphically presented using the Microsoft Excel bar charts and tables.

### *4.4.1. FNOs strategic plans and differentiators for an increasing market competition*

This section details the findings regarding the strategic plans and differentiators of the six FNOs, as presented by the twelve participants. The bar chart below presents the count of number of responses repeated by the participants on strategic plans and differentiators their respective FNOs are focusing on to stay sustainable in this increasing FNO competition in SA FTTH market.

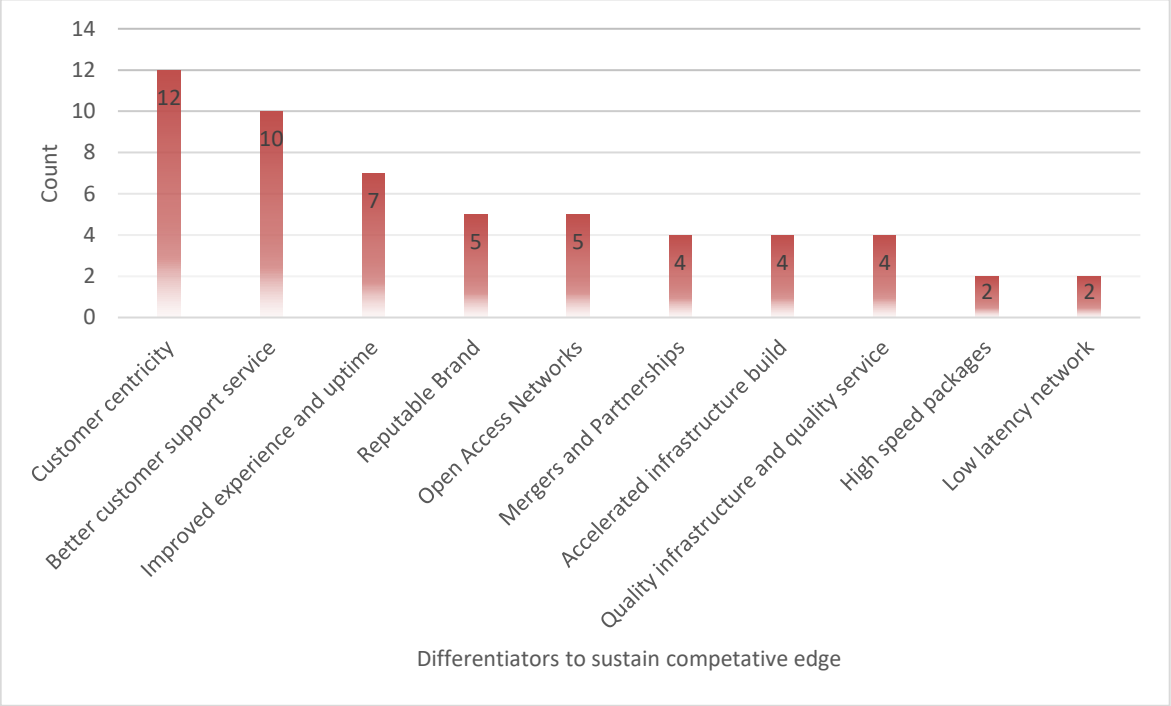


**Figure 4-1: Strategic plans and differentiators to sustain competitive edge.**

The majority of participants highlighted customer centricity, better customer support and improved availability and uptime as the top main focuses for their organisations, and they believe that customer centricity is the core of winning customers loyalty and thus gives a better competitive edge.

For example, one participant mentioned that most organisations have been focusing on cutting edge network technology equipment and service quality, forgetting to put the customers at the heart of their service delivery. He further stated that he deems; customer centricity, good customer care and service update the most important differentiators if an organisation was to own and create customer stickiness. Other participants agreed that although a quality network is important, it is becoming more vital that FNOs provide the quick turn-around time from order placed to service connected, as well as improved customer support post-sales.

Some participants agreed that they are still sustaining their competitive edge through building stronger brand propositions and reputation, engaging in open access network, as well as working on ISP merging and/or partnerships. In addition

to the above, participants stressed that the open access networks, where the ISPs are allowed to sell FTTH services over their respective networks, also drive the presence and competitive edge over their competing FNOs. One participant from the interviewed FNO indicated that they have an internal ISP unit which they are not marketing their services on because that could be viewed as competing with their ISP customers. He further highlighted that they mainly use their own ISP strategically in areas where their ISPs do not have a strong visibility and presence or in new areas of services where ISPs are not registered yet.

They discussed that the accelerated infrastructure build programmes done with good quality also grant organisations the first mover advantage and can use that as their market competition differentiators to some extent. The participants who represented the FNOs having mobile operation service concurred that the accelerated fibre infrastructure build to pass more home is an important strategy for them because it becomes easy for them to continue owning their Long-Term Evolution (LTE) customers, and thus protecting and converting their mobile revenue to the FTTH revenue. This strategic action assists them to reduce churn, while staying very competitive in the FTTH market.

Very few participants mentioned the network qualities such as high speed, low latency, and stability as the real differentiators' organisations much pride themselves with. The belief is that these are arguably the basis of network provisioning and must be non-negotiable.

One participant from the small new entry FNOs in the market indicated that for small FNOs it is difficult to compete with big players as they already have a larger footprint and good brand publicity. He however confessed that the strategy for small FNOs is not really to outgrow or compete the bigger FNOs but they aim to build networks and drive acceptable take-ups to build the value for the organisation with the intention to be merged or be acquired by the bigger FNOs in the future. One of the recent big acquisitions was when Metrofibre acquired the whole FTTH business from Link Africa in 2022, and Vumatel acquired the stake in Herotel's FTTH business. Beside mergers, one participant indicated that they have an important

endorsement by MultiChoice as an FNO of choice to transmit their DSTV service over their fibre infrastructure. Therefore, they consider partnerships as one of their strategic plans and differentiators to strengthen their competitive edge.

On the topic of competition, one participant from one of the top three leading FTTH FNOs brought about a different perspective. He confirmed that they do not view other FTTH FNOs as their only competition but they also consider the wireless Internet service provider (WISPs) and Mobile operators as their other big competitors because they offer an alternative connectivity for FTTH service. He further discussed that the other big competitor that could challenge all FNOs market share is the Starlink satellite Internet connectivity, operated by SpaceX. The service is aimed to service the marginalised and underserved rural, low and middle earning areas globally at a very competitive price offering.

### *4.4.2. FNOs strategic plans and differentiators to better the investment output.*

This section details the findings regarding how the investment outputs (market share, margins, etc.) are affected by an increasing FTTH FNOs market share competition in South Africa, as presented by the twelve participants from the six FNOs. The table below presents the count of the number of responses from participants' respective interviews.

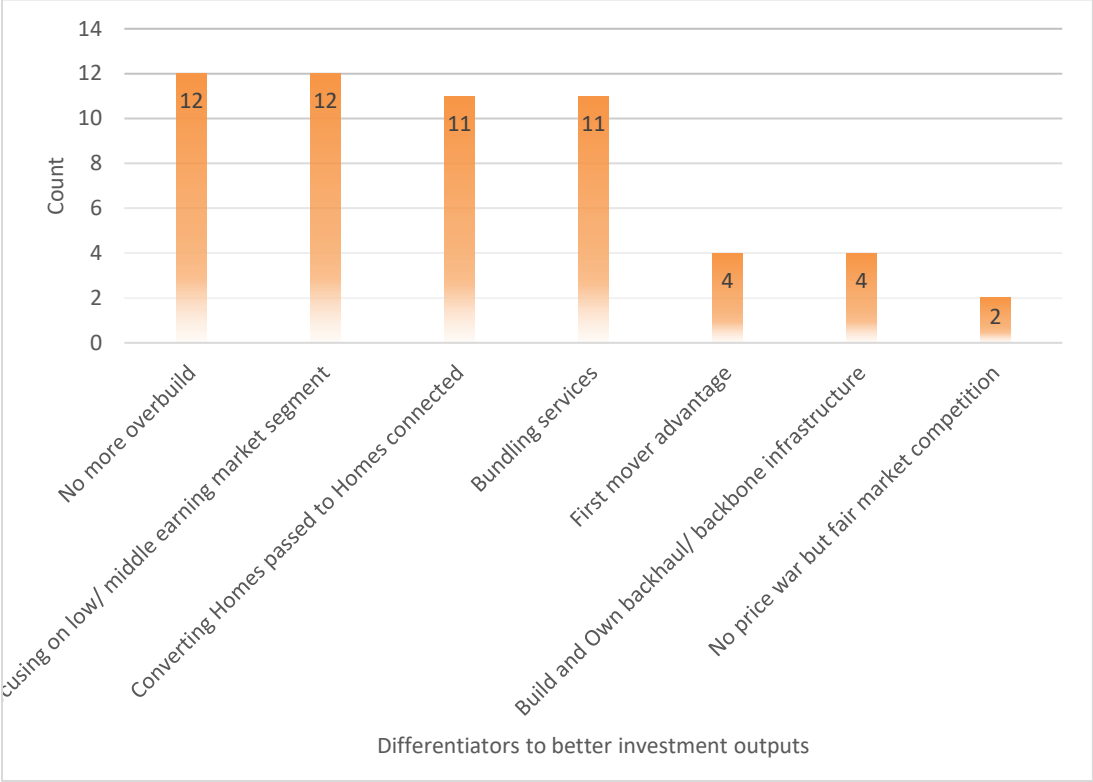


**Figure 4-2: Strategic plans and differentiators to better the investment output.**

Most of the participants had a view that the price war strategy and lower pricing of the FTTH product can no longer be used as a strategic initiative to try to increase the investment output because of the increased market intensity brought by the increased number of FNOs. They agreed that the strategy of keeping on dropping prices to grab customers is not sustainable. In recent years the FTTH pricing has been dropping down with the major price drops experienced early 2020 when the world hit the Covid-19 pandemic, and all people had to work and school from home. These price drops are also done to allow affordability for registered ISPs, so that they can pass on the price reduction benefit on to the customers. Participants also stressed that their FNOs are exploring more strategic initiatives to better their investment outputs. Further responses are discussed below.

All the twelve participants agreed their respective FNOs have shifted from the overbuild strategy because in most high earning areas, the FTTH cream of the crop is already fibred up. To increase their chances of better investment output, they are

now building infrastructure in the low and middle earning areas. They however stated that this strategic shift comes with its challenges, the backhaul costs to these off-net and remote areas is too high. Also, the fact that these areas have a very low home premises density, the cost of deployment per home-passed is also very high.

A very high number of participants from the interviewed population informed the researcher that the other strategic initiative within their organisation is a shift in focus from building more home-passes to now driving the uptake, to sweat the assets and increase their home-connected count. They argued that it is not a wise approach to build the infrastructure and not aggressively push take up, which could in turn enrich organisation's margins and market share.

Some participants stated that their other differentiators to improve their investment outputs are; bundling of value-added services along with their traditional FTTH service, as well as driving content. These bundled services and innovations are discussed in detail in section 4.4.4-4.4.6.

### *4.4.3. Investors' expectations and appetite*

This section details the findings regarding whether the returns on an investment is still meeting investors' expectations and targets, as this FNO FTTH market completion increases. As well as whether this increasing FTTH FNOs market competition reduced the Investors' appetite. The table below presents the count of the number of responses from participants' respective interviews.

**Table 4-3: Responses from FNOs regarding investors' expectations and appetite**

| FNO Participant | Investors Revenue targets met | Investors' Appetite Reduced in FTTH |
|---|---|---|
| A1 | YES | NO |
| B1 | YES | NO |
| C1 | YES | NO |
| D1 | YES | NO |
| E1 | NO | YES |
| F1 | YES | YES |

For this section of the research questionnaire, only the senior expert participants were asked to respond as they are the ones who have first-hand information regarding investors' investment targets and can also give precise review on their investment appetite. All the participants, except one from the total of six FNOs, acknowledged that their investment yields are still meeting the investors' expectations and targets. The one participant who responded with the "NO" is from the small new entry FNO in the SA FTTH market. He discussed that it is difficult to compete for market share with the well-established FNOs who have been in the market for a long time and have taken a long time building their brand. He further stated that due to this challenge of not hitting investors' targets, the organisation is currently going under a strategic transformation to evolve from the FNO business to the ISP business.

### *4.4.4. Value adding products/ customer value propositions (CVPs)*

This section details the findings regarding which products and customer value propositions (CVPs) can be bundled to the traditional FTTH service as a basic needs and utility for most, if not all SA families and to meet the emerging FTTH trends. The bar chart below presents the count of the number of responses from participants' respective interviews.

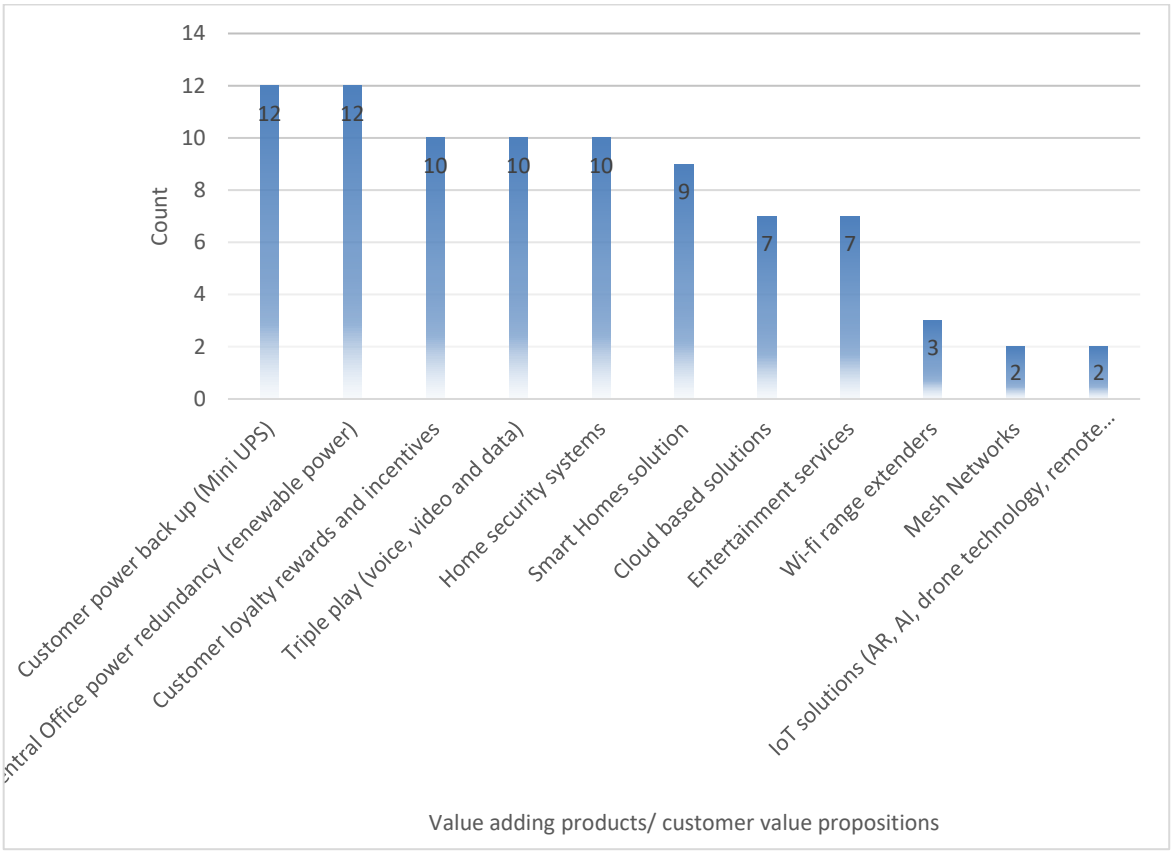


**Figure 4-3: The value adding services to traditional FTTH service.**

The traditional FTTH used to be just about internet connectivity. The literature and responses from these interviews reflected this has recently transformed to the FTTH being bundled with value adding services such as content, digitisation, digitalization, wireless Internet service provider (WISPs) services, triple play (voice, video and data) services, smart home solutions, security systems, cloud-based solutions and many more internet of things (IoT) solutions.

Other participants proceeded to break it down that value adding services can even be on the physical layer to overcome the real clients' problems. The main two examples that were emphasised were provisioning of mini uninterruptible power supplies (UPS's) for FTTH home users to support their connectivity uptime, even during the load-shedding. Along with that, the redundant renewable power supply for data centres and central offices of the FNOs was highly recommended, especially for high stages of load-shedding where the backup batteries do not have enough recharge circle times.

A high number of participants highlighted that because of high crime and security concerns rising in SA, most homeowners and homeowners' associations have deep concerns about their security. Therefore, their organisations have now started developing smart surveillance, security and alarming systems that can be bundled with the traditional FTTH service, either for the free-standing home, multi dwelling complexes or community at large. An existing live example is VumaCam, the closed-circuit television (CCTV) solution provided by Vumatel.

### *4.4.5. Research and development for competitive edge/ advantage*

This section details the findings regarding whether the FNO is intentional about investing in research and development (R&D) to innovate their FTTH technology service offering in order to gain the better competitive edge, competitive advantage and to stay sustainable for the future market need. The table below presents the participants' responses from their respective interviews.

**Table 4-4: Responses from FNOs on whether they are investing in R&D**

| FNO Participant | Have R&D Programmes |
|---|---|
| A1 | YES |
| B1 | YES |
| C1 | NO |
| D1 | NO |
| E1 | NO |
| F1 | YES |

For this section of the research questionnaire, only the senior expert participants were asked to respond as they are the ones who are in senior leadership and involved in driving the vision of the organisations. The three participants from the three FNOs, who are all ranked in top four biggest SA telecommunication companies, confirmed and named their respective innovation programmes that fund and support the research and development. All three have the innovation hub facilities and two of them have a structured partnership with the Council for Scientific and Industrial Research (CSIR). One participant from these leading FNOs discussed that for an organisation to be the leader, it must also be a leader in

innovation, not a follower or inheritor. The two middle playing FNOs and one small entry FNO responded that they do not have active R&D programmes but acknowledged however that they engage in skill improvement for their employees within their organisations.

### *4.4.6. Innovations review on FTTH service*

This section details the findings regarding which innovations each FNO believes must be introduced to better the FTTH service, and which old practices are becoming irrelevant or must be abandoned in an effort for their organisation to still stay relevant in the SA FTTH market. The table below presents the count of the number of responses from participants' respective interviews.

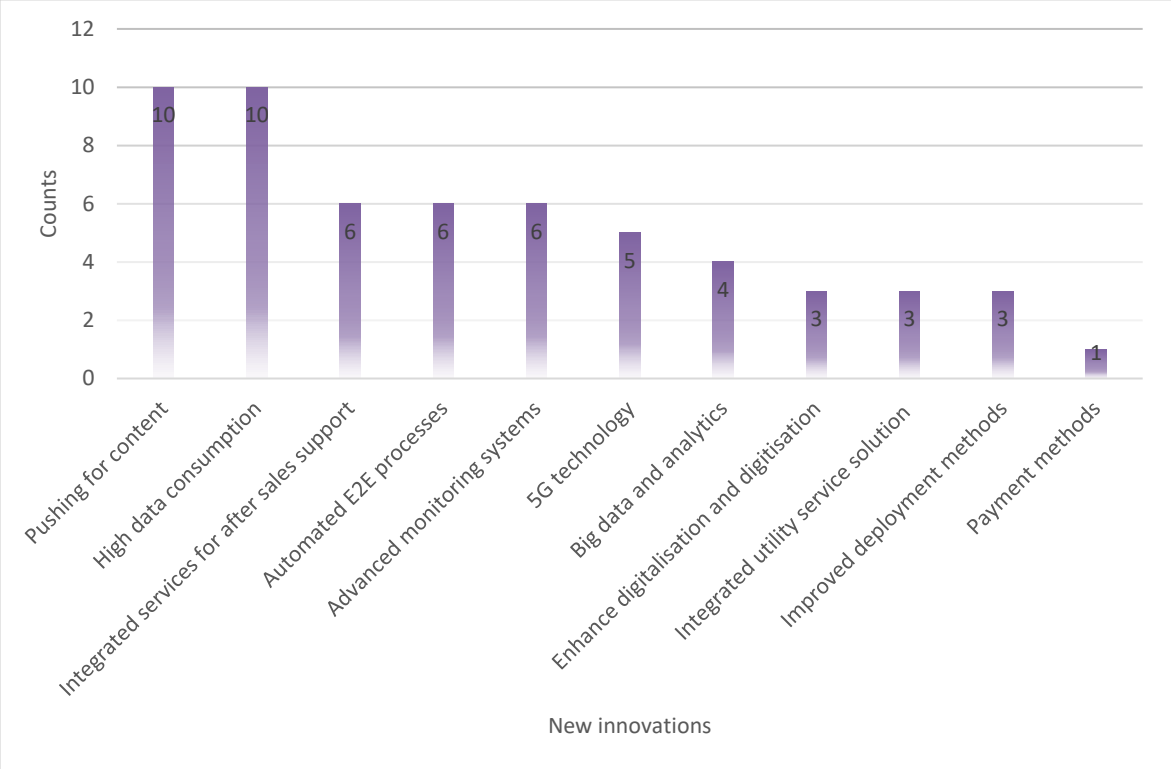


**Figure 4-4: The innovations for FTTH service.**

The majority of participants disclosed that one of the main innovations they are focussed on is pushing for content in order to spark the high consumption for FTTH

users. In the SA FTTH market, the content advocated by participants were mainly online learning educational content, entertainment and gaming content.

The participants from the FNOs who are also mobile operators mentioned that they use their existing mobile client's base contacts as their driver to influence their interest to take up the fibre service. They use the content consumption as a driver and reason for the service request. They concurred that due to the fact that the customers are familiar and have built trust with them, the content driven marketing is one of their more naturally innovative approaches to improve their investment outputs.

A good number of participants advocated for development of advanced cutting-edge network monitoring systems. They indicated that their organisations are looking into innovating such systems that can proactively monitor the network elements end-to-end, from the OLT to the ONT to automatically log calls to their network operations centre (NOC) for attention, as well as alerting affected customers of the outage. These systems can be mapped with analytical capabilities to use the past fault incidents; type, location, time of resolution, in order to proactively provide the potential diagnostic and estimated time for resolution. The participants believed that this could drastically improve the customer experience, which could result in a better competitive advantage.

One participant brought up an interesting topic around the payment methods. He stated that in their organisation, they have identified that different market segments require different payment methods. As much as the traditional FTTH market has been using the post-paid method, organisations need to innovate and develop their payment systems to accommodate the financial diversity of these segments. For instance, the pay-as-you-use payment methods for holiday homes, the weekly prepaid payment method for low and middle earning areas where most customers earn non-permanent salaries per fortnight.

All the participants of FNOs contracted with ISPs for open access network indicated that there is a challenge with these multiple ISPs having varying and fluctuating pricing for the same product, as it is sold on various FNOs network with various

pricing models. They confirmed that this is a big complexity that needs innovative automation to consolidate pricing per area, per ISP and per FNO to reduce the inconsistency and inconvenience for FTTH customers. They believe that automation can ease the marketing, pre-order and operations processes.

Connectivity is now becoming a basic need and utility for home users, like potable water and electricity. Some participants suggested their FNOs have become innovative about the methods of network deployment. To reduce the build costs and shorten the build duration, they have systematically partnered up with property developers under certain set financial agreements for them to include the fibre infrastructure during their build phases along with other services such as potable water and power. They concluded that this approach has significantly reduced their service delivery costs, as well as shortening their delivery timelines.

### *4.4.7. The FTTH market challenges and limitations in South Africa*

Majority of participants mentioned the challenge of service affordability in the low and middle earning areas. Their respective FNOs are unable to reprice the service too low to match the segment pockets because of very high backhaul costs to these remote areas, as well as the expensive method of deployment per home passed due to home low density. They argued that mobile data cost is high but the data consumption demand is also high, therefore FNOs must package the pricing and model the payment models for FTTH well in accordance to this market segment needs. Few participants stated that clients in this segment surely prefers the prepaid payment model instead of a once off debit order payment model.

Fibre network deployment takes a long time - it can take one area more than 10 months from kick-off to the going live date. This usually happens where FNOs come across external challenges and limitations out of their control such as waiting for wayleave approvals from municipality authorities, projects being stopped by community forums by opportunistically requesting ransoms and natural disasters like the recent one that happened in Kwazulu-Natal causing detrimental damage to existing and in-build infrastructure. Only the FNOs who also operate as a mobile

operator have the opportunity to provide their clients with LTE service while they are waiting for the FTTH service.

Some participants raised the concerns that some of their partnered ISPs do not understand their product's packages. For example, they were presented with client's tickets for not meeting the offered speed. Upon troubleshooting, it would be found that the ISPs have used the ONTs that do not have capabilities to support the purchased speed package. Furthermore, participants reported that some FNOs' networks still do not have the capabilities to provision for the higher speed FTTH service of 200Mbps and high on GPON network.

Two participants from FNOs, which are also mobile operators, mentioned that the one financial challenge they are facing is striking the balance between keeping the high consumption mobile network consumers on LTE and migrating them to the fibre network. They admit that FTTH is a better affordable home user solution but this transition brings about a huge revenue drop because fixed FTTH network pricing per megabyte is considerably lower than that of mobile network.

The other main limitation for quicker FTTH network expansion is the high costs of fibre infrastructure deployment, especially in high earning suburbs or metro cities. It is often required from the FNOs to pay a huge lump sum deposits directly to municipalities and local forums in order to get wayleave approvals, to gain the exclusivity to build the infrastructure in such areas, and it is sometimes labelled to be the security deposit should the FNOs do some service damages.

Furthermore, the other external challenge and limitation as discussed by some participants was the regulation measures by regulatory bodies such as Independent Communications Authority of South Africa (ICASA). FNOs are challenged with limited or lack of available spectrum for FNOs in mobile operation business. Also, the market entry is very flexible for new FNOs and ISPs to join in the market, thus increasing the market competition and possible reduction of investment output. One participant indicated that the Electronic Communications Network Service (ECNS) licence is very affordable and easy to get in order to become a competing player. He further mentioned that interested bodies like FTTH Council and Competition

Commission of SA should become intentional about drawing the regulating policies regarding pricing, deployment methods, network quality, open access network, etc. which can have the effect of making the FTTH market landscape conducive to do effective business.

## 4.5. CHAPTER SUMMARY

This chapter provided the overview of the six FNOs that consented to participate in this research, and also provided the profiles for their respective participants. The chapter then presented in detail the research results and findings that were based on the research propositions and main research questions. The challenges and limitations of the FTTH market as per research results and findings were also presented.

# 5. CHAPTER THREE: ANALYSIS OF THE RESEARCH FINDINGS

## 5.1. INTRODUCTION

This chapter gives the analysis of the research results and findings that were presented in Chapter Four above. The chapter also synthesised the findings using the relevant literature set in Chapter Two. The analyses of the findings were done from the perspective of the set objectives in section 1.3. It is important to start before by analysing the FTTH market demand and landscape in SA. These findings are then reviewed against the presented literature, followed by answering of the main research questions.

## 5.2. FTTH MARKET DEMAND AND LANDSCAPE

The FTTH connectivity and demand in SA has substantially increased in the past 5 years. According to the respondent's feedback and other literature, the high demand for connectivity, higher speed and bandwidth hit an extreme high for the majority of households in early 2020 when the Covid-19 pandemic hit the world.

In the table below, (Labuschagne, 2022) presented the number of homes passed and the number of homes connected with FTTH by the top seven biggest FNOs in SA as of end of the year 2022. Herotel could not disclose their number of homes connected, but it was estimated to be around 100,000. Therefore, it is evident that below 2 million households in SA have access to fibre connectivity, while the latest total number of SA households reported by Galal, (2022) was 17.9 million. This calculates to 11.1% of SA Households having access to high speed FTTH connectivity. Although many participants acknowledged that service affordability and deployment feasibility in low and middle earning areas could be a challenge, these statistics and research findings confirm that there is still a large market and high demand for FTTH in SA.

**Table 5-1: The SA FTTH network homes passed and homes connected per FNOs (Labuschagne, 2022).**

| Biggest FTTH networks in South Africa | | |
|---|---|---|
| **Fibre network operator** | **Homes passed** Households that have access to particular network | **Homes connected** Households that use network for connectivity |
| Herotel | 345,000 | Unknown |
| Frogfoot | 350,000 | 135,000 |
| MetroFibre | 450,000 | 116,000 |
| Octotel | 300,000 | 100,000 |
| Openserve | 1,000,000 | 443,469 |
| Vumatel | 1,600,000 | 450,000 |
| Others (Vodacom, Evotel, Zoom Fibre) | 396,828 | 203,302 |
| **Total** | **4,241,828** (includes overlapping homes / overbuilds) | **1,447,771** (excludes Herotel) |

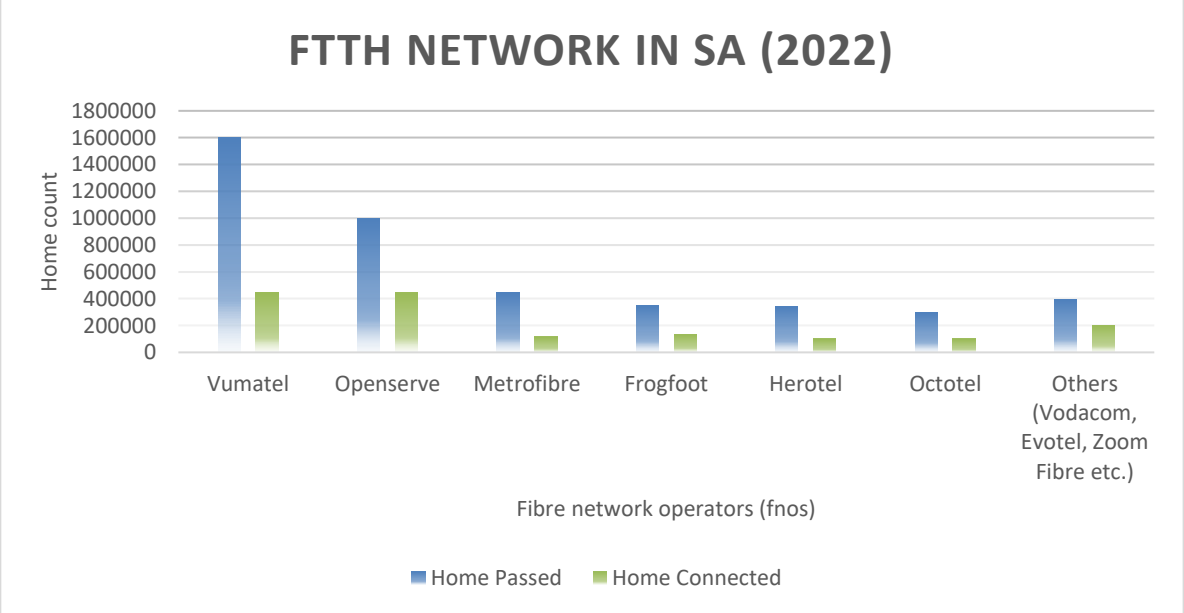


**Figure 5-1: The graphical presentation of the FTTH network in SA (Labuschagne, 2022)**

## 5.3. STRATEGIES FOR FNOs TO ADDRESS INCREASING COMPETITION AND DECREASING INVESTMENT OUTPUT.

Based on the findings presented in section 4.4 from the participants, most South African FNOs have shifted their competitive edge strategies and differentiators to be about the customer experience. They value and drive customer centric initiatives, they vie for better customer support service and improved customer experience and uptime. The South African FNOs are no longer focusing mostly on only better infrastructure and network technology equipment - they acknowledge that the good customer care are best differentiators to own the customer and earn their loyalty. Faulhaber, (2009) also confirms that a customer-centric plan that puts the customer at the centre of everything they do does assist with improved investment yields for the broadband organisations of the U.S.

Although the findings of this study did not rate the quality of underlying fibre infrastructure network as the most important and strategic differentiator to gain a better competitive advantage, Forzati et al., (2011) argued that network quality is one of the commonly uncaptured values in the U.S when doing company valuation. This difference of view point is possibly brought by the fact that these two studies were carried out in different continents with different environments.

Chen & Myagmarsuren, (2011) suggested that the brand equity and image have a direct and significant impact on the customer relationship, which in turn affects customer loyalty towards their telecommunications service provider. This literature aligned with the findings from this research that the competitive edge, as a result of customer relationship and loyalty built through stronger brand propositions and equity, is a key differentiator.

From the findings of the research, the open access network, as well as on-boarding/ merging and/or partnerships with ISPs, have a big influence in driving the presence and competitive edge for FNOs. Whether these ISPs are internal or total external,

they assist in marketing the FTTH service and reaching out to where the FNO resource cannot reach or areas where their ISPs do not have a strong visibility or in new areas of services where ISPs are not registered yet. Chetty et al., (2013) findings suggest that the interconnection and relationship between the FNOs and ISPs has a significant impact on reliability and performance of such ISPs investing on accessibility.

Most FNOs are strategically accelerating the fibre infrastructure build to pass more homes for them to increase their footprint and potential market share. This is also in alignment to the SA government initiative for every household to afford internet connectivity as the key component of the strategy to stimulate economic growth. The FNOs who have mobile operations are also putting much effort in converting their LTE customers from mobile to FTTH clients to avoid churn to other providers. Goldstuck, (2012) also wrote that internet connectivity is the quiet engine of the SA economy because most organisations use the internet as an enabler for running systems, processes, collaborations, transactions and communications.

Gamatham et al., (2013) commented that the developed countries such as Japan have high household density and also have high income per-capita per household, and for those reasons it becomes easier for FNOs, regardless of their size to deliberately capture any potential FTTh market segment and still be able to return profitable margins, unlike in most of the African countries where socio-economic status are diverse and do not allow such a flexibility. In contrary to these findings of the Gamatham et al., (2013), findings from this research state that it is difficult for small FNOs to compete with big players due to them already having a larger footprint and good brand publicity in provinces or across the country.

It was derived from the participant from one of the top leading FTTH FNOs that the FTTH market competition in SA, should not be thought of as only within FNOs. The wireless Internet service provider (WISPs) and Mobile operators are also competitors in this market since they other alternative connectivity to households, Starlink satellite Internet connectivity is also another strong competitor upcoming in African Market. Similarly, Wallsten & Mallahan, (2012) found from their research

that the number of wireline providers in the U.S are able to provide the high broadband speeds across their coverage. Their findings were that the; DSL, and fibre speeds are each significantly higher and stable when there is more than one provider in the area, compared to when there is just one provider.

We also find evidence that prices for broadband subscriptions, especially for slower speeds, are lower where there are more wireline providers.

From the research findings, most participants agreed that the way to sustain one's competitive advantage on this increasing FTTH market competition is by driving initiatives that could earn one the loyalty for the customer. Such initiatives can include loyalty rewards and incentives, free installation fees, free migration fee, free and seamless upgrades/ downgrades, LTE-while-you-wait-for-fibre service and VoIP offering, to mention the few. The findings from both studies conducted by Gillett et al., (2004) and Hoosain et al., (2021), stated that the factors that affect the customer loyalty FTTH market share sustainability are partnerships, pricing, brand equity, innovations and customer loyalty benefits.

## 5.4. FTTH TRENDS AND VALUE-ADDED SERVICES FOR FNOs TO BETTER THEIR INVESTMENT OUTPUT.

From the research findings, it was observed that most participants agreed that offering the traditional FTTH without the value-added service is setting an FNO for out competition. They conquered that the FTTH service can be offered along with many homes needed services such as power backups, Triple play (voice, video and data), Home security systems, Smart Homes solution, Wi-fi range extenders, and Cloud based solutions. Brem et al., (2016) also found from their study of competitive advantage through innovation: the case of Nespresso, that competitive advantage and better investment output is often a result of the implementation of innovative service offerings from recent technologies and through addition of value to one's processes and daily operations. Kim & Mauborgne, (1999) also discussed that

better revenue outputs for organisations are normally through value innovation where new value-added offerings are provided.

Zuhdi, (2012) also stipulated that telecoms organisations can create competitive advantage through creation of value. He discussed that organisations can implement the blue ocean strategic approach where they remodel the new business offering as an enablement to combat current and future market competition challenges to better the investment returns. Similarly, most respondents from the study agreed that the makeover of the traditional FTTH service through value added services and innovation is necessary. The innovations that came top for the future trend and demand are content that ultimately influences high data consumption, automation, digitization, digitalization, advanced network monitoring systems, 5G technology, big data and analytics and payment methods.

## 5.5. CHAPTER SUMMARY

This chapter started by providing the discussion and analysis of the FTTH market demand and landscape in order to set the scope for analysis of results against the set research objectives. The analysis of findings was then done with respect to the set research objectives.

# 6. CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

## 6.1. INTRODUCTION

This chapter provides the summary of the main conclusions and recommendations drawn from the analysed findings. The purpose of the study is to understand how the increasing FNO competition has affected the investment output in the SA FTTH market. The following propositions and research questions were used as the research guidelines;

***Proposition 1 (P1) -*** An increase in FNO's competition in South African FTTH Market causes a decrease in investment outputs.

i. What are your strategic differentiators to still stay sustainable in this "shrinking FTTH market share" in South Africa?
ii. How are the investment yields/ returns (market share, margins, e.t.c) affected by an increasing FTTH FNOs market competition?
iii. Do the returns on an investment meet investors' expectations and targets? Is the increasing FTTH FNOs market competition reducing the Investors' appetite?

***Proposition 2 (P2) -*** There are some innovative value-added services that South African FTTH FNOs can foster in order to stay competitive and sustainable to better their investment output.

iv. The home internet connection is becoming one of the basic needs for most families. Which products can be value adding to the traditional FTTH services to meet the emerging FTTH trends for home users?
v. Are you investing in research and development (R&D) to innovate the FTTH service offering for a better competitive edge, advantage and to stay sustainable for the future market needs?

vi. Which innovations must be offered and which ones are becoming irrelevant to the SA FTTH market?

The chapter further concludes on the validity and reliability of the research data. The research limitations and opportunities for future studies are also discussed in conclusion of the research.

## 6.2. MAIN CONCLUSIONS

The following conclusions are based on detailed results' analysis of the interviews and validity review from the literature pertaining to the topic.

- From the research findings, it is concluded that the number of FNOs may be rapidly increasing but the market is not shrinking. There is still a large untapped green field market segment to be targeted in the low and middle earning areas.
- From the research findings, the main common strategic differentiators to avoid the challenges of increasing competition and improving the investment output are avoidance of overbuild, advocating for creation of content and bundling the value-added services to the traditional FTTH service.
- From the research findings, it was evident from respondents' feedback that this increasing number of FNOs in the FTTH market is not affecting their individual returns negatively. The fibre infrastructure is the long-term investment of 5 years to 15 years. Although the investment return can immediately be measured by immediate service uptake in the short term, most FNOs market share and margins are not affected by the mushrooming number of competing FNOs. The investors' appetite in FTTH is also not affected by the increasing number of FNO players.
- From the research findings, the main value adding products that FNOs should be bundled with the traditional FTTH service to meet the emerging FTTH market trends for home users are;
    - the mini uninterruptible power supplies (UPS). This should not be negotiable due to the ongoing state crises of power load-shedding. If the

home user does not have any means of power back-up, this means that the ONT will stay off with no connectivity until mains power restoration.

- The sustainable and sufficient lithium-ion battery power bank back-ups and sustainable redundant solutions such as renewable power feeds for all the FNOs central offices (COs). With the challenge of prolonged, high stage load-shedding, this should not be negotiable. If the CO does not have sustainable back-up, all the terminated clients will be off until mains power restoration, even if the home users have their own back-up power means such as UPSs and solar back-up.
- The bundled smart home solutions to leverage the existing FTTH connectivity to remotely have control of most home applications, whenever, wherever.
- The bundled home security system connected on the existing FTTH service to enable seamless security functions like high-resolution CCTV, facial recognition, analytics and home alarms.

- From the research findings, the results confirm that most FNOs, especially the leading big players, are investing in research and development (R&D) to innovate not only the FTTH service offering but to develop other fibre-based services and work of integrating and bundling of such services for a better competitive edge, Three out of the six interviewed FNOs have their own in-house Innovation Hubs and funded innovation programmes that are meant to accelerate product and processes innovations.
- From the research findings and results from the FNOs participants, the FTTH technology and market has evolved. There is definite innovation needed to improve the service offering for ever evolving current and future home users' needs and market trends. The innovations are necessary to accelerate the SA vision of bridging the existing digital divide in order to foster the country's economic growth through interconnectivity.

## 6.3. RECOMMENDATIONS FOR FNOs

This chapter details recommendations drawn for the FNOs that provide the FTTH service in SA. These recommendations focus on both creating the better competitive advantage as well as improving their investment outputs:

- FNOs should invest more effort in innovative methods of deployment that can be commercially and technically feasible for the marginalised low and middle earning societies in SA. In these areas affordability and accessibility is the main challenge. There is always less or no competition in these areas.
- FNOs should leverage of existing clientele information and relationships, to advocate for their service packaging upgrades.
- FNOs should not regard the price war as a differentiator. Today's tech-savvy customers rather regard the content and bundled services as their preferred differentiator. For home users, the traditional FTTH service can be bundled with the likes of smart homes solutions and home security in order to influence their bandwidth consumption thus forcing them to upgrade their respective bundle. That would ultimately increase the margins.
- FNOs should avoid overbuild, which means two of more FNOs installing fibre infrastructure for the same area and becoming the direct competition to each other. The open-access network processes already allow different ISPs to sell their services over other competitors' fibre infrastructure. This is the waste of investment resources and unnecessary creation of competition because the other FNOs could be expanding the footprint in the marginalised areas.
- All participants confirmed that there are other external factors that definitely affect the investment value chain from network deployment to maintenance. These include but not limited to delays in wayleave approvals from authorities, ungoverned regulation on overbuilds, territorial and bullish strategies by the so called "Local Forums", unregulated price war fluctuations etc. It is therefore recommended that FNOs call upon government and regulatory bodies for intervention in putting rules around these factors.

## 6.4. RECOMMENDATIONS FOR INVESTORS

This section details recommendations drawn for the investors that fund the FTTH FNOs in SA. These recommendations focus on encouraging the FNOs to allocate and manage the funds in the manner that the investment outputs are improved and competition is avoided:

- Investors should consider setting the measurable deliverable for FNOs to drive content i.e., online self-learning and general educational content, as this will ultimately increase the end users' consumption, which in turn will improve the business returns and margins.
- Investors should strictly regulate and stand against the wasteful funding of the overbuild projects. This will help to avoid unnecessary competition and will also help to accelerate the fibre rollout deployment to the low and middle earning areas.
- Investors should consider forming the backhaul consortium to invest in expanding the fibre footprint by building backbones to various remote small towns and areas with the high connectivity demand but do not have the National Long Distance (NLD) connectivity. This will unfold the new opportunity for their respective FNOs to explore new FTTH markets and avoid the competition in metro cities. The NLD route between Gauteng and KwaZulu Natal was built by the NLD consortium, made up of Vodacom, MTN, Neotel and Sanral (McLeod, 2013). So, the investors can form a similar consortium to explore this opportunity of a new untapped market.

## 6.5. RESEARCH LIMITATIONS AND OPPORTUNITY FOR FUTURE RESEARCH

The study focus was limited to the increasing FNO competition in only the FTTH market within SA, and did not include any other fibre services nor did the study extend beyond SA network operators and service providers in Gauteng province.

Furthermore, it was observed that although most of the participants have more years of experience in the ICT industry, their involvement was initially on copper and mobile infrastructure network and lesser amount of experience in fibre.

Due to tight schedules and unavailability of some of the participants from other FNOs, some of the interviews could not be face-to-face ,nor virtual meetings via teams, but were rather conducted telephonically. This was another limitation, as the interview could not be recorded or transcribed; this may result in misinterpretation or misunderstanding between the researcher and the participant.

The research findings concluded that the increasing number of FTTH FNOs competition does not directly imply the decrease in investment yield because only about 3.9 million homes or the 17 million SA homes were passed with fibre in August 2022 (My Broadband, 2022). This is only about 23% coverage, primarily in the high earning areas, thus leaving the big digital divide with the low and middle earning areas normally referred to as townships and rural areas. There is therefore an opportunity for further research on strategies for FNOs to explore suitable investment methodologies to bridge this digital gap within SA.

There are other fibre services such as fibre-to-the-business (FTTB) and enterprise links that were not in the scope of the research, thus offering the good potential for further research in the SA fibre market, or even expand with the comparative study of how the SA Fibre market and landscape differs with those of other African countries.

## 6.6. CHAPTER SUMMARY

This chapter re-introduced and recalled the purpose of the study, propositions and research questions that main conclusions were based on. The main conclusions, recommendations for FNOs and recommendations for investors were then drawn based on the research findings that were analysed. It further discussed the limitations of the research and opportunities for future research.

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# APPENDIX 1: DATA COLLECTION INTERVIEW QUESTIONNAIRE TEMPLATE

Wits Business School
*Sculpting global leaders*

Wits Business School
2 St David's Place
Parktown, 2193
Johannesburg
Gauteng, South Africa
Tel: 011 717 3544, Web: https://www.wbs.ac.za

**Data Collection Interview Questionnaire**

**Tittle of the project:** Strategies of fibre network operators to address increasing competition and decreasing investment output in the South African fibre to the home (FTTh) market.

**Section A: Interview Details**

Date of Interview: _____

Time of Interview: _____

Mode of Interview: _____

Venue of Interview: _____

Total Duration of Interview (Minutes): _____

**Section B: Interviewee Details**

Current Position/Role in Organisation: _____

Professional membership or external participation in the industry: _____

Nature of employment contract (i.e. Full-time): _____

Number of years in the ICT Industry: _____

Other necessary information: _____

If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, or email hrecnon-medical@wits.ac.za.

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**Section C: Interview Questionnaire**

The following standardized questionnaire will be used to interview the participants of the selected sample and population.

| The Organisation is an: FNO ☐ | ISP ☐ | BOTH ☐ |
|---|---|---|

| NO | QUESTION | ANSWER |
|---|---|---|
| 1. | What are your strategic differentiators to still stay sustainable in this "shrinking FTTh market share" in South Africa? | |
| 2. | How are the investment yields/ returns (market share, margins, e.t.c) affected by an increasing FTTh FNOs market competition? | |
| 3. | Are the returns on an investment meet investors' expectations and targets? Is the increasing FTTh FNOs market competition reducing the Investors' appetite? | |
| 4. | The home internet connection is becoming one of the basic needs for most families. Which products can be value adding to the traditional FTTh services to meet the emerging FTTh trends for home users? | |
| 5. | Are you investing in research and development (R&D) to innovate the FTTh service offering for a better competitive edge, advantage and to stay sustainable for the future market needs? | |
| 6. | Which innovations must be offered and which ones are becoming irrelevant to the SA FTTh market? | |
| 7. | Other relevant, additional information that may add value to the research, | |

Thank you for your willingness to participate and for answering this interview questionnaire truthfully.

If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, or email hrecnon-medical@wits.ac.za.

# APPENDIX 2: INTERVIEW GUIDE AND CONSENT FORM FOR PARTICIPATION IN MBA RESEARCH PROJECT

Wits Business School
*Sculpting global leaders*

Wits Business School
2 St David's Place
Parktown, 2193
Johannesburg
Gauteng, South Africa
Tel: 011 717 3544, Web: https://www.wbs.ac.za

**Interview Guide and consent form for participation in an MBA research project**

**Tittle of the project**: Strategies of fibre network operators to address increasing competition and decreasing investment output in the South African fibre to the home (FTTh) market.

Dear Respondent

You are herewith invited to participate in an academic research study conducted by Molefe Donald Tsoana, a student in the Masters of Business Administration (MBA) at Wits Business School (WBS), under the supervision of Professor Zunaid Bulbulia.

The purpose of this research is to study the strategies of South African FNOs to address increasing competition and decreasing investment output in the South African FTTh market.

You are kindly invited to participate in the study by accepting the single 45 minutes interview to be conducted by researcher, where you will be answering some questions related to the study. The interview will be conducted using a communication medium of your choice i.e., telephonic, virtual or face to face at a place of your convenience. With your permission, I would like to audio record the interview for ease of transcription and accurate reflecting of the outcome. This research data will only be accessed by myself as the researcher, it will be safely stored in a password protected personal laptop for a period of 18 months and will be deleted thereafter.

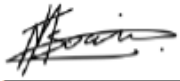
All your answers will be treated as confidential. Neither your personal information nor organisation's identity will be disclosed in any of the research reports emanating from this research, in accordance to POPIA. The results will rather be presented as i.e., respondent A of organisation 1. The results of the study will be used for academic purposes only and may be anonymously published in an academic journal if you grant such further consent. You will also have the right to request summary of the research findings.

Your participation in this study is very important in understanding the future of South African FTTh market versus investment outputs. Also, to add value in the telecommunications body of knowledge and ICT fraternity at large. Your participation in the research is however voluntary and you may withdraw your participation at any time should you decide not to continue participating, without any negative consequences. You also have the right to choose not to answer some of the research interview questions if you feel they may compromise your organisations information in any way.

For any inquiries regarding the study, please don't hesitate to contact me on +27 83 489 4024/ 2492259@students.wits.ac.za OR you may directly contact my supervisor, Professor Zunaid Bulbulia, +27 11 717 3625 or zunaid.bulbulia@wits.ac.za.

Yours sincerely,

Molefe Donald Tsoana



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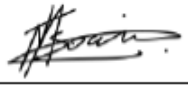
**Consent form**

Researcher's consent;

I, **Molefe Donald Tsoana**, the Researcher, hereby commit to protect the Participant personal information and his/her Organisation's identity confidential to ensure my research is ethically conducted and in accordance to POPIA.



_____ 10/01/2023

**Researcher's signature** **Date**

Research Participant Consent;

I, _____, the research Participant, herewith give my consent to participate in this study. I have read the letter and understand my rights with regard to participating in the research.

_____ _____

**Respondent's signature** **Date**

If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, or email hrecnon-medical@wits.ac.za.

# APPENDIX 3: CONFIRMATION OF ETHICS CLEARANCE

**Graduate School of Business Administration**
**University of the Witwatersrand, Johannesburg**

**Wits Business School Ethics Committee**
Constituted under the University Human Research Ethics Committee (Non-Medical)

## Ethics Clearance Certificate

**Ethics protocol number:** WBS/BA2492259/707

*This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below)*

This certificate is only valid if accompanied by formal permission from the relevant stakeholder(s).

| | |
|---|---|
| **Project title** | Strategic response by fibre network operators to increasing competition and decreasing investment output in the South African fibre to home market |
| **Investigator / Researcher** | Mr Molefe Donald Tsoana |
| **Nature of Project** | MBA (Research Article) |
| **Decision of the Committee** | Approved, provided stakeholders and participants are guaranteed confidentialty. |
| **Issue Date of Certificate** | 21 10 2022 |
| **Expiry date** | Date of submission of the project / research report |
| **Chairperson** | Prof Anthony Stacey<br>☎ +27 11 717 3587<br>+27 82 880 4531<br>anthony.stacey@wits.ac.za |

**Declaration by Researcher**

*One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.*

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

Signature

25 October 2022
Date: