AN EXPLORATORY STUDY ON THE CHALLENGES AND SURVIVABILITY OF ISP LICENSEES IN THE NIGERIAN TELECOM SECTOR

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EXECUTIVE SUMMARY

This research is an exploratory Study on the challenges and survivability of ISPs Licensees in the Nigerian Telecom Sector carried out by the Emerging Technologies Research Unit of the Research and Development Department for the Nigerian Communications Commission.

The objectives of the Study are to examine the challenges facing Internet Service Providers and their survivability in Nigeria, to identify the problems, challenges and prospects of the internet service sector, to find out the determinants factors that affects the expansion (growth) of the sector, to look at the reason why Internet Service Providers (ISPs) are failing in Nigeria, to examine the contemporary positions and challenges faced by the ISPs in Nigeria and the nature of how it has continued to serve as an obstacle to their survivability. In the pursuance of these objectives, the research takes a critical look at the development of the internet and the Internet Service Providers that provides Internet access to users or subscribers of its service. The method utilized is the descriptive method of research design using qualitative and quantitative approaches in gathering information about the present condition.

The Study found that the licence renewal rate of ISPs in Nigeria continues to drop, even as others take up the licence. In view of the critical need of internet connectivity for the digital economy and for mass digitalisation of Nigeria, the role of ISPs is central also for uptake of internet of things (IoT). The Study therefore undertook detailed assessment of the challenges facing ISPs in Nigeria and these were found to include: competition with MNOs offering ISP services, harsh business environment, inadequate National Broadband Infrastructure. Additional, Multiple Taxation by different levels of Government, and unfavourable conditions for the Industry in terms of disparity between advertised Internet speeds and actual speed obtainable on the networks, inadequate provision of redundancy by ISPs to handle network down time and lack of compensation for downtime and poor quality of service.

Survival and growth are the two main objectives of any organisation in today's competitive world. Every organisation tries to be different and accelerative from their competitors to achieve their goals and become market leaders. For ISPs in Nigeria survivability entails overcoming the major challenge of improving customer base and competing with the MNO's.

The Study also revealed the urgent need for ISPs to develop business niches, improve their customer base through aggressive marketing as well as identifying the right cost of data purchase, and other sound business that will ensure that continuity.

From the findings and conclusion of this study, it can therefore be recommended that:

- To solve the issue of artificially low internet/data prices, a regulated minimum price level has to be put in place by the Government and the Commission, in

order for both big and small telecom operators to compete on the quality of the network and customer services they provide.

- There is an urgent need for the Commission to ensure the conclusion of the study on cost-based pricing determination in Nigeria for retail broadband and data services. The study report will allow the decision on the price of the data floor to encourage a level playing field for all industry operators.

- As investment in telecommunications infrastructure is essential to economic growth, the Commission should encourage adequate infrastructure build out as it contributes to the efficient operation of the sector and the survivability of the ISPs.

- The Commission should provide the best enabling environment that encourages additional Investment in telecommunications infrastructure as essential to economic growth, as adequate infrastructure contributes to the efficient operation of the sector.

- The Commission should conclude a critical review/amendments to the obsolete portions of the Nigerian Communications Act 2003 which is heavily concentrated on the provision of voice services, without much direction on the more relevant emerging technologies. Today, more emphasis should be placed on competition in the sector in a saturated market, the economy and other services closely related to the telecommunications industry, such as finance, technology and media services.

- The Commission should champion the ubiquitous use of e-Services, e-Governance and e-Business, which would result in an increase in the need for internet services which would invariably lead to more business opportunities, niches, and customers for the smaller ISPs especially in more rural areas which might not be so commercially viable for the MNOs to compete in.

- There is a need to encourage ISPs to improve their general business processes / practices to ensure long-term growth and sustainability in order to create new revenue streams, recreate existing products, diversify into new areas for which resources and capabilities are available and establish a minimum market price.

CHAPTER ONE
INTRODUCTION

1.1   BACKGROUND TO THE STUDY

There are about 4.8 billion Internet users in the world as at Q2 2020. This equates to 62.0% of the world population in 2020, representing a growth rate of 1239% between years 2000-2020[1].

WORLD INTERNET USAGE AND POPULATION STATISTICS 2020 Year-Q2 Estimates						
World Regions	Population (2020 Est.)	Population % of World	Internet Users 30 June 2020	Penetration Rate (% Pop.)	Growth 2000-2020	Internet World %
Africa	1,340,598,447	17.2 %	566,138,772	42.2 %	12,441 %	11.7 %
Asia	4,294,516,659	55.1 %	2,525,033,874	58.8 %	2,109 %	52.2 %
Europe	834,995,197	10.7 %	727,848,547	87.2 %	592 %	15.1 %
Latin America / Caribbean	654,287,232	8.4 %	467,817,332	71.5 %	2,489 %	9.7 %
Middle East	260,991,690	3.3 %	184,856,813	70.8 %	5,527 %	3.8 %
North America	368,869,647	4.7 %	332,908,868	90.3 %	208 %	6.9 %
Oceania / Australia	42,690,838	0.5 %	28,917,600	67.7 %	279 %	0.6 %
WORLD TOTAL	7,796,949,710	100.0 %	4,833,521,806	62.0 %	1,239 %	100.0 %
Fig. 1.1 Internet Usage and World Population Statistics estimates are for July 20, 2020						

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[1] https://www.internetworldstats.com/stats.htm

Internet World Penetration Rates
by Geographic Regions - 2020 Q1
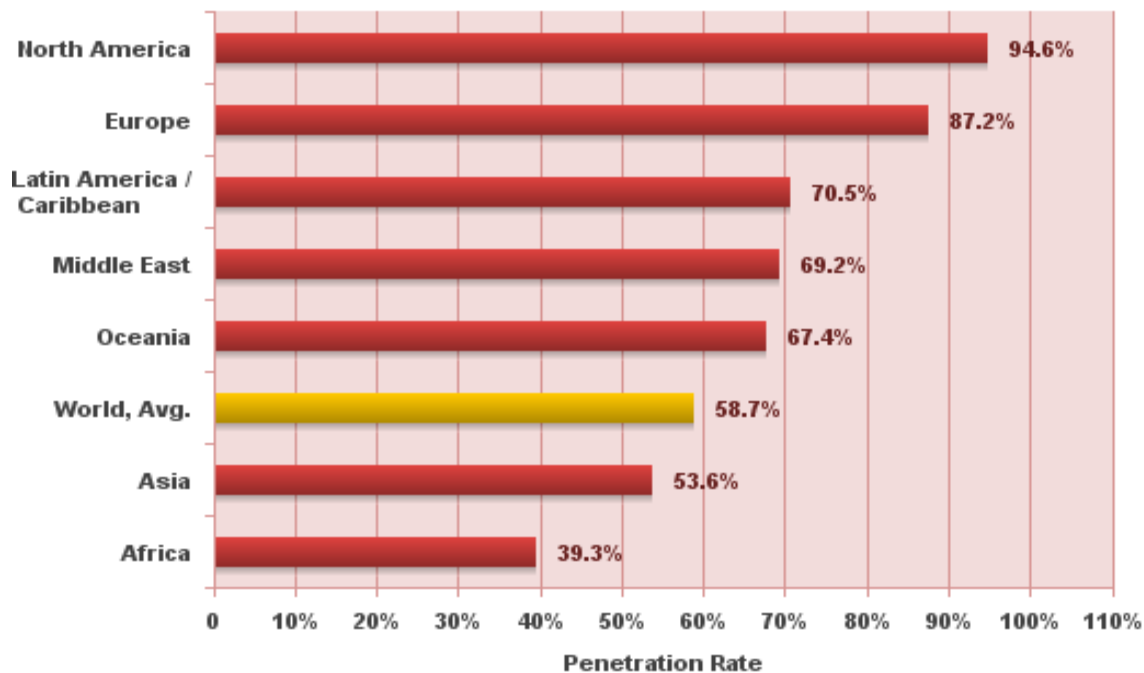
Source: Internet World Stats - www.internetworldstats.com/stats.htm
Penetration Rates are based on a world population of 7,796,615,710
and 4,574,150,134 estimated Internet users in March 3, 2020.
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Fig 1.2

The internet has become a very important part of our day to day life in the 21st century. It helps us to access information, have the world at our reach, and helps to connect the whole world from one location. It is essential for business enterprises, students, and individuals survivability.[2] It is a vast global system of interconnected technical networks made up of heterogeneous information and communication technologies[3]. It is also a social and economic assemblage that allows diverse forms of communication, creativity, and cultural exchange at a scope and scale unknown before the late twentieth century[4]. The Internet is distinct from the applications and technologies that are built upon it, such as e-mail, the World Wide Web, online gaming, filesharing networks, e-commerce and e-governance initiatives.

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[2] (Anderson & lee, 2018)

[3] (https://www.encyclopedia.com/science-and-technology/computers-and-electrical-engineering/computers-and-computing/internet)

[4] (https://www.encyclopedia.com/science-and-technology/computers-and-electrical-engineering/computers-and-computing/internet)

The Internet can also be defined as a huge communications facility which consists of a world-wide network of computer networks deployed to communicate information. End users and content providers can connect to the Internet with a modem under contract with an Internet Service Provider[5]. An Internet service provider (ISP) is an organisation that provides services for accessing, using, or participating in the Internet. Internet service providers can be organised in various forms, such as commercial, community-owned, non-profit, or otherwise privately owned.

Internet services typically provided by ISPs can include Internet access, Internet transit and domain name registration, web hosting, Usenet service and colocation, as well as serve as the access point or the gateway that provides a user, access to everything available on the Internet,[6] with Individual customers and businesses paying ISPs for Internet Access.

ISPs are interconnected to one another at network access points. In turn, ISPs pay other, larger ISPs for their internet access, which in turn pay still other ISPs. This cascades multiple times until transmissions reach a Tier 1 carrier, which is an ISP capable of reaching every other network on the internet without purchasing IP transit or paying settlements. However, it is difficult to determine the status of a network because the business agreements to pay settlements are not made public. Also, traffic is always routed through several networks, jumping back and forth from Tier 1 carriers to Tier 2 and 3 several times before data reaches its destination.
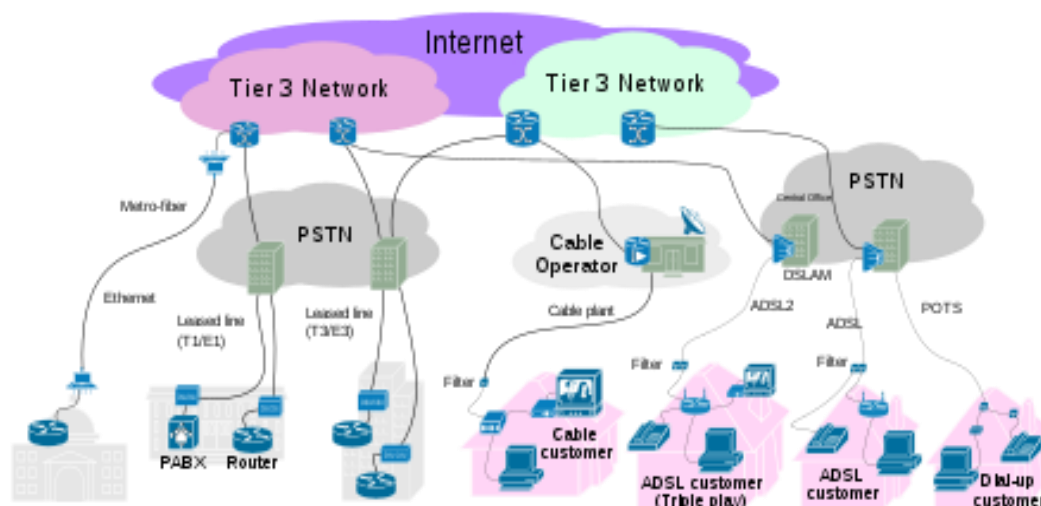

Fig 1.3 Internet connectivity options from end-user to tier 3/2 ISPs

ISPs may have more than one point of presence (PoP), which is an access point to the Internet comprised of a physical location housing servers,

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[5] https://www.cyberlibel.com/?p=1132
[6] "What is an Internet Service Provider?". WhatIsMyIPAddress.com.

routers, ATM switches and digital/analog call aggregators. Some ISPs have thousands of PoPs. Multiple PoPs may have separate connections to an upstream ISP. And each ISP may have upstream ISPs and connections to each one of them at one or multiple PoPs.[7]

The implementation pattern and use of ISPs in Nigeria is the same as globally. In Nigeria, since the deregulation of the telecommunications sector by the Federal Government of Nigeria on 24th November 1992, and the creation of the Telecommunications Regulator, the Nigerian Communications Commission (NCC), the telecommunications sector in Nigeria has grown in leaps and bounds. As part of the mandate of the Nigerian Communications Commission which is established in the Nigerian Communications Act 2003, the NCC has been granted powers including the issuance of licenses and imposition of terms and conditions on licenses.[8] The Nigerian telecommunication sector is structurally segmented and this explains why the Nigerian Communications Commission (NCC), guided by the Nigerian Communications ACT 2003[9], has various categories of licences for interested and qualified players to apply and deploy telecoms products and services in the country.

One of such categories is the Internet service market which is the domain of Internet Service Providers (ISPs) in the country. Following the commencement of the issuance of Internet Service Provision license by the NCC in 1996, thanks to the efforts of the Commission, the good work done by the Mobile network operators (MNOs) who provide ISP services, as well as the ISP license holders themselves, Nigeria with a population of over 200 million people now boasts 151,512,122 million internet users representing a 75.7% active internet subscription as at September 2020[10]. It is necessary to note that the 75.7% does not represent individual numbers of users, as a number of subscribers with multiple SIM cards also have multiple active internet subscription. Therefore, data from statistics indicates that Nigeria has approximately 99.05 million internet users. This figure is projected to grow to 131.7 million internet users in 2023. The internet penetration amounted to 46.6% of the population in 2020 and is set to reach 65.2% in 2025[11].

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[7] https://www.techopedia.com/definition/2510/internet-service-provider-isp
[8] (https://www.ncc.gov.ng/stakeholder/statistics-reports/industry-overview)
[9] (NCA 2003)
[10] Available at https://www.ncc.gov.ng/statistics-reports/industry-overview#view-graphs-tables-5
[11] Available at https://www.statista.com/statistics/183849/internet-users-nigeria/

Currently in Nigeria, Internet subscription services are provided by the following technologies: GSM, CDMA, Fixed Wired, and Voice Over Internet Protocol (VoIP)[12]

1.2 STATEMENT OF THE PROBLEM

Following the commencement of the issuance of Internet Service Provision license by the NCC, the number of licensed operators was at one time over 170 but because of the challenges surrounding the business, many operators quit.

The Nigerian Communications Commission (NCC) currently has a total number of 143 Internet Service license under their individual service license category issued[13] as at 26th Oct. 2020. The companies listed are those that have paid their license fees in full, and have collected their license documents for the respective telecommunications undertaking.

The NCC has over the years licensed many ISPs but findings show that not all are still in business. Internet Service Providers in the Nigerian telecommunications industry have been struggling to stay afloat due to challenges confronting their market to remain in business, expand operations and post profit after every financial year.

As ISPs serve as the gateway to the internet and a digitized world, it is imperative to understand the reason for their demise as it has impact on the digitization agenda of Nigeria.

1.3 SIGNIFICANCE OF THE STUDY

The study would be valuable to several stakeholders for the following reasons:
- The results can be used to establish effective policies and strategic responses to challenges and to further enhance the sector's efficiency.
- It will allow NCC implement policies that will improve the country's broadband penetration and economic growth.

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[12] Available at https://www.ncc.gov.ng/statistics-reports/industry-overview#cdma-2
[13] https://www.ncc.gov.ng/licensing-regulation/licensing/licensees-list#internet-services

- It will help ISP businesses to understand some of the challenges they face or are likely to face.
- The research will provide solutions to challenges that hinder ISPs' smooth operations and their survival in Nigeria.
- The study will offer recommendations on ways to improve the sustainability of the ISPs.
- The study would also provide a source of motivation to the researcher for self-professional development and enrichment.

1.4   RESEARCH QUESTIONS

1. **Research question 1:** How many licensed ISPs are currently providing internet service in Nigeria

2. **Research Question 2:** What is the average capacity of the licensed ISPs?

3. **Research Question 3:** What is the financial viability of ISPs in Nigeria

4. **Research Question 4:** What are the challenges that plague the ISPs and threaten their survivability?

5. **Research Question 5:** What are the mitigating actions carried out by the Nigerian Communications Commission as the sector Regulator to ensure survivability of Nigerian ISPs

1.5   LIMITATIONS

The study is an exploratory research design that does not seek to provide the final and definitive answers to research questions, but merely examines the subject of research with varying degrees of depth.   The research uses data from a small number of ISPs that submitted data to the Commission due to the COVID-19 pandemic, time and cost constraints.   Instead of the 2020 Year End Subscriber/Network Data report which is yet to be released, it also utilizes information from the 2019 Year End Subscriber/Network Data report. Hence part of the research includes current but not up-to-date data.

CHAPTER TWO

LITERATURE REVIEW

2.1   THE DEVELOPMENT OF INTERNET

The Internet (originally known as ARPAnet) was developed as a network between Government research laboratories and participating Departments of Universities[14]. Other companies and organizations joined by direct connection to the backbone, or by arrangements through other connected companies, sometimes using dialup tools such as UUCP (Unix-to-Unix Copy). By the late 1980s, a process was set in place towards public, commercial use of the Internet. Some restrictions were removed by 1991[15], shortly after the introduction of the World Wide Web[16].

During the 1980s, online service providers such as CompuServe and America On Line (AOL) began to offer limited capabilities to access the Internet, such as e-mail interchange, but full access to the Internet was not readily available to the general public[17].

In 1989, the first Internet service providers, companies offering the public direct access to the Internet for a monthly fee, were established in Australia, and the United States. In Brookline, Massachusetts, 'The World' became the first commercial ISP in the US. Its first customer was served in November 1989[18]. These companies generally offered dial-up connections, using the public telephone network to provide last-mile connections to their customers. The barriers to entry for dial-up ISPs were low and many providers emerged.[19]

However, the cable television companies and the telephone carriers already had wired connections to their customers and could therefore offer Internet connections at much higher speeds than phone dial-up, using broadband technology such as cable modems and digital subscriber line (DSL). As a result, these companies often became the dominant ISPs in their service areas, and what was once a highly competitive ISP market

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[14] https://en.wikipedia.org/wiki/Internet_service_provider
[15] Outreach: The Internet, U.S. National Science Foundation, "In March 1991, the NSFNET acceptable use policy was altered to allow commercial traffic."
[16] "Web history timeline". 2014-03-11. Retrieved 21 September 2015.
[17] https://en.wikipedia.org/wiki/Internet_service_provider#cite_note-3
[18] Robert H'obbes' Zakon. "Hobbes' Internet Timeline v10.1". Retrieved 14 November 2011. Also published as Robert H. Zakon
[19] (https://quod.lib.umich.edu/j/jep/3336451.0001.121?view=text;rgn=main)

became effectively a monopoly or duopoly in countries with a commercial telecommunications market, such as the United States.

In 1995, National Science Foundation Network (NSFNET) USA was decommissioned removing the last restrictions on the use of the Internet to carry commercial traffic and network access points were created to allow peering arrangements between commercial ISPs.[20]

2.2   INTERNET SERVICE PROVIDER

Alternatively known as an access provider or network provider, an Internet service provider (ISP) is a company that provides Internet access to users or subscribers of its service. An ISP gives you an Internet account (access to the Internet), e-mail address, and/or web space for a web page.[21]

The Internet is largely a collection of such providers linking a great number of networks together. There are three main types of Internet Service Provider, Tier 1, Tier 2 and Tier 3 Providers.

At the top of the Internet access pyramid are Tier 1 Internet service providers. A Tier 1 Internet service provider is an ISP that has access to all the networks on the Internet using only network peering agreements they do not have to pay for. To help conceptualize what purpose Tier 1 ISPs serve, think of Tier 1 ISPs as the major highways of the Internet. These ISPs connect all corners of the World Wide Web. Some popular examples of Tier 1 ISPs include AT&T, MainOne Cable Co. Nig Ltd, GlobaCom, British Telecommunications, and Verizon. Fig 3.1 Internet Service Providers Tier

Tier 1 Internet service providers sell access to their networks to Tier 2 ISPs. Tier 2 ISPs then sell Internet access to organizations and home users. However, sometimes Tier 1 ISPs may sell Internet access directly to organizations and individuals. Additionally, a second intermediary ISP, referred to as a Tier 3 ISP, may purchase network bandwidth from a Tier 2 ISP before selling that bandwidth to end users.

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[20] (www.internetsociety.org)
[21] (https://www.computerhope.com/jargon/i/isp.htm).
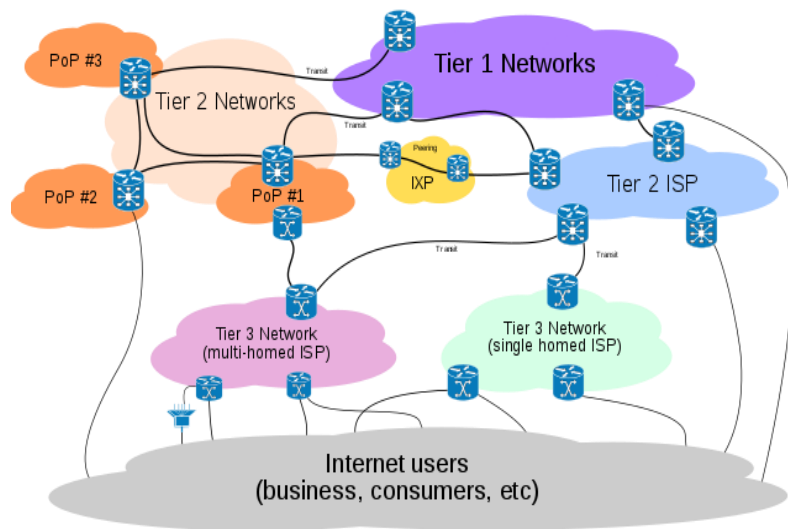
When traffic is routed from your home network to the Internet, it goes through a number of hops before reaching its destination. For example, traffic may travel from your modem, to your Tier 3 ISP's network, to a Tier 2 ISP's network, to a Tier 1 ISP's network, then back down through a different set of ISPs before reaching the destination.

The underlying technology that ISPs use to establish connectivity can be based on analog telephone lines (dial-up), DSL, cable, satellite, Wi-Fi, fiber optics, or other connectivity mediums. The reason many cable and telephone providers are also ISPs is because their underlying infrastructure can accommodate Internet traffic.[22]

2.2.1 TYPES OF SERVICES PROVIDED BY ISPs

- **Access Providers**

Access provider ISPs provide Internet access to the different grades of customers which include single home users, small business, and big businesses. To meet customer demand, they employ a wide range of technologies to connect their users. These include computer modems, telephone lines, television cable (CATV), Wi-Fi, fiber optics, copper wires, digital subscriber line (DSL), asymmetric digital subscriber line (ADSL), cable modem or Integrated Services Digital Network (ISDN), amongst others.

Wireless access is another option, including cellular and satellite Internet access. Examples of access providers in Nigeria include Spectranet Limited, InterWeb Satcom Limited, VPS Technologies Ltd, NGCOM Limited amongst others.

- **Upstream ISPs**

An upstream ISP usually has a larger network than the contracting ISP or is able to provide the contracting ISP with access to parts of the Internet the contracting ISP by itself has no access to. Just as their customers pay them for Internet access, ISPs themselves pay upstream ISPs for Internet access.

In the simplest case, a single connection is established to an upstream ISP and is used to transmit data to or from areas of the Internet beyond the home network; this mode of interconnection is often cascaded multiple times until reaching a tier 1 carrier. In reality, the situation is often more

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[22] https://www.whoismyisp.org/articles/what-is-an-isp

complex. ISPs with more than one point of presence (PoP) may have separate connections to an upstream ISP at multiple PoPs, or they may be customers of multiple upstream ISPs and may have connections to each one of them at one or more point of presence[23]. Main One Cable Co. Nig Ltd and Glo 1 are one of the upstream ISPs in Nigeria.

- **Virtual ISPs**

A virtual ISP (VISP) is an operation that purchases services from another ISP, sometimes called a wholesale ISP in this context, which allow the VISP's customers to access the Internet using services and infrastructure owned and operated by the wholesale ISP. VISPs resemble mobile virtual network operators and competitive local exchange carriers for voice communications.

Nigeria's first Virtual ISP provider (VISP) Abuja Connect Limited commenced operations in May 2008. Abuja Connect was a public private partnership ICT venture, between Alteq ICT and Abuja Investments.

- **Free ISPs**

Free ISPs are Internet service providers that provide service free of charge. Many free ISPs display advertisements while the user is connected; like commercial television, in a sense they are selling the user's attention to the advertiser. Other free ISPs, sometimes called freenets, are run on a nonprofit basis, usually with volunteer staff. This category of ISPs are not available in Nigeria, except for limited access in maybe hospitals and airports.

2.3 IMPORTANCE OF ISPS
Below are some important roles and functions of ISPs:
- They provide internet access to the user through dial up service, DSL service, and cellular data service.

- They serve large companies by providing a direct connection from the company's network to the internet.

- They provide internet services like email, access to software tools, security service and Web hosting.

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[23] (https://www.techtrendsng.com/internet-bandwidth-key-national-development-part-2/)

- Some companies provide free ISP services to users that only require occasional use of the internet.

- They host sites for businesses and also build build corporate websites.

- They act as a mediator between the user and internet which is both the fastest mode of communication as well as playing an important role in the advancement of mankind.[24]

2.4 SOME SELECTED INTERNET PROVIDERS IN NIGERIA

The Nigerian Communications Commission is the independent National Regulatory Authority for the telecommunications industry in Nigeria. The Commission is responsible for creating an enabling environment for competition among operators in the industry as well as ensuring the provision of qualitative and efficient telecommunications services throughout the country.

Over the years NCC has earned a reputation as a foremost Telecom regulatory agency in Africa. The Commission is hoping to catalyze the use of ICT'S for different aspect of national development. The Commission has initiated several programs such as State Accelerated Broadband Initiative (SABI) and Wire Nigeria Project (WIN) to help stimulate demand and accelerate the uptake of ICT tools and services necessary for the enthronement of a knowledge society in Nigeria[25].

In order to achieve its mandate, the Commission has put in place the necessary licensing and regulatory framework for the supply of telecommunications services.[26]. One of such licences is the Internet Services Licence established in year 1996.

Some notable provider of internet services across Tiers 1, 2 and 3 include:

- **Globacom**
Globacom Limited, commonly known as Glo, is a Nigerian multinational telecommunications company founded on 29 August 2003 by Mike

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[24] (http://www.oceanic.com)

[26] (https://www.ncc.gov.ng/the-ncc/who-we-are)

Adenuga. GLO has over 52 million subscribers (June 2020)[27], making it the second largest network operator in Nigeria.

In 2011, GLO became the first telecommunication company to build an $800 million high-capacity fibre-optic cable known as Glo-1, a submarine cable from the United Kingdom to Nigeria[28]. It is the first successful submarine cable from the United Kingdom to Nigeria.

- **MTN Nigeria**

MTN Nigeria is a subsidiary of MTN Group Limited a South African multinational mobile telecommunications company operating in many African, European and Asian countries with its head office in Johannesburg[29]. MTN is the largest mobile network operator in Africa[30]. Active in over 20 countries, one-third of company revenue come from Nigeria[31], where it holds about 40% market share as at June 2020[32].

MTN Nigeria Communications Limited provides cellular telecommunications services in Nigeria. It offers cellular network access and information and communications technologies (ICT) solutions. The company also provides Internet services, such as video calling, data services and Internet browsing, mobile Internet, and mobile wi-fi services. In addition, it offers international roaming services, including data roaming, in-flight roaming, and wi-fi roaming services. Further, the company provides voice short message service (SMS), fashion and lifestyle tips, mobile television (TV), bulk short message service (SMS), mobile newspaper, radio, back up, conference call, and missed call alert services[33]

- **Spectranet**

Spectranet was awarded a License from the Nigerian Communications Commission in 2009 to promote Internet services across Nigeria Spectranet was the first Internet Service Provider to launch 4G LTE internet service in Nigeria and aims to be a leader in the Internet Services space.

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[27] https://www.ncc.gov.ng/statistics-reports/subscriber-data#quarterly-subscriber-operator-data
[28] IT News Africa "Glo One Submarine Cable Debuts in Lagos", IT News Africa, 8 September 2009. Accessed21 August 2015.
[29] "Head Office South Africa". Retrieved 15 August 2011.
[30] MTN Group Limited. "MTN Group Limited - Interim Results for the six months ended 30 June 2016" (PDF). mtn.com. Archived from the original (PDF) on 20 December 2016. Retrieved 11 December 2016.
[31] https://en.wikipedia.org/wiki/MTN_Group#cite_note-2
[32] https://www.ncc.gov.ng/statistics-reports/subscriber-data#quarterly-subscriber-operator-data
[33] https://africanfinancials.com/company/ng-mtn/

According to data provided to NCC, as at Quarter 2-2020, Spectranet has 247,650 connected subscribers of which 138, 680 are active with 633 points of presence. The Company has 83% of total connected subscribers to ISPs.[34]

- **ipNX Nigeria**

ipNX is one of Nigeria's growing Information and Communications Technology companies, serving a multitude of needs across enterprises, small businesses and residents with innovative, world-class services.

ipNX is a pioneer and a leading Fibre-To-The-Home (FTTH) operator in Nigeria, currently providing services to various industries and market segments using industry-leading technology (such as Fibre-To-The-Home (FTTH) cable technology) as their core access network infrastructure and fixed wireless radio services (via licensed frequency).[35] According to data provided to NCC, as at Quarter 2-2020, ipNX has 13,039 connected subscribers of which 8,077 are active with 52 points of presence.

- **Cyberspace**

It is a Nigerian company and has been in operation in Nigeria since 1995. They deployed their 4G LTE network infrastructure in 2014. They provide a very wide range of Internet services and are among the fastest Internet service providers in Nigeria. They also provide various other network solutions to individuals and cooperate entities.

- **VDT**

VDT is one of the leading broadband communication service provider in Nigeria, with 15 Years Experience in providing Internet Service and other communication services to companies in all the 36 States of Nigeria, including 23 Banks. They offer VDT 4G LTE-Advanced to Personal and Small-Business Internet Users[36]. According to data provided to NCC, as at Quarter 2-2020, VDT has 3,549 connected subscribers of which 2,379 are active with 58 points of presence[37].

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[34] https://www.ncc.gov.ng/statistics-reports/subscriber-data#internet-service-operator-data
[35] https://www.ipnxnigeria.net/pages/corporate_profile
[36] https://www.vdtlte.com/about/
[37] https://www.ncc.gov.ng/statistics-reports/subscriber-data#internet-service-operator-data

- **Cobranet Nigeria**

Cobranet is an internet and data provider in Nigeria. It was launched in 2003. Currently, they provide residential plans as well as corporate internet plans for organizations and medium sized businesses over a radio network in Lagos, Abuja and Port Harcourt[38].

2.5 HOW ISPS HAVE FAIRED IN NIGERIA

Seven years after developed countries such as the United State of America (USA) and some other European countries have set the pace, Nigeria's telecoms regulator, NCC, recorded the first giant stride in 1996 by licensing 38 internet service providers to sell internet services in Nigeria[39].

This came five years before the deregulation of the country's telecoms industry that resulted into introduction of Global Service for Mobile Communication system (GSM), even as GSM operators have today, occupied the centre stage of the internet space.

It was however on January 1, of the following year, 1997, that Linkserve Limited, one of the licensees, began commercial rollout of internet in the country, thus becoming the very first internet service provider (ISP) in Nigeria.

As the number of the operators kept rising year after year however, so also did the number of unsuccessful operators who had unwillingly shut down operations due to inability to cope in the challenging market.[40]

Pioneer Nigerian ISPs faced intense competition when mobile network operators, with their large subscriber base, started offering Internet services,crashing the price of data, and inadvertently making the business unprofitable for small operators. As a result, there has been a huge churn in the industry due to the inability of the ISPs to renew their licences. Experts noted that the successful operators were those who have carved a niche for themselves in the market or act as resellers for the MNOs.

Findings showed that most of the ISPs who served the enterprise market lost revenue during the lockdown in April because their services were cancelled or suspended, despite procuring wholesale capacity. In an interview recently, the President, Association of Telecommunications

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[38] http://www.cobranet.org/about
[37] https://www.ncc.gov.ng/accessible/the-ncc/who-we-are
[39] https://www.businessamlive.com/as-nigerian-isps-trudge-along-stormy-terrain/
[40] https://www.businessamlive.com/as-nigerian-isps-trudge-along-stormy-terrain/

Operators of Nigeria, Mr Olusola Teniola, said the ability of ISPs to access spectrum at the last mile was a challenge.[41]

2.6   ISPs IN OTHER COUNTRIES

- **United States Of America**

The United States ranks #1 in the world with 7,000 Internet Service Providers (ISPs) according to the Encyclopedia of the World[42]. Internet bandwidth per Internet user was the 43rd highest in the world in 2016[43]. As of 2019, 90% of adults in America use the internet, either irregularly or frequently.

To remedy anti-competitive climate, the governments worked to minimize the costs that entrants may incur. The Telecommunicatons Act of 1996 expanded access rights for ISPs with federal subsidies in an aim to encourage provider participation[44]. To reduce costs and expand the market, the FCC has also approved a "Dig Once" policy—a mandate that requires cities to implement broadband conduits during construction of federally-funded roads[45]. Because the financial price of laying down fiber constitutes such a large portion of deployment costs, measures sympathetic towards this step of entrance make it easier for more actors to invest.

A number of counties have also issued ordinances or grants that waive or offset certain fees associated with building infrastructure in order to encourage broadband building projects.

Outside of regulatory and legislative action, states have at their disposal informal policies that offer other incentives for investment, such as collecting and providing local data to streamline deployment action or communication efforts[46].

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[41] https://punchng.com/ncc-licenses-18-new-isps-in-six-months/

[42] "Internet Service Providers (ISPs) - The World Factbook - CIA, Country Comparison, Nations Statistics". www.nationsencyclopedia.com. Available at https://www.nationsencyclopedia.com/WorldStats/CIA-Internet-Service-Providers-ISPs.html

[43] "Internet bandwidth by country, around the world". TheGlobalEconomy.com. Retrieved 2019-02-11.

[44] "Pole Attachments 101" (PDF). FCC.gov. Edison Electric Institute. Retrieved 23 August 2018.

[45] "Eshoo Applauds Passage of RAY BAUM'S Act". Congresswoman Anna G. Eshoo. Office of Congresswoman Anna G. Eshoo. Retrieved 24 August 2018.

[46] "INFORMAL POLICIES Community Broadband Playbook". North Carolina State Broadband. Broadband Infrastructure Office. Retrieved 23 August 2018.

- **Kenya**

The Internet first became available in Kenya during 1993. Full Internet access was established in 1995. The African Regional Centre for Computing (ARCC), an NGO based in Nairobi , Kenya , became the first provider of web-based Internet service. The first commercial ISP, Formnet began operating in 1995. Soon competition increased with the entry of three other ISPs. All the ISPs would lease analogue or digital data lines from Kenya to the US to access the Internet backbone.

In 2000, there were about 200,000 Internet users in Kenya , with an estimated monthly growth of 300 new subscribers each month. The main users of the Internet in Kenya are Multinational corporations, international organizations and NGOs. All the government's ministries are now accessible via the internet.[47]

The 2019 estimate of Internet users in Kenya from the ITU is 46,870,422 people, corresponding to a penetration rate of 89.7%. At present there are 72 licensed ISPs of which about half are operational. Currently the Communications Commission of Kenya (CCK) is considering conducting a comprehensive Internet Usage Study to confirm the latest number of users in Kenya.

Since many people in Kenya do not have fixed phone lines, computers, or electricity, internet shops known as cyber cafes provide access to internet and emailto citizens, mainly in the major towns.[48]

2.7   CHALLENGES FACED BY ISPS IN NIGERIA

Major operators in the ISP space have identified numerous huddles they have had to cope with and in fact, a good number of them have given in to these challenges to exit the market. Some of these challenges as identified, are general to the telecoms sector while some are specific to consumer dissatisfaction with ISPs such as:

1.   Competition with MNOs offering ISP services

2.   Harsh Business Environment

3.   Inadequate National Broadband Infrastructure

4.   Multiple Taxation

5.   Vandalism of Infrastructure

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[47]https://www.internetworldstats.com/af/ke.htm#:~:text=The%202019%20estimate%20of%20Internet,which%20about%20half%20are%20operational.

[48]https://www.internetworldstats.com/af/ke.htm#:~:text=The%202019%20estimate%20of%20Internet,which%20about%20half%20are%20operational.

6. Disparity between advertised Internet speeds and actual speed obtainable on the networks

7. Inadequate provision of redundancy by ISPs to handle network down time and lack of compensation for downtime

8. Poor quality of service

9. Inexplicable depletion of data services

10. Auto renewal of service among others

The above challenges have led to the low rate of renewal of licenses by the ISPs which is affecting the Internet service segment of the country's telecommunications sector.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

The research is a study on the challenges and survivability of internet service providers in the Nigerian telecom sector. The study is conducted utilizing the descriptive method of research design using qualitative and quantitative approaches in gathering information about the present condition.

3.2 RESEARCH STRATEGY

The purpose of this study is an exploratory research, as the name implies, intends merely to explore the research questions and does not intend to offer final and conclusive solutions to existing problems. Exploratory research "tends to tackle new problems on which little or no previous research has been done"[49]

3.3 DATA COLLECTION METHOD

The study is carried out by using quantitative data from the Nigerian Communications Commission and qualitative methods for data collection (e.g. Journals, Newspapers, official websites of organizations, documented interviews with stakeholders) which are best for describing, interpreting, contextualizing, and gaining in-depth insight into specific concepts or phenomena under study.

3.4 DATA ANALYSIS METHOD

The data analysis of this research will be mostly represented on quantitative manner. The data was gathered from the Policy Competition & Economic Analysis Department and Licensing & Authorization Department in the Nigerian Communication Commission. As a result the analysis will be quantitative. However, there will be few qualitative solutions.

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[49] Brown, R.B. (2006) "Doing Your Dissertation in Business and Management: The Reality of Research and Writing" Sage Publications, p.43

3.5 RESEARCH OBJECTIVES

The broad objective of this paper is to make an extensive study on the challenges facing Internet Service Providers and their survivability in Nigeria.

The specific objectives are:
- To identify the problems, challenges and prospects of the internet service sector.

- To find out the determinants that affects the expansion (growth) of the sector.

- To look at why Internet Service Providers (ISPs) are failing in Nigeria.

- To determine the significance of the competitive challenges facing the ISPs

- The work intends to examine the contemporary positions and challenges faced by the ISPs in Nigeria and the nature of how it has continued to serve as an obstacle to their survivability.

- The work also intends to proffer recommendations to alleviate challenges inhibiting the smooth operations of ISPs and their survivability in Nigeria.

3.6 RESEARCH QUESTIONS
- **Research question 1:** How many licensed ISPs are currently providing internet service in Nigeria

- **Research Question 2:** What is the average capacity of the licensed ISPs?

- **Research Question 3:** What is the financial viability of ISPs in Nigeria

- **Research Question 4:** What are the challenges that plague the ISPs and threaten their survivability?

- **Research Question 5:** What are the mitigating actions carried out by the Nigerian Communications Commission as the sector Regulator to ensure survivability of Nigerian ISPs

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

Nigeria is the largest mobile telecommunications market in Africa, largely based on rapid development following the successful auction of Digital Mobile Licenses (DML) in 2001. As at December 2019, the market served over 184 Million Mobile lines, with 126 Million of those lines connected to Internet services. According to the NCC, telecommunication services in the country have grown from a tele-density of lower than 1% on fixed wireline and wireless networks before the DML auctions, to reach approximately 89% population coverage for voice services in 2019 primarily based on 2G/2G+ networks[50].

Internet services in the country are currently provided on 2G, 3G, and increasingly 4G mobile networks. However, though 4G coverage is available to 37% of the population, download speeds in the country are noted to be generally uncompetitive with other countries in the same income bracket[51].

In recognition of the tremendous economic growth opportunities afforded by the deployment of broadband technologies to help further grow Internet services and internet service provision in Nigeria

, Nigeria established its first broadband plan in 2013 for a period of five years. The plan set out to achieve broadband access, defined as minimum download speeds of 1.5Mbps with at least 30% coverage, and an objective of achieving 3G coverage to at least 80% of the population. Given the current state of technology, development and applications of broadband technology, the 30% penetration achievement lags the aspiration of the country as the developed world marches towards widespread deployment of 5G technologies, while the country is yet to achieve significant 4G coverage and adoption.[52]

Hence, on 17th December 2019, The Federal Government released a new five year National Broadband Plan to cover 2020-2025. The new Broadband Plan is designed to deliver data download speeds across Nigeria

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[50] https://www.proshareng.com/news/Mobile%20Money%20and%20Telcos/Nigerian-National-Broadband-Plan-2020-2025/49970#

[51] https://www.ncc.gov.ng/documents/880-nigerian-national-broadband-plan-2020-2025/file

[52] https://www.proshareng.com/news/Mobile%20Money%20and%20Telcos/Nigerian-National-Broadband-Plan-2020-2025/49970#

of a minimum 25Mbps in urban areas, and 10Mbps in rural areas, with effective coverage available to at least 90% of the population by 2025 at a price not more than N390 per 1GB of data (i.e. 2% of median income or 1% of minimum wage). In order to achieve these ambitious targets, the plan is focused on recommendations in 4 critical pillars:

- Infrastructure
- Policy
- Demand Drivers
- Funding & Incentives

4.1 RESEARCH QUESTION 1: How many licensed ISPs are currently providing internet service in Nigeria?

Nigeria in particular is one of Africa's largest telecom markets, benefiting from being the second largest economy on the continent. Today, over 100 million Nigerians are now connected to the internet, with 250,000 new subscribers logging on in the last quarter of 2019, according to data from the Nigerian Communications Commission.

As stated by Chidinma Nwagbara of Nairametrics, between January to October 2019, the Nigerian Communications Commission (NCC) licensed a total number of 20 new Internet Service Providers (ISPs) . This makes the operators licensed by the NCC 120 in number. The number of licensed operators was at one time over 170 but because of the challenges surrounding the business, many operators quit.

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Statistics also obtained by the Guardian of 9th October 2019 from the Nigerian Communications Commission (NCC), showed that only 41 ISPs were duly registered with commission as at first quarter (Q1) of 2019. These ISPs have a total connection of 233, 364, but active users on their networks were 160,090 through 1,135 Point of Presence (PoPs)[53].

Data also obtained from the Nigerian Communications Commission (NCC), showed that 143 Internet Services Individual Licenses have been granted by the Commission as at 28th October 2020[54]. However, only 43 Internet Service Operator Data was reported to the Commission as at Quarter 2-2020. These ISPs have a total of 298,681 connected subcribers, but active

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[53] https://guardian.ng/technology/isps-struggle-for-patronage/
[54] https://www.ncc.gov.ng/licensing-regulation/licensing/licensees-list#internet-services

users on their networks were 172,842 through 1,306 Point of Presence (PoPs) spread across the country[55].

4.2. RESEARCH QUESTION 2: What is the average capacity of the licensed ISPs?

This research work utilizes data from the 2019 Year End Subscriber/Network Data report as the 2020 Year End report is yet to be published.

4.2.1 ANALYSIS OF 2019 YEAR END SUBSCRIBER/NETWORK DATA– INTERNET SERVICE PROVIDERS (ISPs)[56]

Consistent with Section 89 subsection 3(c) of the Nigerian Communications Act 2003 (NCA 2003), the Commission (NCC) regularly collates statistical information from Internet Service Providers (ISPs) and produces reports on the industry statistics based on the information gathered.

The Commission has 104 ISP licensees on its database, however, requests for submissions were forwarded to Ninety Eight (98) active ISP licensees, and a total of Forty (40) submissions were received for the 2019 Year End Subscriber/Network Data which formed the basis of the analysis in this report. The number of submissions increased from 33 (Thirty Three) in Year 2018 to 40 (Forty) in year 2019.

The analysis was carried out based on the submissions from the following Operators:

N/S	OPERATORS
1.	Estream ltd
2.	CBC EMEA Limited
3.	Cobranet limited
4.	Ekovolt Telco Limited
5.	Electronic Connection Limited
6.	Ejalet Tech ltd
7.	Odua Telecoms Limited
8.	Excelsimo Networks Limited
9.	Futurecom Limited
10.	Skymax Integrated Networks

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[55] https://www.ncc.gov.ng/statistics-reports/subscriber-data#internet-service-operator-data
[56] https://www.ncc.gov.ng/docman-main/industry-statistics/policies-reports/915-2019-year-end-subscriber-network-data-report/file

11.	Hyperia
12.	Information Connectivity Solutions Limited
13.	ipNX Nigeria Limited
14.	Is Internet Solutions Limited
15.	Juniper solutions limited
16.	KHAL Communications
17.	Layer3
18.	Mainone Cable Company Limited
19.	Mobitel
20.	Netaccess Ltd
21.	Comternet World Ltd
22.	Spectranet Nigeria Limited
23.	Tizeti Ltd
24.	Trefoil Limited
25.	VDT communications limited
26.	Winrock Nigeria Limited
27.	Platinum Index Data
28.	Content Oasis
29.	Orange Business Communications
30.	Coquina Software Company
31.	Priority Communication Ltd
32.	Trakatel
33.	Interweb Satcom Ltd
34.	Sea-Net Technologies
35.	Vodacom Business Africa Nigeria Limited
36.	Arcelor Networks Ltd
37.	Nanocom International Ltd
38.	Coscharis Technology
39.	VPS Technologies Limited
40.	Clear Sky Broadband Ltd

4.2.2 INSTALLED SUBSCRIBER CAPACITY

Spectranet had the largest Installed capacity of 490,000mbps while IPNX has 150,000mbps and Mobitel had 20,000mbps. Priority Communications had the lowest installed subscriber capacity which was 2mbps.

	Installed Subscriber Capacity	
1.	Is internet solutions limited	560 Mbps
2.	Vodacom Business Africa	12944796Mbps
3.	Winrock Nig Ltd	611Mbps

4.	CBC Emea	155mbps
5.	Cobranet limited	6Gbps
6.	Coscharis Technologies Ltd	155Mbps
7.	Electronic Connections Ltd	105mbps
8.	Odua telecoms limited	1tbps
9.	Ekovolt Telco Limited	400mbps
10.	Arcelor Networks Ltd	620Mbps
11.	Excelsimo Networks Limited	10Gbps
12.	Information Connectivity Solutions Limited	1 Gbits
13.	Futurecom Limited	0.2Gbps
14.	Comternet World Ltd	10MBbps
15.	Interweb Satcom Limited	200Mbps
16.	ipNX	150000Mbps
17.	Juniper solutions Limited	STM2
18.	KHAL	10Mbps
19.	Layer3	Internet:1348.7Mbps, Longhaul: 295mbps, Metro 403mbps
20.	Mobitel	20000Mbps
21.	Netaccess	40mbps
22.	Coquina Software Co	220Mbps
23.	Nanocom International ltd	150Mbps
24.	Spectranet Nigeria Limited	HSS:490000 LTE Base Station: 193,698
25.	Tizeti	12080Mbps
26.	Trefoil	up -47mbps/ down - 47mbps
27.	Skymax	358Mbps
28.	VDT Communications Limited	Enterprise=10,000mbps, retail=25,000mbps
29.	Priority Communication	2MBPS
30.	Platinum Index Data	150mBPS
31.	VPS Technologies Limited	30MBPS

4.2.3 OPERATOR BANDWIDTH CAPACITY

Mainone had the largest bandwidth capacity with 5TB followed by Spectranet with 45,000mbps and IPNX Limited had 14,807mbps.

Bandwidth Capacity		
1.	Coscharis Technologies Ltd	1 STM (155MBPS)

2.	CBC Emea	155mbps
3.	Cobranet limited	5Gbps
4.	Ekovolt Telco Limited	800MBPS
5.	Electronic Connections Ltd	10Mbps
6.	Nanocom International Ltd	155Mbps
7.	Odua telecoms limited	1tbps
8.	Futurecom Limited	0.2Gbps
9.	Arcelor Networks Ltd	620Mbps
10.	Hyperia	1920Mbps
11.	Information connectivity solutions Limited	0.920gbits
12.	Skymax	350MBPS
13.	ipNX Nigeria Limited	14807Mbps
14.	Is Internet Solutions Limited	10240Mbps
15.	Juniper solutions limited	STM1
16.	Main One	1.92Tbps - 4.96 Tbps
17.	Mobitel	45Mbps
18.	Netaccess	45Mbps
19.	Excelsimo Networks	10Gbps
20.	Tizeti	2GBPS
21.	Trefoil	up -47mbps/ down - 47mbps
22.	VDT Communications Limited	5,162Mbps
23.	Winrock Nigeria Limited	665Mbps
24.	Priority Communications Ltd	2MBPS
25.	Platinum Index Data	100mBPS
26.	Spectranet Nigeria Limited	45 GBPS
27.	Ejalet Tech ltd	85 Mbps
28.	Comternet world Ltd	10Mbps
29.	Interweb Satcom Limited	250Mbps
30.	Coquina Software Co	256 Mbps
31.	KHAL	10Mbps
32.	Vodacom Business Africa	15728640Mbps
33.	Layer3	310mbps, 1030mbps
34.	VPS Technologies Limited	60MBPS

4.2.4   ACCESS SPEED BEING OFFERED:

As at December 2019, the access speed offered by operators ranged from 250kbps to about 95Gpbs. Mainone Ltd recorded access speeds of 95.2Gbps; the most common access speed delivered to subscribers in the

category ranged between 1mbps - 620mbps but less than 1GB. Some operators like Layer 3, are able to grant unlimited speeds as shown in table below, depending on the payment plan of the subscriber.

From the analysis of the access speed offered by ISPs, Layer 3 has unlimited access speed while VDT ranged from 512kbps to 425mbps access speed. Operators like Cobranet, IS Internet Solutions, Juniper, CBC EMEA and Hyperia fall under this group; while KHAL Communications provided access speeds in kbps.

		Access Speed(s) Being Offered
1.	CBC EMEA	155mbps
2.	Cobranet Limited	220Mbps
3.	Ekovolt Telco Limited	2mbps to 10mbps
4.	Electronic Connections Ltd	1,2,3,4,5 to 10mbps and above
5.	Information connectivity solutions Limited	1mb-40mb
6.	Platinum Index Data	2MBPS
7.	Odua Telecoms Limited	620Mbps
8.	Hyperia	1920Mbps
9.	Is Internet Solutions Limited	256Kbps - 2440 Mbps
10.	Juniper Solutions Limited	2MB-50Mbps
11.	Netaccess	1/2/5/10mbps
12.	Tizeti	2 - 5Mbps
13.	Trefoil	up -47mbps/ down - 47mbps
14.	VDT Communications Limited	512Kbps, 425mbps
15.	Coquina Software Company Limited	110Mbps
16.	Arcelor Networks Ltd	6Mbps
17.	Platinum Index Data	100mMbps
18.	Main One	95.2Gbps
19.	Comternet World Ltd	6Mbps
20.	KHAL Communications	1000kbps
21.	Coscharis	155Mbps
22.	Vodacom Business Africa	1Mbps,
23.	Layer 3	Unlimited
24.	Nanocom International Ltd	2Mbps
25.	Skymax Ltd	190Mbps 156Mbps 70Mbps
26.	VPS Technologies Limited	2MBPS

4.2.5   SUBSCRIBER & SERVICES DATA:

- **Total Wired Internet Subscriptions**

In December 2019, a comparative analysis of the submissions made in this category showed a huge increase; in 2018, the total wired internet subscriptions was 151 while the total wired subscriptions in 2019 was 2002. Interweb Satcom Limited recorded the highest figure with 1200 which accounted for 60% of wired internet in 2019, while VDT Communications Ltd and Vodacom Business Ltd had 486 and 167 subscriptions respectively indicating a percentage increase of 24.3% and 8.34% respectively, while KHAL Communications and Hyperia recorded the lowest number of wired internet subscriptions with 5 subscriptions each.

- **Average Number of Users per Fixed Internet Subscriptions (Broadband)**

Fixed broadband subscriptions on the ISP market segment increased from 197,839 subscribers in December, 2018 to 248,187 subscribers in December 2018, indicating an increase of 25%. Spectranet Ltd constituted 99% of the 2019 figure, the highest of all the Operators in this category. Hyperia and Comternet World recorded the least with 10 and 5 subscriptions respectively, contributing 0.004% and 0.002% respectively to the total.

- **DSL Internet Subscriptions**

In this category, only Interweb Satcom Ltd communications made submissions with 1100 DSL internet subscriptions in 2019.

- **Fiber to Home/Building**

The analysis of this category shows that Fiber to Home subscriptions recorded 691 subscribers in December 2019 from 252 in December 2018. In December 2019, Excelsimo Networks Limited recorded a total of 250 which accounted for 36% of the subscriptions in this category while Odua Telecoms Ltd had the least subscription of 1 accounting for 0.14% of the subscriptions in this category.

- Total Wireless Broadband Subscriptions

Total Wireless broadband subscriptions increased from 199,232 connections in December, 2018 to 257,326 in December 2019. In this category, Spectranet had the highest number with 246,308. An analysis

of this category shows that the Total Wireless Broadband subscriptions increased by 29%.

- **Average Number of Users per fixed Wireless Broadband Subscriptions**

In December 2018, the average number of users per fixed Wireless broadband subscriptions (A Fixed Wireless Broadband service is an Internet connection providing high-speed bandwidth delivered wirelessly from the service provider to a location) was 6,874 while that for December, 2019 was 12,051. There was a 75% increase in the average number of users per fixed wireless broadband subscriptions from December, 2018 to December, 2019.

- **Total Number of Terrestrial Subscriptions [Fixed & Fixed Wireless]**

During the period under review, the total number of terrestrial subscriptions increased by 47% considerably from 3065 as at December, 2018 to 4520 in December 2019. In this category, Cobranet has the highest number with 1944 which accounted for 40% of the Subscriptions. Trefoil recorded the least figure with One (1) subscription which represented 0.002% of the total terrestrial subscriptions.

- **Total Number of Satellite Subscriptions**

Total number of Satellite subscriptions also increased over the period from 1602 in December, 2018 to 2657 in 2019, indicating an increase of 66%, this analysis was based on the submissions by Fourteen (14) operators in this category.

- **Number of Internet Users per Region**

In December, 2019, the total number of internet users' i.e. those who are connected through ISPs as opposed to the GSM service providers, in the six geopolitical zones for was 257,085, a 21% increase from the 211,636 recorded as at December, 2018.

The analysis of the breakdown is as follows:

1. South West had the highest number of users in 2017, with 193,405 or 75% of the total subscriptions.

2. South-South had 6% with 15,536 users.

3. North West had 0.06% with 166 users.

4. South East had 0.12% with 333 users.

5. North-East had 0.13% with 344 users.

6. North Central had 47,301 users which indicates 18% of the total number of users.

7. North West had 0.06%, which was the least of all the regions with 166 users.

- **Number of Users by Internet Speed**

Apart from the users via the major MNOs, in December 2019, out of a total of 278,190 users via ISPs, 2,052 users subscribed to speeds between 256Kbps-2Mbps, representing 6.4% of the total user base; 17,888 users between 2–10Mbps, representing 6.4% of the total user base; & 258,250 subscriptions in the 10mbps & above category, which makes 93% of the total.

4.3   RESEARCH QUESTION 3: What is the financial viability of ISPs in Nigeria?

- **Revenue**

As at December 2019, a total Revenue of N53, 745,324,069.20 (Fifty Three Billion, Seven Hundred and Forty Five Million, Three-Hundred and Twenty Four Thousand, Sixty-Nine Naira, Twenty Kobo Only) was generated, which was a 23% increase from the N43,829,309,568 (Forty Three Billion, Eight Hundred and Twenty Nine Million, Three-Hundred and Nine Thousand, Five hundred and Sixty-Eight Naira Only that was generated in 2018.

Spectranet, Vodacom Business Africa, Mainone and IS Internet Solution had 21.8%, 21.6%, 21% and 6% respectively of the total revenue, making them the biggest Revenue generating ISPs in 2019. Conversely, Comternet World Ltd had the least revenue in 2019, with N1,820,000 (One Million, Eight Hundred and Twenty Thousand Naira Only) only, or 0.003% of the total revenue generated by ISPs in 2019.

- **Operating Cost**

The value of Operating Cost increased from =N=25,271,669,324.38 (Twenty Five Billion Two Hundred & Seventy One Million Six Hundred and Sixty Nine Thousand Three Hundred & Twenty Four Naira Thirty Eight Kobo Only in 2018 to =N=41,106,763,063.46 (Forty One Billion One Hundred & Six Million Seven Hundred and Sixty Three Thousand & Sixty Three Naira Forty Six Kobo Only. This indicates an Increase of 62%.

From the analysis of the submissions made, Vodacom recorded the highest operating cost in 2019, with N11,069,000,000.00 while Spectranet and IS

Internet were second and third with N10,851,000,000 and N2,878,000,000 respectively. The three operators together make up 60% of the total operating cost for the 2019 financial year. The lowest in Operating Costs for the 2019 financial year came from Mobitel Limited with N2, 979,000, making 0.007% of the total figure.

- **Staff Profile**

As at December 2019, the number of staff of ISP operators decreased to 2,877 from 3,136 recorded in 2018. This showed a decrease of -8% in the work force. There was a total of 2215 male and 697 female staff. A further breakdown reveals that 2,812 of the work force are Nigerians, while expatriates were 65.

4.4 RESEARCH QUESTION 4: What are the challenges that plague the ISPs and threaten their survivability?

4.4.1 Competition With Mnos Offering Isp Services

The Nigerian telecoms & information services sector contribution to GDP grew by 18.10% in Q2 2020 from 9.71% in Q1 2020 and 10.26% in Q4 2019[57]. This was driven largely by four major Mobile Network Operators (MNOs) who provide services to over 99.8% of 196 million active lines with 126 Million of those lines (68%), connected to the Internet (2G+/3G/4G).
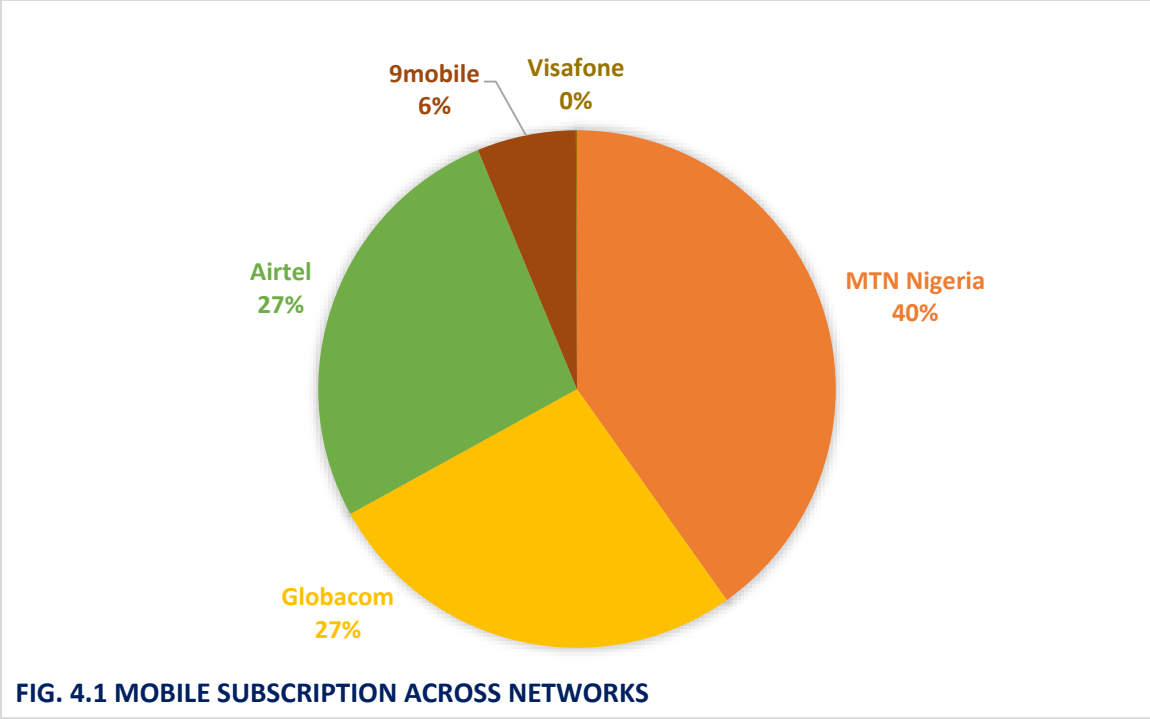
In addition to these four major operators, the country has an additional number of specialised service providers – Internet Service Providers (ISPs), Private network operators, International Gateway Providers, Value Added Services companies, and Tower companies actively participating in the sector and providing services across the telecoms value chain.

The 196 million mobile subscriptions were distributed across the networks of MTN Nigeria, Globacom, Airtel, 9Mobile and Visafone, each having 40.17%, 26.82%, 26.76%, 6.18% and 0.07% market share respectively.[58]

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[57] Nigerian Gross Domestic Product Report (Q2 2020)
[58] https://www.ncc.gov.ng/statistics-reports/subscriber-data#quarterly-subscriber-operator-data

FIG. 4.1 MOBILE SUBSCRIPTION ACROSS NETWORKS

The incursion of telecommunication operators such as MTN, Globacom, Airtel and 9mobile has been a major development in the life of the ISPs. The telecoms operators, which possess Universal Access Service Licence (UASL), offer mobile Internet service, which hitherto was the traditional service offering of ISPs. The already existing large subscriber market leveraged by MNOs is a battle to the ISPs who are struggling to retain 233, 364 customers with only 69% of them active.

According to a major ISP CEO in the country, who spoke on the condition of anonymity, they disclosed that the major challenge the operators face is the arbitrary fixing of prices by bigger operators just to stifle smaller operators and force them out of market. [59]

4.4.2   Harsh Business Environment

This entails the GSM operators providing internet services/access on their platform and through devices, thus competing with ISPs in retail service offering, instead of focusing on solely providing wholesale Tier 1 services. A telecoms expert, Kehinde Aluko explained that the ISPs buy broadband data in wholesale from companies like nTel, MainOne, Glo1, and MTN, who have berthed their submarine cables with huge bandwidth capacities

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[59] https://guardian.ng/technology/isps-struggle-for-patronage/

at the shores of the country, in turn, "they retail the broadband data bundle to individuals and organisations, but the same broadband company that sell to them are now in competition with them, selling directly to same customers even at reduced price, thus making competition and survival extremely difficult for ISPs." [60]

Furthermore, Mr Olusola Teniola, president of the Association of Telecommunications Companies of Nigeria (ATCON) opined that regulatory decision in the provision of broad licences to MNOs that encompass the scope of the ISP's scope of work and provisioning, puts the indigenous and often micro-sized ISPs in direct competition with the larger MNOs that are now offering ISP services to their voice consumer base. This he further stated has led to a great number of ISPs to exit the market or seek niche areas of the addressable market[61].

4.4.3　　　Inadequate National Broadband Infrastructure

According to the Nigerian Communications Commission (NCC), Nigeria needs about an additional 120,000 km of fibre cables to achieve its goal of pervasive broadband penetration. However, only about 54,000 km have been laid, and often with multiple duplications across the same routes. Along with a bevy of other factors, this huge deficit is responsible for the high cost of data and fluctuating service quality Nigerians often experience.

Often, the process of delivering internet access to a region requires telecom companies to deploy fibre optic cables traversing multiple roads. These roads are under the administration of their respective tiers of Government (Local, State and Federal) and each of these tiers gets to charge their own Right of Way (RoW) fees.[62]

A Right of Way, (RoW), is a right to make way over a piece of land, usually to and from another piece of land. When applied to telecoms, a RoW refers to the land on which telecom companies can lay their infrastructure, including connectivity cables.

Right of Way charges has been an issue for broadband operators in Nigeria for quite a while now. In addition to the lack of designated paths for fibre

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[60] https://guardian.ng/technology/isps-struggle-for-patronage/
[61] https://guardian.ng/technology/isps-struggle-for-patronage/
[62] https://nextbillion.net/digital-finance-right-of-way-nigeria/

optic cables to pass through. There is the issue of cable vandalisation and exorbitant charges by some State governments that are contrary to the NEC approved charge N145 per linear metre. All of these have made broadband penetration to be a problem, and have forced operators to limit their investments in cable laying across the country.

The Minister of Communications and Digital Economy, Dr. Isa Pantami during a webinar organised by the Association of Telecommunications Companies of Nigeria (ATCON), pointed out that RoW is beyond the seven Governors that have agreed to the N145 per linear meter, "during the meeting we had with stateGgovernors, at least 34 governors were present and some represented. It was agreed that they will work with the N145 per linear meter instead of the arbitrary charges we have had. So, telecoms operators should resist any hike in RoW. There has been a general consensus with the Governors' Forum." According to him, prior to the resolution of the RoW issues, many operators disclosed they spent as much as 70 per cent of their investment in paying for right of way charges.

"Examples of amounts charged for RoW per linear metre in the past included N4,500 and N5,500, some states even charged about N16,000! To give a better illustration, for a particular state, the estimated cost of connecting two Local Government Areas was a staggering N560 million before the implementation of the RoW resolution, and now it costs just N150,000," he stated. [63]

Checks showed that states, including Ekiti, Imo, Kaduna, Katsina, and Plateau have issued Executive Orders agreeing on a maximum RoW charge of N145 per linear meter of fibre.[64]

4.4.4 Multiple Taxation

Telecommunications service providers have presence in different locations across the country in order to provide services and support to their subscribers. This sometimes leads to conflicts with several governmental agencies, communities and tax authorities on the taxes and levies payable on their operations.

To them, the current heavy taxes imposed on telecoms companies at the federal, state and local government levels, have been major obstacle, which

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[63] https://guardian.ng/technology/telcos-should-resist-row-tariff-hike-by-states/
[64] https://guardian.ng/technology/telcos-should-resist-row-tariff-hike-by-states/

retards economic growth, limits profits, compromises quality of service and slows network expansion.[65]

4.4.5   Vandalisation Of Infrastructure

The telecom industry has experienced a lot of setbacks as a result of a number of factors that are negatively disruptive to the infrastructure. These factors include:

- Willful damage to the infrastructure in order to extort money from service providers

- Communities and individuals barring technical staff of the service providers from installing their equipment or carry out maintenance at the sites

- Destruction of telecom infrastructure due to road construction projects in urban and semi-urban areas

- Outright vandalism of components of infrastructure.

4.5   RESEARCH QUESTION 5: What are the mitigating actions carried out by the Nigerian Communications Commission as the sector Regulator to ensure survivability of Nigerian ISPs

The Nigerian Communications Commission is the independent National Regulatory Authority for the telecommunications industry in Nigeria. The Commission is responsible for creating an enabling environment for competition among operators in the industry as well as ensuring the provision of qualitative and efficient telecommunications services throughout the country.

- **On Competition**

To combat anti-competitive practices by dominant operators, the Commission wrote to the Mobile Network Operators (MNOs) on November 1, 2016 on the determination of an interim price floor for data services after the stakeholder's consultative meeting of October 19, 2016. The smaller operators were exempted from the new price regime, by virtue of their small market share. The decision on the price floor was taken in order to protect the consumers who are at the receiving end and save the smaller

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[65] https://guardian.ng/technology/communications/multiple-taxation-choking-telcos-says-alton/

operators from predatory services that are likely to suffocate them and push them into extinction.

However, following the opposition that greeted the directive to introduce price floor for data segment of the telecommunications sector, the NCC, on November 30, 2016, suspended the directive, which was supposed to take effect from December 1, 2016.[66]

- **On Infrastructure**

The then Chairman, Governing Board of the Nigerian Communications Commission (NCC), Otunba Olabiyi Durojaiye at the 2019 Board Retreat of the Commission, has listed some of the key achievements of the Board and Management of the Commission over the years, just as he emphasised the readiness of the Board to support the Management towards catalysing improved growth in the telecommunications industry through appropriate policy direction.

He stated that 2019 has been a successful year under the firm guidance of Prof. Umar Danbatta, the Chief Executive Officer and the distinguished executive commissioners.

Prof Durojaiye affirmed that the NCC had maintained the steady overall contribution to the country's Gross Domestic Product (GDP) to the tune of over N10 trillion quarterly just as the Commission has had several engagements with external stakeholders including various agencies and departments of government to ensure greater collaboration to sustain the growth of the telecom sector.

On infrastructure drive, Durojaiye said, there has been immense broadband infrastructure expansion through approvals of licensing of Infrastructure Companies (INFRACOS) in various geo-political zones of Nigeria[67].

Telecoms expert, Kehinde Aluko, said the Nigerian Communications Commission (NCC), with the backing of NCA 2003, was working assidously on the Commission's Strategic Vision Plan (SVP), which housed the eight point agenda, as broadband penetration moved from six per cent in 2015 to 42.02 per cent by July, 2020. Its contribution to the GDP increased

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[66] https://www.thisdaylive.com/index.php/2017/06/08/revisit-suspended-data-price-floor-stakeholders-urge-ncc/
[67] https://www.ncc.gov.ng/media-centre/news-headlines/728-durojaiye-lists-achievements-of-ncc-as-2019-board-retreat-opens-in-kano

from 8.50 per cent in 2015 to 14.30 per cent in Q2, 2020. When Danbatta assumed leadership of the Commission in year 2015217 access gap clusters were identified in the country affecting 40 million Nigerians who were without access to telecoms services. But today, it has reduced to 114, with 15 million previously digitally-excluded Nigerians now having access to telecoms services.

Danbatta, while giving account of his stewardship in the last five years with media executives[68], said the Commission is committed to addressing the remaining access gap clusters, which are areas outside the frontier of economic viability to ensure the remaining 25 million Nigerians have access.

Similarly, on assumption of office, there were 47,000 kilometres of fibre optic cables laid across the country. However, five years later, as a result of regulatory focus, this has been extended to 54,725 kilometres through the efforts of some private sector operators.

"In line with the Federal Government's target, additional 120,000 kilometre of fibre are being planned over the next four years. In this regard, the NCC is working on last-mile connectivity to different parts of the country through leveraging the 40 terabyte capacity of five submarine cables on the coastal shores of Nigeria," he said.

Danbatta pointed out that the licensing of six infrastructure companies (InfraCos) to deploy fibre infrastructure across the six-geo political zones will also help to galvanise increased connectivity. "This will also bring about a reduction in cost of data from N1000, per gigabyte of data to around N390 with broadband penetration target of 70 per cent to cover 90 per cent of the population within the next five years, as contained in the new National Broadband Plan (2020-2025)," the EVC said.

He reiterated NCC's commitment towards delivering on its mandate of ensuring quality of service to the consumers, driving investment and boosting healthy competition in the industry as enshrined in the Nigerian Communications Act (NCA), 2003.

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[68] https://www.ncc.gov.ng/media-centre/news-headlines/864-danbatta-gives-account-of-5-year-stewardship

- **On Multiple Taxation**

The Nigerian Communication Commission ("the Commission") recently announced that it had signed a memorandum of understanding (MOU) with the Federal Inland Revenue Service (FIRS). This is to enable the FIRS to ascertain the accuracy and completeness of value added tax (VAT) and other taxes payable by telecommunications operators ("the Telcos").

The MOU is part of inter-agency collaboration aimed at improving transparency of business operations in Nigeria. Under the MOU, the FIRS will integrate its application programme interface (API) technology with the systems of the Telcos for independent verification of VAT payable on qualifying transactions by the mobile network operators rather than rely solely on the Telcos' book of accounts.

The Commission noted that it had conducted its due diligence, as the telecommunications industry regulator, to ensure that the API will not create another layer of tax on the Telcos, who are already dealing with multiple taxation issues. It further reassured that the integration of the technology with the Telcos' transactions systems will not impact the cost and quality of service provided to consumers by the Telcos.[69]

- **On Vandalism**

The Nigerian Communications Commission (NCC) in its efforts to ensure the protection of telecom infrastructure regularly carries out a robust sensitisation exercise of the general public. The excercise is to create awareness on the critical implication of vandalism of telecom infrastructure and the need for its protection by all in order to ensure good quality of telecom services and to consolidate the growth of the telecom industry.

During a webinar organised by the Association of Telecommunications Companies of Nigeria (ATCON), the Minister of Communications and Digital Economy, Dr Isa Patanmi stated that the Government on its part has made several strategic efforts to protect telecom investments in the country. He said the Federal Government is working with the Nigerian Communications Commission (NCC), to install unique identification (ID)

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[69] https://home.kpmg/ng/en/home/insights/2020/06/ncc-and-firs-sign-mou-to-ascertain-vat-elements-of-telcos--trans.html

on every infrastructure, which will enable security agencies to track and protect such infrastructure across Nigeria. [70]

The President, Major General Muhammadu Buhari (retd.), has designated all digital and telecommunications infrastructure as Critical National Infrastructure and directed all security agencies to ensure their protection.[71]

- **On Policy And Regulation**

According to Analysts, the impact of regulation cannot be isolated from the telecoms sector's positive contributions to the country's economic growth.

Industry stakeholders attributed the second quarter contribution of telecoms sector, which represents a leap from the 10.88 per cent in Q1 2020, to the sound regulatory environment enthroned by the Nigerian Communications Commission (NCC)[72].

To sustain this growth, the ALTON Chairman, Gbenga Adebayo said the country should continue to invest in network expansion and maintenance operations, access to foreign exchange to procure network critical equipment, consistency in policy, and policy environment.

Adebayo said there should be access to spectrum and friendly policies around its allocation, assignment and cooperation between the stakeholders. [73]

ATCON President, Olusola Teniola, said: "telecoms industry has remained bullish owing to the quality of leadership at the helm of affairs at the Commission." He added that NCC had become reference point in telecoms regulatory ecosystem in Africa and beyond. [74]

In the same vein, President of National Association of Telecoms Subscribers of Nigeria (NATCOMS) Adeolu Ogunbajo, said the proactive

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[70] https://guardian.ng/technology/telcos-should-resist-row-tariff-hike-by-states/

[71] https://punchng.com/buhari-directs-protection-of-telecom-infrastructure/

[72] https://guardian.ng/business-services/telecoms-sector-contributes-n2-3trn-to-q2-gdp/#:~:text=Despite%20the%20economic%20impact%20of,the%20second%20quarter%20of%202020.&text=821%20trillion%20in%20the%20first%20quarter%20of%20the%20year.

[73] https://guardian.ng/business-services/telecoms-sector-contributes-n2-3trn-to-q2-gdp/#:~:text=Despite%20the%20economic%20impact%20of,the%20second%20quarter%20of%202020.&text=821%20trillion%20in%20the%20first%20quarter%20of%20the%20year.

[74] https://guardian.ng/business-services/telecoms-sector-contributes-n2-3trn-to-q2-gdp/#:~:text=Despite%20the%20economic%20impact%20of,the%20second%20quarter%20of%202020.&text=821%20trillion%20in%20the%20first%20quarter%20of%20the%20year.

regulatory approach of Danbatta has helped made telecoms "the oxygen that keeps economic activities afloat during the lockdowns and consumers are appreciative of the fact that the Commission, working with its supervising Ministry, didn't allow consumer to suffer serious disruption to quality of service and quality of experience." [75]

Checks showed that effective regulatory regime, backed by various initiatives of the Commission and efforts of the supervising Ministry of Communications and Digital Economy at addressing industry challenges, is providing the needed digital valves that have supported the economy from collapse, since the outbreak of COVID-19 pandemic in the country.

The increase in broadband penetration, Internet usage, number of access to telephone and several other initiatives by the Commission, especially in the areas of driving tech innovations, employment creation, promotion of digital inclusiveness, which are policy directions of NCC, an industry regulator, have, in the last five years, boosted the sector's contribution to GDP.

These policy activities have also enhanced growth of digital-based activities across other sectors of economy increasing efficiency and effectiveness in economic operations.

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[75] https://guardian.ng/business-services/telecoms-sector-contributes-n2-3trn-to-q2-gdp/#:~:text=Despite%20the%20economic%20impact%20of,the%20second%20quarter%20of%202020.&text=821%20trillion%20in%20the%20first%20quarter%20of%20the%20year.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1   CONCLUSION

Survival and growth are the two main objectives of any organisation in today's competitive world. Every organisation tries to be different and accelerative from their competitors to achieve their goals and become market leaders. For ISPs in Nigeria survivability entails over coming the major challenge of improving customer base and competing with the MNO's.

With the other challenges highlighted in this study, one may wonder why new operators still express interest in the market despite challenges facing it, experts and industry watchers have explained that this may be ascribed to a probable identification of a niche aspect of the market by the newcomers which might enable them succeed where several others have failed and help them thrive without being consumed by extant challenges in the market.

Responding to this development, Teniola said the NCC is legally within its powers by NCA 2003 to issue various licences to ensure services are rendered to all Nigerians. He however stressed that the responsibility of success lies with those who take on the ISP licences from NCC and not NCC.

"It would appear that those seeking the ISP licences at this stage of the market development still feel that they are able to push a unique service offering in the market. I presume they have done a proper feasibility analysis to determine their business case,"

From the study of the financial data, it seems to show that the provision of internet services is a financially viable field.

5.2   RECOMMENDATIONS

- To solve the issue of artificially low internet/data prices, a regulated minimum price level has to be put in place by the Government and the Commission, in order for bothbig and small telecom operators to compete on the quality of the network and customer services they provide.

- As investment in telecommunications infrastructure is essential to economic growth, the Commission should encourage adequate infrastructure build out as it contributes to the efficient operation of the sector and the survivability of the ISPs.

- The Commission should provide the best enabling environment that encourages additional Investment in telecommunications infrastructure as essential to economic growth, as adequate infrastructure contributes to the efficient operation of the sector.

- The Commission should conclude a critical review/amendments to the obselete portions of the Nigerian Communications Act 2003 which is heavily concentrated on the provision of voice services, without much direction on the more relevant emerging technologies. Today, more emphasis should be placed on competition in the sector in a saturated market, the economy and other services closely related to the telecommunications industry, such as finance, technology and media services.

- The Commission should champion the ubiquitous use of e-Services, e-Governance and e-Business, which would result in an increase in the need for internet services which would invariably lead to more business opportunities, niches, and customers for the smaller ISPs especially in more rural areas which might not be so commercially viable for the MNOs to compete in.

- The Commission should conclude the INFRACO licence award and implementation to grow ubiquitous roll out of fibre, across capital cities and to homes.Customers can also play a part in regulating prices by valuing and promoting services that offer the best customer experience and not those that offer only the cheapest price.

- There is a need to encourage ISPs to improve their general business processes / practices to ensure long-term growth and sustainability in order to create new revenue streams, recreate existing products, diversify into new areas for which resources and capabilities are available and establish a minimum market price.

It can be said that the Commission has worked assiduously to maintain a level playing field for all Licensees and licence category holders in the Telecommunications sector in Nigeria. To further support ISPs by mandating high cost of data, the consumers suffer. By lowering prices of data, Consumers are happy, the MNOs might cope or cross subsidize to continue business, however, the ISPs for whom are the original licence for the provision of internet services in Nigeria, ultimately suffer. It is indeed

a fine line of both regulatory decisions on meeting consumer needs and sustaining the overall economic viability of the Sector.

NCC has its role to play, but so do the ISPs. Some ISPs have thrived even within the emerging challenges brought about by convergence of data and voice. It is therefore ultimately the responsibility of ISPs to ensure they have secured a niche in the ISP market, the right cost of data purchase, and other sound business that will ensure that continuity. On its way, the Nigerian Communications Commission will continue to review, analyse and collaborate with Stakeholders to ensure where necessary, adequate support is provided to the smaller ISP players, without unduly compromising the sustainability of the Nigerian Telecoms Sector in Nigeria as a whole.

CHAPTER SIX

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APPENDIX

1. Fig 1.1 World internet usage and population statistics 2020 Year-Q2 estimates

2. Fig 1.2 Internet world penetration rate

3. Fig 1.3 Internet connectivity options from end-user to tier 3/2 ISPs

4. Fig 3.1 Internet Service Providers Tier

5. Fig. 4.1 Mobile subscription across networks