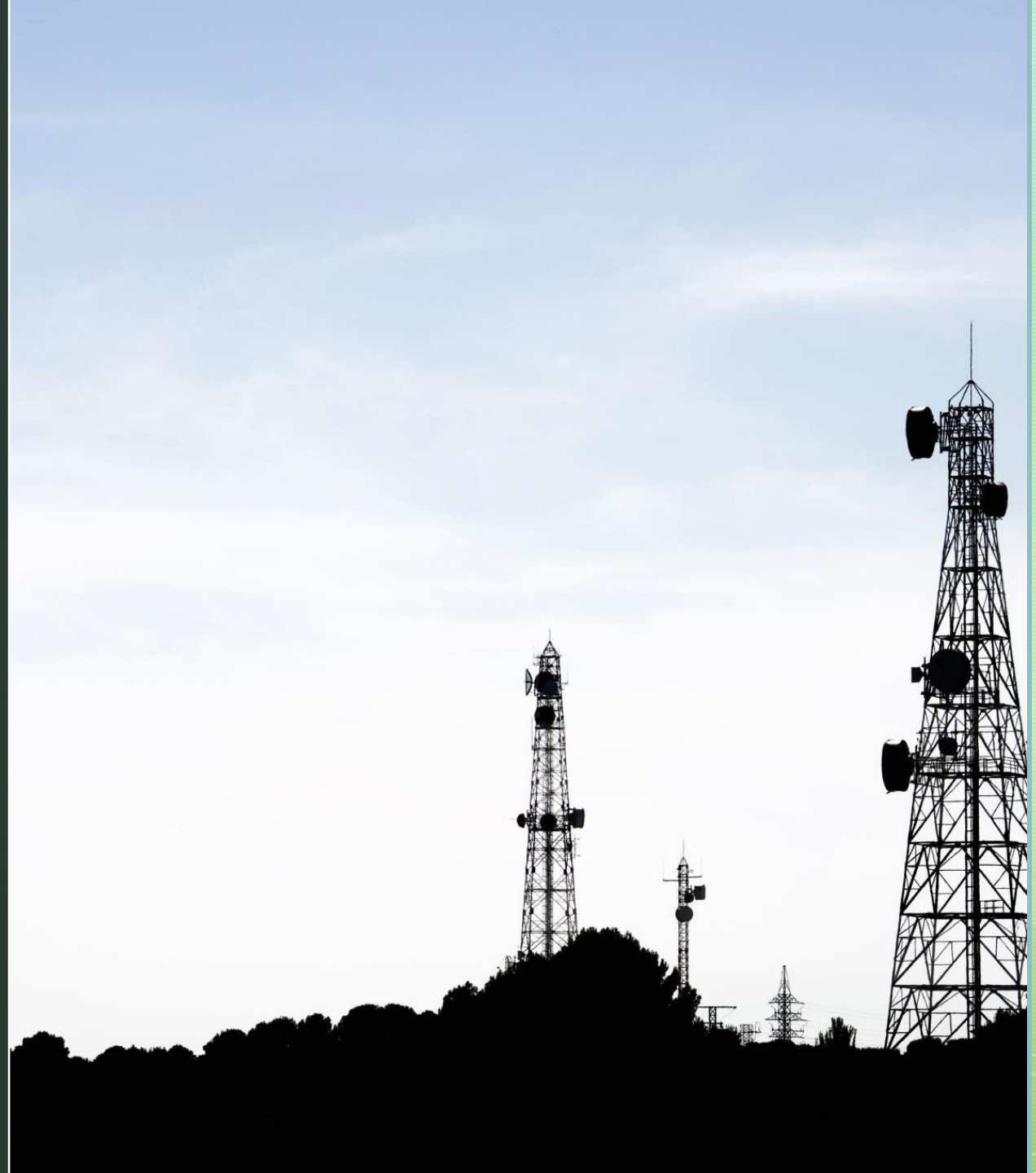
Constructing Nigeria's future using innovations in Telecommunications

8th August 2023

Nigeria Computer Society (NCS)
Annual Conference

Muhammed Rudman
Internet exchange Point of Nigeria (IXPN)



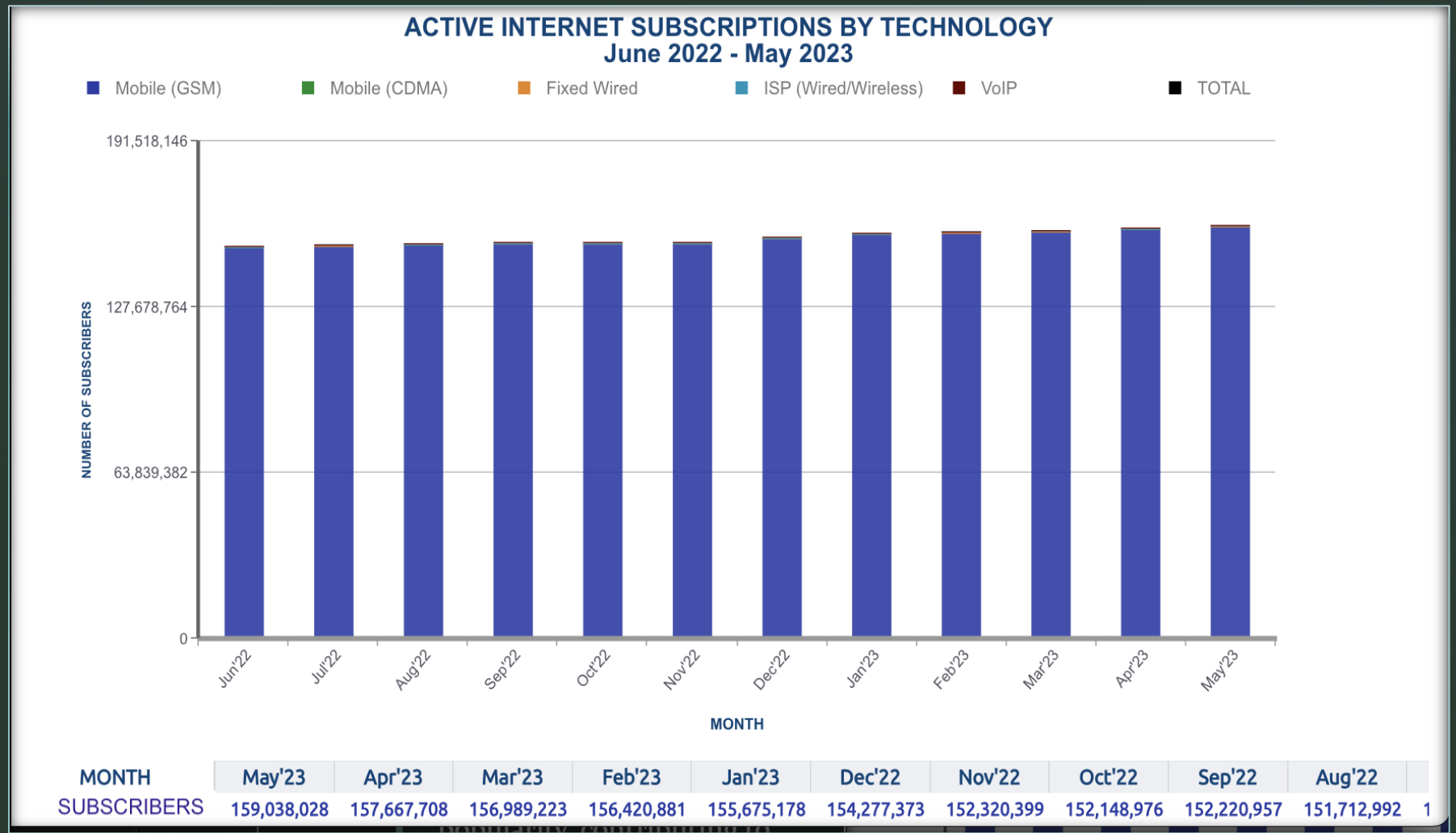
AGENDA

- **STATUS OF NIGERIA'S TELECOMMUNICATIONS SECTOR**
- **KEY PLAYERS**
- **TRENDS AND INNOVATION**
- **CHALLENGES**
- **RECOMMENDATIONS**

STATUS OF NIGERIA'S TELECOMUNICATION SECTOR

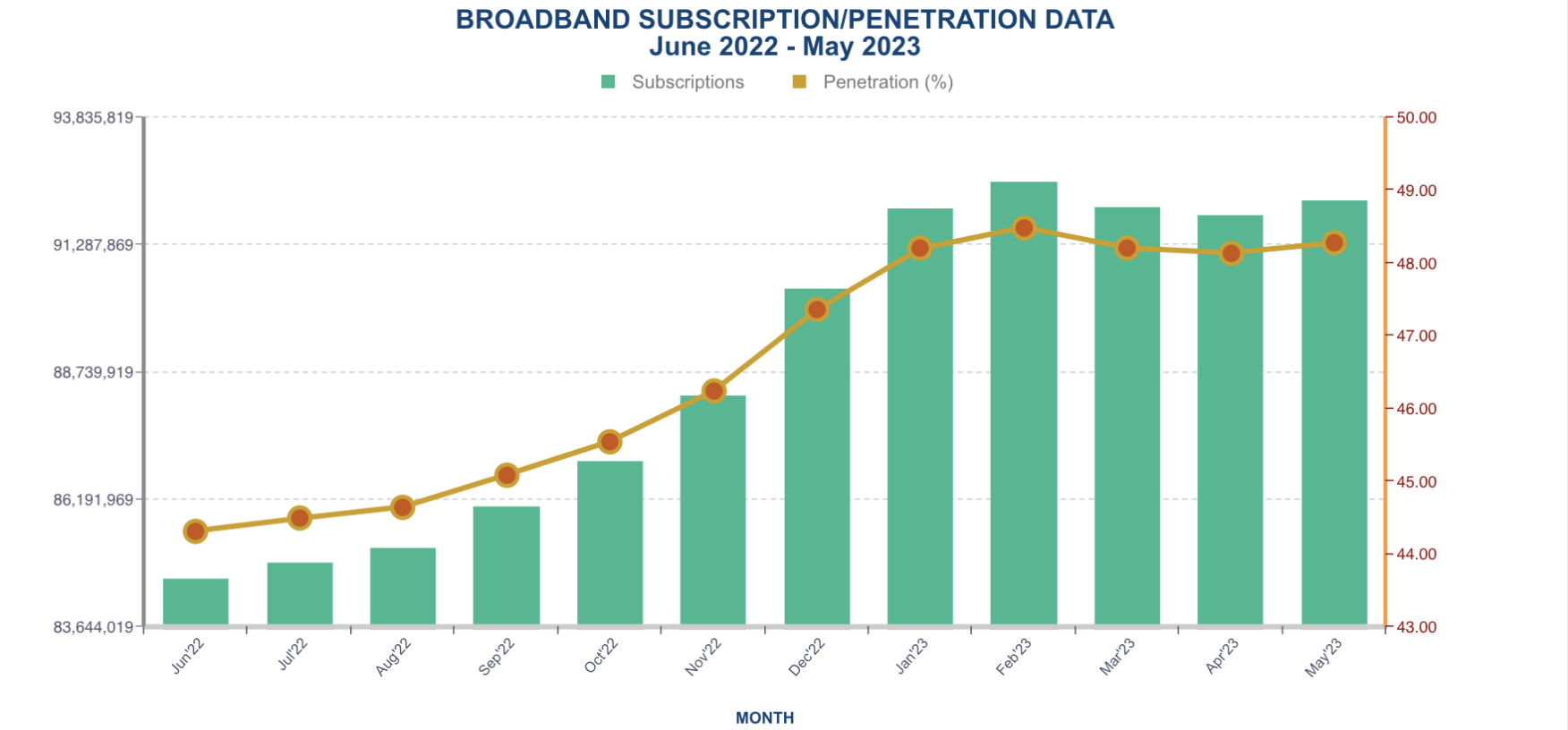
INTERNET USAGE

The internet has become more accessible to Nigerians, driven by the proliferation of smartphones and improved network coverage. Social media and online services have gained popularity, contributing to increased internet usage.



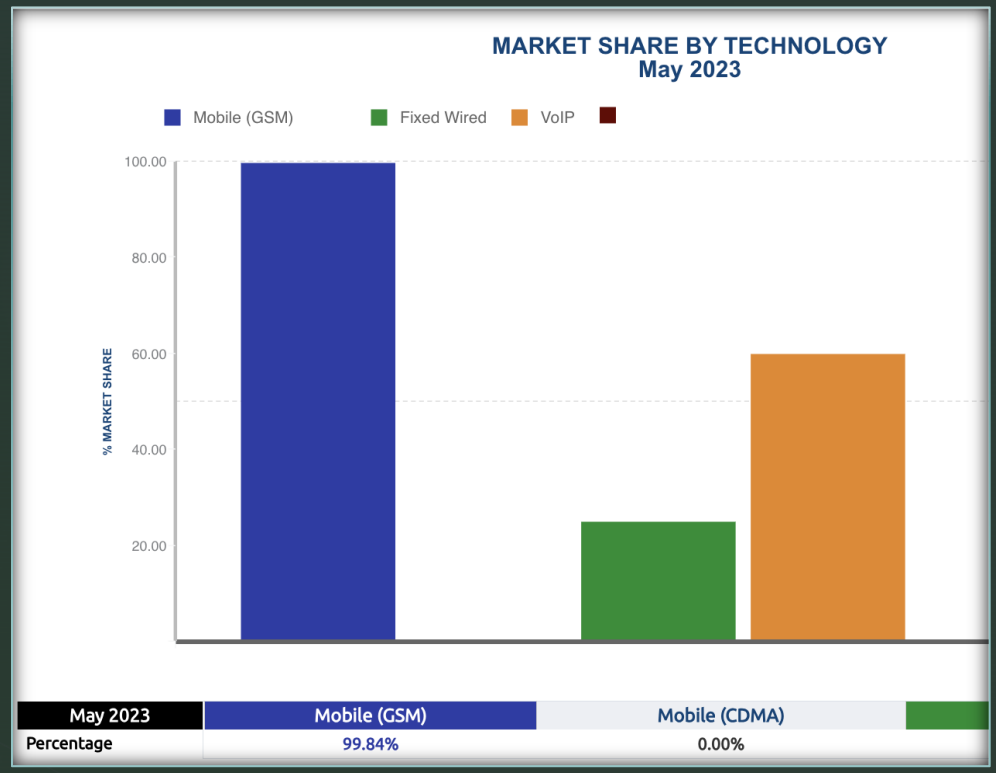
MONTH	May'23	Apr'23	Mar'23	Feb'23	Jan'23	Dec'22	Nov'22	Oct'22	Sep'22	Aug'22	
SUBSCRIBERS	159,038,028	157,667,708	156,989,223	156,420,881	155,675,178	154,277,373	152,320,399	152,148,976	152,220,957	151,712,992	1

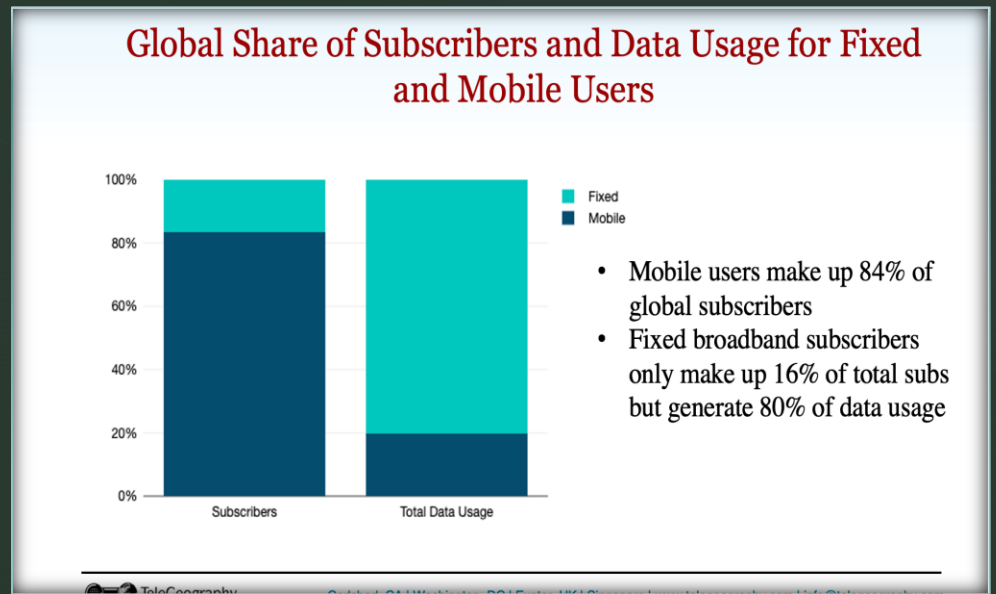
Broadband Penetration

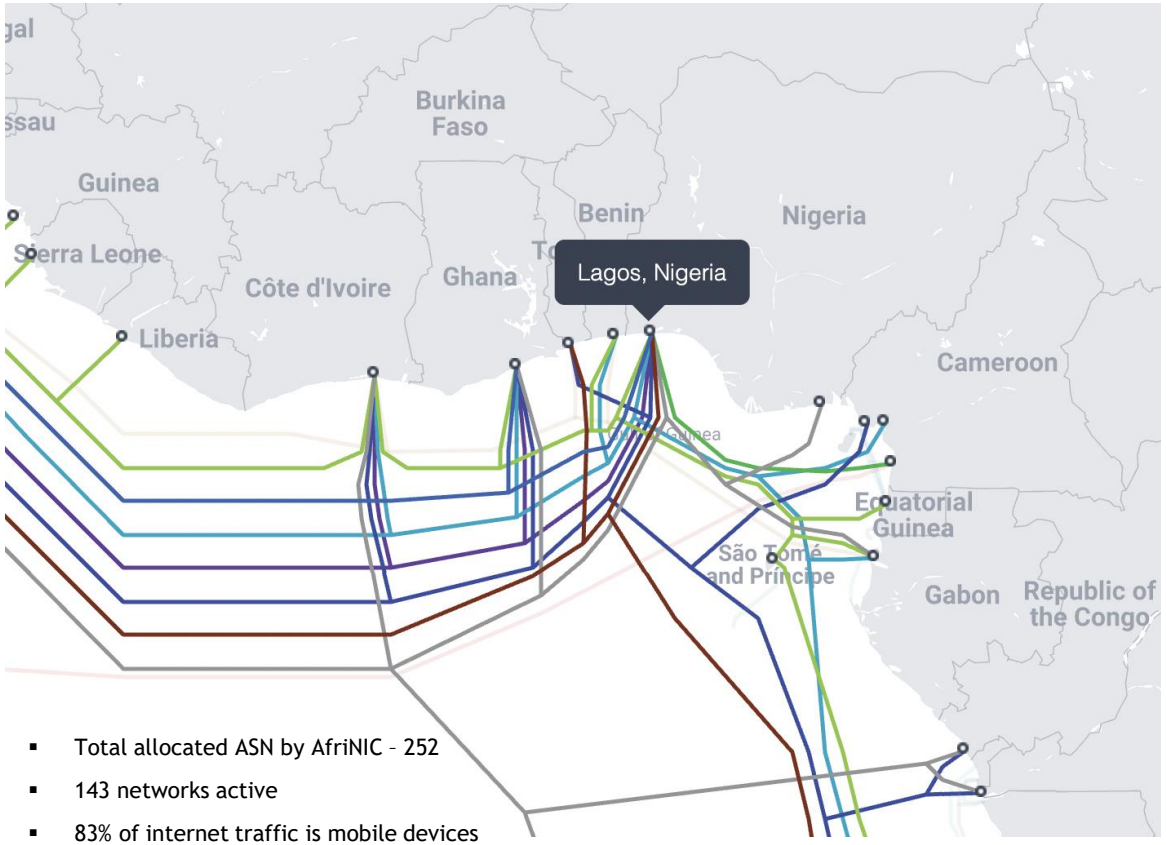


MONTH	May'23	Apr'23	Mar'23	Feb'23	Jan'23	Dec'22	Nov'22	Oct'22	Sep'22	Aug'22	Jul'22	Jun'22	M
Subscriptions	92,169,176	91,886,980	92,033,267	92,561,842	92,011,259	90,398,960	88,273,690	86,949,451	86,062,025	85,232,291	84,917,994	84,607,363	83,3
Penetration (%)	48.28%	48.14%	48.21%	48.49%	48.20%	47.36%	46.24%	45.55%	45.09%	44.65%	44.49%	44.32%	43

PERCENTAGE(%) MARKET SHARE BY TECHNOLOGY







- Total allocated ASN by AfriNIC – 252
- 143 networks active
- 83% of internet traffic is mobile devices
- Six major submarine cable system

- SAT-3/WASC
- Glo1
- Mainone
- West African Cable System
- African Coast to Europe (ACE)
- Equiano
- 2Africa (2023)
- Nigeria Cameroon Submarine Cable System

https://www.submarinecablemap.com/landing-point/lagos-nigeria

OTHERS

As of 2021, the total investment in the nation's telecommunications sector, which includes both foreign direct investment (FDI) and local investment, stands at $75.6 billion.

Telecom Infrastructure: Telecommunications infrastructure has improved, especially in urban areas. There has been an expansion of 3G, 4G/LTE and 5G networks, providing faster data speeds and better internet access

Regulatory Environment: The Nigerian Communications Commission (NCC) is the regulatory body responsible for overseeing the telecommunications industry. It has taken various measures to promote fair competition and protect consumers' interests

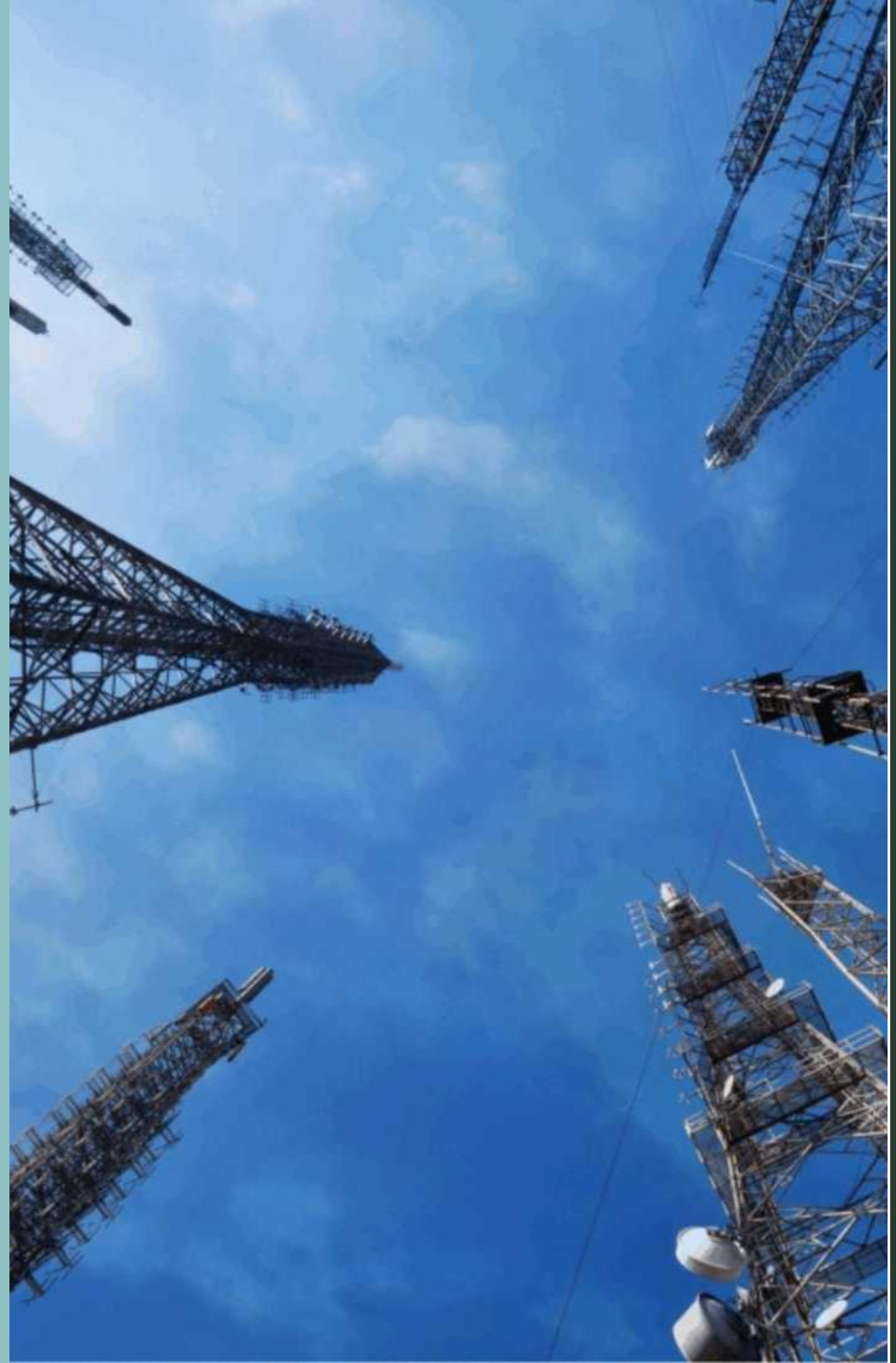
KEY PLAYERS

NIGERIAN COMMUNICATION COMMISSION (NCC)

NCC functions as the autonomous National Regulatory Authority overseeing the telecommunications sector in Nigeria. Its core responsibilities include fostering a conducive environment for healthy competition among industry operators and ensuring the widespread availability of high-quality and effective telecommunications services across the nation.

TELECOM OPERATORS

Offer telecom services to subscribers, with MTN, Airtel, Globacom, and Etisalat being the prominent players. Among them, MTN holds the largest subscriber base. These four major operators collectively cater to over 99% of the telecommunications market, providing services to the majority of users.

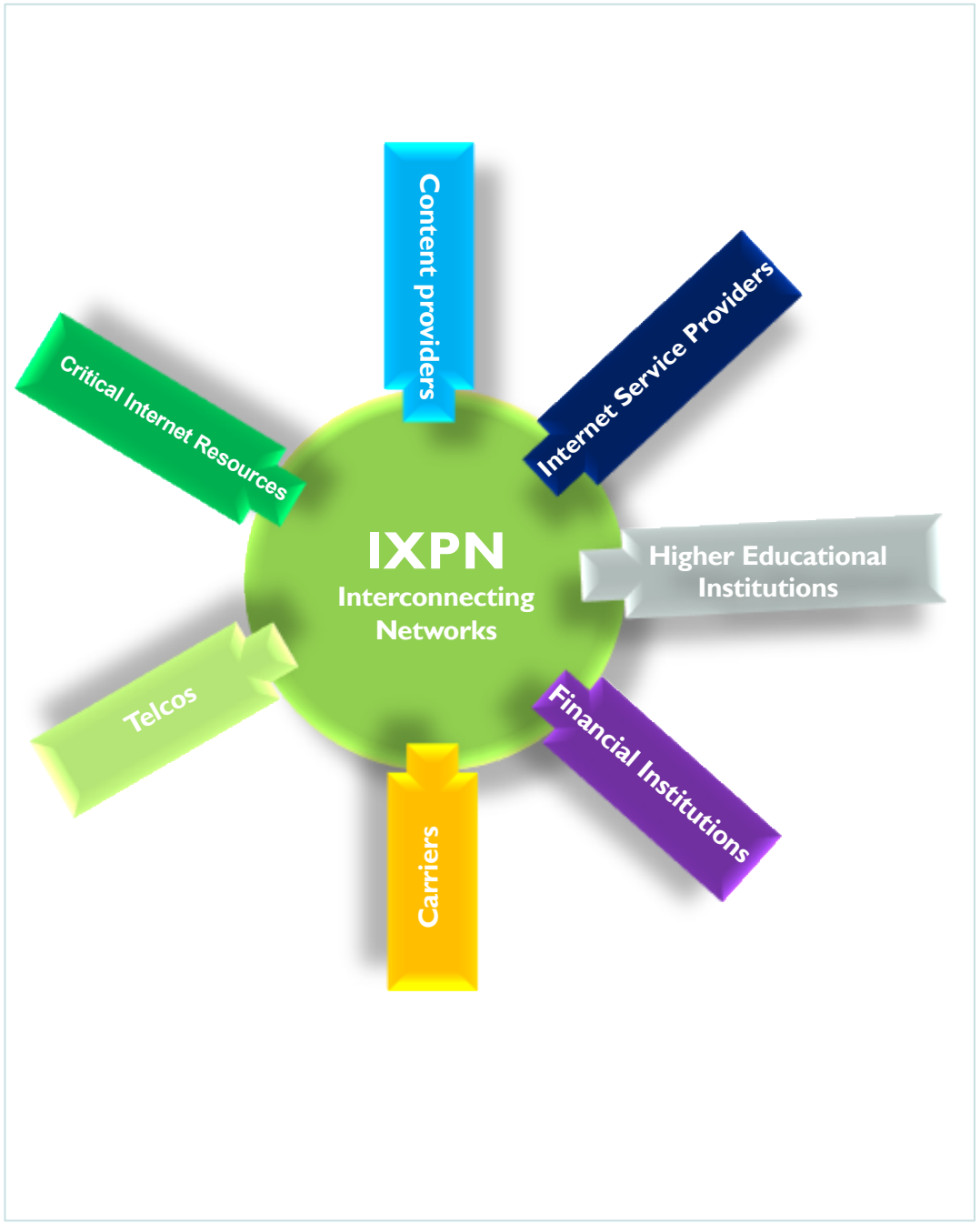


INFRASTRUCTURE PROVIDERS

Offer vital infrastructural services, such as facilitating the collocation of base stations on towers. These providers take charge of powering, securing, and maintaining the sites. Some infrastructure providers also offer connectivity services, including in-land fibre connectivity and international (internet) fibre connectivity. Prominent players in this sub-sector include IHS, ATC, HTN, Glo, MainOne, MTN among others.

DATA CENTER (DC) OPERATORS

DCs host and manage the hardware and software components that drive telecommunications networks, such as servers, switches, routers, and storage systems. These centres facilitate the processing of voice, video, and data traffic, ensuring smooth transmission and minimal latency. Notable operators in this space are Rack Centre, Medallion Communications, Africa Datacentres, Cloud Exchange, MDXi Data centre etc.



INTERNET EXCHANGE POINTS (IXPs)

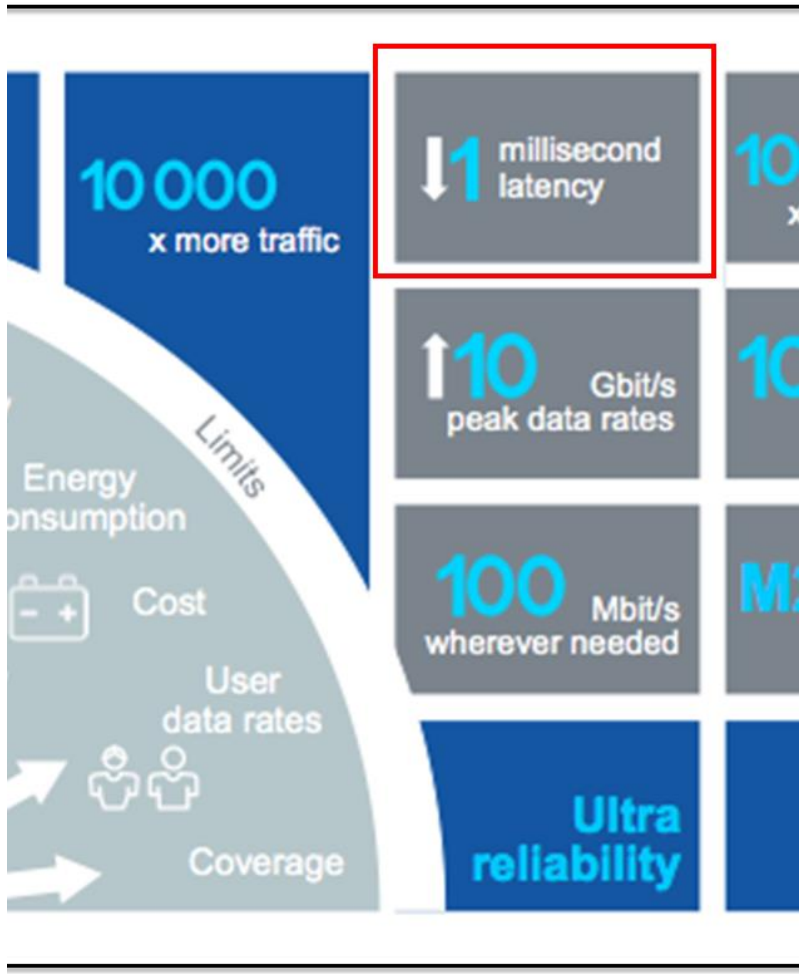
An IXP serves as a physical infrastructure where various service providers interconnect to exchange Internet traffic. The Internet exchange point of Nigeria (IXPN) is the first and major IXP in Nigeria. By connecting to an IXP, companies can shorten their data path to the transit provided by other participating networks, leading to reduced latency, improved round-trip time, and potentially lower costs.

TRENDS AND INNOVATIONS

5G TECHNOLOGY

5G technology represents the fifth generation of wireless communication technology, designed to provide faster data transfer rates, enabling speeds of up to 10 gigabits per second (Gbps), which is approximately 100 times faster than 4G.

This enhanced speed allows for quicker downloads, seamless streaming of high-definition content, and supports emerging technologies like augmented reality (AR), virtual reality (VR), and the Internet of Things (IoT).



5G TECHNOLOGY

One of the key features of 5G is its lower latency, which refers to the time it takes for data to travel between devices and the network. 5G achieves ultra-low latency, reducing delays to as little as one millisecond. This instant responsiveness is crucial for applications that require real-time communication, such as remote surgery, autonomous vehicles, and immersive gaming experiences.

5G TECHNOLOGY

Another defining aspect of 5G technology is its increased capacity. By utilizing higher frequency bands, 5G can support a significantly larger number of devices simultaneously. This is particularly vital for the IoT, where billions of connected devices are expected to communicate with each other, enabling smart homes, smart cities, and improved industrial automation.

CLOUD COMPUTING

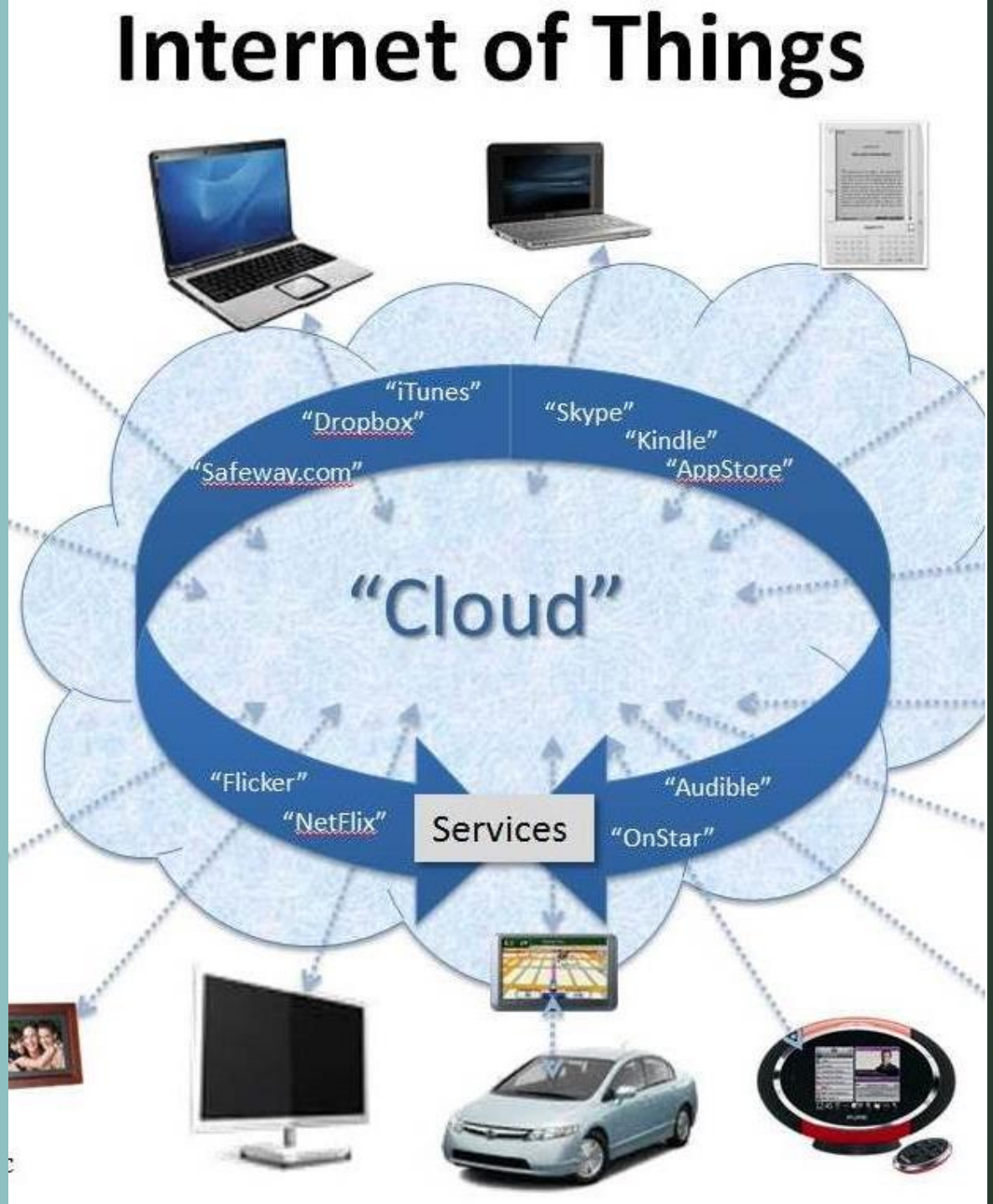
- Cloud computing enables telecom operators in Nigeria to scale their services and infrastructure more efficiently. Instead of investing in costly physical hardware and data centers, telecom companies can leverage cloud-based solutions to rapidly expand their capabilities based on customer demands.

CLOUD COMPUTING

- Cloud computing enhances the efficiency and cost-effectiveness of telecom operations in Nigeria. By utilizing cloud-based platforms and software-as-a-service (SaaS) applications, telecom companies can streamline their internal processes, such as billing, customer management, and network monitoring.

INTERNET OF THINGS (IOT)

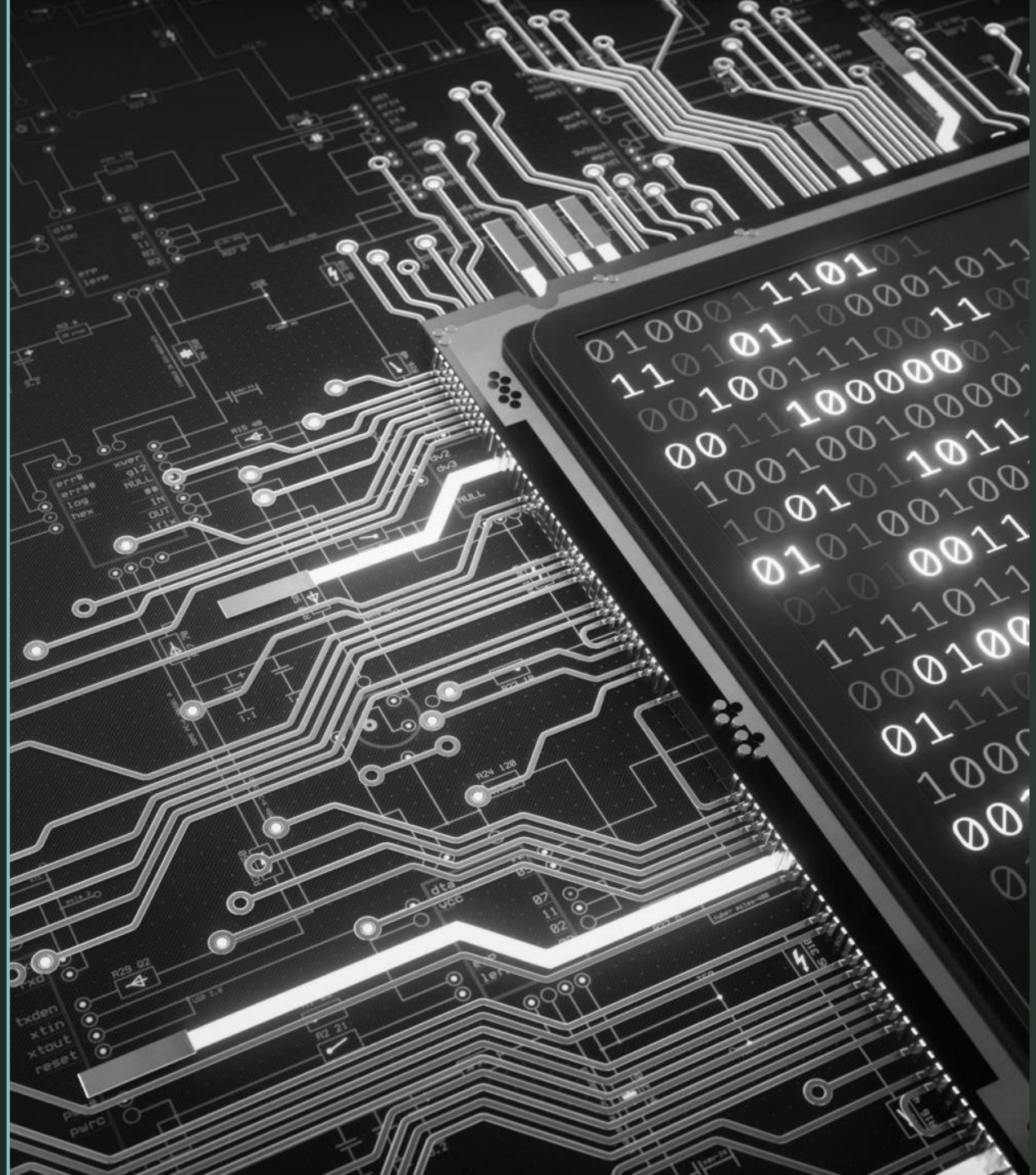
IoT enables the interconnection of various devices and objects, creating a vast network of smart and connected systems. In Nigeria, this interconnectedness can be leveraged to enhance numerous industries, such as agriculture, healthcare, transportation, and smart cities. IoT-powered agricultural solutions can optimize farming practices, improve crop yields, and conserve water resources, contributing to food security and economic growth.



INTERNET OF THINGS (IOT)

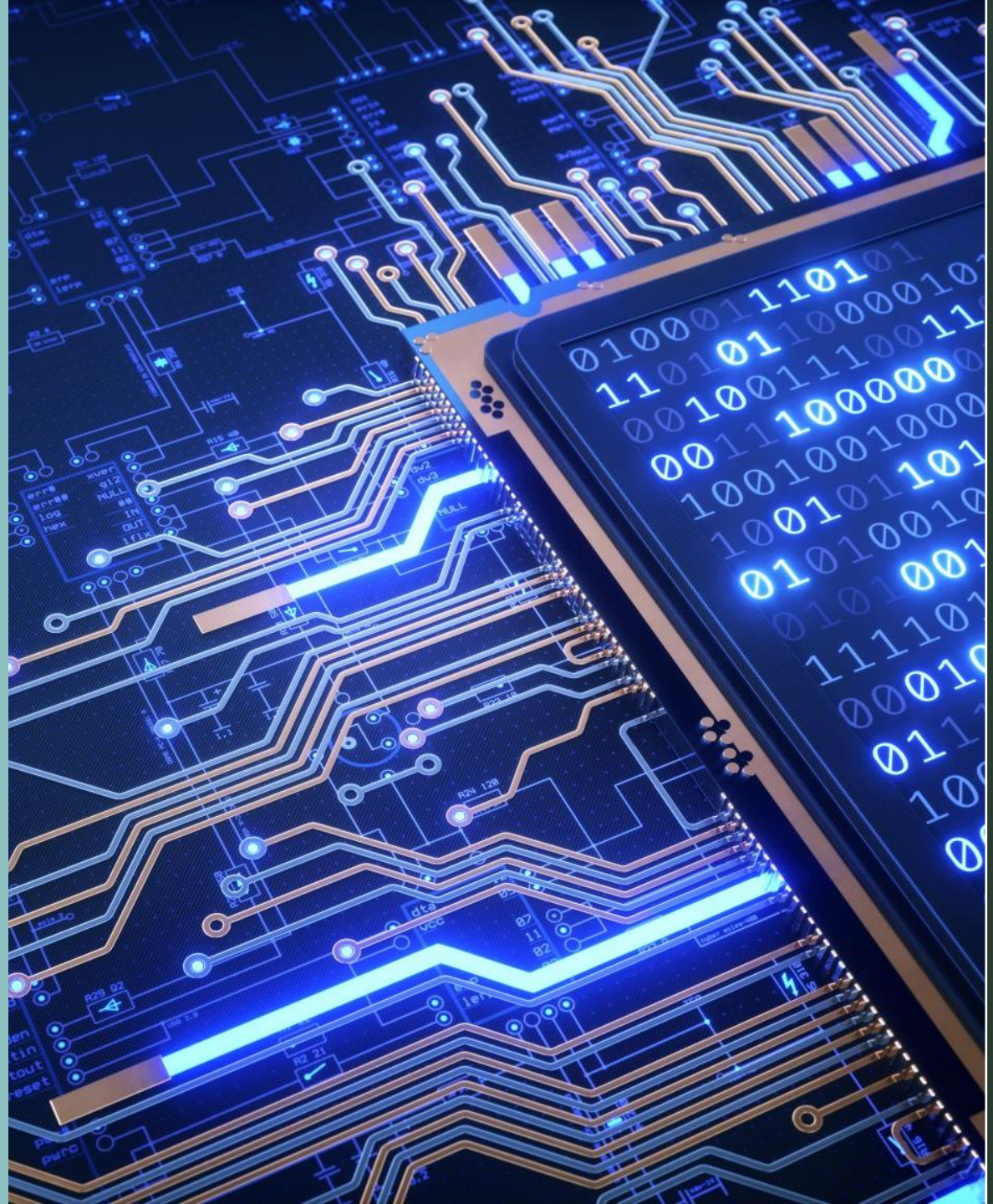
IoT devices can be utilized to monitor and manage network infrastructure, enabling proactive maintenance and reducing downtime.

Proliferation of IoT devices and services opens up new revenue streams for the Nigerian telecom sector. As the number of connected devices increases, there will be a higher demand for data connectivity and IoT-specific services



Artificial Intelligence (AI)

Artificial Intelligence (AI) is a branch of computer science that aims to create intelligent machines capable of performing tasks that typically require human intelligence. AI systems are designed to learn from experience, adapt to new information, and make decisions based on patterns and data analysis.

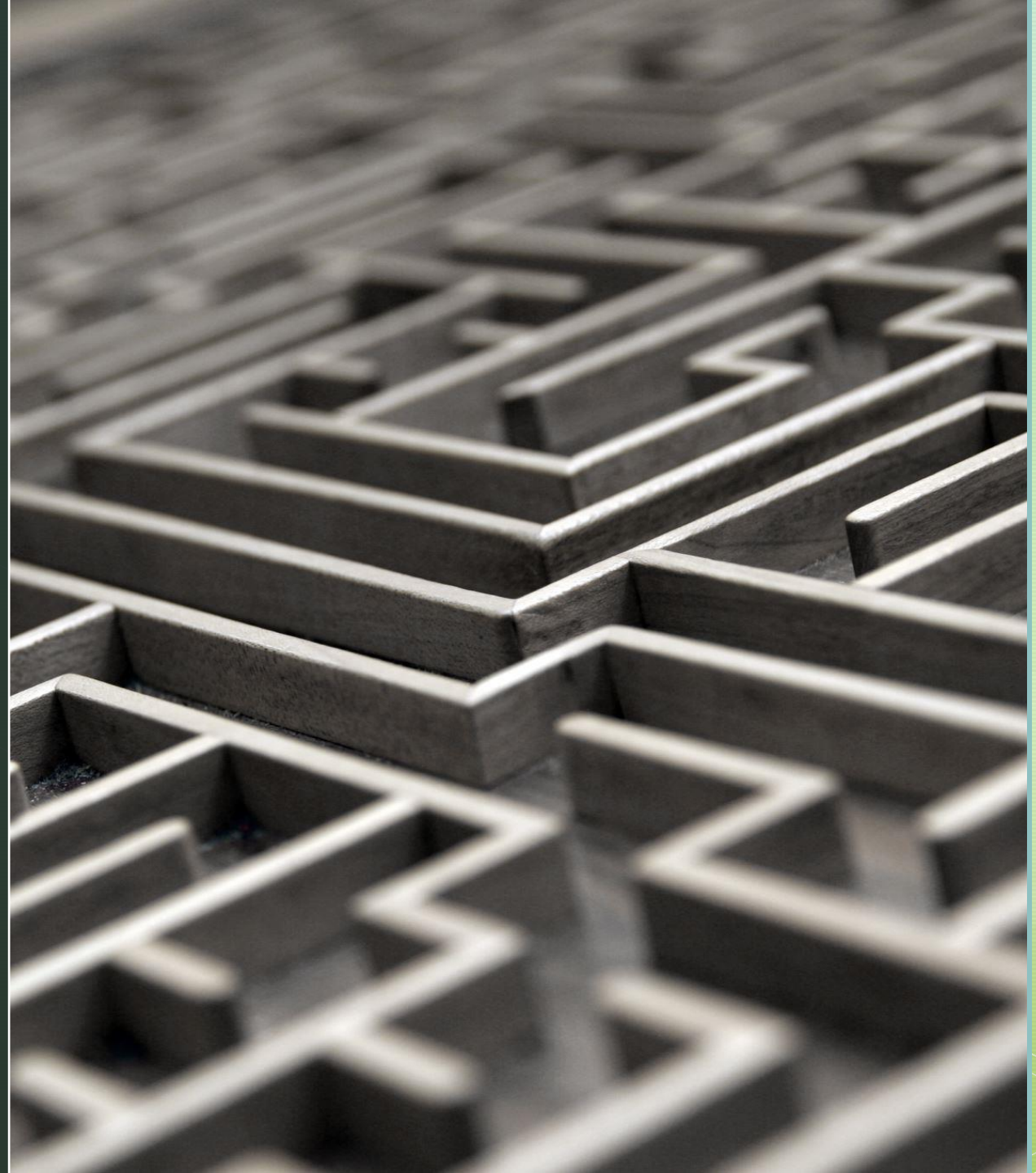


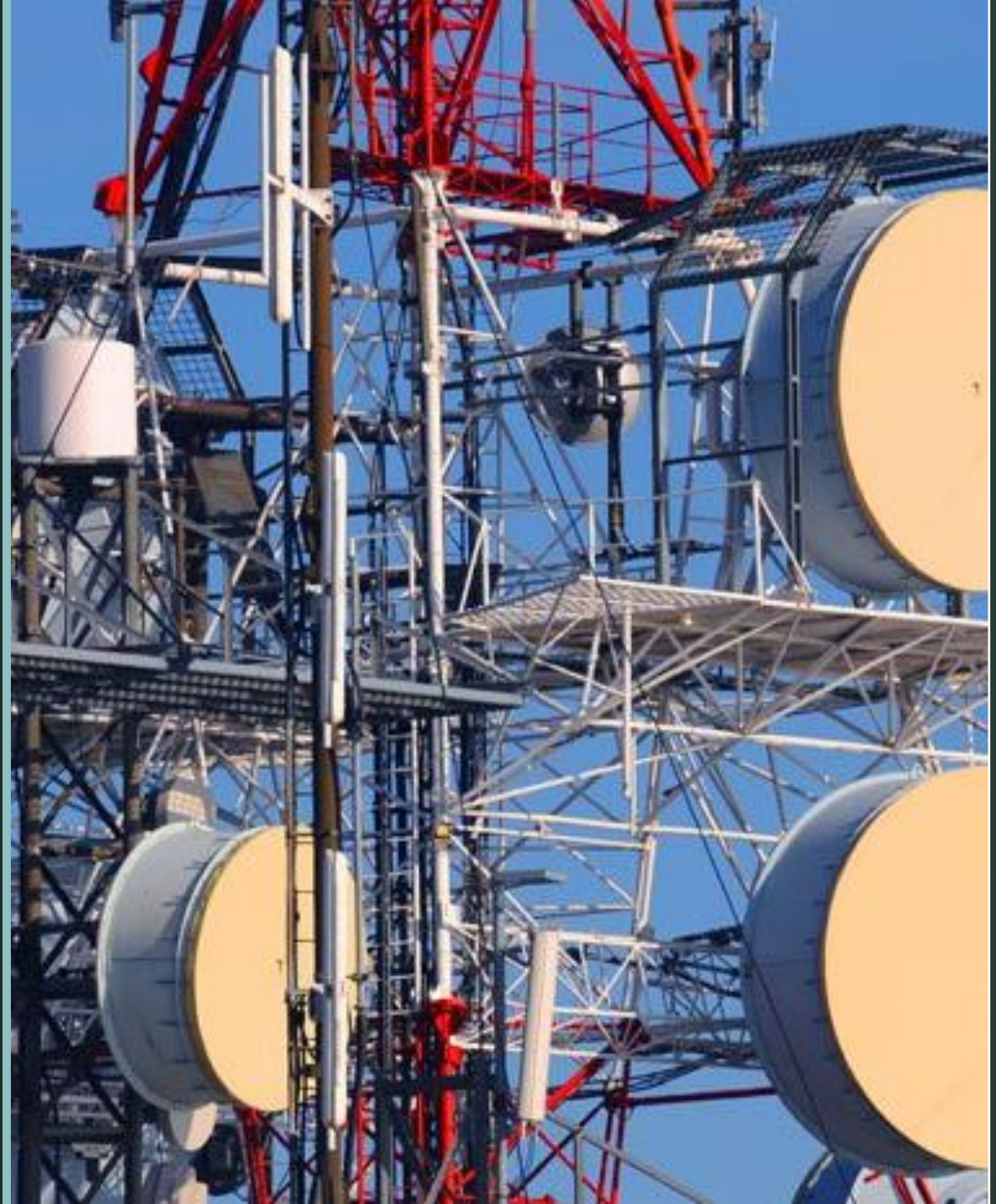
Artificial Intelligence (AI)

AI can optimize network management and performance. By leveraging AI-based predictive analytics, telecom companies can proactively identify and address network issues before they escalate, leading to improved network reliability and reduced downtime.

AI can drive business intelligence and decision-making in the Nigerian telecom sector. By analysing large volumes of data from diverse sources, AI algorithms can extract valuable insights and trends that can inform strategic decision-making.

SOME of the CHALLENGES





INADEQUATE INFRASTRUCTURE

Inadequate and poorly maintained telecom infrastructure is a significant hurdle to the sector’s growth. Limited coverage and insufficient network capacity in rural and remote areas result in digital exclusion and unequal access to telecom services. The lack of infrastructure development hampers the rollout of advanced technologies like 4G and 5G, hindering the sector's ability to meet the increasing demand for data and high-speed internet.

CYBERSECURITY CONCERNS

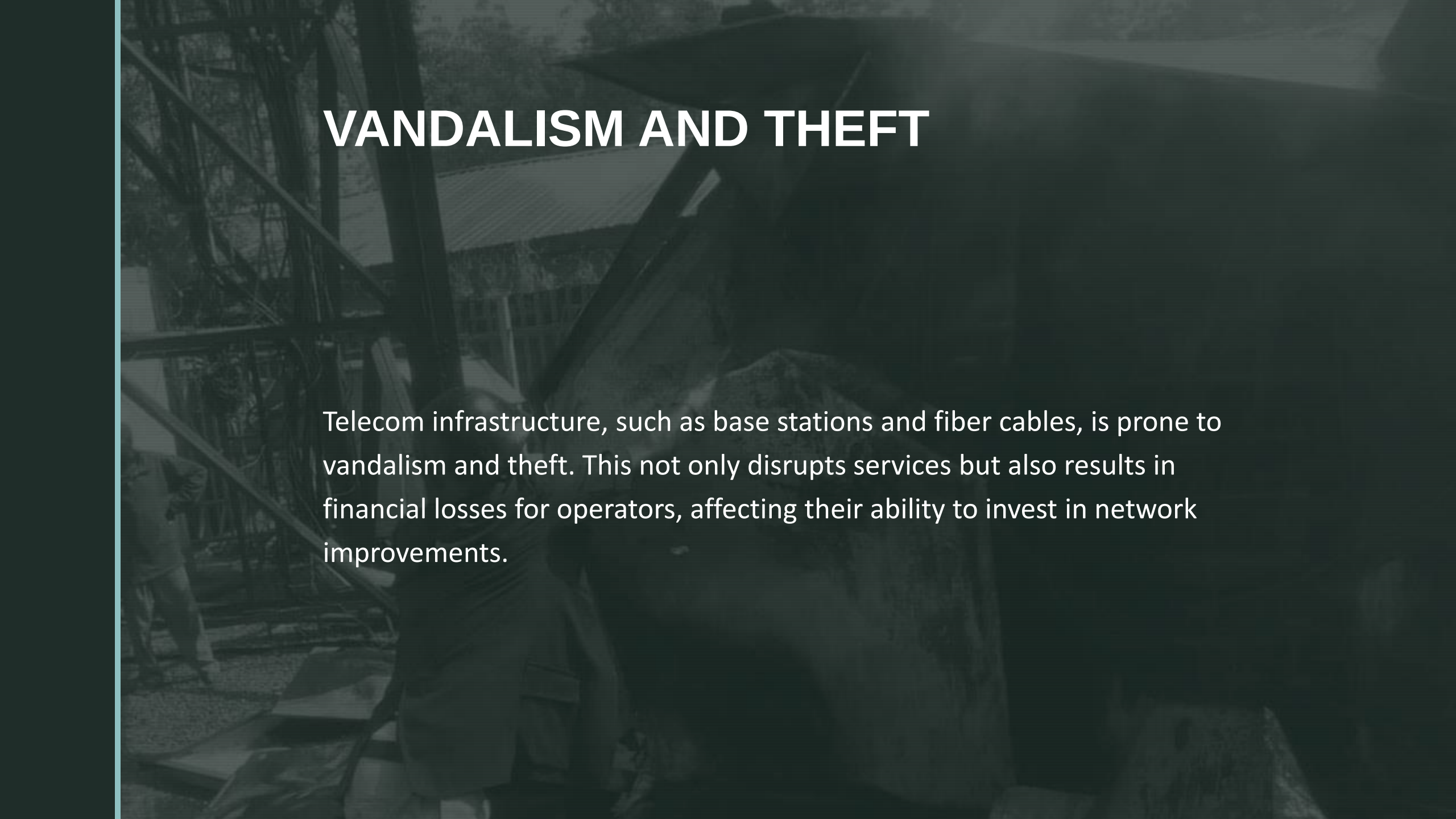
The telecom sector in Nigeria faces cybersecurity threats, including data breaches, network intrusions, and fraud. Cyberattacks can disrupt services, compromise user privacy, and erode trust in the industry. Without robust security measures, both telecom companies and their customers are at risk, and addressing these concerns is crucial for sustainable growth.

REGULATORY CHALLENGES

Regulatory Challenges: Lengthy approval processes and high taxes on telecom services can impede infrastructure expansion and service improvements. A stable and predictable regulatory environment is necessary to attract investments, stimulate competition, and drive sector growth.

RIGHT OF WAY (RoW) ISSUES

The process of obtaining RoW approvals for laying fiber optic cables and deploying telecom infrastructure is often time-consuming and expensive. High fees and bureaucratic hurdles can deter operators from expanding their networks, particularly in urban areas where RoW costs can be exorbitant.



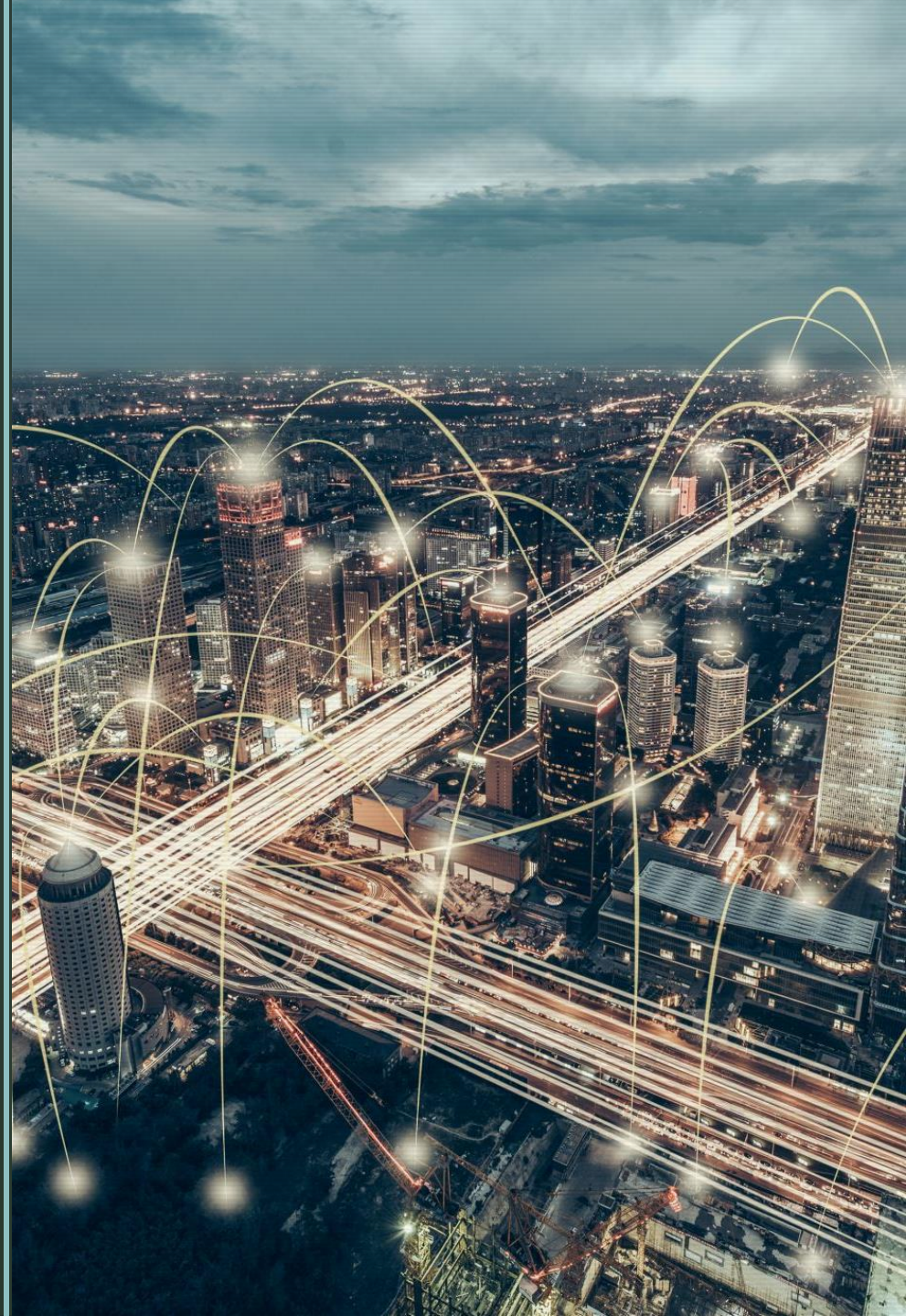
VANDALISM AND THEFT

Telecom infrastructure, such as base stations and fiber cables, is prone to vandalism and theft. This not only disrupts services but also results in financial losses for operators, affecting their ability to invest in network improvements.

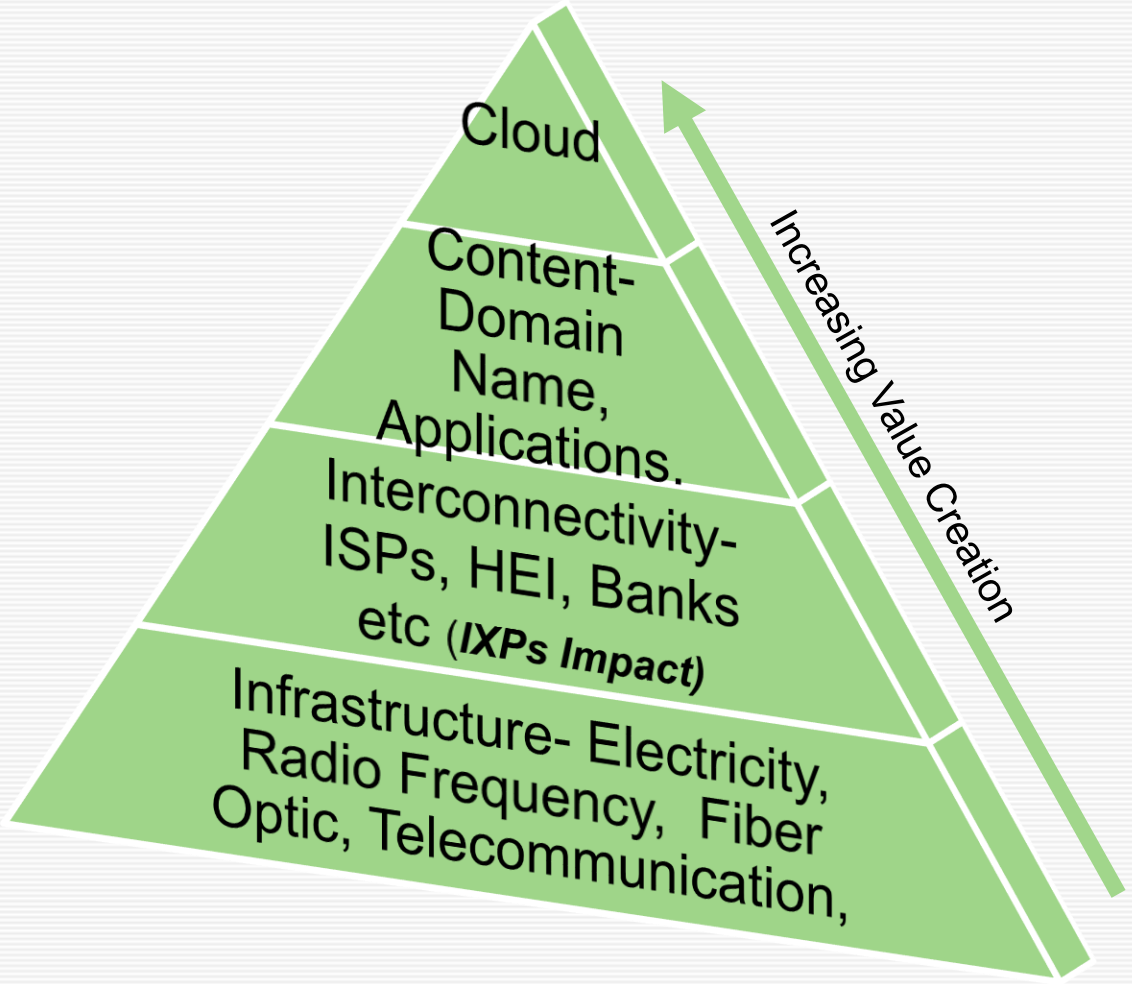
ECONOMIC FACTORS

Fluctuations in the economy, currency devaluation, and inflation can impact telecom operators' profitability and investment capacity. Economic uncertainties can deter investors and hinder long-term planning for infrastructure expansion and upgrades.

RECOMMENDATIONS AND FOCUS AREAS

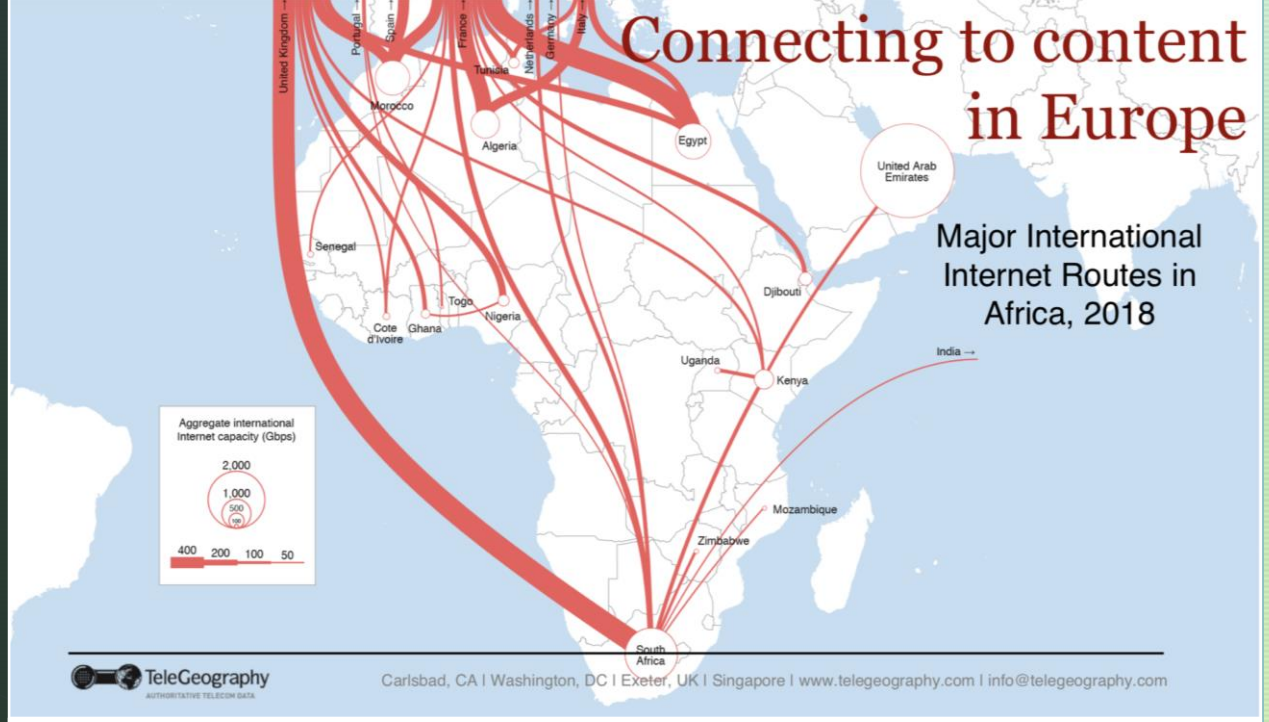


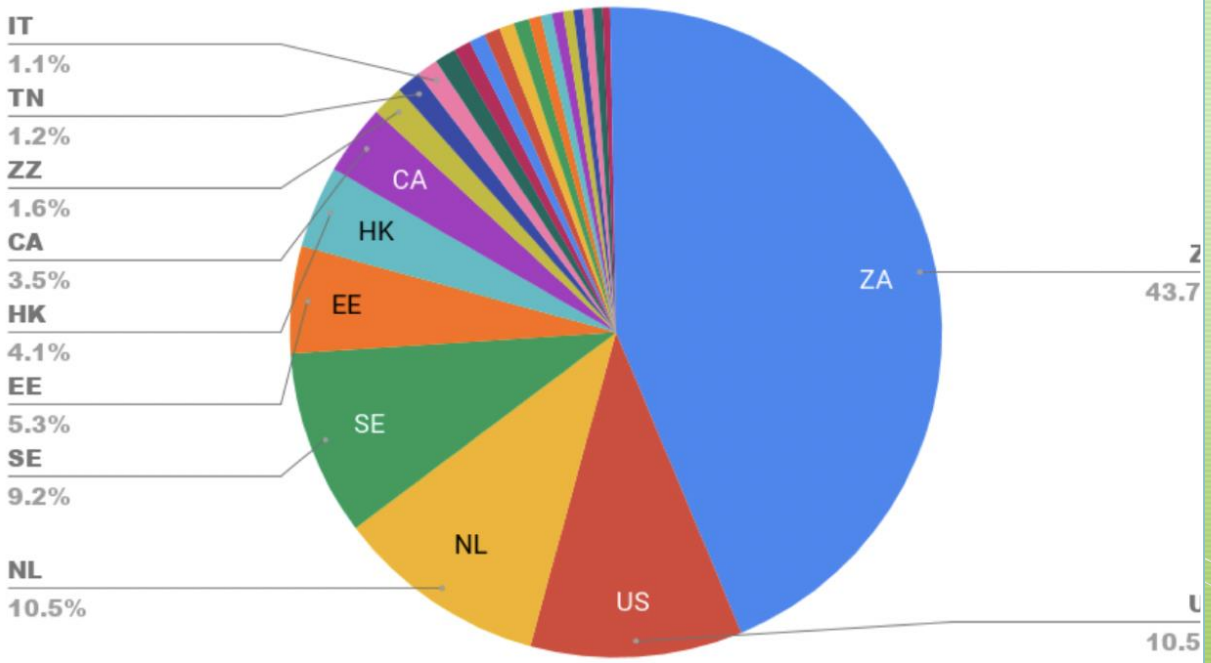
DOMESTICATION/LOCALIZATION OF INTERNET CONTENT (CLOUD)



Technical infrastructure required to support local ICT Ecosystem growth

Location of AfriNIC IPs used for hosting





- Source: Cloudflare and TeleGeography
- https://blog.cloudflare.com/african-traffic-growth-and-predictions-for-the-future/

USE 5G TO STRENGTHEN THE EDUCATIONAL SYSTEM

Smart campus

Walled-off classroom

VR & AR
for education

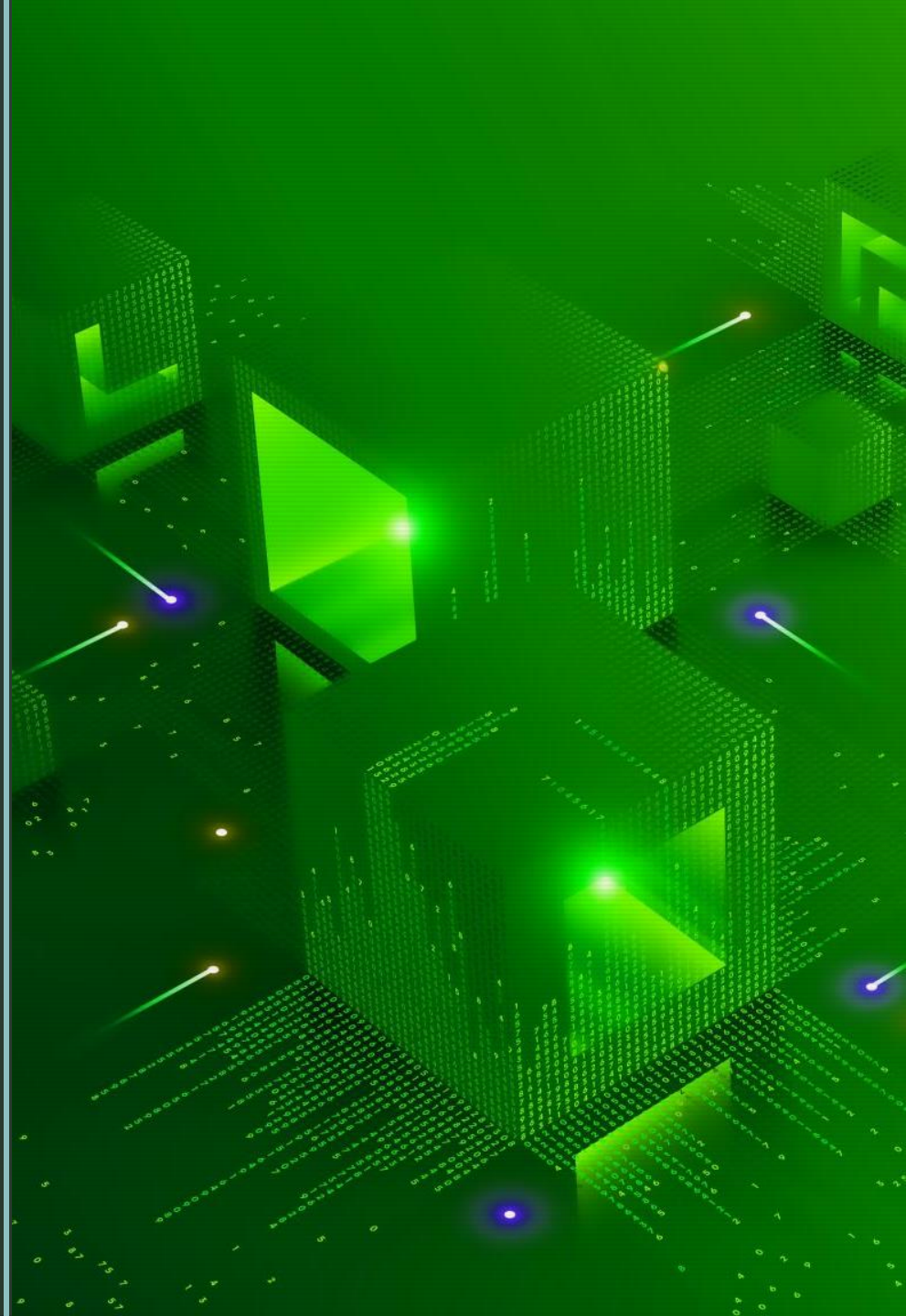
AI-based system to analyse students' engagement

Classroom's automated attendance system

Automation of teachers' administrative tasks

RECOMMENDATIONS

- Infrastructure Development: Focus on expanding and upgrading the telecom infrastructure across the country. This includes increasing the coverage of high-speed internet, especially in rural and underserved areas, and deploying advanced technologies like 5G to accommodate future demands. Government and industry collaboration can play a significant role in accelerating infrastructure development.
- Digital Inclusion: Implement initiatives to bridge the digital divide and promote digital inclusion. This involves making internet services affordable and accessible to all segments of the population, fostering digital literacy programs, and encouraging the adoption of digital services across various sectors, such as healthcare, education, and e-commerce.
- Regulatory Framework: Create a conducive regulatory environment that promotes competition, innovation, and consumer protection. Proactive policies that facilitate investment, fair market practices, and spectrum management are crucial to attracting investments from both local and international players.



RECOMMENDATIONS

Cybersecurity: Strengthen cybersecurity measures to safeguard both users and critical telecom infrastructure. The increasing reliance on digital technologies and data exchange requires robust cybersecurity practices, including regular audits, training programs, and collaborations with cybersecurity experts.

Research and Development: Encourage research and development initiatives in the telecom sector to drive innovation and technology advancements. Supporting local startups and tech companies can foster a culture of innovation, resulting in the creation of homegrown solutions and products tailored to Nigeria's specific needs.

THANK YOU!

- QUESTIONS?