Nigerian Exploits in New and Emerging Technologies

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Introduction

In the evolution of every society, we witness opportunities and advancements which lead to the development of different systems, solutions which in themselves get adopted and become obsolete. These then get replaced or built on.

We see these evolution in the different sectors of the economy including:

- Financial Sector
- Health Sector
- Transport Sector

However, with the Telecommunications sector, advances from this sector has a huge impact on every other sector of the economy.

Nigeria's Economy

- Nigeria's Gross Domestic Product (GDP) stands at $477.4 Billion dollars [1] as at Q4 2022.

- With an annual growth rate of 3.25% at 2022. However, this declined to 2.31% in Q1 2023. This can be attributed to the cash crunch experienced due to the Naira redesign policy [2].
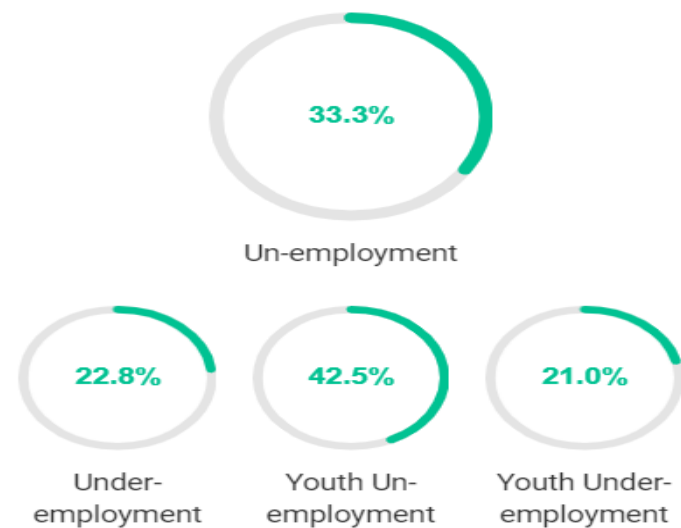
Unemployment Statistics

33.3%
Un-employment

22.8%
Under-employment

42.5%
Youth Un-employment

21.0%
Youth Under-employment

Figure 1. Unemployment Statistics [3]

Nigerian Telecommunications Industry

- The Nigerian Telecommunications Industry contributes 14.13% to Nigeria's GDP.

- Broadband Penetration is 47.01%

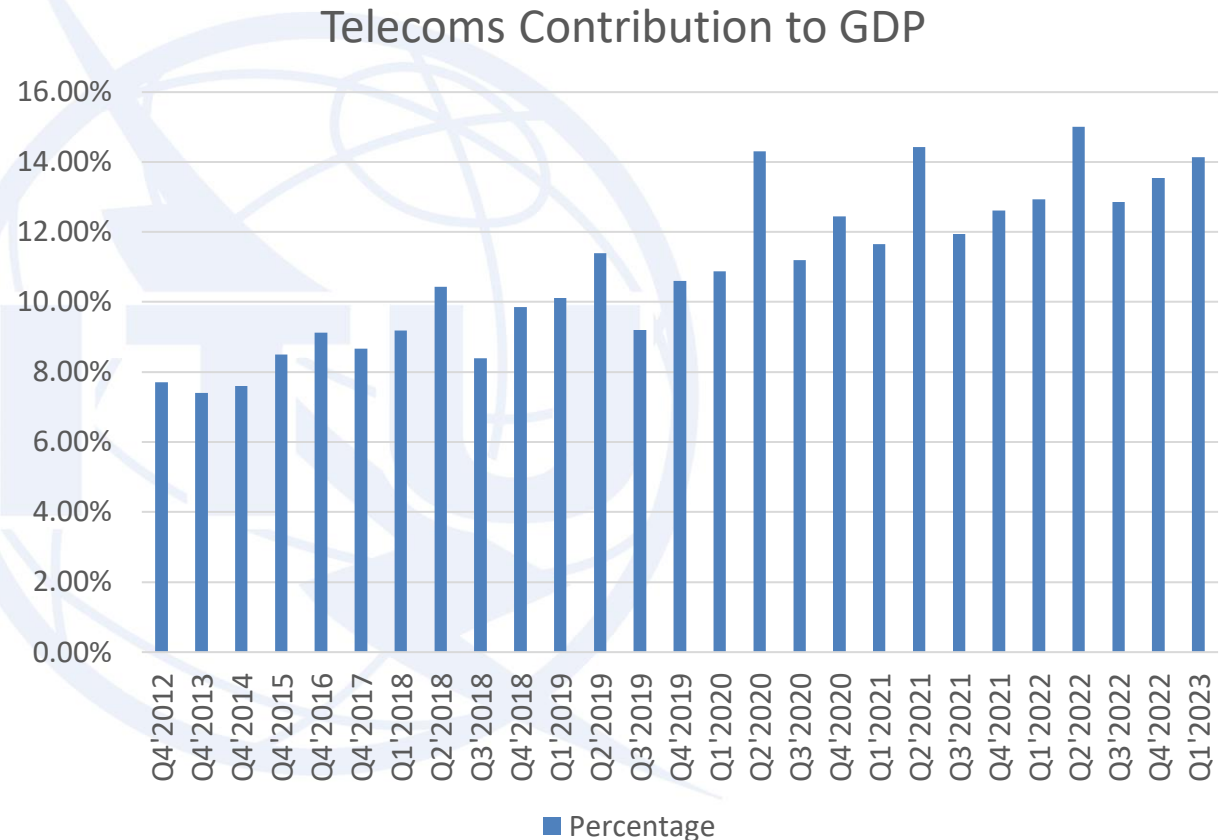- Internet Subscription is 159,498,826

- Tele density is 115.30% [4]

Figure 1: Telecoms Contribution to GDP [4]

Exploits

Nigerian Tertiary institutions and other organizations have been working hard in the exploitation of new and emerging technologies.

We have seen success in:

Agriculture

Data Applications

Contactless Systems for Healthcare

Agriculture

- A data harvesting and monitoring system to Secure Large Scale Farmlands was developed locally. This system integrated the use of IoT devices and sensors across a farmland for efficient farm management.

- An automated animal feeding livestock farming system is being developed. This system has an automated feeder for livestock in a farmland. This is integrated with sensors.
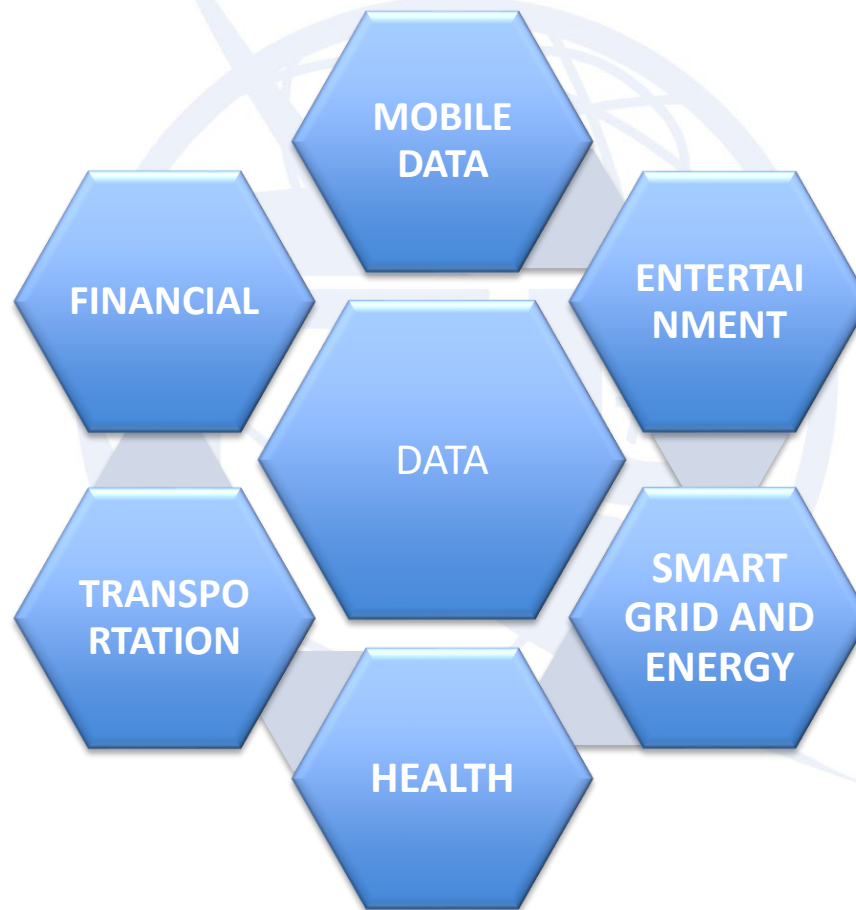
Quadcopter Farming Project

Quadcopter Farming Project

- This system utilizes a smart data harvesting system. The system collects several sensor information at a hub point. The Quadcopter travels round the farmland collecting the information from the different hub points. An intelligent system aggregates the data collected.
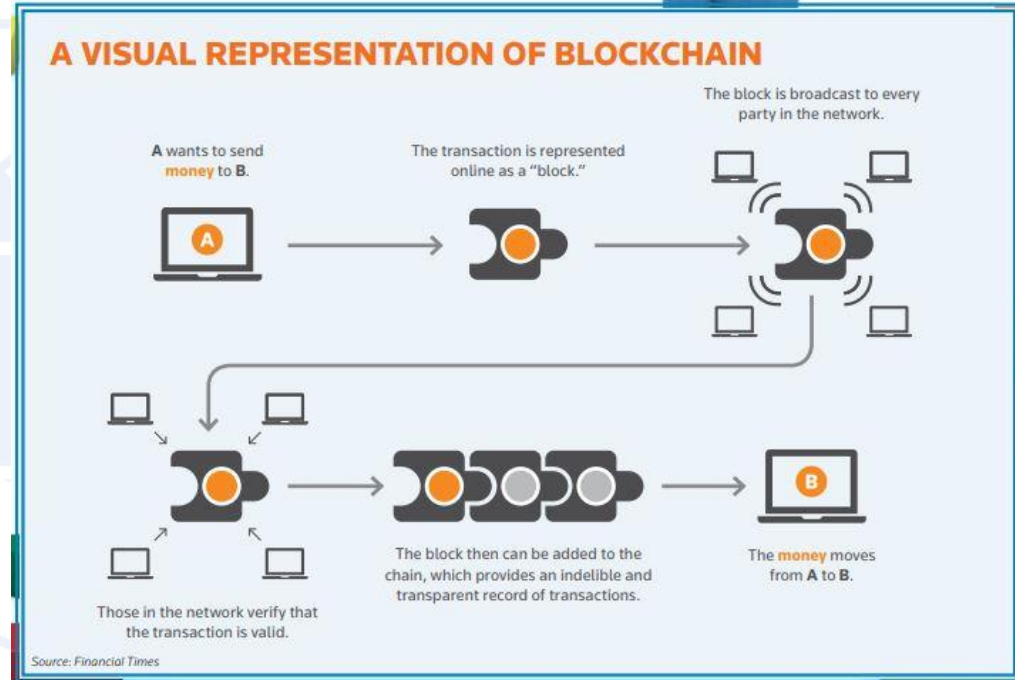
Data

Big data analysis is emerging as a key source of a lot of metrics for socio-economic developments. With a tele-density of 115.30% as at June, 2023 [4]. The amount of data generated within the telecoms sector in Nigeria alone is enormous. Furthermore, looking at it from the population of the country, the sheer data generated within the country is astronomical.

Data Generating Areas in Nigeria

Blockchain

- Blockchain is a shared, immutable ledger for recording transactions, tracking assets and building trust[5].

A VISUAL REPRESENTATION OF BLOCKCHAIN

A wants to send money to B.

The transaction is represented online as a "block."

The block is broadcast to every party in the network.

Those in the network verify that the transaction is valid.

The block then can be added to the chain, which provides an indelible and transparent record of transactions.

The money moves from A to B.

Source: Financial Times

Impact of Blockchain

- Nigeria, Kenya and South Africa are responsible for 70% of the funding for Blockchain technology in Africa. This 70% translates into $88.5 million dollars investment in blockchain within the three countries.

- The key area of blockchain engagement is the financial sector with Fintech revenues projected to reach $30 billion dollars in 2025.

- Within the country, the adoption of the technology in terms of developing indigenous solutions is within the real estate sector. [6]

Data in Over The Top (OTT) Technologies

OTT is defined as content, a service or an application that is provided to the end user over the public Internet. Despite the provision of OTT over public networks, these are provided through the open Internet access, based on the network neutrality principle and by using best-effort approach for packet delivery.

Impact of OTT

- The biggest benefit of these services are the entertainment industry in Nigeria. Amazon Prime and Netflix are investing money in developing and producing Nigerian movies.

- Both Amazon Prime and Netflix are also paying for other movies to add to their catalogue.
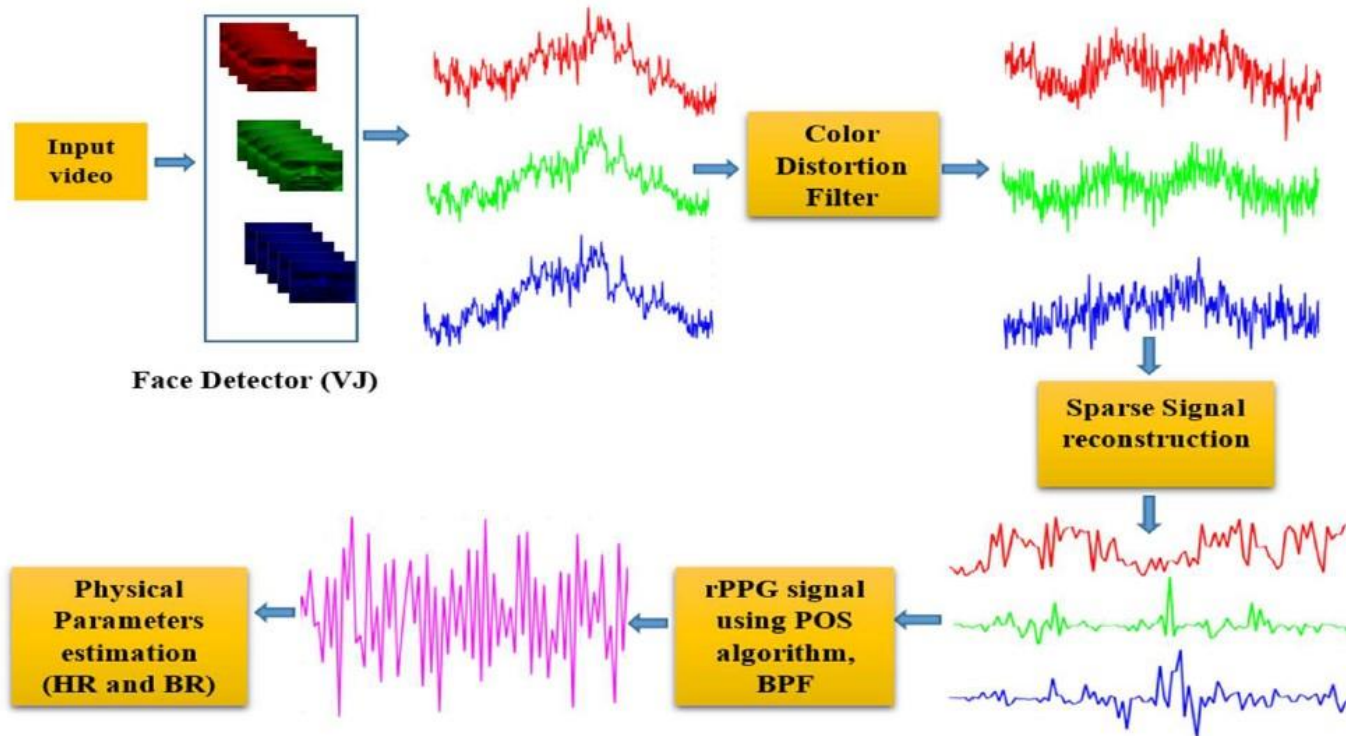
Cloud Computing

Impact of Cloud Computing

- Cloud computing enables a lot of remote based work and services for the Nigerian economy.

- OTT services are mostly depending on these platforms to deliver their services.

- Recent trends have shown that a Mobile Virtual Network Operator (MVNO) can deploy their services via the cloud. Some MVNO are adopting cloud-based approach for service delivery.
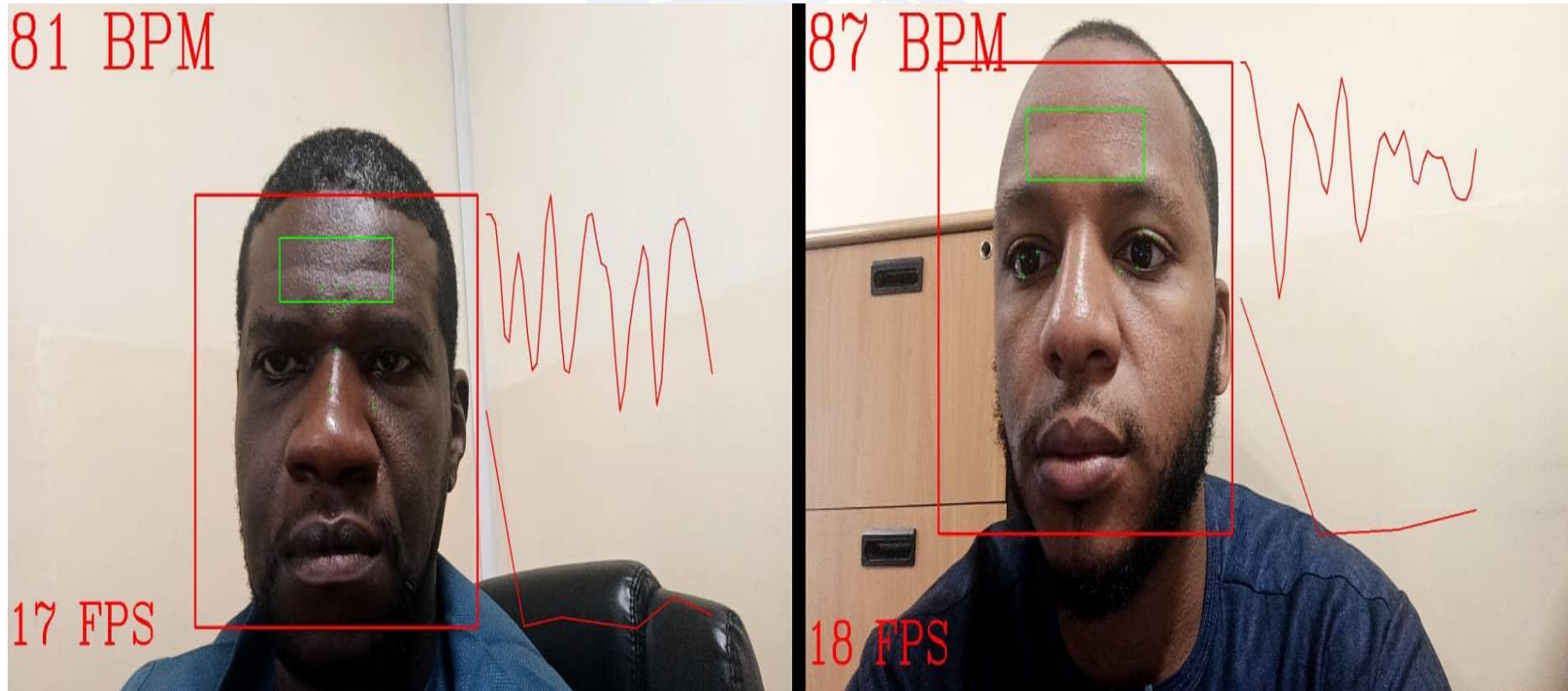
Contactless Health Care

- A contactless heart monitoring system was developed locally during the pandemic. This system uses pattern recognition to identify a few key parameters from facial data.

- The system is a non-invasive heart rate measurement system using sparse representation.

Contactless Vital Sign Monitoring System

Visual Representation of the Vital Signs

Conclusion

- We are seeing more and more adoption of future technologies in the country.

- The activities in the country show that it is ripe for future networks.

- There is need to harmonize the different data generated in the country.

- There is need for collaboration between different stakeholders to move the standardization efforts in developing countries forward.

- Awareness of internal stakeholders should be carried out by members from developing nations to carry key stakeholders along.

THANK YOU

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