

Examining the prospects of 5G Network policy and its Economic Impact in Nigeria.

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ABSTRACT: The advent of 5G network has necessitated a paradigm shift in network and telecom industries in the world. As such, Nigeria has joined the host of other nations that has embraced, accepted and adopted a policy to the use of 5G network in the telecom space. This study aims at examining the prospects, importance and acceptance by the federal government(FG) of Nigeria to adopt the usage of 5G technology in Nigeria. The benefits of this technology were reviewed across the section of network users, E-business vendors and service providers to ascertain the supposed usefulness, economic impact and quality of service delivery etc. A strong acceptance and correlation of opinion among the network users, E-business vendors and the service providers in support of the decision of the FG to adopt this new network technology to improve the economy digitally was observed, hence the urgent need for its deployment.

KEYWORDS:5G, 4G, Telecom, Stakeholders

I. INTRODUCTION

Nigeria has over the years remain an import driven economy that rely mostly on the export of oil as the only source of revenue. This has consistently kept the gross domestic product(GDP) on a steady fall. There are several sectors, ministries, departments and agencies of the government that has the capacity to drive the nation economy to maintain a steady good health. One of such includes the ministry of communication and digital economy. Just recently. the ministry headed by the Hon. Minister, Dr. Isa Pantami has successfully led the federal government to approve the Fifth Generation Network, otherwise known as 5G for the nation. This approval did not come hitch free, as so many stakeholders were against the advent of this network in the Nigeria space due to some erroneous perceived health implication in the wake of covid-19 and some political interest. The approved network will undoubtedly improve the

communication and economic status of different sectors in Nigeria. The advent of 5G has improved the telecom industries in the world at large and has enhanced the economy of the various nations in use of this technology.

Nigeria in the past has boosted its economy through the existence of some telecom industries in the country including MTN, GLO, AIRTEL etc whose existence brought about job employment opportunities, effective communication, establishment of online and E-business architectures which has a positive impact on the economy.

The importance of 5G in different sectors and the nation generally cannot be underestimated, even the agricultural sector is not left out as opined by [1] that Over the next decade, the superfast 5G network will play a critical role in farming industries to improve the yields and quality of crops while using minimal labor. Smart and precision farming allows farmers to be more informed and productive. The advent of 5G will considerably change the nature of jobs in farming and agriculture.

Also, [2] posited that the development of wireless communications benefits society—from science and technology to community and people’s well-being. The progress and the demands in society in turn propel the innovation and the development of wireless communications systems. From 2000 to 2010, we witnessed a 1,000-fold capacity increase of wireless communications systems, with the main drivers being air-interface spectrum efficiency improvement and new spectrum acquisition. Such a capacity increase has fostered the rapid growth of the mobile Internet accompanied by various new applications and services.

II. MOTIVATION OF THE STUDY

The motive of this study is to examine the prospects of 5G network in the Nigeria digital space and its economic impact to the nation.

The specific objectives include

- i) To determine if the network will be of issues or help to users
- ii) To ascertain the economic importance of the technology
- iii) To establish a co-existence relationship style among users, service providers and business vendors

III. PREVIOUS WORK

Comparative Examination of 4G and 5G

According to [3], the 4G is the long-term evolution of the 3G network that marks an audacious shift from the hybrid data and voice networks to only data IP networks. LTE-A is the bridge between the 4G and 5G networks. Nowadays the 4G networks are undergoing rapid deployment whereas the industry is targeting the 202 for the widespread deployment of the 5G network. Till now the 4G networks were focused on the availability of the raw bandwidth which causes low connectivity speed so to overcome this problem, the 5G is aiming for the pervasive connectivity to lay grounds, which provides fast access to the internet users. Unlike 4G, the 5G wireless networks provide internet users the ability to handle a wide range of connected devices and various varieties of traffic types. 5G will also allow internet users to stream and download HD video streaming and low data usage.

5G, People and the Society

According [4] Since the birth of 5G, it has attracted much attention from all countries in the world. The development of 5G industry is particularly important for domestic economic development. They opined that 4G changes life while 5G changes society. 5G will not only accelerate the speed of people surfing the Internet, but also bring revolutionary changes to all aspects of social life, making people's lives, work and entertainment more convenient and diverse. The economic impact of the development of the 5G industry in China cannot be underestimated. Nowadays, information and communication technology has increasingly become a new driving force for economic development. 5G technology has already become a key technology pursuit for countries to compete for the status of world power, and it has also become an indispensable part of contemporary economic and social development. We should give full play to the government's guiding role, and work with network giants to build a new platform for cooperation, promote coordinated industrial development, achieve win-win results, and promote economic and social prosperity and development.

To date, mobile technology has progressed from a predominantly people-to-people platform

(3G) toward people-to information connectivity on a global scale (4G). 5G will leverage and extend the research and development (R&D) and capital investments made in prior mobile technologies to advance mobile to a platform that delivers the much-needed ubiquity, low latency, and adaptability required for future uses. 5G will make possible new classes of advanced applications, foster business innovation and spur economic growth. The emergence of 5G is a fulcrum in the evolution of mobile technology from a technology that had transformative impact on personal communications to a true GPT that promises to transform entire industries and economies [5]

Users and 5G Network

Users are the last participants in the configuration of network architecture. As such, the existence of 5G network in other countries has boosted the rate of data communication among users. Reduced latency has been achieved against the other existing networks. The concept of this new network structure has brought about a relief of data streaming which enhances faster performance and time rate of communication.

As opined by [6], Usually, in the field of data communications, something better means actually something that is faster. The wireless data transmission of 5G refers to actually work over a certain range of radio frequencies. These frequencies are actually limited but the 5G technology uses an algorithm to aggregate different frequencies (bands) in order to obtain a cumulative bandwidth greater than 1 Gbps. The transfer of data within a 5G network will go around a "super-highway" – a way to hugely improve not only the speed for one device streaming a certain set of data, but to all the devices streaming the same data in the same time. This concept will actually give the possibility of tens or hundreds of thousands, even millions, of devices being interconnected in a certain physical area.

This will in no doubt enhance the user performance and improve the speed of data transmission while maximizing data usage. Nothing is as boring to a user as to having a low speed network in internet and mobile communication, but 5G is in place to bridge this gap of latency mostly experienced in the existing networks (3G and 4G).

Telecoms in Nigeria Backs 5G

Meanwhile, ALTON has said Nigeria is ready in terms of infrastructure for 5G rollout across the country. Chairman of ALTON, Gbenga Adebayo who spoke yesterday on ARISE NEWS

Night Channel, the broadcast arm of THISDAY Newspapers, said telecoms operators have built their networks to synchronize with 5G technology and that they are currently upgrading their networks to work seamlessly with 5G technology. According to Adebayo, “The approval of 5G technology for Nigeria is a welcome development that will enhance Nigeria’s drive towards digital economy. The best we can have at this time as a country, is the approval for 5G technology, reason being that every successful generation of mobile technology service has brought improvement both in user experience and the quality of the service. “Studies have shown that 5G is the next generation technology that will bring about high quality of user experience, and faster speed in data transmission. The approval is a good development and we thank all the stakeholders that worked towards the approval.” Asked if Nigeria is ready for 5G rollout, Adebayo said the national networks of telecoms operators were built to accept 5G technology and that telcos were upgrading their facilities to support 5G technology. “What we have deployed on our national network is of international standard that can be compared to networks of developed countries. In terms of readiness for 5G rollout, telecoms operators are ready, even though the telecoms operators still have work to do on their networks,” Adebayo said. He further said when 3G technology was introduced in Nigeria years back, there was some forms of resistance from the public and that telecoms operators would not see the current agitations against 5G rollout as something new. Speaking about the advantages of 5G network, Adebayo said “5G comes with high speed data transmission, low latency and high quality of user experience in the area of big data. “Adebayo further said 5G remained the best technology to be adopted now, and warned that if Nigeria did not adopt 5G technology now, the country would be playing catch-up game later, which he said would be more expensive for Nigeria to bear [7]

The Use of 5G

The use of this network span across different sectors and application areas which enhances the pervasiveness nature of the technology. The application areas include:

- i) Mobile broadband
- ii) IoT
- iii) Artificial Intelligence

Mobile Broadband in Nigeria

Nigeria is the largest mobile market in Africa. At the end of 2019, there were more than 170 million mobile connections (60% of which used 3G or 4G mobile broadband technologies) and the

country accounted for around one in six mobile subscriptions on the continent. [8]

This means that Nigeria is a major stakeholder in terms of mobile network market and requires a very high and fast network technology such as 5G to cushion the effects of the population density in the mobile network environment to continually maintain the quality, availability and reliability of the network connection.

[9]stated that mobile networks can be conceptually divided in two components. The first is the Core Network that ensures the intelligence of the network, such as switching user calls or routing user data to and from the internet. The second is the Radio Access Network, which is the collection of relay sites (i.e. towers hosting base stations and radio equipment) that connects the User Terminal (e.g. mobile phones) to the core of the network. Relay sites communicate with mobile phones in their vicinity using electromagnetic signals. The quality and availability of this communication link can be affected by several factors such as distance between the relay site and the mobile phone or the presence of obstacles (e.g. hills or buildings). A geographical area is considered covered when the signal of any relay site is strong enough for mobile phones in that area to establish a usable connection link with that relay site. The aggregated coverage of a mobile network is calculated by adding up the coverage of all the relay sites in its Radio Access Network.

There is a big expectation in the use of 5G to stimulate the technological and digital economy in this 21st century. This assertion is justified by [1] that IHS Markit anticipates that as 5G technology advances and becomes embedded within devices, machines and processes, wireless communication will similarly have a transformative effect across industries and geographies and help spur a new age of innovation and economic advance. They also viewed that digital mobile technology has steadily progressed from interconnecting people to serving up the data people depend on in both their personal and professional lives. Accordingly, many of the advancements in mobile technology to date have delivered increasingly higher bandwidth necessary to provide nearly ubiquitous voice and data coverage. Despite media and investor hype for companies at the mobile vanguard such as Uber, mobile technologies have yet to make significant inroads in radically transforming the industrial or public sectors of economies.

Internet Usage in Nigeria.

According to a report by [10], internet freedom in Nigeria is among the most established in

Africa. According to an examination of three broad categories, obstacles to access, limits on content as well as violations of user rights, Nigeria is in third place in Sub-Saharan Africa. With one of the youngest and largest populations in the world, Nigeria has a considerable internet audience. Despite an internet penetration rate of below 50 percent, the number of internet users is around 85 million people. A particular aspect of internet usage in Nigeria is the remarkably high penetration of mobile internet. Over 70 percent of internet traffic in Nigeria is generated by mobile devices. However, this might also indicate a lack of adequate equipment to fully use the internet.

The largest internet service provider in Nigeria is Spectranet. Spectranet is an Indian company which counts over 100 thousand active users in Nigeria. When it comes to mobile internet, Nigeria's main operator is MTN, a South-African company. MTN has over 60 million internet subscribers in Nigeria. Recently, the Central Bank of Nigeria licensed mobile providers to operate mobile payments, in which MTN is also active. Some other leading players in mobile internet are Globacom, a Lagos-based company, 9mobile from Nigeria, and the Indian provider Airtel. In terms of prices, Nigeria is 58th in a list of 228 countries worldwide, placed from the cheapest to the most expensive for mobile data.

When compared regionally, Nigeria ranks among the nations with lower costs for mobile data in Africa. A vast mobile internet penetration and some of Africa's largest smartphone ownership rates could imply a profitable market for social media. As of 2020, Nigeria has almost 30 million social media users. The most popular social media are WhatsApp and Facebook. YouTube and Instagram followed. Unsurprisingly, young adults made up the largest share of social media users in Nigeria. An interesting demographic feature of internet usage in Nigeria is the gender disparity. Data analyzing the online advertising audience reveal that the male audience share is noticeably higher among all age groups. In some age ranges, there were even twice as many male social media users.

Also, report on e-commerce spending in Nigeria by (12) shows that in 2020, fashion and beauty accounted for the largest online spending in Nigeria. This sector was worth 1.82 billion U.S. dollars, followed by travel, mobility, and accommodation, with 1.79 billion dollars. Furthermore, other leading categories in terms of value were electronics, physical media, and video games. During 2020, the sector of travel, mobility, and accommodation experienced the only and largest loss among all e-commerce categories.

Economic Importance of 5G in Nigeria

With the connection of 5G networks, smart factories have become the general trend. The combination of smart factories and many advanced technologies in the future will maximize resource utilization, production efficiency and economic benefits. For example, with the help of 5G highspeed networks, the use of big data and cloud computing technology to integrate information and manage and analyze related data, identify problems and make adjustments in a timely manner. Under the premise of ensuring normal production, the production process, equipment, and energy should be correspondingly handled. Supply and personnel adjustments to minimize costs and maximize returns are the ultimate goals pursued by each enterprise; when managing raw material inventory, when a customer order is placed, the system automatically calculates the required raw materials, and according to the supply. The supplier information calculates the purchase time of raw materials in real time to ensure that the inventory cost is the lowest or even zero while meeting the delivery time [4].

The significance of internet usage in Nigeria reveals that the deployment of 5G network will greatly improve the economy digitally in all ramifications. Also, infusing IoT on the platform of 5G is another area that will lift the digital eco system to address and introduce the use of smart agriculture, smart homes, smart cities, remote monitoring etc. These are in no doubt the enablers of the economy in 21st century and cannot be eluding a country with high population density and high internet audience like Nigeria.

In 2020, the telecom sector in Nigeria led the growth of the economy because of the lock down occasioned by covid-19. This is because virtual communication took the stage against physical communication and meetings using platforms such as zoom, skype etc. Though there were issues of poor connectivity due to latency and other network problems experienced in a 4G network. These latency issues are taken care of in the use 5G as it doubles the speed of data communication and operates on fast speed rate.

IV. CONCLUSION

This study provides new evidence on the prospects of adopting the use of 5G technology to improve the different sectors in the Nigeria economy as many opportunities consisting economically, academically, agriculturally etc will be created. It is also expected that employment rate will increase in the next decade as the use of 5G will

enhance the productivity of the small and micro enterprises who will take advantages of this technology to digitally grow their businesses and industries and in turn create employment. The study also concludes that the economic benefits of the 5G outweighs the issues of both political and perceived health implications hindering the deployment of this technology by the operators. The deployment of this newest technology will definitely result to a paradigm shift in the nation technological driven economy in the nearest future as the benefits includes lower latency, larger capacity, quality of service and higher data rate which will improve the area of IoT, Mobile broadband and Artificial intelligence. Thus, the approval by FG came at the right time where the nation is struggling to rebuild its economy in the aftermath of covid-19 lock down.

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