

# E-readiness Assessment of the Nigerian Populace for E-governance

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**Abstract**—E-readiness assessment has no specific tool because e-readiness goals vary, however, the existing tools target the goals of e-readiness such as: e-infrastructure, e-economy, e-society, e-government, and e-governance. The goal of e-readiness in this study is e-governance, therefore, the online presence of the Nigerian government and the internet access by the populace was investigated via government websites, active telephony subscribers, teledensity, and active internet subscribers data. It was observed that: the Nigerian government is present online, the population of Nigerians between 15 and 100 years in 2020 UN data is 116,496,000, the annual active telephony subscribers have been above 168 million since 2018 with teledensity above 98% since 2014, the average monthly active internet subscribers have been above 120 million since 2019. It was also observed that new government policies in telecommunications have negative impacts on telephony subscriptions, teledensity, and internet subscriptions, however, the telecommunications industry have contributed more than 10% to the GDP of Nigeria since the 4th quarter of 2019. The rate at which the Nigerian populace has adopted ICTs is incremental because they have accepted, can access and afford ICTs, therefore, they are e-ready for e-governance.

**Keywords**—e-governance; e-readiness; internet subscriber data; Nigerian population; teledensity.

## I. INTRODUCTION

The advancement in Information and Communication Technologies (ICTs) has made it a key factor for sustainable development. Electronic-readiness (E-readiness) definition depends on the author's goals. The Computer Systems Policy Project (CSPP) gave the first definition of e-readiness in 1998 as the degree to which a community is prepared to participate in the networked world [1]. This definition was adopted by the Centre for International Development (CID) at Harvard in 2000, with the support of the World Bank, World Economic Forum (WEF), and International Business Machines (IBM). Other definitions of e-readiness are variants of the first definition depending on the goals of the author(s). [2] defined e-readiness as the readiness of an individual or a company in accepting the application of

information and communication technology. [3] defined e-readiness as a measuring tool of a national or large-size organization's readiness to provide quality e-services. [4] defined e-readiness as a measure of the degree to which a country, nation or economy is ready, willing or prepared to obtain the benefits of ICTs.

Governance is the exercise of political, economic, and administrative authority in the management of public affairs within a country, including citizens' expression of interests, and the exercise of legal rights and obligations [5]. Governance nowadays can be via traditional means or ICTs. Failure of the traditional means of consultation in developing countries like Nigeria has affected the Nigerian citizen's expression of interest, though some may argue that the country practices representative governance, which implies that the state house of assembly and the national assembly members are representing the public. These representatives are disconnected from the citizens immediately after elections because they do not employ ICTs in consulting the public and the traditional means of consulting the public is no longer adequate for the present population. Most times they represent their interest, that of the traditional rulers, and influential people rather than the public. Therefore, citizens' expression of interests, and exercise of their legal rights and obligations are lacking in developing countries like Nigeria due to the disconnection between the electorate and the elected government officers.

Good governance means empowering the public and ensuring that the citizens are connected to the government. The characteristics of good governance such as: participation, rule of law, transparency, responsiveness, consensus orientation, equity, inclusiveness, effectiveness, efficiency, and accountability [6] are missing in the Nigerian governance system and lack of good governance have resulted to underdevelopment in the country.

Public officers with good intentions are not able to consult the citizens to know their needs and views on public affairs because there is no provision of modern technologies such as online discussion forums, and online surveys. Most elected government officers are disconnected from the public immediately after elections, which is improper because they were elected as a representative of the public, thus, they

are to communicate with the citizens to know their needs and views on public affairs.

The Nigerian citizens demand good governance due to reoccurring corruption that has prevented the nation from attaining its heights internationally. Nigeria is the 7<sup>th</sup> most populous nation in the world with an estimated population of 206,140,000 people in 2020 according to the United Nations (UN) data [7], however, she is the most underdeveloped among the first ten most populous nations (China, India, United States of America, Indonesia, Pakistan, Brazil, Nigeria, Bangladesh, Russia, and Mexico). The rise in corruption is due to the failure of the traditional means of governance to provide robust monitoring and evaluation mechanism, however, electronic-governance (e-governance) is the solution to bad governance [8].

The UN requests that member states devise a robust monitoring and evaluation system to be able to achieve the UN 2030 agenda for sustainable development. The agenda suggests that governments all over the world should ensure responsive, inclusive, participatory, and representative decision-making at all levels. Honest and responsive government was chosen as the fourth-highest priority after education, good healthcare and jobs, in one of the UN surveys called "My World". Respondents agreed that: people should participate in what the government's priorities should be, and have confidence that they will implement those priorities competently, governments should agree and implement standards for making information available to all citizens on how public money is spent [9]. The UN 2030 agenda for sustainable development will be difficult to achieve without e-governance.

The lack of the use of ICT for citizens' inclusion, and consultation for decision-making in Nigeria is the motivation behind this research to find out if the Nigerian populace is e-ready to be electronically governed.

For the rest of this paper, section II reviews e-governance, e-participation, and e-readiness. Section III investigates the online presence of the Nigerian government, the population of Nigerians eligible to participate in decision-making, telephony subscriptions, teledensity, monthly internet subscriptions, and the contributions of the Telecommunications Industry to the Gross Domestic Product (GDP) of Nigeria. The study is concluded in section IV.

## II. LITERATURE REVIEW

### A. E-Governance

E-governance is a product of e-government and the characteristics of good governance; the shaded region of Fig. 1. According to the UNESCO, "E-governance is the public sector's use of ICTs to improve information and service delivery, encouraging citizen participation in the decision-making process

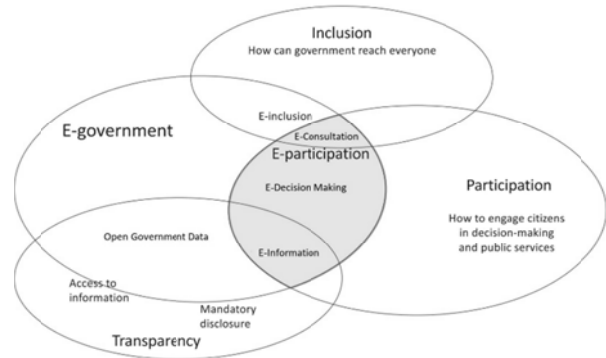


Fig. 1: The interactions between e-government and major characteristics of good governance [10]

and making government more accountable, transparent and effective" [11] [12] [13] [14]. E-governance is a governance style that employs ICTs to ensure transparency, accountability, inclusion, consultation, and participation, which if employed in a country will lead to rapid development. E-governance creates the environment for robust monitoring and evaluation which helps to fight and reduce corruption [15] [16] [13].

[17] stated that e-governance is demanded all over the world to ensure transparency, effectiveness, accountability and efficiency in government sectors and improve decision-making, public policy formulation, and access to information. In e-governance, the government and the citizens manage the public affairs together. E-governance absorbs the knowledge of citizens to produce efficient governance [18]. E-governance leads to transformation in organisational and political services of the government, new codes of conduct and security principles [19]. It is a transformative tool that provides channels for communication and public discourse, through which citizens are ensured transparent governance and participation in decision-making processes [20].

[21] reported that ICT has been used as a means for engaging the citizens in processes like policymaking, disaster response of governments, and the improvement of democracy. [22] reported that ICT tools such as e-mails, online discussion forums, online chat, online surveys, and group support systems are utilized in e-governance. According to [23], many countries have implemented laws and regulations that allow the government to involve the citizens in decision-making through participatory processes.

The Chinese government provided an online communication system for the citizens to make enquiries, transactions, suggestions, and participate in policy discussions for the first time in 2009. At that time, 24% of the population (316 million people) were internet users [18]. Outstanding e-governance initiatives have been reported recently in countries like Finland, Brazil, Malta, the Republic of Korea, and Spain in the 2018 and 2020 UN e-government surveys and they are presented hereafter.

In Finland, the Openness of Government Act was revised in 1999 to improved transparency and citizen participation in governance. The Government's Project Register was established in 1999, and otakantaa.fi website was established in 2000 to promote public discussions on government proposals. There was availability of the government portal ([www.demokratia.fi](http://www.demokratia.fi)) in Finnish and Swedish languages so as to allow every citizen to participate in suggesting initiatives, and make comments to the national, and local governments. In 2012, the Citizen's Initiative for a legislative proposal was launched and initiatives that received more than 50,000 citizens' endorsement at a given time were to be sent to the parliament for assessment as legislative reform [24].

The Brazilian President signed Decree 8.243 in 2014, establishing the National Social Participation Policy and creating the National System of Social Participation. The government has hosted more than 200 participatory processes and over 30 public government consultations through its social participation platform, [participa.br](http://participa.br) ([www.participa.br](http://www.participa.br)). Knowledge Networks were established through Ordinance No. 290 of 2016 so as to improve social participation. Citizens, institutions and communities were invited to be involved in the thematic discussion groups [24].

The Government of Malta presented Digital Malta (the National Digital Strategy) in 2014, and encouraged the citizens, trade unions, civil society organizations, business organizations, government institutions, political parties, and other actors in governance to participate in the online public consultation platform. The platform has provision for the citizens to subscribe for notification about consultations in their areas of interest [24].

Participatory budgeting has been practiced in South Korea for more than 30 years at the municipal level. The citizen's interest in budget was improved by allowing the citizens to make budget proposals and participate in the screening and prioritization of proposals through the national participatory budget system, which was designed to enhance transparency of financial operations. Comprehensive timeline for online, and offline processes were available in the portal [10].

In 2015, the Decide Madrid web platform was created by the city of Madrid to promote the direct participation of residents in key government processes. The platform contains several web tools for:

1) Ideation: The citizens can present proposals to improve the city and proposals that received sufficient endorsement were put to popular vote. If approved, it is binding for the municipal to implement it.

2) Consultations: The City Council consults the residents about the criteria that should be used for carrying out certain projects, or allows them to choose between alternative projects.

3) Participatory budgeting: The City Council reserves a specified amount of money for projects proposed and voted for by the residents. In 2016 and 2017, €100,000,000 was allocated annually, and this was the largest amount dedicated to participatory budgets in the world as at that time [10].

### B. E-Participation

Electronic-participation (E-participation) is one of the key dimensions and measurements of e-governance. E-participation is the use of ICT to engage citizens in policy, decision-making, and service design and delivery. Electronic Participation Index (EPI), is the qualitative assessment of participatory services that are available and relevant in government websites of a country, as compared to all other countries at a particular point in time [9].

Table 1 is the comparison between the EPI of the first top 10 and last top 10 ranking countries in the UN EPI of 2020 [10], and their respective Corruption Perception Index (CPI), from Transparency International in 2020. The CPI ranks 180 countries by their perceived levels of public sector corruption, with a scale of 0 to 100, where 0 is highly corrupt and 100 is very clean [25]. It could be observed that countries that are rated high in EPI have good CPI ratings, while countries that are rated low in EPI, have poor CPI ratings. This is evidence that e-governance reduces corruption.

### C. E-readiness Assessment Tools

There are various e-readiness assessment tools in literature, each looking at different aspects of ICT, society, and the economy. Therefore, selecting a suitable e-readiness assessment tool is dependent on the author's goal or perspective.

The Technology Acceptance Model (TAM), presented by Davis in 1989 was developed based on the Theory of Reasoned Action (TRA) to understand the relationship between end-users beliefs, attitudes, and internal intentions, as well as to predict and explain the acceptance of ICTs. The main variables used in TAM are: perceived ease of use, perceived usefulness, behavioural intention to use, and the actual use of technology [26] [27].

The perceived ease of use, and perceived usefulness determine the behavioural intention to use which in turn determines the actual use of technology. Popular e-readiness assessment tools developed by organizations are [28] [29]:

1) The UN Technological Achievement Index (TAI): It is a made up of different technological achievements of a country, which reflects the level of technological progress and thus the capability of a country to participate in the network age. It has four dimensions which are: the creation of technology, diffusion of newest technologies, diffusion of oldest technologies, and human skills.

2) Global Diffusion of the Internet (GDI): It was

TABLE 1: COMPARISON OF THE FIRST TOP 10 AND LAST TOP 10 RANKING COUNTRIES IN THE UN EPI AND THEIR RESPECTIVE CPI FROM TRANSPARENCY INTERNATIONAL IN 2020.

| Country  | EPI Rank (out of 193) | EPI Score (nearer to 1; more E-Participation) | CPI Rank (out of 180) | CPI Score (nearer to 100; less Corruption Perceived) |
|--|-----------------------|---|-----------------------|--|
| Estonia  | 1                     | 1.0000  | 17                    | 75   |
| South Korea  | 1                     | 1.0000  | 33                    | 61   |
| United States of America                             | 1                     | 1.0000  | 25                    | 67   |
| Japan  | 4                     | 0.9881  | 19                    | 74   |
| New Zealand  | 4                     | 0.9881  | 1                     | 88   |
| Austria  | 6                     | 0.9762  | 15                    | 77   |
| United Kingdom of Great Britain and Northern Ireland | 6                     | 0.9762  | 11                    | 77   |
| Singapore  | 6                     | 0.9762  | 3                     | 85   |
| Australia  | 9                     | 0.9643  | 11                    | 77   |
| Denmark  | 9                     | 0.9643  | 1                     | 88   |
| Netherlands  | 9                     | 0.9643  | 8                     | 82   |
| Algeria  | 183                   | 0.1548  | 104                   | 36   |
| The Central African Republic                         | 184                   | 0.1429  | 146                   | 26   |
| Comoros  | 185                   | 0.119   | 160                   | 21   |
| Mauritania   | 186                   | 0.0952  | 134                   | 29   |
| Guinea-Bissau  | 187                   | 0.0833  | 165                   | 19   |
| Equatorial Guinea                                    | 188                   | 0.0714  | 174                   | 16   |
| North Korea  | 189                   | 0.0357  | 170                   | 18   |
| The Gambia   | 189                   | 0.0357  | 102                   | 37   |
| Libya  | 189                   | 0.0357  | 173                   | 17   |
| South Sudan  | 192                   | 0.0238  | 179                   | 12   |
| Eritrea  | 193                   | 0.0000  | 160                   | 21   |

developed by the MOSAIC Group and is a comprehensive framework that depicts the diffusion of the Internet in a country. The six dimensions of the framework are: pervasiveness, geographic dispersion, sectoral absorption, connectivity infrastructure, organizational infrastructure, and sophistication of use.

3) McConnell International (MI) Ready? Net.Go tool: This measures the status and progress on five correlated attributes namely; connectivity, information security, e-leadership, e-business climate, and human capital.

4) Networked Readiness Index (NRI): It was developed by the World Economic Forum (WEF), INSEAD and infoDev. It is the preparedness of a nation or community to participate in and benefit from IT developments. The variables of this index are; subscribers per hundred inhabitants, Internet users per hundred inhabitants, cellular Internet users per host, availability of public access to the Internet and the percentage of computers connected to the Internet.

5) World Bank's Knowledge Assessment Methodology (KAM): This is based on the knowledge economy framework that integrates four areas viz; developing innovation capability, long-term investments in education, modernizing the information infrastructure, and having an economic environment

that is conducive to market transactions.

6) The Economist Intelligence Unit (EIU) E-Readiness Ranking Tool: It measures the degree to which a market is conducive for internet-based opportunities. It considers the quality of IT infrastructure, the strength of government initiatives, and the degree to which the internet is creating real commercial efficiencies.

7) The UN Conference on Trade and Development (UNCTAD) ICT Development Index: This examines and evaluates ICT development using ICT diffusion indicators across countries. The ICT development indices include; connectivity, access, policy, and usage of ICTs.

[2] adopted the Technology Acceptance Model (TAM) method to determine the e-readiness of employees of the Communication and Information Office of Badung Regency for the e-government system. Questionnaires were distributed to 100 employees of the Communication and Information Office of Badung Regency and the analyses showed that the employees were ready to use the E-government system.

[30] evaluated India's e-readiness via different world-class reports and indices such as: the United Nation's e-government Survey of 2014, the World Economic Forum Networked Readiness Index (NRI) of 2014, the International Telecommunication Union

ICT Development Index of 2014 and the 2008 e-readiness report of India by the Department of Information Technology and the National Council of Applied Economic Research of India. The status of India's e-readiness was compared to that of the world leaders to determine the areas of concern, and challenges of e-readiness in India and the initiatives taken by the government to overcome the challenges were presented.

[31] assessed the effect of four cultural factors to e-readiness for e-government in Sudan. The chosen factors were; age, gender, education and monthly income level. Two questionnaires were distributed; one to the citizens and the other to the employees. 1000 samples were collected from the citizens, and 500 samples were collected from the employees. The responses were analysed with the statistical analysis program SPSS. It was found that: the citizens and employees believed that there are benefits of e-government such as; ease of transactions, increase in efficiency and effectiveness of services, timeliness, and reduction in administrative corruption.

### III. METHODOLOGY

Our intention is to investigate the willingness of the Nigerian populace to use the internet since e-governance is internet dependent, therefore, the TAM model was adopted to evaluate the e-readiness of Nigerians eligible for decision-making. To do so, the population of Nigerians eligible to participate in decision-making was investigated for comparison to telephony and internet subscriptions. Such an investigation requires recent data from the Nigerian Population Commission (NPC) and all the telecommunications industry in Nigeria. As at the time of this research, the NPC does not have recent data on Nigerian population, thus, the UN's data was used. The Nigerian Communications Commission (NCC) has the licence of telephony and internet subscriptions data in Nigeria, therefore, data on telephony and internet subscriptions (the indicators of behavioural intentions of the end-user to use the technology), and teledensity (the indicator of the actual use of the technology) were gathered from the NCC and employed for analyses.

#### A. Online Presence of Nigerian Government, and Decision-Making Population

The Nigerian government website, <https://nigeria.gov.ng/>, provides links to all the state government websites and e-government services in the country. The federal government is rendering e-government services like; company registration, customs, tax, driver's license, drug administration, and immigration, however, there is no form of online citizens' inclusion, consultation, and participation in decision-making.

The decision-making age as enshrined in the 1999 constitution of Nigeria, section 117 (2), states that;

"Every citizen of Nigeria, who has attained the age of 18 years residing in Nigeria at the time of the registration of voters for purposes of election to any legislative house, shall be entitled to be registered as a voter for that election". Also, the Nigerian Electoral Act, 2010, section 12 (2) states that; "A person shall be qualified to register as a voter if such a person has attained the age of 18 years".

The 2020 estimated age group population (both sexes combined) from 15 to 100 years in Nigeria according to the UN data is shown in table 2 [7]. There is no justifiable means of extracting the population of Nigerians between the ages of 18 and 19 years from the data, therefore, the total estimated population of both sexes from 18 to 100 years is less than that of 15 to 100 years, that is, the total estimated population for decision-making in Nigeria for 2020 is less than 116,496,000 people.

#### B. Telephony Subscriber and Teledensity in Nigeria

Teledensity is the number of active telephone connections per one hundred (100) inhabitants living within an area and is expressed as a percentage in Fig. 2. Fig. 2 is the chart of active telephony subscribers and teledensity in Nigeria from 2010 to 2021. The teledensity is based on active subscribers and calculated for a population estimate of 190 million [32].

It could be seen that the annual telephony subscriptions were incremental from 2010 to 2021, depicting continuous increment in intentions to use ICT except for the years 2017 and 2021 which experienced a drop from the previous year's subscriptions due to new government policies on

TABLE 2: AGE GROUP POPULATION (BOTH SEXES COMBINED) FROM 15 TO 100 YEARS

| Age Group (Years) | Population (Thousands) |
|-------------------|------------------------|
| 15-19             | 21,910                 |
| 20-24             | 18,069                 |
| 25-29             | 15,109                 |
| 30-34             | 13,045                 |
| 35-39             | 11,324                 |
| 40-44             | 9,459                  |
| 45-49             | 7,579                  |
| 50-54             | 5,943                  |
| 55-59             | 4,757                  |
| 60-64             | 3,657                  |
| 65-69             | 2,602                  |
| 70-74             | 1,717                  |
| 75-79             | 907                    |
| 80-84             | 333                    |
| 85-89             | 75                     |
| 90-94             | 9                      |
| 95-99             | 1                      |
| 100               | 0                      |
| Total             | 116,496                |

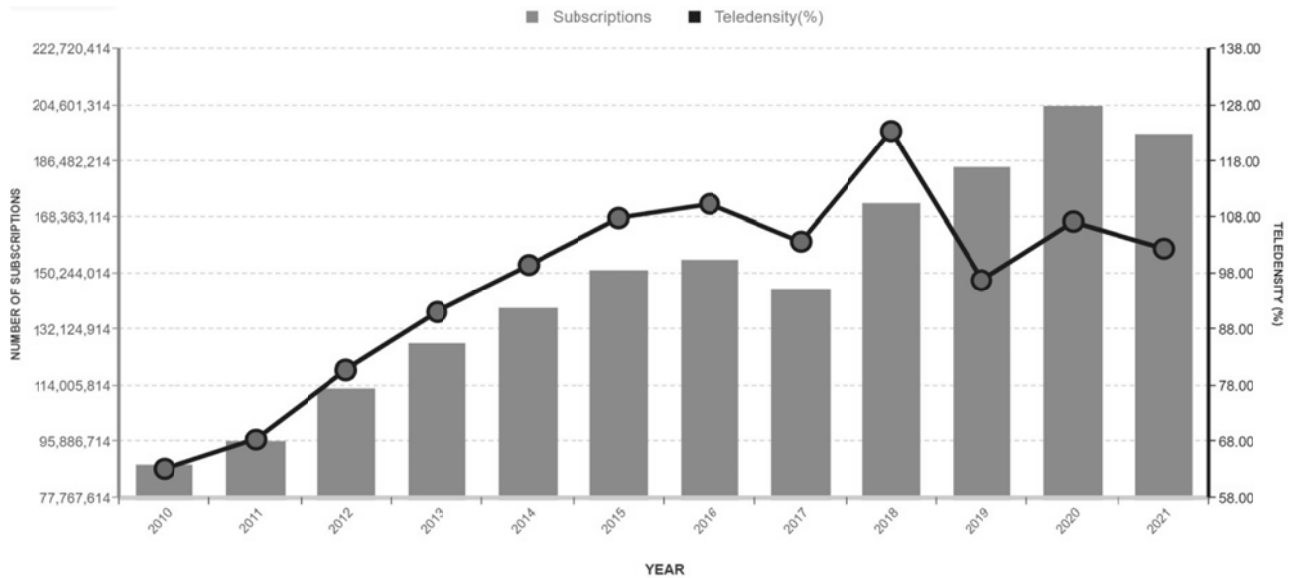


Fig. 2: Annual subscriber and teledensity from 2010 to 2021 in Nigeria [32]

telecommunications which led to the loss of subscriptions to subscribers. However, it has been above 168,000,000 subscriptions since 2018. The teledensity has also been incremental since 2010, though it has a downsize in the years 2017, 2019, and 2021 due to new government policies on telecommunications such as the registration of telephone subscribers' regulations of 2021. However, it has been above 98% since 2014, portraying high level of ICT usage.

C. Internet Subscriber Data in Nigeria

Table 3 shows 2019, 2020, and 2021 monthly active subscribers for data (internet) services for all the licensed service providers utilizing the different technologies such as Global System for Mobile (GSM), Code Division Multiple Access (CDMA), Fixed Wired, and Voice over Internet Protocol (VoIP) in

Nigeria. It could be seen that the total internet subscribers is incremental between the years 2019 and 2020, but dropped in 2021 due to the registration of telephone subscribers regulations of 2021.

The average monthly internet subscribers in 2020 and 2021 are 144,228,487, and 142,513,428 subscribers respectively. The age of the subscribers is not known, however, the internet subscribers in 2020 and 2021 are far above the 2020 estimated population of Nigerians between 15 and 100 years (116,496,000). This shows high intention of Nigerians within the decision-making age to use ICTs.

A. Contributions of the Telecommunications Industry to Gross Domestic Product of Nigeria

Another strong indicator of the perceived acceptance of ICTs by the Nigerian populace is the

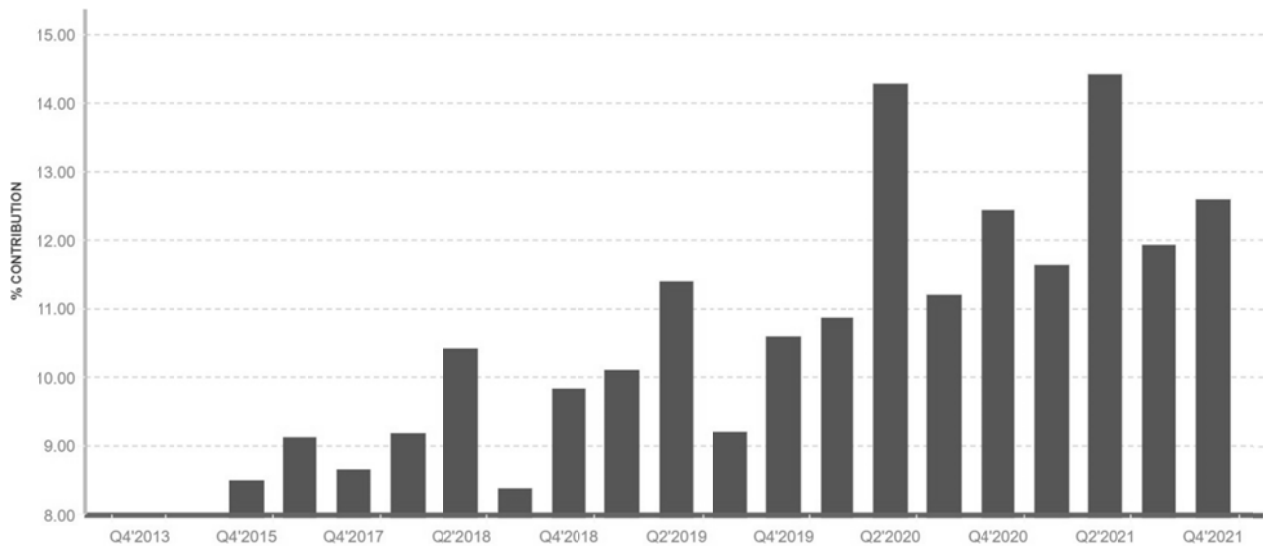


Fig. 3: Contributions of the telecommunications industry to gross domestic product of Nigeria [32]

growth of the telecommunications industry in Nigeria. The telecommunications industry has experienced consistent growth over a period of time as shown in Fig. 3. The telecommunications industry has been contributing more than 10% to the GDP of Nigeria since the 4th quarter of 2019.

#### IV. CONCLUSION

New government policies in telecommunications have negative impacts on telephony subscriptions, teledensity, and internet subscriptions, however, the telecommunications industry have contributed more than 10% to the GDP of Nigeria since the 4th quarter of 2019. The Nigerian government is present online, the total estimated population between 15 and 100 years in 2020 is 116,496,000 people, and the annual telephony subscriptions in 2020 are 204,601,314 subscribers with a teledensity of 108%. The monthly internet data subscriptions in 2020 are 144,228,487 subscribers. This implies that of the citizens within the decision-making age can access and afford internet subscriptions. The rate at which the Nigerian populace has adopted ICTs is incremental because they have

accepted, can access and afford ICTs, therefore, they are e-ready for e-governance.

TABLE 3: STATISTICS OF ACTIVE INTERNET SUBSCRIBERS IN NIGERIA FOR 2019, 2020, AND 2021

| Year  | 2019          | 2020          | 2021          |
|-------|---------------|---------------|---------------|
| Jan.  | 114,306,598   | 128,723,188   | 151,296,836   |
| Feb.  | 115,161,218   | 132,013,241   | 148,518,720   |
| Mar.  | 116,310,154   | 136,114,413   | 144,949,194   |
| Apr.  | 119,877,297   | 138,644,915   | 141,765,721   |
| May   | 123,001,218   | 141,069,537   | 140,488,490   |
| Jun.  | 122,673,623   | 143,636,816   | 140,175,169   |
| Jul.  | 123,069,084   | 147,148,307   | 139,744,180   |
| Aug.  | 122,975,740   | 149,772,236   | 140,225,598   |
| Sep.  | 123,163,027   | 151,512,122   | 140,275,459   |
| Oct.  | 123,559,596   | 152,927,670   | 140,337,560   |
| Nov.  | 122,834,559   | 154,878,203   | 140,412,649   |
| Dec.  | 26,078,999    | 154,301,195   | 141,971,560   |
| Total | 1,453,011,113 | 1,730,741,843 | 1,710,161,136 |

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