Utilization of Nigerian Communications Satellite (NigComSat-1R) Services for Internet Access among Agencies of Federal Ministry of Communications and Digital Economy in Nigeria

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Abstract

The importance of Internet access to nation-building and the development of businesses cannot be over-emphasized. This makes its availability and accessibility a major concern to nations. Communications satellites exist to provide the best alternative for people living in both urban and rural areas. The study focused on the Utilisation of Nigerian Communications Satellite (NigComSat-1R) Services for Internet Access among Agencies of Federal Ministry of Communications and Digital Economy in Nigeria. A descriptive survey design was adopted for the study. The instrument used for data collection was a structured and closed-ended questionnaire. This study has a population of five hundred and nine (509) members of staff that comprises the staff of the two (2) agencies selected for the study. A purposive sampling technique was used to censor 22 members of staff attached to Network Operation Centres (NOC) of both agencies based on their technical knowledge about the different Internet platforms available and suitable to adopt for their respective agencies. Total enumeration sampling techniques were used because the 22 staff sampled is very few and less than 200. The data collected were subjected to descriptive statistical analysis of frequency, percentages, mean and standard deviation. The result shows that NigComSat-1R has three major broadband (C, Ku, and Ka-band)for providing Internet access with high potentials to increase Internet penetration in Nigeria. However, it was discovered that the satellite whose inbuilt capacity for Internet penetration is 39% has very little contribution to the current 33.2% Internet penetration in Nigeria. The study findings revealed that the challenges were lack of adequate patronage due to risk involved in depending on one satellite that lacks backup satellite for redundancy, lack of suitable platforms for deployment of the satellite services for easy accessibility by all, and lack of adequate legislation /regulation that will enforce its patronage. The study concludes that the satellite has been seriously underutilized for over nine (9) years of its existence, and it was recommended that the Federal government of Nigeria should, as a matter of urgency, launch at least two more communications satellites to eliminate the fear of high risk involved in depending on a single satellite-like NigComSat-1R and put in place, proper legislation/regulatory policy that will guide and enforce its usage.

Keywords: Internet Access, Broadband penetration, Nigerian Communications Satellite (NigComSat-1R) and Agencies of Federal Ministry of Communications and Digital Economy

Introduction

Internet is arguably one of the most important resources that drive the economic fortune of any country that aspires to move along with the current trend of globalization. Internet is defined as a universal network of interconnected computer systems that involve billions of

public, private, education, security, business, and government networks. It's an all-encompassing network that allows users at any one computer with permission to get information from another computer and can sometimes communicate directly to other users via different computers at different locations (Margaret, 2019).

The importance of the Internet makes its access a topmost priority and concern to nations. It is accessibility to the Internet that brings about the current trends of paradigm shift from an industrial era (capital-based economy) to an information era (information-based economy), which has now transformed into what is known as a digital economy.

However, Nigeria, in its 25 years National Space Development Roadmap, made provision for the development and application of communications satellite systems to enhance the growth and development of the country in all sectors of the economy. Today, that dream stands to berealized with the launch of Nigerian Communications Satellite, code-named NigComSat-1 R, on Monday 19th December 2011. NigComSat-lR is a replacement of the NigComSat-1 that was launched in May 2007. Though, it was later de-orbited on November 10, 2008, due to malfunctioning of its Solar Array Deployment Assembly (Ahmed,2011).

The Nigerian Communications Satellite (NigComSat-lR) is a satellite designed to meet the needs of telecommunications, Internet penetration, maritime, defense and broadcast media in Africa and some parts of Europe and Asia (Osuagwu & Akinhoade, 2011).

Ahmed (2011), said the satellite was placed in geostationary orbit and positioned at 42.50E. It has a launch mass of 5,100kg, with an expected life span of 15 years. This means that by 2026, The satellite has 28 active transponders quadrant bands of L, C, Ku, and Ka.

Problem Statement

The importance of Internet access to the nation's building and development of businesses cannot be over-stressed. This makes its accessibility a major concern, and Communications satellites exist to provide the best alternative for people living in urban and rural areas. With the successful launching of the Nigerian Communications Satellite (NigComSat-1R), which has 15 years life span and high data speeds with an inbuilt capacity to increase Internet penetration in Nigeria by 39%, Nigerians were hopeful that the satellite would provide the required Internet access at a reduced cost, save the cost of providing Internet access from foreign satellites and other sources and contribute to the gross domestic product (GDP) of Nigeria. This, among other benefits, made the idea of adopting satellite technology a timely wise decision in the best direction.

However, despite the existence of the Nigerian Communications Satellite (NigComSat-1R) services for over nine (9) years now, the Nigerian Communications Commission (NCC) has recently put the Internet penetration from all the available sources of Internet access in Nigeria at 33%. And the largest percentage of this figure is attributed to Mobile data services. This disparity in figures warrants an investigation because Nigeria's Internet penetration is below the 39% inbuilt capacity that NigComSat-1R alone was designed and launched to provide.

Therefore, in order to increase Nigeria's Internet penetration, there is the need to investigate the Utilisation of Nigerian Communications Satellite (NigComSat-1R) services forInternet Access among Agencies of the Federal Ministry of Communicationsand Digital Economy in Nigeria.

Objectives of the Study

Specifically, the work is focused on:

1. Identifying the types of Internet access provided by the NigComSat-1R servutilizedlised among Agencies of Federal Ministry of Communications and Digital Economy in Nigeria
2. Determining the extent of utilisation of NigComSat-1R services for Internet access among Agencies of Federal Ministry of Communications and Digital Economy in Nigeria.
3. Ascertaining the levels of challenges face by Agencies of Federal Ministry of Communications and Digital Economy in the cause of utilising NigComSat-1R services for Internet access in Nigeria.

Literature Review

Internet

The Internet, sometimes simply called "the net" is a worldwide system of computer networks. The Internet consists of many linked computer networks forming a global network that is largely free and open, allowing users to communicate with each other for work and recreational purposes and for corporate and personal reasons (Deven, 2009). This is why the Internet has witnessed such rapid growth and development. According to Zinsitrep (2016), Internet access is the process that enables individuals and organizations to connect to the Internet using computer terminals, computers, and mobile devices, sometimes via a computer network. Once connected to the Internet, users can access Internet services, such as email and the World Wide Web. Eng (2014) defined Internet access as "the ability to access, comprehend and utilize information and support appropriate to one's characteristics."

Satellite's Internet Access provides you with Internet service via a communication satellite, just like a satellite TV service; you will have to install a satellite dish near your house or office building to use the service (David, 2019). However, of all the technologies available for Internet access, the emergence of hybrid technology arising from the convergence of computer and telecommunications systems, simply known as a communication satellite, is the best to deploy Internet Access and Penetration (Britz, 2007).

Types of Internet access platforms

The commercial satellite operators provide three major types of Internet access services through the use of C-band, Ku-band, and Ka-band platforms. Already, Internet applications are being developed and implemented today by all communications satellites in the 4/6 GHz (C band), 11/14 GHz (Ku band), and 20/30 GHz (Ka-band) FSS allocations, without the need for any changes to the ITU Radio Regulations (ITU, 2012).

The Nigerian communication satellite (NigComSat-1R) was equally developed to provide three major types of Internet access platforms that require a different amount of bandwidth. Ahmed (2011) listed some of the important technical features that made up information resources of Nigerian Communication Satellite (NigComSat-1R) to include: C-band payload, with 4 operational channels; Ku-band payload, with 14 operational channels and a-band payload, with 8 channels. Others are L-band (L1 and L5) and Ground control stations at Abuja, and a backup station at Kashi, China, for tracking and controlling the satellite.

Utilization of NigComSat1R

The Nigerian Communications Satellite (NigComSat-1R) has the potentials to cover Nigeria and has been positioned as such to cover Nigeria, Africa, and some parts of Europe and Asia. In the last five years, the Nigerian Communications Satellite (NigComSat-1R) has contributed significantly to the rating of Nigeria in the comity of nations with global information and Communication centers. The Nigerian Communications Satellite (NigComSat-1R) is said to have been providing access to the Internet for 79 government universities which include both Federal and State own universities alongside 56 Colleges of Education. This development is a great achievement considering the way it is likely to reduce drastically or eliminate completely a large amount of foreign exchange spent on the provision of bandwidth and Internet connectivity before now by higher institutions of learning (Greg, 2017). The Nigerian Communications Satellite (NigComSat-1R) services are the backbone for Internet access that has made the Public Service Learning Management System (PSLMS) possible within the civil service ofNigeria(Lawal, 2018).

Challenges

The Nigerian communications satellite (NigComSat-1R) covers 52 countries in sub-Saharan Africa (Nigeria Inclusive), Europe, and Asia. Unfortunately, the satellite does not currently enjoy the desired patronage despite its huge potentials and its large area of coverage (Dayo, 2016). In the same light, Greg (2017) said the biggest challenge facing the Nigerian communications satellite (NigComSat-1R) is the non-acceptability of its usefulness by organizations and agencies of government. He affirmed that "There is a grievous irony about launching the satellite." He wondered why the government would spend huge taxpayer's money to design, build and launch the satellite to provide services for the country, but its agencies and departments have refused to invest or patronise the services of the satellite, and still, the government keeps servicing the satellite (Greg, 2017).

Also, some factors are likely to be responsible for the low patronage of the satellite. This could be partly due to inter-agency rivalry between NIGCOMSAT sister agency called NASRDA, or due to inadequate funds to pay for foreign training of local satellite Engineers, or due to lack of effective management on the part of the NIGCOMSAT management team (Dayo, 2016).

Methodology

A survey design was used for the study. The population of the study is five hundred and nine (509) members of staff that comprise the staff from both Nigerian Communications Satellite Limited and Galaxy Backbone, which were the two (2) agencies selected for the study. A purposive sampling technique was used to censor 22 members of staff attached to Network Operation Centres (NOC) of both agencies based on their technical knowledge about the different broadband that provides Internet access, its availability, and the suitability for their respective agencies. Total enumeration sampling techniques were used because the 22 numbers of staff sampled are very few, which is the reason for using the entire members of the population. The instrument used for data collection was a questionnaire with a reliability of 0.91. The data collected were analysed using descriptive statistics such as frequency counts and percentages to find the response rate and demographic data of the respondent. Mean scores and standard deviation were also used to analyse the data collected from the respondents. 21 copies of the

questionnaire were duly completed, returned, and found worthy for the analysis, representing a response rate of 95.4 %.

Findings

Table 1: Types of Internet Access Platforms Provided by Nigerian Communications Satellite- 1R Services for Access to the Internet by Agencies of Federal Ministry of Communications in Nigeria

S/N	Types of Internet Access Platforms Provided by Nigerian Communications Satellite- 1R Services for Access to the Internet by Agencies of Federal Ministry of Communication in Nigeria	Agencies		Total	%	Mean	S.D
		Nigerian Communications Satellite Limited	Galaxy Backbone				
1	C- Band Internet Access	14	4	18	85.7	0.8	0.9
2	Ku- Band Internet Access	12	7	19	90.5	0.9	0.9
3	Ka-Band Internet Access	10	3	13	61.9	0.6	0.8

Source: Fieldwork,2

Table 1 presents the types of Internet access provided by NigComSat-1R services utilised among agencies of the Federal Ministry of Communications and digital economy in Nigeria. The table shows that the major types of Internet Access provided by NigComSat-1R services are: C-band, Ku-band, and Ka-band with a total count of 14, 12, and 10, respectively. This finding is in line with Wolfgang, Renata& Antonio (2016), who said the parts of the frequency spectrum used by commercial satellite services are C - Band, Ku – Band, and Ka-Band.

Table 2: Extent at which Agencies of Federal Ministry of Communications and Digital Economy Utilised NigComSat-1R Services for Internet Access in Nigeria

S/N	Extent at which Agencies of Federal Ministry of Communications and Digital Economy Utilises NigComSat-1R Services for Internet Access in Nigeria	Agencies						Total	Mean	S.D
		Nigerian Communications Satellite Limited			Galaxy Backbone					
		U	R	UN	U	R	UN			
1.	C- Band Internet Access	13	1	0	4	3	0	21	7.6	2.8
2.	Ku- Band Internet Access	11	0	3	6	1	0	21	9.1	3.0
3.	Ka-Band Internet Access	10	4	0	3	3	1	21	8.5	2.9

Key: U=Use, representing Use and Highly Use. R=Rarely Use, representing Rarely Use and Not Use. While UN=Undecided representing only Undecided

Table 2 presents the extent to which agencies of the Federal Ministry of Communications Utilised Nigerian Communications Satellite-1R Services for Internet Access in Nigeria. From the table, it was revealed that C- Band Internet Access platform with a total count of 13 was the major type of Internet Access platform utilised by Nigerian Communications Satellite Limited. The least type of Internet Access platform utilised by the agency was Ka- Band Internet Access platform with a total count of 10. On the part of Galaxy Backbone, Ku- Band Internet Access platform with a total count of 6 was the major type of Internet Access platform utilised by the agency. The least type of Internet access platform utilised by the agency was Ka- Band Internet Access platform with a total count of 3. From the mean and standard deviation angles, Ku- Band Internet Access platform with a mean score of 9.1 was the major type of Internet access platform utilised by the agencies of the Federal Ministry of Communications in Nigeria. This implies that Ku- Band Internet Access platform was the most readily available type of Internet access platform utilised by the agencies of the Federal Ministry of Communications in Nigeria. This finding is not unexpected because out of the 28 quad-band payloads of Nigerian Communications Satellite (NigComSat-1R), Ku-band alone has 14 transponders. Thus making the finding to be in line with the International Telecommunication Union (2012) that said the demand for Ku-band transponders would dominate the satellite market between the periods of the year 2010 and 2020.

Table 3: Levels of challenges face among agencies of Federal Ministry of Communications and digital economy in the cause of utilising NigComSat-1R services for Internet access in Nigeria.

S/N	Levels of challenges face among agencies of Federal Ministry of Communications and digital economy in the cause of utilising NigComSat-1R services for Internet access in Nigeria	Agencies						Total	Mean	S.D
		Nigerian Communications Satellite Limited			Galaxy Backbone					
		U	R	UN	U	R	UN			
1.	Lack of adequate ICT infrastructures to deploy the services of NigComSat-1R for Internet access	8	6	0	4	3	0	21	8.4	3.0
2.	Lack of proper legislation and regulatory policy that will guide and enforce its usage	10	2	2	5	2	0	21	8.9	3.0
3.	Fear of high risk involved in depending on its services for Internet access due to lack of backup satellites for redundancy	11	0	3	7	0	0	21	8.9	3.0
4.	Lack of stable power supply to support its usage in Nigeria	10	4	0	5	2	0	21	7.9	2.8
5.	Availability of better alternative sources of accessing Internet in Nigeria	10	4	0	6	1	0	21	7.8	2.8
6.	The services of the satellite for Internet access is too expensive compared to the alternative source available in Nigeria	10	4	0	6	1	0	21	7.8	2.8

Key: U=Use, representing Use and Highly Use. R=Rarely Use, representing Rarely Use and Not Use. While UN=Undecided representing only Undecided

Table 3 presents the challenges of accessing the Internet by agencies of the Federal Ministry of Communications and digital economy for utilising Nigerian Communications

Satellite-1R services in Nigeria. From the table, it was revealed that fear of high risk involved in depending on NigComSat-1R services for Internet access due to lack of backup satellite for redundancy with the total counts of 11 and 7 were the major challenges of the utilisation of NigComSat-1R services by both Nigerian Communications Satellite Limited and Galaxy Backbone respectively.

From the mean and standard deviation angles, fear of high risk involved in depending on NigComSat-1R services for Internet access due to lack of backup satellite for redundancy and lack of proper legislation/regulatory policy that will guide and enforce the usage of NigComSat-1R with both means of 8.9 were the major challenges of the utilization of NigComSat-1R services for Internet access by the agencies of Federal Ministry of Communications and digital economy in Nigeria. The first finding on the fear of high risk involved in depending on a single satellite is in line with Greg (2017), who quoted Engineer Francis Pam a digital satellite/terrestrial transmitter Engineer, to have said, "Satellite business is a high risk and high-profit industry; small players like NIGCOMSAT Limited hardly offer any competition when you consider the likes of Intelsat with a fleet of over 50 satellites in orbit. With any failure, they can easily move traffic around to other satellites." Therefore, the lack of backup satellite to NigComSat-1R could be responsible for some government agencies' inability to patronize the satellite. However, this claim which corresponds to the findings of this study, was explained by Chatman's third construct of information poverty theory who said, before people pursue or accept any new information, they would subject the new information to a vigorous analysis by weighing the new information, determining whether the source of information is trustworthy and by deciding if the new information has the possibility of improving their social life (Chatman, 1996).

Also, the second finding on lack of legislation/regulatory policy agrees with Kumar (2012), which said the regulatory policy would enable the satellite to attract new investments, initiate new technologies, motivate innovations, promote fair competition, ensure non-discriminatory market entry, and enforcing compliance. Therefore, without proper legislation/regulatory policy from the government that will guide and enforce government agencies to patronise and utilise effectively the Internet access provided by NigComSat-1R services, the satellite will continue to remain underutilised. Similarly, this position was acknowledged by Greg (2017), who said despite the potentials of NigComSat-1R and huge tax payer's money spent by the government to design launch, and to service, the satellite, government ministries, departments, and agencies refused to invest their resources in the satellite and patronise its services. The factor responsible for making government agencies engage in this kind of behaviour was best explained by Chatman (1996), which said people are not engaging in information seeking or sharing behaviour because they wanted to give an appearance of normalcy. That is, they did not want to be viewed as somehow less capable than their neighbours in coping with self-stresses. This is one of the hiding reasons, among others, that prevented some government agencies from utilising the services of NigComSat-1R for Internet access. This behaviour keeps going on unabated despite knowing the high capacity of the satellite to deliver the required broadband Internet access and acknowledging the huge amount of capital invested in the satellite by the Federal government of Nigeria.

Summary of Major Findings

The following were the major findings of the study:

The following were the major findings of the study:

1. C, Ku, and Ka-band Internet Access are the three major Internet access platforms provided by the NigComSat-1R services.
2. Ku- Band Internet Access is the major type of Internet access platform utilised the most by the Federal Ministry of Communications in Nigeria.
3. The major challenges confronting the utilisation of NigComSat-1R services for Internet access are the lack of backup satellites for redundancy and the lack of proper legislation/regulatory policy.

Conclusion

From the analysis and summary of findings of the study, it is clear that the services of Nigerian Communications Satellite-1Rfor Internet access among agencies of the Federal Ministry of Communications and digital economy in Nigeria are highly underutilised. This is because the patronage and extent of utilisation of the satellite's services by agencies of government under the Federal Ministry of communications and digital economy in Nigeria are by far below the expectation. Despite the potentials and capacity of NigComSat-1R services and the fact that the government has spent a huge amount of money in designing, building, launching, and servicing the satellite, agencies, and departments of government have refused to patronise and effectively utilise the services of the satellite for Internet access in Nigeria. This might be largely in line with Chatman's belief that "valuable and useful information are ignored due to people's perception of either the information is seen as too costly to purchase, or the information seeker is motivated by a sense that in the end, why bother?" This is where government enforcement should come in to ensure that every agency of government is forced to utilise the services of NigComSat-1R for their Internet access.

Recommendations

In line with the findings of this study, the following recommendations were made:

1. Nigerian Communications Satellite Limited should rise to the occasion and ensure vigorous marketing of her Internet broadband services.
2. The Federal government of Nigeria should, as a matter of urgency, launch at least the two proposed communications satellites (NigComSat 2 and 3) to eliminate the fear of high risk involved in depending on a single satellite like NigComSat-1R.
3. The Federal government of Nigeria should put in place proper legislation/regulatory policy that will guide and enforce the usage of NigComSat-1R services for Internet Access in Nigeria especially, by making it the sole provider and soul negotiator of Internet services to every government MDAs in Nigeria in order, to ensure maximum patronage and utilisation of the satellite.

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