

FIRST NIGERIAN SCHOOL OF COMMUNITY NETWORK



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BY

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Understand the basics of a community network and its management

CITAD-LOCNET

Introduction

The cyberspace in Nigeria is characterized by multiple layers of the digital divide. This divide manifests along different parameters. For example, there is a rural-urban dimension in which urban areas tend to be better connected than rural areas. Similarly, there is a generation divide in which younger people are more adept and skillful in the use of the digital opportunities than older people who for a number of reasons are able to make the transition to digital competence. It also assumes a geographical form as the south, especially around Lagos where all the major submarine cables made their landing, is better connected than the northern tips of the country, some which have witnessed the destruction of telecommunication infrastructure by insurgents and bandits in addition to the fact that it has not been easy to deliver submarine cables to the hinterland and to the far flung northern reaches of the country. By far the most problem is the gender dimension in which more women are excluded from the benefits of digital systems compared to men.

Underlying these different manifestations of the digital divide are issues associated with availability, affordability and digital skills. Many people do not have the opportunities to acquire digital skills as to be competent users of the digital systems. On the other hand, infrastructure sanction deployment has been circumscribed by market constraints in the sense that it is largely deplored to areas where profits could be made. Leaving out sparsely populated communities where profit is doubtful. Finally, there is the reality that although, Nigeria is considered as one of the countries with low affordability threshold, affordability is still a big barrier for many.

For most Nigerians, the dependable source of connectivity mobile telecoms. Theoretically, there is full coverage of the country by the four national carriers operating in the country. However, in spite of this and their overlap, there are still many blind spots where signal are either too weak or are not accessible at all, the Universal Service Provisions Fund (USPF) found out that there are about 114 such communities. This communities with a combined population is significant segment of the Nigerian population. While this illustrates infrastructure limitation, there is another aspect that combines both infrastructure and affordability limitations. This is the fact that along there as of March 2021, there are only a total of 298,823,195

connected lines out of which 297,536,702 were said to be active, only about 40% of them are connected to the internet. In this sense, access to internet is far below 50% of the population.

Both infrastructure limitation and affordability challenge as well as skills gaps could be addressed by letting community networks to flourish.

Introduction to Community Networks

Community networks are telecommunications infrastructure deployed and operated by a local group to meet their own communication needs and also a communications infrastructure, designed and erected to be managed for use by local communities. This communication needs can be voice, data, etc. and can be point of convergence for community to come together to address their common community problems.

Beyond the definition of CN, the success story of the community networks across the globe has been awesome. It has proven as an educative tool for the community to grow its economic resources, given access to educate the people

In Nigeria Community Networks is seen as a recent development which main activities are determined by Association for Progressive Communications (APC) and Internet Society. though before now there are several other Initiative that could be qualified and identified as community networks, for example the 5 Computer Centers that was Initiative by Center for Information Technology and Development (CITAD) in the rural Community of Federal Capital Territory in Abuja, and two centers in Jama'are and Itas-Gadai in rural part of Bauchi State, that provide email some of the services that community networks could provide such as provide points of access to internet for communities and digital training programs but these are not considered as community networks in the proper sense of the word. The 2005 first known community network that was concertized in 2005 but established fully in 2008 by Fantasum Foundation, in Kafanchan, which activities is deploying a wireless network to provide internet connectivity to rural communities around the area as well provides for education meeting of education institution within the community and another community network in Ibadan which is known as "Ibadan WUG", documented by Internet Society, located in Ibadan, It served about 22 nodes. Another initiative that could pass for community network is Community NetHUBs, originally called Red Hub , located in shades area of Lagos and the Zaria Community

Network and Culture Hub, which is a collective initiative between the Nigerian chapter of the Internet Society and the Ahmadu Bello University, Zaria. And lastly the Fiam Wi-Fi in Lagos which is seen an entirely different model that is commercially oriented is set up around rural communities in Lagos State. Fiam Wi-Fi is one of Nigeria's newest telecommunications companies, providing internet via hotspot to underserved communities that have been short changed for internet by incumbent operators. Its strategy is focused on driving down cost of delivery and ensuring integration into the communities we serve by actively driving digital inclusion through partnerships with healthcare and educational providers of content. Fiam provides a trusted reliable, fast and affordable internet service developed for the people of the community.

These pioneer initiatives are serving to inspire other initiatives, they however face major challenge in that poor infrastructure such power has been that operating community networks requiring high operational cost, which in the end tend to make commercial service relatively high compared to those of the dominant market players, this has an important role in determining the sustainability of these initiatives. Additionally, because there are no specific and no clear policies regarding community networks in the country, it is often difficult to initiate, run and maintain them.

Although theoretically, mobile telephony has universal covered of Nigeria, in reality there are a number of blind spot where there is no signal, meaning that communities in these areas do not have access to internet as. This is the case in the three areas of Pasepa, Leleyi Gwari and Tugan Ashere, all within a few kilometers distance from the Federal Capital, Abuja.

SPECTRUM ALLOCATION

COMMUNITY NETWORKS, HOW IT IS RELATED TO SPECTRUM ALLOCATION

Spectrum allocation is the process of regulating the use of the electromagnetic spectrum and dividing it among various and sometimes competing organizations and interests. This ensures that there is little competition when using a specific frequency band, which can cause interference if the same frequency band is used for different and unregulated purposes. This regulation is controlled by various governmental and international organizations.

Spectrum allocation is also known as frequency allocation.

Spectrum allocation came to be because of the emerging and convergence of wireless telecommunications technology which created huge demands on the radio frequency spectrum for various services such as high-speed data transfer and communication. Therefore, the purpose of various spectrum policies and laws is the regulation and management of the resource (the electromagnetic spectrum) for the benefit of everyone using it. This basically means that spectrum allocation is done to prevent major interference and chaos in the air waves, which would serve no one at all.

Imagine a four-lane road that is quite small for highway standards and that there is no regulation where different vehicles are allowed to travel in. Now, consider that there is a fleet of large trucks moving together and driving at a slower speed for safety. Without regulation on which lane they can drive in, the various members of this fleet of trucks would use all four lanes, effectively blocking all other vehicles. This causes all other vehicles behind to travel at speeds slower than or equal to those of the trucks since there is no way for them to pass. This is the purpose of spectrum allocation, to simply put everything in its place, in this case in a specific radio spectrum, to prevent interference and chaos.

Some standardization organizations working on spectrum allocation and regulation:

- European Conference of Postal and Telecommunications Administrations (CEPT)
- International Telecommunication Union (ITU)
- Inter-American Telecommunication Commission (CITEL)

Types of spectrum allocation:

- No one may transmit — Spectrum band is reserved for a specific use such as radio astronomy so that there is no interference with radio telescopes
- Anyone may transmit — As long as transmission power limits are respected

- Only licensed users/organizations of the specific band may transmit — Examples are cellular and television spectrums as well as amateur radio frequency allocations

Learn more about community networks, how it is related to spectrum allocation

By Internet Society

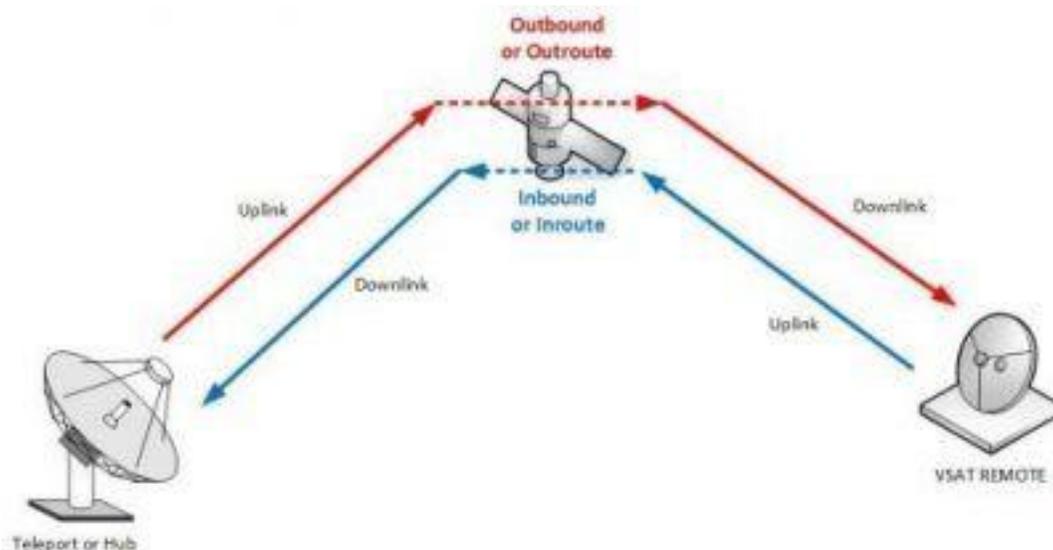
<https://www.internetsociety.org/policybriefs/spectrum/>

VSAT

Very Small Aperture Terminal (VSAT)

A very small aperture terminal (VSAT) is a small-sized earth station used in the transmit/receive of data, voice and video signals over a satellite communication network, excluding broadcast television.

A VSAT consists of two parts: a transceiver placed outdoors in direct line of sight to the satellite, and a device that is placed indoors to interface the transceiver with the end user's communications device, such as a PC. The transceiver receives or sends a signal to a satellite transponder in the sky. The satellite sends and receives signals from a ground station computer that acts as a hub for the system. Each end user is interconnected with the hub station via the satellite, forming a star topology. The hub controls the entire operation of the network.



For one end user to communicate with another, each transmission must first go to the hub station, which then retransmits it via the satellite to the other end user's VSAT. VSAT data throughput speeds have increased significantly throughout the years and now can provide multimegabit service in downstream and upstream. Antenna/dish sizes usually range from 1.2 meters to approximately 3 meters in diameter. Generally, these systems operate in Ku-band and C-band frequencies

IKTech Corporation



StarWin 3.7m Ka Band VSAT Antenna Dish | IK Tech image

VSAT Installation

In this VSAT Installation Guideline we will walk you through the various steps in a VSAT installation:

Ground mount:

This involves a tube/pipe lowered into a hole which is then filled in with concrete. Alternatively the tube may have a metal base plate attached so that it

may be screwed to a plain concrete base using expanding bolts or similar. The pole should be accurately vertical so that when you swing the dish around to find the satellite the elevation angle stays the same all the time.

Securing the area with fencing or similar may be necessary.

Non penetrating mount:

Based on an angle iron frame covered in concrete slabs. The antenna support tube is held vertical by several angle braces. Make sure that all angle braces are tight so that the pole does not wobble or twist in the wind. Read the assembly instructions carefully. The lower and upper angle braces may need to be attached to opposite sides of the vertical pole to prevent twisting.

A permanent safety rope is advised to be attached between the dish assembly and some fixed part of the building so that the dish does not blow off the building in exceptionally high winds.

Check the building roof is strong enough to support the weight of all the concrete blocks. In many cases a non-penetrating mount is not possible due to weak roof.

IFL Cables

One or two coax cables will be required for the radio signals. These also carry low voltage DC supplies to power the LNB and BUC. The centre pin of the F connector must stick out about 2 mm. The outer braid of both coax cables must be well connected at all four ends. If the outer braid of one coax cable is disconnected somewhere there will be very strange effects.

The antenna structure should be earthed to provide some protection from lightning strikes. If the building uses PME type earthing then consult a competent electrician regarding the lightning earth connection as there is a risk of hazard if an electricity network fault arises. In some countries useful regulations exist and provide guidance on how to earth the antenna safely.

Take care connecting up both the coax and earth cables as there may be differential earth voltages at each end. A thick earth cable between the antenna structure and the indoor chassis unit should make it safe to connect up the coax cables. If in doubt, use the outer of one coax to make contact between the

indoor unit chassis and the antenna before plugging in the other coax, noting that the centre pin of the coax may connect up first before the outer.

The indoor data processing unit (IDU) or satellite modem

The indoor data processing unit (DPU) should be located in a dry, cool and clean place.

Safety

Installing a dish is normally dangerous. Take care not to fall down and not to drop tools on others below. Be careful with ladders – always tie off the top to some secure point. A small electric shock may make you fall off a ladder so be extra careful.

If you are a beginner, practice the complete VSAT installation at ground level before moving everything to the roof.

Accuracy of dish pointing and polarization alignment

The dish pointing (azimuth and elevation) needs to be near perfect (within the - 0.25 dB of the beam peak on transmit) as the transmit beam is narrower than the receive beam.

The feed rotation polarization adjustment needs to be to 1 deg accuracy to ensure that you are in the very sharp null. Make this adjustment very slowly while the hub staff watch the CW signals on their spectrum analyser. Give the hub staff plenty of time to make each measurement (20 seconds) and then rotate the feed a fraction while talking to them. They are looking for a signal about 25 – 35 dB down so it is not easy.

reference

<https://www.linksystems-uk.com/vsat-installation-guideline/>

learn more about VSAT, how it is related to community networks here

https://www.saintsjd.com/malawi/blog/jon/vsat_community_networks.html

marketing skills, entrepreneurship and sustainability strategy for Community networks

SUSTAINABILITY STRATEGIES FOR COMMUNITY NETWORKS

To sustain community networks there is need for money and other resources required Adding more services and acquiring more skills by the community members, will recover most of community network expenses

Some service that community networks offer are:- Digital marketing centre, selling data services, call Centre, Educational activities like examination registration, Financial and billing services, Training, Digital learning centre, ICT security management, ICT Network and Infrastructure, ICT Technical / Solutions Architecture, and Digital solutions etc. all these services community network will not be able to deliver it until the community members have the skills to offer the services, as if someone want deliver digital solutions like E-commerce website, he must have knowledge in the area of website development

There is so many resources and eLearning platforms that will help community members, if they have the network to learn by themselves, some of these resources are mobile apps, websites, and web apps

LIST OF WEBSITES/APPS TO LEARN COMPUTER SCIENCE / DIGITAL MARKETING

1. Tutorials point
2. Smartherd
3. Devslope Academy
4. Khan Academy
5. Malamin Gida in Hausa
6. Study Tonight
7. Geek for Geek
8. Google Digital Skills
9. Udemy

10. W3 School
11. Computer Hope
12. Javat Point
13. YouToube

DIGITAL MARKETING AS A MEANS TO SUSTAIN COMMUNITY NETWORKS

Digital marketing is the component of marketing that uses internet and online based digital technologies such as desktop computers, mobile phones and other digital media and platforms to promote products and services.

In the past decade, digital marketing has become a vital component in organizations' overall marketing strategy. It allows companies to tailor messages to reach a specific audience, making it possible to market directly to people who are likely to be interested in their product. Digital marketing encompasses a wide variety of marketing tactics and technologies used to reach consumers online. Two academic team members from Southern New Hampshire University (SNHU) spoke about how digital marketing aligns with traditional tactics and shared information on some of the types of digital marketing in practice now.

Types of Digital Marketing for Community Networks

Search Engine Optimization (SEO)

The goal of SEO is to get a business to rank higher in Google search results, ultimately increasing search engine traffic to the business's website. To accomplish this, SEO marketers research words and phrases consumers are using to search for information online, and use those terms in their own content. According to leading SEO software company Moz's "Beginners Guide to SEO," SEO encompasses many elements, from the words on your web pages to the way other sites link to you on the web to how your website is structured.

So, what are some things that can improve a site's SEO? It's important to understand that one of the things that makes SEO challenging is that the answer to this question always depends on Google and its most current algorithm. Keeping

that in mind, here are a few of the most important things for SEO strategists and marketers in general to understand about how SEO works today, from Moz's Beginners Guide to SEO:

Content indexing – It is important to allow search engines to clearly “read” what your site content is, by doing things like adding alt text for images and text transcripts for video and audio content.

Good link structure – It is important that search engines can “crawl” your site structure to easily find all the content on your site. There are many things that an SEO specialist can do to properly format links, URLs, and sitemaps to make them most accessible to site crawlers.

Keywords and keyword targeting – Properly deploying your keywords – i.e. the search terms you want your site to be found for—in your content and headers is one of the fundamental building blocks of SEO. It is no longer good practice to “stuff” your content with as many keywords and keyword variations as possible. Writing high-quality content that uses keywords in the headers and a few times in the crawl-able page content is now considered better practice, and will make pages rank better in search results.

Social Media Marketing

This includes everything a business does via social media channels. Just about everyone is familiar with social media, but marketers must approach social with an integrated and strategic approach. Social media marketing goes far beyond simply creating posts for social channels and responding to comments.

A woman using her cell phone to track the results of a social media marketing campaign. To be effective, efforts must be coordinated and consistent rather than an afterthought. To help keep posts consistent, there are many online tools available to automate and schedule social media posts, although marketers only should use automation as a tool, not a “set it and forget it” solution. Users will figure it out quickly if there is no real person behind the posts.

Social media marketers should not be in a silo separate from other marketing functions. Social marketers need to work with the company’s wider marketing team to coordinate their message across all platforms, online and off, so that every part of the brand is telling the same story.

Content Marketing

Content marketing uses storytelling and information sharing to increase brand awareness. Ultimately, the goal is to have the reader take an action towards becoming a customer, such as requesting more information, signing up for an email list, or making a purchase. “Content” can mean blog posts, resources like white papers and e-books, digital video, podcasts, and much more. In general, it should first and foremost provide value to the consumer, not just advertise the brand or try to make a sale. Content marketing is about building a sustainable, trusting relationship with your customers that can potentially lead to many sales over time, not just making a single transaction.

Content marketing is a great avenue for people who enjoy writing and/or video and audio production. But as with digital marketing in general, it also calls for strong strategic and analytic skills.

Mobile marketing reaches people through text messages, social media, websites, email and mobile applications. Marketers can tailor offers or special content to a geographic location or time, such as when a customer walks into a store or enters an event.

Community Networks & Digital Marketing Skills

Digital marketers support the wider marketing team and the strategic goals of the whole community by rolling out marketing strategies in the online environment, Hobson said. Digital marketers strive to be a voice for the customer and how they want to interact with a brand digitally, Rogers said. “(Marketers) strategically approach the brand’s channels to maximize investments, drive traffic and conversions, as well as manage integrated digital content.

Technology changes quickly; the hot social media app of today may be all but abandoned by next year, but many of the foundational principles of marketing remain the same. employers include these soft skills with the technology-related proficiencies in job posting requirements, according to Rogers.

"A basic tenant of marketing is communicating a marketing message to a target audience," she said. "... Not only must we communicate with our teammates, but we must be able to communicate to customers, executives and more. These folks are our target audience and without strong communication skills, messages will not be received in the way in which we intended."

Since digital marketing is a rapidly changing space and it is imperative for companies to stay up to date on new and emerging strategies, Hobson said. There are many ways that companies do this, some of which are the responsibility of digital marketers and some of which is done by other departments.*Reference*

<https://www.snhu.edu/about-us/newsroom/business/types-of-digital-marketing>

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