INTERNET ACCESS COMPARISON BETWEEN GSM AND CDMA NETWORKS

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ABSTRACT

A comparism of the internet access quality between two competitive networks (GSM and CDMA) using a measuring tool/software called myspeedlite was carried out in Okada Town and Benin City both in Edo State of Nigeria.

The software myspeedlite was installed on four laptops each representing the various network MTN, AIRTEL, MULTLINK and VISAFONE as case study and the test was carried out for a period of 15 days in Okada and for a period of 15 days at Benin to test for the application and capacity speed test which comprises of the download speed test, upload speed test, Quality of service, round trip time, maximum pause and route hops. The result obtained from the various test run on the different networks showed that VISAFONE in Okada had a better Quality of service of about 35% followed by MTN with Quality of service of about 27% and AIRTEL with about 17% while VISAFONE had better results in Download speed test, Upload speed test, Round trip Time and max pause.

The observation in Benin from the result showed that MTN had a better Quality of service of 68% followed by VISAFONE with Quality of service of about 62% and AIRTEL with 55% while MTN had better results in Download speed test, Upload speed test, Round trip Time and max pause.

The implication of this finding is that VISAFONE in terms of internet access quality service in Okada is better and MTN in terms of internet access quality service at Benin City is the better network considering the result obtained from the test run. This result would help to educate the intending users on which network they should use most especially for internet service in these two locations. The result obtained in the research work is only limited to Okada and Benin City for which were the case study and for recommendation purpose, the various test should be run for a longer period.

KEYWORDS: Bandwidth, Broadband, Download, GSM, Modem, Upload

INTRODUCTION

GSM is the "branded" term referring to a particular use of TDMA (Time-Division Multiple Access) technology. GSM is the dominant technology used around the globe and is available in more than 100 countries. It is the standard for communication for most of Asia and Europe. GSM operates on four separate frequencies: You'll find the 900MHz and 1,800MHz bands in Europe and Asia and the 850MHz and 1,900MHz (sometimes referred to as 1.9GHz) bands in North America and Latin America. GSM allows for eight simultaneous calls on the same radio frequency and uses "narrowband" TDMA, the technology that enables digital transmissions between a mobile phone and a base station.

With TDMA the frequency band is divided into multiple channels which are then stacked together into a single stream, hence the term narrowband. This technology allows several callers to share the same channel at the same time. [1] [2]

CDMA takes an entirely different approach from GSM/TDMA. CDMA spreads data out over the channel after the channel is digitized. Multiple calls can then be overlaid on top of one another across the entire channel, with each assigned its own "sequence code" to keep the signal distinct. CDMA offers more efficient use of an analog transmission because it allows greater frequency reuse, as well as increasing battery life, improving the rate of dropped calls, and offering far greater security than GSM/TDMA.[3] [4] [5]

CDMA therefore has strong support from experts who favor widespread development of CDMA networks across the globe. Currently, you will find CDMA mostly in the United States, Canada, and North and South Korea. [6] [7] (As an interesting aside, CDMA was actually invented for the military during World War II for field communications.) GSM's high-speed wireless data technology, GPRS (General Packet Radio Service), usually offers a slower data bandwidth for wireless data connection than CDMA's high-speed technology (1xRTT, short for single carrier radio transmission technology), which has the capability of providing ISDN (Integrated Services Digital Network)-like speeds of as much as 144Kbps (kilobits per second). However, 1Xrtt requires a dedicated connection to the network for use, [8] [9] whereas GPRS sends in packets, which means that data calls made on a GSM handset don't block out voice calls like they do on CDMA phones. Note: The new GSM EDGE technology means that GSM speeds have caught up with CDMA, but EDGE coverage and availability remains patchy. [10] [11] [12]

METHODS

The software (my connection pc), Modems (MTN and AIRTEL) for GSM while (VISAFONE and MULTILINK) for CDMA was used to run the test at intervals for a period of one month.

The software (my connection pc) was installed on four laptops representing the four networks that would be used for the comparison with the corresponding internet modems.

The software was run at regular intervals at the same time on the four different networks for a period of one month. The tests carried out were application speed test and capacity speed test, which comprises of upload, download, quality of services, round trip time and maximum pause.

RESULTS AND DISCUSSIONS

The observation from all the data collected at okada showed that VISAFONE had a better quality of service as compared to the other two GSM networks AIRTEL and MTN.
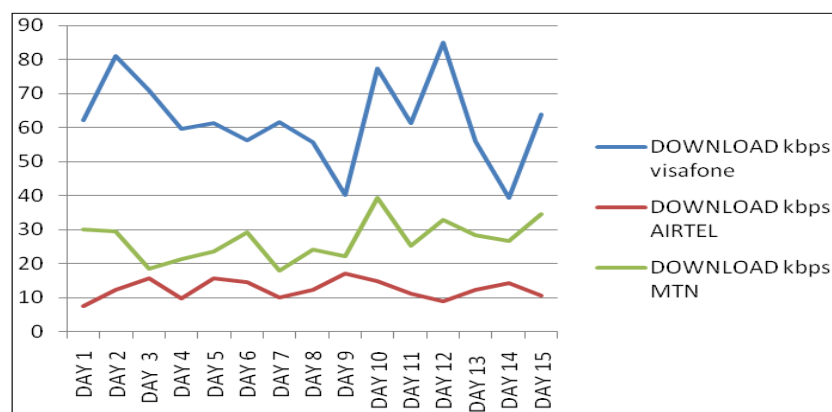

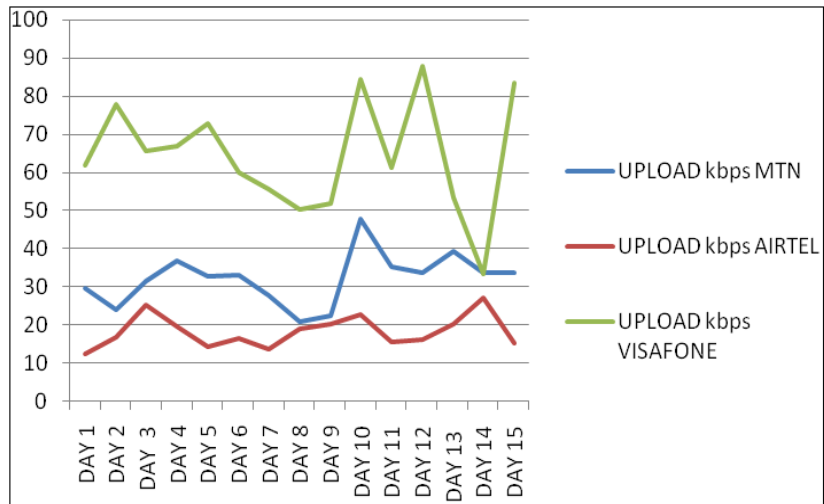**Figure 1: Average Downloads Speed of the Networks at Okada**

Figure 2: Average Uploads Speed of the Networks at Okada
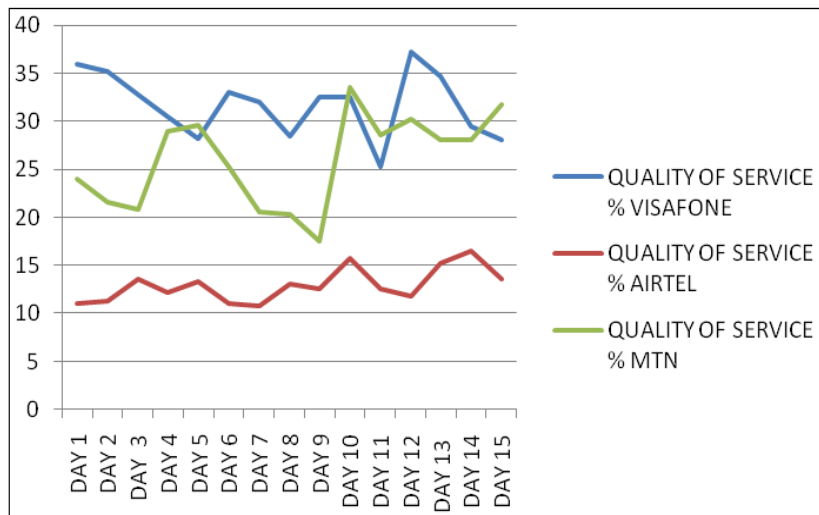

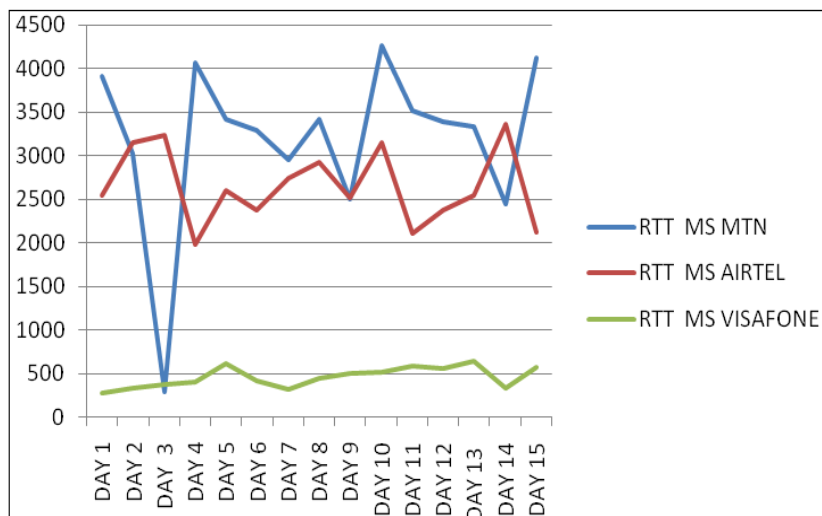**Figure 3: Average QOS (%) of the Networks at Okada**

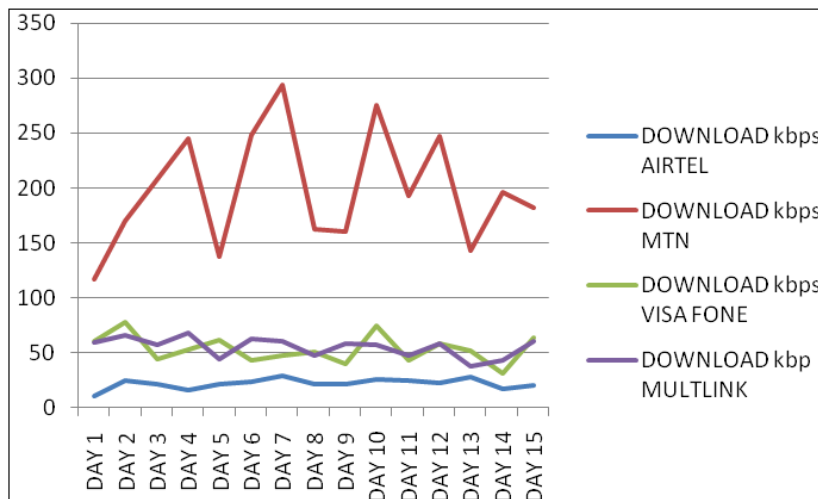**Figure 4: Average Round Trip Time of the Networks at Okada**

Figure 1: Showing the average download speed of the networks at Okada for a period of 15 days showed that VISAFONE had the higher download speed of 85kbps, followed by MTN with download speed of 40kbps and AIRTEL with download speed of 20kbps

Figure 2: Showing the average upload speed of the networks at Okada for a period of 15 days showed that VISAFONE had a better upload speed of 88kbps, followed by MTN with upload speed of 49kbps and AIRTEL with 27kbps

Figure 3: Showed that VISAFONE had the best quality of service of 35%, followed by MTN with quality of service of 27% and lastly by ZAIN with quality of service of 17%

Figure 4: Showing the average round trip time of the networks at Okada for a period of 15days showed that VISAFONE had the lowest round trip time of 500ms, followed by AIRTEL with round trip time of 3500ms and lastly by MTN with round trip time of 4000ms

The research was also carried out at Benin for a period of 15 days and the following were observed.

Figure 5: Average Downloads Speed of the Networks at Benin
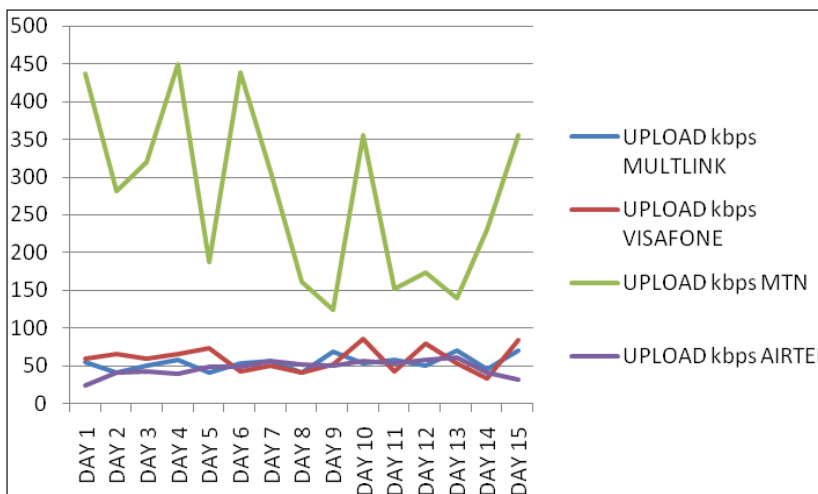
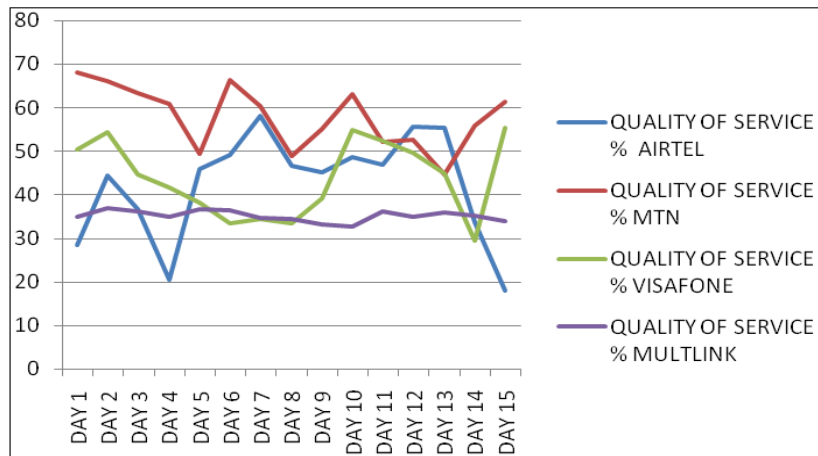**Figure 6: Average Uploads Speed of the Networks at Benin**
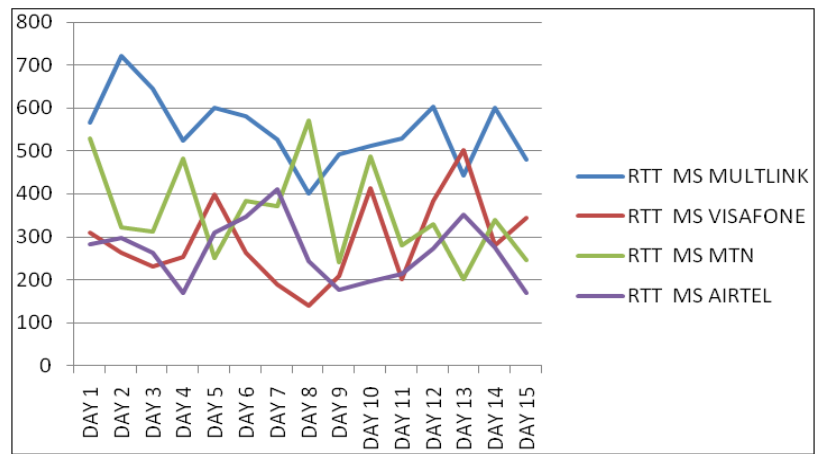
Figure 7: Average QOS (%) of the Networks at Benin

Figure 8: Average Round Trip Time of the Networks at Benin

Figure 5: Showing the average download speed of the networks at Benin for a period of 15 Days showed that MTN had the highest download 0f 277kpbs followed by VISAFONE with download speed of 76kpbs, followed by MULTLIINK with download speed of 70kbps and lastly by AIRTEL with download speed of 55kbps

Figure 6: Showing the average Upload speed of the networks at Benin for a period of 15 Days showed that MTN had the best upload speed of 432, followed by VISAFONE with upload speed of 81kbps, followed by MULTLINK with upload speed of 62kbps and AIRTEL with upload speed of 43kbps

Figure 7: Showing the average Quality of Service of the networks at Benin for a period of 15 Days showed that MTN had Quality of Service of 66%, followed by AIRTEL with Quality of service of 57%, followed by VISAFONE with Quality of Service of 54% and MULTLINK with Quality of Service of 35%

Figure 8: Showing the average round trip time of the networks at Benin for a period of 15 Days showed that MULTLINK had the highest round trip time of the four competitive networks

CONCLUSIONS

Based on the parameters considered in this research, a good network must have high Download speed, high upload speed and high Quality of Service while maintaining a Low round trip time.

The results obtained during the cause of the research therefore shows that VISAFONE in terms of internet access Quality is a better network in Okada town. While MTN in terms of internet access Quality is a better network in Benin City.

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