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# INTERNATIONAL JOURNAL FOR RESEARCH IN APPLIED SCIENCE AND ENGINEERING TECHNOLOGY (IJRASET)

## Improving the Quality of Service of Etisalat Nigeria

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**Abstract**-Quality of service is a vital performance indicator that is used in determining the efficiency of an industry in terms of services rendered. Delivering excellent service is a winning strategy. Quality service sustains customers' confidence and is essential for a competitive advantage. In telecommunication system, accessibility, retainability and connection (voice) quality are three major factors used in evaluating quality of service of an operator. Etisalat, as one of the leading telecommunication industry in Nigeria, it is expected that maximum satisfaction be derived by their customers in regards to any service(s) paid for. This paper has therefore aimed at suggesting on how to improve on the quality of services rendered by Etisalat Nigeria.

**Keywords:** Etisalat, Quality of service, telecommunication, satisfaction, accessibility

### I. INTRODUCTION

There is an unprecedented growth in the demand for wireless communication services in Nigeria. The obvious challenge for network providers is the provision of quality of service to the teeming customers. Following initial system deployment, subscriber's enrollment tends to increase on daily basis and an attempt to accommodate every new subscriber becomes cumbersome.

Service is a key component of value that drives any company's success. To the customer, value is the benefits received for the burdens endured such as price, an inconvenient location, unfriendly employees, or an unattractive service facility.

Quality of Service (QoS) refers to the state of nature of services rendered by the telecommunication operator, which can either be good or bad quality. For the service to be considered as good, it has to satisfy the demand expectation of the customers. Technically speaking, QoS was defined in the ITU standard X.902 as a set of quality requirements on the collected behavior of one or more objects. Quality of service comprises requirements on all the aspects of a connection, such as service response time, loss, signal-to-noise ratio, cross-talk, echo, interrupts, frequency response,

loudness level, etc [1]. QoS helps a company maximize benefits and minimize non-price burdens for its customers. Excellent service is a profit strategy because it results in more new customers, more business with existing customers, fewer lost customers, more insulation from price competition, and fewer mistakes requiring the re-performance of services. Excellent service can also be energizing because it requires the building of an organizational culture in which people are challenged to perform to their potential and are recognized and rewarded when they do. Etisalat Nigeria currently serves a growing subscriber base of over 10 million subscribers and consistently demonstrates its core values of optimism, simplicity and caring – for which it has become known in other markets to the Nigerian people as it offers them world-class telecommunications services[2]. It is investing heavily in the Nigerian economy as well as in its own human resources. From day-one of its operations in Nigeria, it has put in place various skills acquisition and training programs to enable its people offer outstanding and quality services to Nigerians. Etisalat has also grown capabilities to develop and deploy effective telecommunication services to the business market.

### II. BACKGROUND REVIEW

In 2001, Nigeria embraced the global system for mobile communication (GSM). Its adoption is expected to serve as a

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viable alternative to the then analog (Nitel) system. Also, during its launching, the core objective is to provide effective telecommunication services that will support good speech quality, roaming, spectral efficiency, minimized crosstalk, etc. The deployment of GSM system into Nigerian market was universally embraced and found to be relatively efficient at the inception.

Many communication companies have moved into the market. The industry is looked at as one of the fastest growing market in Africa and indeed the world.

Emirates Telecommunications Corporation, branded trade name Etisalat is a UAE based telecommunications services provider, currently operating in 15 countries across Asia, the Middle East and Africa. As of February 2014, Etisalat is the 12th largest mobile network operator in the world, with a total customer base of more than 150 million. Etisalat was named the most powerful company in the UAE by Forbes Middle East in 2012[3]. It began commercial operations in Nigeria on 23 October 2008 in seven cities and now has network in all thirty six states of the federation covering major cities and towns with continuing densification to guarantee qualitative service delivery in all areas that it has presence world ("Etisalat Nigeria") [4]. Showing exponential growth, in just six years of commercial operations, it has over 14 million active subscribers and recently acquired a 3G license. Etisalat Nigeria continually seeks to bring easy communications to its subscribers in order to positively contribute to the quality of their life [5]. Its various products and services are designed with the needs of its customers at heart.

### III. THEORY

There are four fundamental aspect of quality of service: network accessibility, connection quality, network retainability, billing and accuracy [6].

#### A. Network Accessibility.

This has to do with hooking up to the network and the availability of the desired network. Here the signal strength is measured within coverage area to get to the size of the cell.

#### B. Connection Quality

For the duration of the successful call, how good was the user experience while making of the desired service.

#### C. Network Retainability.

While using the desired network service, does it fail intermittently or is the user able to have a full conversation and download file through a GPRS session. This is what network is all about.

#### D. Charging Accuracy

The user network has to be billed accurately. The quality of service (QoS) should be Important to users, Measurable, Comparable between GSM operators.

### IV. FACTORS AFFECTING QUALITY OF SERVICE

Below are some of the major factors affecting quality of service of telecommunication in Nigeria

#### A. Bandwidth Allocation

When the telecommunication operator takes more users than it can handle, the consequential outcome is jamming on the network. What it means is that there are no available channels to route call through.

#### B. System Frequency harmonization

Lack of Base Transceiver Station (BTS) harmonization effects GSM handover performance, resulting to some degradation of quality of service. The speech quality of calls between two handsets, undergoing handover between two BTSs harmonized with variable frequency offset, was measured in terms of Mean Opinion Score (MOS) and speech clipping. The result shows that without the network harmonization, there is about 40% performance degradation. The Mean Opinion Score is a measure of listening quality with score ranging from bad; poor; fair; good; excellent according to the scale defined in ITU-T Rec. Speech Clipping is a measure to indicate the loss of speech segment.

#### C. Instability in Power Supply

Recent study revealed that 80% of the total cost of operations by telecommunication operators goes into provision of generators and its fueling. The epileptic nature of our power supply system in Nigeria had necessitated the over-dependence on generators. The direct connotation of this is that call tariff will significantly shoot up. Apart from this, it is obvious that the cost of procurement and fueling is so enormous. If our power supply system is stable, this huge amount could have been used in

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upgrading and optimizing existing base stations in order to improve service efficiency.

## D. Security of infrastructure

Due to the volatile nature of some parts of the country, telecommunication equipments are not safe from vandalisation. There have been many reported cases of theft and vandalisation at base station sites. This development has prompted telecoms operators to invest heavily on recruitment of security personnel at their base station sites. One direct implication of this is that the cost incurred on these security guards goes into the total cost of operation and subsequently leading to increase in call tariff.

## E. Call set up failure

This is the ability of a subscriber to initiate a call and granted access. Technically, during a GSM call setup, a speech call is assigned from a SDCCH (stand alone dedicated channel) to a TCH (traffic channel). If the TCH selected suffers from interference, then the mission will fail. And the mission failure message will be sent to the MSC. The call will then be re-established back.

## F. Call retention

Call retention is the ability to retain a GSM call after it has been established while dropped call is a situation whereby an established call is abruptly terminated while conversation is ongoing. It is a common occurrence in Nigeria's GSM system that communication is terminated unexpectedly while conversation is ongoing.

## G. Congestion

Congestion is a phenomenon in telecommunication system that occurs when more subscribers attempt simultaneously to access the network than it is able to handle. This is a situation where subscriber numbers has completely overgrown network capacity.

## V. RESULT

Table 1 below demonstrates how subscriber QoS varies by service type.

Table 1: Comparison of QoS and Performance Requirements by Service Type.

| SERVICE                      | QOS EXPECTATION                                 | PERFORMANCE ATTRIBUTES   |
|------------------------------|---|--|
| Internet                     | Low – best effort                               | Variable bandwidth consumption<br>Latency and loss tolerant                              |
| Enterprise/Business Services | High – critical data                            | High bandwidth consumption<br>Highly sensitive to latency<br>High security               |
| Peer-To-Peer                 | Low – best effort                               | Very-high bandwidth consumption<br>Latency and loss tolerant                             |
| Voice                        | High – Low latency and jitter                   | Low bandwidth – 21-320 Kbps per call<br>One-way latency < 150ms<br>One-way jitter < 30ms |
| Video                        | High – low jitter and extremely-low packet loss | Very-high bandwidth consumption<br>Very sensitive to packet loss                         |
| Gaming and Interactive       | Services High – low packet loss                 | Variable bandwidth consumption<br>One-way latency < 150ms<br>One-way jitter < 30ms       |

## VI. SUGGESTED METHODS OF IMPROVEMENT

In order to remain the best choice telecommunication industry in Nigeria, the following under listed methods are suggested towards improving the quality of service of Etisalat Nigeria.



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A. The engineers of Etisalat should design their works having good quality of service at the back of their minds. The network should be designed in such a way that it will never fail. That is it should be able to create alternative links to resolve transient changes over the network. Protocols, gateways and backbone for the network should be wisely chosen or decided upon.

B. Etisalat should invest heavily in transmission network development and have a proper radio planning. This would ensure increased network resilience, improved bandwidth utilization and alleviation of capacity bottleneck.

C. Build additional switching centers across the country and increase capacity to handle more traffic.

D. Etisalat should upgrade and optimize all existing base stations. If this is done, it will stem call set up failures due to rise in traffic volumes.

E. They should install additional base stations across the country. This would create room for the network to handle more traffic.

F. If a particular base station is to be taken "offline" (either for schedule maintenance, repairs, upgrades etc.), all neighbouring base stations should have their communication power level increased. This will increase their coverage area, thereby reducing congestion and dropped calls.

G. Incessant power failures should be addressed by the government. This will stop the over-dependence on generators for power supply. If this is achieved, call tariff would drastically go down.

H. As technologies emerge rapidly, Etisalat Nigeria should be very proactive in the acquisition and deployment of new electronic when they come onboard. The network should be accessible to the largest number of users. The land mass of the country should be taken into serious consideration, Knowing that greater part of the population reside in the rural areas.

I. The use of Automated Test Calls and GIS (geographic information system) based tool is highly recommended. Automated Test Calls overcomes all the limitations of manual

Test Calls in monitoring quality of service. However, the use of GIS-based tools becomes imperative as it helps to make informed technical decision in resolving network issues. It shows areas experiencing low quality of service.

## VII. CONCLUSION

Quality of service is seen as a vital performance indicator that is used in determining the efficiency of an industry in terms of services rendered.

This paper has x-rayed different factors affecting quality of service of telecommunication industries in Nigeria (A case study Etisalat Nigeria a), and also suggested different methods of improving them.

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