**REPORT OF EXERCISE ON NCC DATA**

**INTRODUCTION**

The Global System for Mobile Communications (GSM) has undergone significant advancements over the years, leading to a substantial increase in the number of mobile subscribers globally. In Nigeria, for instance, the Nigerian Tribune reported that the number of mobile subscribers surpassed 200 million in 2022. While this increase in mobile subscribers may signify growth and development, it also poses a challenge to the network infrastructure due to network congestion. Network congestion is one of the most significant causes of poor quality of service worldwide, and it occurs when the traffic load on a network exceeds its capacity to handle the traffic effectively.

The performance of Mobile Network Operators (MNOs) is crucial in providing quality telecommunication services to their subscribers. In Nigeria, MNOs such as MTN, Glo, Airtel, and 9mobile face significant challenges in meeting the regulatory standards set by the Nigerian Communications Commission (NCC) due to several factors, including network congestion. Despite regulatory expectations, poor quality of service has remained a persistent challenge for MNOs in Nigeria, as indicated by previous studies (Oseni et al., 2014; Obiyemi et al., 2015; Ajayi et al., 2021).

Measuring MNO performance is essential in identifying areas that require improvement and optimizing the network infrastructure to provide quality services to subscribers. Key Performance Indicators (KPIs) are used to measure MNO performance, and they are a set of parameters that indicate the level of service quality provided by the network. KPIs typically include network availability, call success rate, call drop rate, and data throughput, among others.

Call drop rate is a critical KPI that measures the number of calls that are disconnected before completion due to network issues. A high call drop rate indicates poor network performance and dissatisfaction among subscribers. Therefore, measuring the call drop rate is essential in identifying areas of the network that require improvement to provide quality services to subscribers.

This study aimed to leverage crowdsourcing to analyze KPIs and predict call drop in the Nigerian GSM network, with the objective of contributing to the body of knowledge on network optimization and enhancing the quality of service provided by MNOs in Nigeria.

**OBJECTIVES**

* Collect data on quality of service of some major mobile networks
* Compare with NCC and international benchmarks

**LITERATURE REVIEW**

**METHODOLOGY**

The methodology employed in this study aimed to predict call drop in the Nigerian GSM network using Quality of Service (QoS) parameters. Specifically, the QoS parameters considered were Received Signal Level (RxLev), Received Quality (RxQual), Frame Error Rate (FER), Bit Error Rate (BER), Timing Advance, and Signal to Noise Ratio. These parameters were chosen as they are commonly used to measure network performance in the telecommunications industry.

The data used for this study was collected in February 2022. The datasets for MTN, Glo, and Airtel were collated from 17th to 24th February 2022, while that of 9mobile was collated from 18th to 24th February 2022. The data was collected through crowdsourcing, which is a widely adopted data collection method in the telecommunications industry due to its cost-effectiveness and ability to gather large volumes of data from a diverse range of sources.

The data collected through crowdsourcing contained Key Performance Indicators (KPIs) used to measure network performance, such as call success rate, call drop rate, and data throughput. These KPIs were used to predict call drop in the network, which is a crucial factor in assessing network performance and subscriber satisfaction.

The data collected through crowdsourcing was first cleaned. The data cleaning was done visually with Microsoft Excel and programmatically using the Python programming language. The cleaning step was a critical step in preparing the dataset for further analysis.

After cleaning, the data was analyzed using statistical methods and modeling techniques. These techniques were applied to identify patterns and relationships between the QoS parameters and call drop rate. The findings from this analysis were used to develop a model that predicts call drop rate based on the QoS parameters.