Building an Integrated Quality of Experience (QoE) management & monitoring system for mobile networks in Bangladesh

Description: The study proposed a framework model to develop an integrated QoE measurement process considering big data analytics and virtual agent using machine learning platform which is a high-level, high-performance management & monitoring system to ensure good quality of services at the end user level. This considers mobile users as prosumers to make the process interactive to provide network self-optimization, service/tariff level restructuring, regulatory compliance through an integrated system for the diversified nature of services without compromise.

Abstract: Knowing user perceived QoE, the regulator can estimate the contribution of network performance to the overall level of customer satisfaction and measure the quality of services to be provided by operators. The use of user experience dataset involving time and location gathered from the mobile network traffic for modeling perceived QoE through an integrated platform is still limited in the literature. Therefore, this study proposed a framework for building an integrated QoE management & monitoring system considering existing infrastructure of mobile networks in Bangladesh using the machine learning and big data analytics approach. The proposed framework describes the process of estimating or predicting perceived QoE based on the datasets of QoS obtained or gathered from the mobile network in Bangladesh, complaints from the Customer Complaint Management System (CCMS) as well as to develop comparison & obligatory mechanism considering regulatory aspects.

The research framework model is constructed analyzing the consolidated snapshot for Bangladesh’s current situation and relevant solutions have been studied from benchmarking countries to get reference viewpoints. Capacity calculation, model estimation, big data analytics, virtual agent through machine learning platform, and other provisioning to get passive intrusive probe connectivity with the MNOs are major doorsteps to construct an integrated management & monitoring system.
Centralized self – reorganizing process in the whole eco-system is designed with customer experience management, service/tariff analysis, & networking monitoring through machine learning mechanism and real-time user/service level optimization using big data analytics platform. The proposed model used semi intrusive probes to collect data for mapping between KPIs and KQIs using QoE estimation model which will provide valuable input regarding the analysis of the root causes of QoE degradation. At the operator’s side, probes will collect end user-related data, context data, device-related data, application data, network traffic data as well as collect data from Customer complaint management system (CCMS) & virtual agent through machine learning. It provides the best insight into the service quality that users actually perceive and collect QoE information feedback to the network, service/application, content, or cloud provider to adapt, control, and optimize the QoE.

The overall goal of QoE management & monitoring system is related to optimizing end-user QoE (end-user perspective), while making efficient (current and future) use of network resources and maintaining a satisfied customer base (Provider as well as Regulator perspective). QoE based Integrated system shall have the way forward path for regulator to get early preparedness for futuristic society to cope up with ultra-minimum latency society where QoE based management and monitoring would be more effective tools to provide optimum level of service. QoE based regulation restructuring, Spectrum reframing, QoS standard revisiting, Tariff remodeling etc. are the prime concern for regulator to adopt this QoE based integrated Management and Monitoring system in telecommunication sector.