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QOS evaluation methods and measured QoS parameters for Telecommunication Network in Uganda-Operators' Perspective

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Our Vision

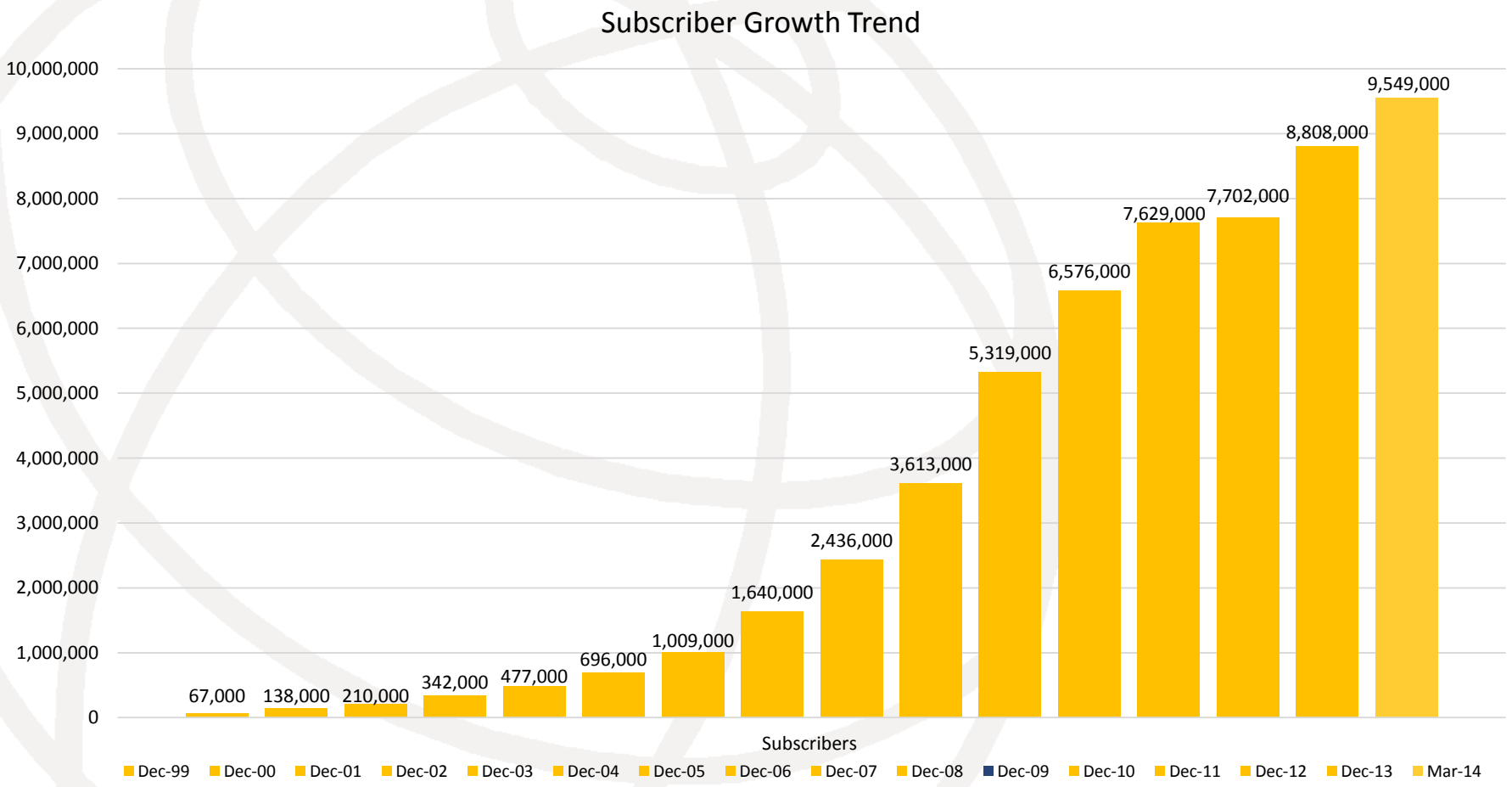

Our Vision:
To lead the delivery of a
bold, new
Digital World to our customers.

Introduction MTN Uganda

- MTN Uganda started operations in October 1998
- MTN Uganda holds a National Operator license and therefore provides all services Fixed Line, Mobile, Data and ISP
- MTN Uganda currently has 9.5 million subscribers and 56% of the market share

MTN Uganda

- Subscriber growth since inception (1998-2014)



Evolution of QoS evaluation Uganda (1)

Original QoS requirements

- The Second National Operator license that was issued to MTN Uganda specified the Service Quality requirements that had to be met
  - Successful call completion rate
  - Fault recovery rate
  - Connection time for new subscribers/customers
  - Digitalization of network

Evolution of QoS evaluation Uganda (2)

- The evaluation methodology at the time was based on statistics from the entire network. Operator required to provide the Regulator with reports on a quarterly basis.
- Reports include;
  - Achievement of Key Performance Indicators; average performance of entire network
  - Number and nature of critical service affecting incidents experienced
  - Usage of radio spectrum
  - Network Coverage and services provided

Evolution of QoS evaluation Uganda (3)

Review of Quality of Service Standard

Over time the QoS standards and guidelines have been reviewed regularly

- Quality of Service (QoS) standards 2007. New guidelines issued by Regulator
- Major changes were
  - **Methodology** An independent measurement of QoS referred to as verification audits/benchmarking drives using the "**Drive Test" method**
  - **KPIs**: Additional Key performance indicator (KPI) to be measured
  - **Targets:** Change in targets to be achieved
  - **Publication**: Results to be published

Evolution of QoS evaluation Uganda (4)

- The change in methodology caused a bit of a stir and the first publication of the results caused even more of a stir among operators

Evolution of QoS evaluation Uganda (5)

- The change in strategy has been recognized as being in line with the changing landscape of the telecommunications market in the country.
  - The original requirement by customers was for coverage and quick and easy subscription/connection
  - Customers are more sophisticated now that the basic requirement is in place. Demanding for more value for money and quality is part of that

Evolution of QoS evaluation Uganda (6)

- The new methodology has caused a change in the way operators verify network quality. Similar to the Regulator more focus on Customer Experience than only network /technical perspective
- With the growth in maturity of the telecommunications market, the focus is more on quality and innovative products rather than coverage and price. *Where there are many players the customer has choice*
- To be commended was the informing/engagement of the Operators by the Regulator

Previous QoS Evaluation Methodology vs New Methodology (1)

- Previous methodology
  - Reports based on statistics
  - Reports from Network/Technical perspective provided by Operator
  - Covers entire network all the time
  - Not independently verified
  - Not published

Previous QoS Evaluation Methodology vs New Methodology (2)

- New Methodology
  - Reports based on drive tests carried out by Regulator
  - Reports from end user/device perspective
  - Covers specific towns only and only on particular days
  - Independent from Operator
  - Published

Previous QoS Evaluation Methodology vs New Methodology (3)

- Both methodologies have their pros and cons
- Why must we have an either/or approach? Why not use both and more.

Drive Test Methodology (1)

- Whereas the drive test methodology provides a view of the customer experience, it has some short comings
  - Sample shows snapshot of network performance at a specific point in time at a specific spot in the network
  - It does not cover the entire network
  - It cannot be used to quantify all aspects that determine the customer experience

Drive Test Methodology (2)

- Equivalent to using a 10 minute oral quiz to test a students' mathematics ability as opposed to a full 3 hour written examination that covers all aspects of the subject. Whereas the 10 minute quiz can be an indication of the students aptitude, would it be a fair measure to be used to award them a school certificate and admission to the university?

QoS Parameters for measurement (1)

In line with the focus on Customer Experience rather than the technical network what is important to a customer and how can this be measured?

Can I make a call?

- Network Availability
- Network Coverage – Rx Level
- Call Setup Success Rate or Call Block Rate
- Network congestion

QoS Parameter to measurement (2)

Can I hold the call/remain connected?

- Drop Call Rate

Is the voice quality good?

- Signal Quality/Speech Quality. PESQ/SQI

- Not all the parameters can be appropriately measured using the Drive test methodology such as Network Availability and Network congestion

QoS Targets

- Determination of QoS parameter Targets
  - In line with industry recommendations/benchmarks (International)
  - Benchmarking with other Regional Regulators

Suggestion

- QoS Targets to be set considering other factors:
  - Penetration levels- a mark of maturity of market
  - Environmental and Socio-economic factors such as road infrastructure, electricity grid, security of telecommunication infrastructure.

    More of this in challenges

Suggestion

- Suggested blended methodology
- Network statistics based on network wide statistics that are captured 24/7/365. Can be independently verified by third party or Regulator

And

- Drive test methodology

And

- Documented/evidence of increased investment in network infrastructure in line with growth in subscriber numbers/services offered and subscribed to

Challenges (1)

- Vandalism of telecommunication infrastructure
  - Very frequent fibre cuts; even where outage can be prevented due to protective/alternative routes, the fibre quality gets degraded over time due to frequent joints and splices
  - Theft of copper cables
  - Theft of batteries from sites
  - Theft of fuel from sites
- Access to sites- improvement of road infrastructure needed

Challenges (2)

- Limited electricity mains grid availability- Many rural sites run solely on diesel generators and high capacity batteries. When generators run 24/7 fuel must be refilled 3 times a month. Cannot have very high capacity fuel tanks due to threat of fuel theft

Road Infrastructure Challenges (1)

Approaching Adwari –Gulu District

Road Infrastructure Challenges (2)

- Enroute to Karita site. In the rainy season the rivers over-run the banks making the road impassable
- The pictures attached show the river bed in the dry season (see right picture above) and the river like now in the rainy season (see right picture below)

Damage to Fibre due to Road Works (1)

Conclusions and Recommendations

- A strong law that makes damaging of telecom infrastructure a CRIMINAL offence is required. Action is required by the whole sector the Operator, the Regulator and Government to ensure it is enforced as a prerequisite of ensuring and maintaining optimal QoS and QoE. Need to especially see the Regulator intervening to ensure that telecom infrastructure is protected
  - Overall improvement will be achieved as a result of collaboration between all stakeholders. Harmonization of standards is desired, however the required outcome can only be achieved if the prevailing conditions are harmonized too.
- A more holistic approach to measuring QoS.
  - The whole network all the time as opposed to samples.
  - All aspects of QoS to be measured using appropriate methodology
- In a market with many players/competition a customer has choice, they will vote with their money and feet if their requirement for quality is not being met by one Operator.