

Overall, this is an excellent effort from Ofcom outlining the various issues involved in obtaining accurate mobile quality of experience information for consumers and in-turn improving the coverage and performance of mobile networks. It also provides a good discussion of the pros and cons of different data collection approaches.

Section 2 on consumer experience and needs survey seems to suggest that they mostly care about making/receiving voice calls as opposed to using mobile internet. However, it is important to bear in mind that this is the current state of affairs considering the UK as a whole, as also reflected by the fact that consumers who participated in the survey were generally less satisfied with the mobile internet service. As 4G networks get rolled out, there could be a great diversity in consumer perception on what they need from mobile networks and even their actual experience with mobile internet use taking more importance. This should be kept in mind when chalking out a future proof plan for obtaining mobile QoE information for consumers.

It is pleasing to see that the document points out that different consumers have different requirements from mobile networks and the value of grouping consumers when providing them information on mobile QoE. We explored this issue in some depth in a research paper titled "BSense: A Flexible and Open-Source Broadband Mapping Framework" in 2012 (<http://homepages.inf.ed.ac.uk/mmarina/papers/networking12.pdf>) and suggested the use of utility functions and multi-attribute utility theory towards this purpose. I would suggest that Ofcom define popular set of consumer groupings in terms of their expectations on mobile coverage and performance and publish them along with the granular mobile QoE data for third-parties to use in generating useful consumer information. I would also point out that it is important to consider price and choice information in conjunction with consumer grouping.

Coming to the data collection approaches that focus on actual performance, although drive testing and fixed probes have certain niche benefits, they are actually not viable solutions for continual, accurate and cost-effective measurement, leaving only crowd-sourcing as the only remaining option in addition to and to complement MNO collected information. Since there is not enough documentation on what useful performance information gets collected by operation systems of all MNOs, it would be useful for Ofcom to produce a document that elaborates on this issue. That document could also discuss more recent provisions in the 3GPP standards to allow for user-side measurements.

Concerning paragraph 3.38: Given the complexity of mobile network measurement (compared to fixed broadband measurement) and ample scope for commercial arrangements between MNOs and third-party organisations with the risk of compromising interests of consumers, I believe Ofcom should take an active leading role in promoting and coordinating actual performance measurement complement predicted performance data and MNO sourced data for more complete and reliable information to consumers.