OpenSignal

OpenSignal comments on Draft BEREC STRATEGY 2015 – 2017

OpenSignal is creating a comprehensive database of cell phone towers, cell phone signal strength readings, and Wi-Fi access points around the world. We create this database to provide insight on connectivity, adopting the philosophy that only a data driven examination of the true performance of these networks can lead to active improvements of electronic communications infrastructure. We achieve this by collecting data on mobile devices through our Android and iOS apps, which have had over 11 million downloads around the world.

We are providing comments on the Draft BEREC Strategy 2015-2017 because the three strategic pillars of the strategy,

1. Promoting Competition and Investment,
2. Promoting the Internal market, and
3. Empowering and protecting end-users

are directly aligned with OpenSignal's mission and methodology of crowdsourcing data to allow accurate analysis of the performance of networks. Based on our extensive experience on data collection and analysis, we are providing comments relating to how a crowdsourced methodology can contribute to achieving the aims laid out in the strategy.

About OpenSignal

The OpenSignal data is collected from real world consumer smartphones, and is recorded under conditions of normal usage. Rather than approximate the user experience, we directly measure it from the users of our smartphone application. Our application can be freely downloaded on either iOS or Android devices and constantly monitors the true network experience that users are getting on those devices. Through being located on consumer smartphones, we are able to observe the network exactly as the end user experiences it. This customer-centric approach allows us to measure the true end-to-end experience of the mobile network. We're not interested in models, simulations or assumptions – our goal is to directly measure user experience through the eyes of the users themselves.

Although operators have been monitoring how their networks perform since the very beginning, there remains a disconnect between the standard network KPIs and what surveys say about customer experience. We believe that the only way to bridge this gap is to measure the network using the customer experience as our starting point.

The OpenSignal website provides consumer-focused visualizations and analysis, based exclusively on data collected from the users of the OpenSignal application. Our website's features include coverage maps that show cellular signal strength for a given geographical area, ranking all of the networks by performance in that location, and the locations of all cell towers within that particular region.

Strategic pillar 1 – Promoting Competition and Investment

"BEREC and its members, the National regulatory authorities (NRAs), must promote effective competition, and in so doing promote efficient investment and innovation in new and enhanced infrastructures and services."

At OpenSignal, we could not agree more. Effective competition encourages companies to

innovate, improve their service offering and lower costs, which can in turn be passed onto consumers. When network operators self-report coverage, it is often hard to compare on a consistent basis. Drive testing methodologies differ, as do testing devices, making apples-to-apples comparison across networks effectively impossible. A crowd-sourced methodology, independent of network and device type allows for consistent reporting of performance of the competition. OpenSignal's crowd-sourced data compares network operators' performance at the user level. One way in which this data is presented is through our coverage map, available on our website and in the app itself. This map tool allows the user to compare all network types in a given region, and filter to view the coverage of both individual operators and network types (e.g. 2G, 3G or 4G).

Regular analysis of the performance of networks within a country can highlight opportunities for competition for infrastructure improvements. An example is OpenSignal's study on Denmark's Notspots in 2013. The report found 21,098 'notspots' - areas where multiple users reported have no 3G access on a particular network, demonstrating a tangible opportunity for Danish networks to expand their service into these areas.

Since Opensignal empowers users to report on the quality of their cell phone coverage, both actively and passively through the application, this creates an opportunity for network operators to compete to offer better services to their customers. This in turn encourages and incentivizes further investment in network infrastructure.

Strategic pillar 2 – Promoting the Internal market
"Developing consistent regulatory practice. The objective is to help ensure that all of Europe is subject to a (high) minimum level of quality of regulatory practice (e.g. fair and transparent processes), and that those with pan-EU ambitions can rely on consistent regulatory approaches across Europe. Consistent approaches enable the realisation of potential economies of scale."

OpenSignal agrees it is important to ensure that all countries within Europe strive for the same high standards of connectivity for their citizens. Using a consistent methodology to compare coverage across borders is challenging, however crowd-sourcing data that is agnostic of nation states allows for consistent framework for reporting on and comparing coverage between countries.

Consistent reporting on quality of service is also important for brokering cross-boarder deals, such as agreements between carriers for international roaming.

*"**Addressing cross-border issues**. Typically this relates to activity targeting services which are provided across national borders. This includes cases where a single coordinated approach is required (e.g. international roaming), or cases where cooperation between regulators is required (e.g. cross-border dispute resolution or consumer protection concerns arising from cross-border fraud or misuse of numbering resources)."*

Consistent reporting is important not only for cross-border roaming opportunities, but also domestic roaming. OpenSignal investigated the impacts national roaming could have on signal availability in the UK in 2014, demonstrating how if this were possible then the time an average UK user spends with no signal would drop from 15% to 7%. Being able to draw consistent comparisons across networks internationally across Europe, such as we have done with this study within the UK, demonstrates the benefits that can be won through making consistent performance comparisons throughout the European Market.

Strategic pillar 3 – Empowering and protecting end-users

'it is essential that NRAs, both individually and jointly through BEREC, monitor market evolutions and, to the extent possible, respond to ensure end-users' continued ability to choose the services of their choice, at appropriate levels of price and quality. … NRAs need to ensure end-users are equipped to make informed choices about the increasingly complex products emerging in a convergent environment."

Empowering and protecting end users is not only a admirable objective to aim for in itself, but also integral to the success of pillars 1 and 2 of BEREC's proposed strategy; Until the end-user's needs are put first, effective competition will not prosper and internal markets cannot improve in efficiency. Removing knowledge asymmetries and ensuring that consumers can make informed choices is key. OpenSignal embraces this approach and benchmarks network operators' performance against each other. Our network rank methodology calculates which operator is best based on a number of metrics.

This network rank algorithm uses a series of Quality of Service (QoS) parameters (listed below), all of which are measured empirically from users of the OpenSignal mobile app. To calculate the ranking, the score assigned to an operator for a given parameter is calculated according to the best performing operator for that parameter in a given region. In other words, it is a measure of the performance of an operator in relation to the local best operator. Therefore the network rank is not based on an absolute scale and rankings of operators from different regions cannot be compared directly.

Network Rank Parameters

- Signal Coverage: This is an average of the signal strength reported. For LTE this is the RSRP, but for all other network types this is the RSSI (as defined by 3GPP specifications TS 27.007 8.5).
- Download Speed: This is an average of the download speeds reported by any data network tests (see data network test section or more detail) carried out in the region.
- Upload Speed: This is an average of the upload speeds reported by any data network tests carried out in the region.
- Latency: This is an average of the latency times reported by any data network tests carried out in the region.
- Data Reliability: This is based on a combination of the success rates of the latency, download and upload tests. It is the proportion of data requests that are successfully completed.

OpenSignal has partnered with consumer groups to ensure that end-users are informed of the performance of the network options they are considering. For example, we have partnered with Which, a UK based consumer group, to embed our coverage map on their website and to publish a number of reports examining the status of coverage in several UK cities. We are also in discussions with several other consumer groups across Europe, including Altroconsumo in Italy and Deco Proteste in Portugal. OpenSignal has also partnered will cell phone retail websites to allow consumers to be fully informed of their options, such as mobiles.co.uk, which also has an embedded coverage map on their website.

Being able to conduct periodic analysis of network performance is also cost effective through OpenSignal's app since there is a ready user-base on continual data collection. For

example, we produce an annual State of LTE report. 2014's report found that Tele2 of Sweden is one of the top networks in terms of coverage.

OpenSignal has real world experience of using crowd-sourced methodology to analyze network performance, empowering the end-user both in terms of enabling them to contribute data on their own experience of the network, but also so that they are informed of the best options available to them.

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