Q&A Transcript

1. API boxes. My understanding is QoS is used to improve services to customers but the operator has no visibility of customer tests over the API boxes. The customer tests maybe different from the operator tests and may have different results.

   - *The final objective is to improve the experience of the end-user. Customer tests and operator tests can be complementary to guaranty a good QoS/QoE for end user and help identify bottle necks. For example, if the results are different, it's maybe because of the Wi-Fi or the cross-traffic, the API will helps take out the biases that can't be detected by operators in their tests.* ***(Response from Samih Souissi, ARCEP, France****)*

2. To Janusz, does the Regulator have to install a specific internal system to enable access of the crowdsourcing results and analysis? If yes, which system or app?

   - *The solution is typically delivered via the cloud so there is no installation necessary to Regulator's systems. There are of course different apps/systems. I can only talk about ours, you can find out more at www.speedchecker.com, or reach out to me at janusz@speedchecker.com for more information. (****Response from Janusz Jezowicz, Speedchecker****)*

3. To the Last Presenter, how did you motivate participants in this model?

   - *We paid them a small amount of money for conducting active tests. The passive data were gathered by motivating the users to keep the measurement software installed on their device.* (***Response from Werner Robitza, CEO and Co-founder AVEQ GmbH, Germany***)

4. To Werner: Do you have test results from the period of COVID-19 confinements? Any findings?

   - *We stopped the campaigns at the end of 2019, so there are fewer passive data that we have now, and thus we did not analyze it in detail. We noticed higher usage of video — that was also confirmed by other operators like Bitmovin. I would have to look into it though; perhaps it could become a contribution for one of the future meetings.* (***Response from Werner Robitza, CEO and Co-founder AVEQ GmbH, Germany***)

5. How fixed QoS models incorporate Wi-Fi measurements coming from smartphones?

   - *Wi-fi measurements have additional complexity over cellular measurements as they are more difficult to validate. In the majority of scenarios, wi-fi measurement's aim is to measure QoS of fixed networks. As you can see from ARCEP's presentation there are new approaches being implemented by regulators which can overcome those challenges and offer more accurate measurements on fixed networks. At SpeedChecker we also tackle this problem but we use a different methodology. Our approach relies on a novel wi-fi measurement which estimates wi-fi capacity and excludes fixed network measurements if wi-fi capacity is not sufficient. (****Response from Janusz Jezowicz, Speedchecker****)*

6. I have one question for Mr. Jezowicz (SpeedChecker). I note your lesson learned (or key takeaway) to involve the stakeholder including MNO since the beginning of the project. The question would be how is the relationship nowadays when the regulator aims to start an action plan with one MNO in some place or if any MNO still argue against the results (pointing different source and so on)?

   - *MNOs can be involved before the project is launched publicly to give them heads up what data will be published and what is the methodology for data collection and processing. It is common that there is a pushback on some data being published, especially from MNOs who do not come on the top for certain KPIs.*

*We hope that regulators now have more frameworks at their disposal such as the new ITU E.812 recommendation on crowdsourcing. This new document gives regulators more confidence in the process and how to introduce crowdsourcing to their QoS monitoring strategy. (**Response from Janusz Jezowicz, Speedchecker**)*

7. To Mr Janusz, how do you get voice KPI?
   - *We use available APIs from mobile OS to get the state of the device, e..g if device is in calling mode or idle and based on information such as these we can provide voice quality KPIs. (**Response from Janusz Jezowicz, Speedchecker**)*

8. To Janusz: Is the regulator in Bahrain using the measurements from the app to benchmark MNOs? If yes, how are they able to deal with the challenge of data being generated from random locations at random times and from a myriad of users.
   - *Bahrain TRA does not use crowdsourced measurements for benchmarking (**Response from Janusz Jezowicz, Speedchecker**)*

9. To Janusz: What are some important factors that determine a good active and passive measurement?
   - *It is quite a broad question. If we take it from a perspective if a measurement is valid or invalid then criteria to determine very much depend on the type of measurement. For example passive measurements which read the state of the device, e.g. if a user is connected to 4G can be validated easily as the device offers that information accurately. However, measurement of e.g throughput (both active and passive) can be influenced by a lot of other factors such as available system resources, bandwidth utilization on the device etc. Each crowdsourcing vendor has to have a robust measurement methodology to describe how the measurements are collected and processed. (**Response from Janusz Jezowicz, Speedchecker**)*