MONITORING AND MAPPING OF THE QOS – INITIATIVES OF THE PRESIDENT OF UKE

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ITU-EC-UKE Regional Conference for Europe
Broadband Services and Infrastructure Mapping
Warsaw, 11-12 April 2016

- Agenda

Data sources for the purposes of QoS/QoE mapping

Memorandum on cooperation for QoS in the telecommunications market

Reports on testing the quality of mobile services
- sample of mapping the results of QoS drive tests

NPK - Measurement Tool under the project on Information System on Broadband Infrastructure and the Broadband Poland portal

Dashboards for QoS analytical visualizations - case study in a nutshell

Memorandum on cooperation for QoS in the telecommunications market

Memorandum on cooperation for improving the quality of services in the telecommunications market provided to users,

proposed in May 2012 by the President of UKE and eventually signed with other entities on 26 October 2012, in accordance with the provisions of the Universal Service Directive which stipulates that:

- **contracts for services** should be structured in a clear, understandable, easily accessible form,
- **published information on the quality of services** provided by telecommunications undertakings should be comparable, relevant and up to date,
- **the user shall have access to** comprehensive, comparable, reliable **information** presented in a friendly form,
- **measurable indicators of quality of service shall be identified, as well as the content, form and method of providing information to be published,**
- **minimum quality requirements** shall be identified in order to prevent deterioration of the quality of service in public networks.

UKE Report on testing the quality of mobile services

In the fourth quarter of 2015, the President of UKE carried out tests of service quality for four telecommunications operators.

The analysis was conducted across the country; most measurements were made within cities and urban agglomerations in order to reach as many consumers as possible. However, for the reason of the specificity of coverage of the respective transmitters, the results of the analysis should not be viewed as reliable for every point in Poland, nor generalized for the whole country
http://en.uke.gov.pl/president-of-uke-presents-a-research-report-the-quality-of-mobile-phone-services-19050

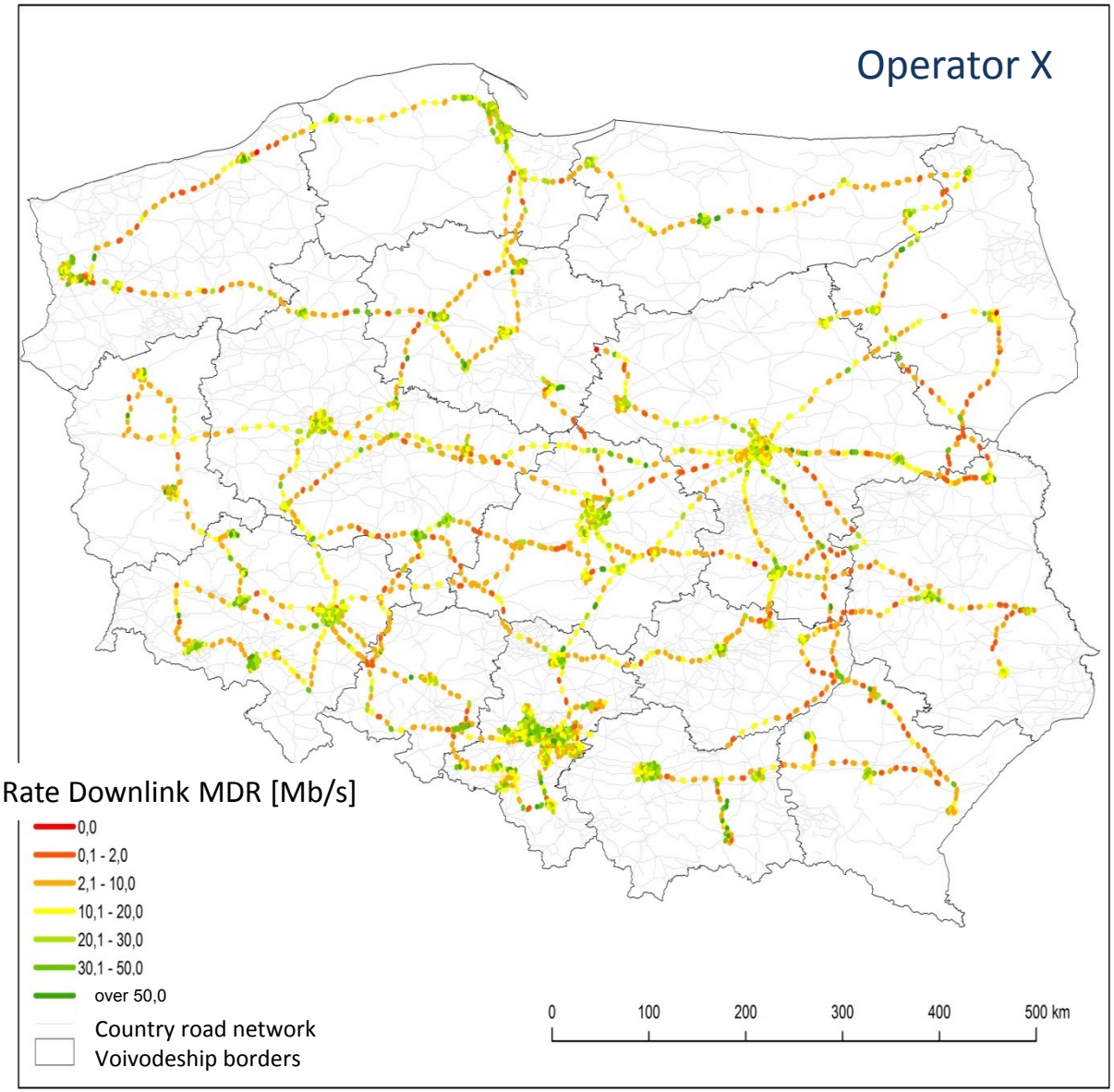
- **Use of the technology (**GSM (2G), UMTS (3G), LTE (4G)**) in a given area, in terms of voice and data transmission**
- **Test statistics**
  - **Voice calls**
  - **Data transfer test – Download/Upload**
  - **Delays in transmitting data packages test**
  - **Test of delay variability**
  - **Test of the reference website**
  - **YouTube Test**

UKE Report on testing the quality of mobile services

Map of measurement routes in Poland

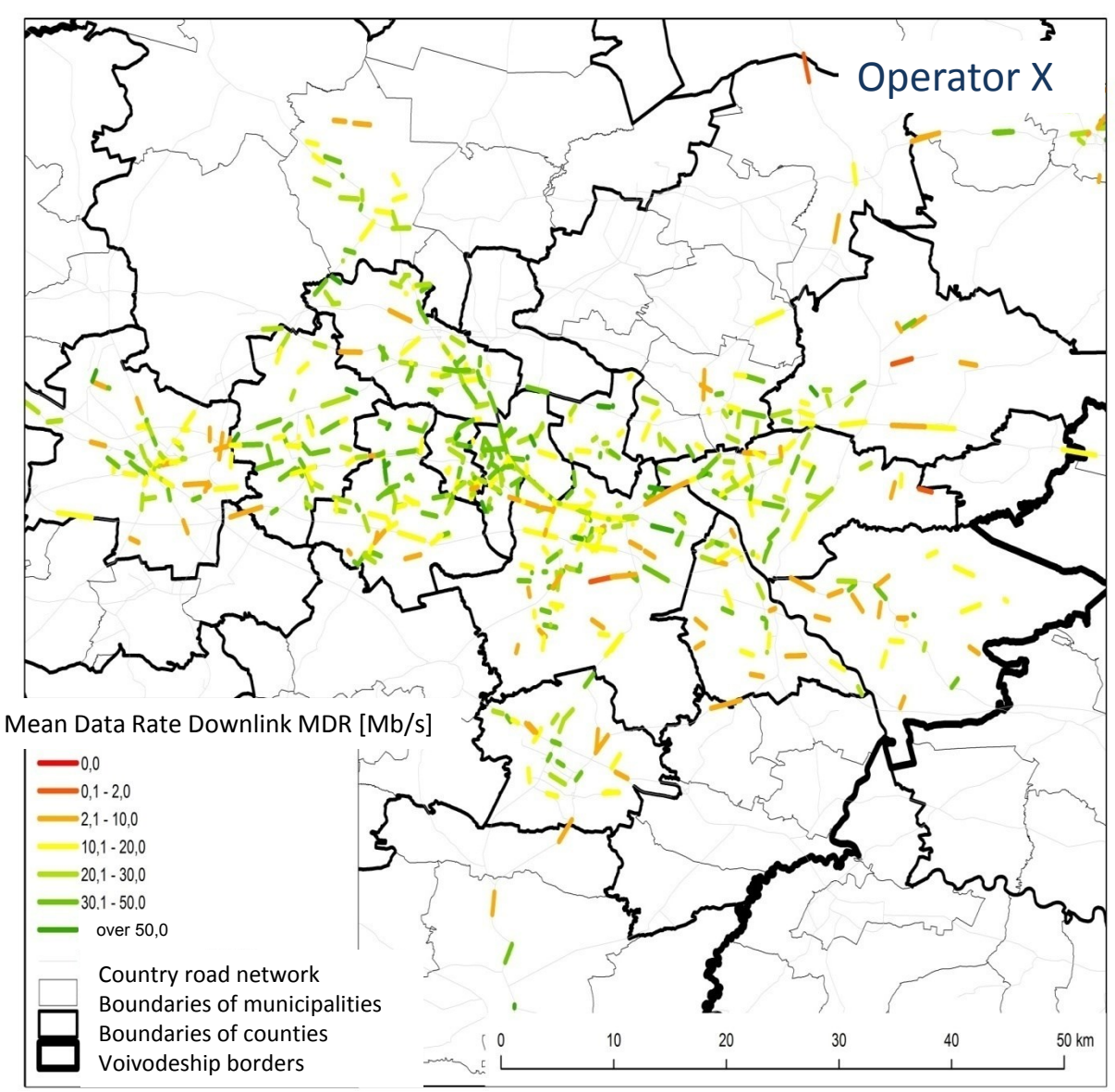
Data sources for the purposes of QoS/QoE mapping

Mapping the results of the QoS drive tests – whole Poland



Data sources for the purposes of QoS/QoE mapping

Mapping the results of the QoS drive tests
– Katowice Region



NPK - Measurement Tool under the project on Information System on Broadband Infrastructure and the Broadband Poland portal

The NPK project supports the Information System on Broadband Infrastructure. The system collects the updated data related to:

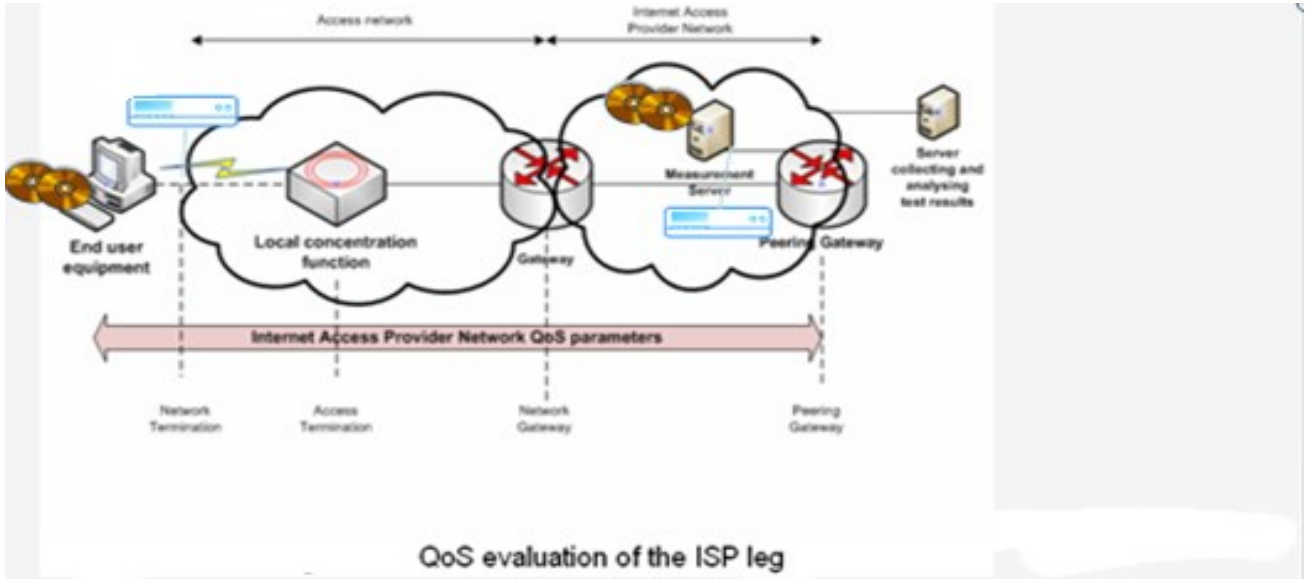
- telecommunications infrastructure providing or allowing for the provision of broadband Internet access,
- main elements of public telecommunications networks providing or allowing for the provision of broadband Internet access:
  - public telecommunications network nodes,
  - transmission systems of the public telecommunications network,
  - public telecommunications networks' interconnection points,
- buildings enabling co-location

Data sources for the purposes of QoS/QoE mapping

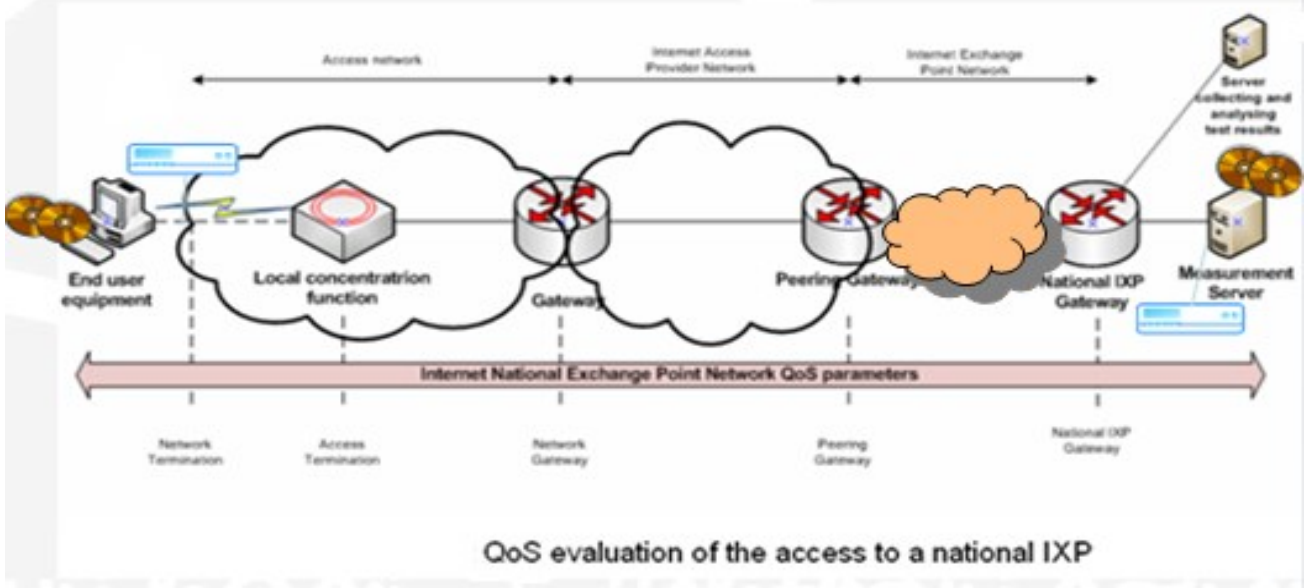
BEREC Model of QoS evaluation of the ISP in the provision of internet access services (IAS)

- Applications for the auditors/testers

- Measurement probes

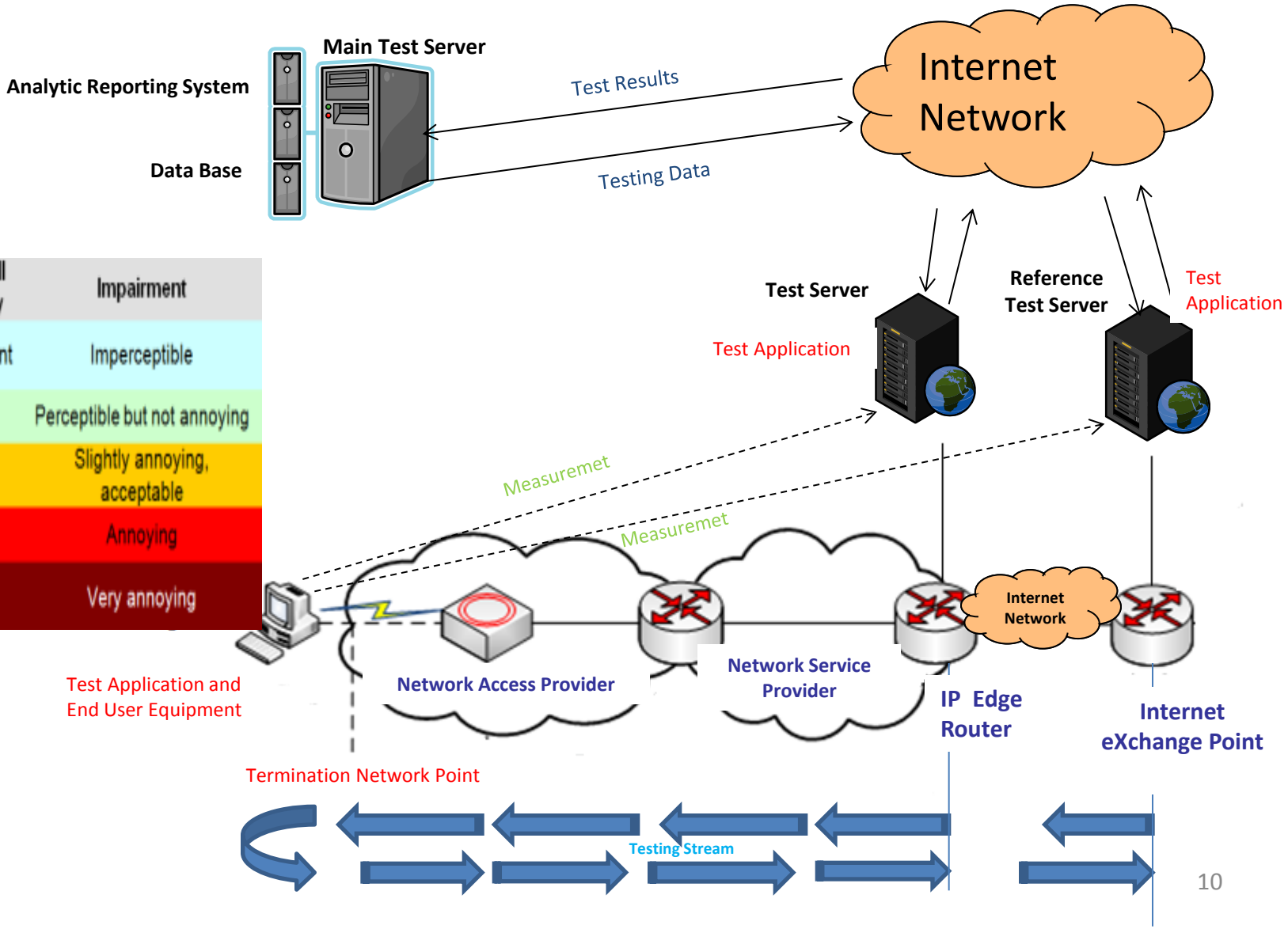


QoS evaluation of the ISP leg



QoS evaluation of the access to a national IXP

Model of Client Application Measurement in NPK



Score	Overall quality	Impairment
5	Excellent	Imperceptible
4	Good	Perceptible but not annoying
3	Fair	Slightly annoying, acceptable
2	Poor	Annoying
1	Bad	Very annoying

Dashboards for QoS analytical visualizations - case study in a nutshell

Observations

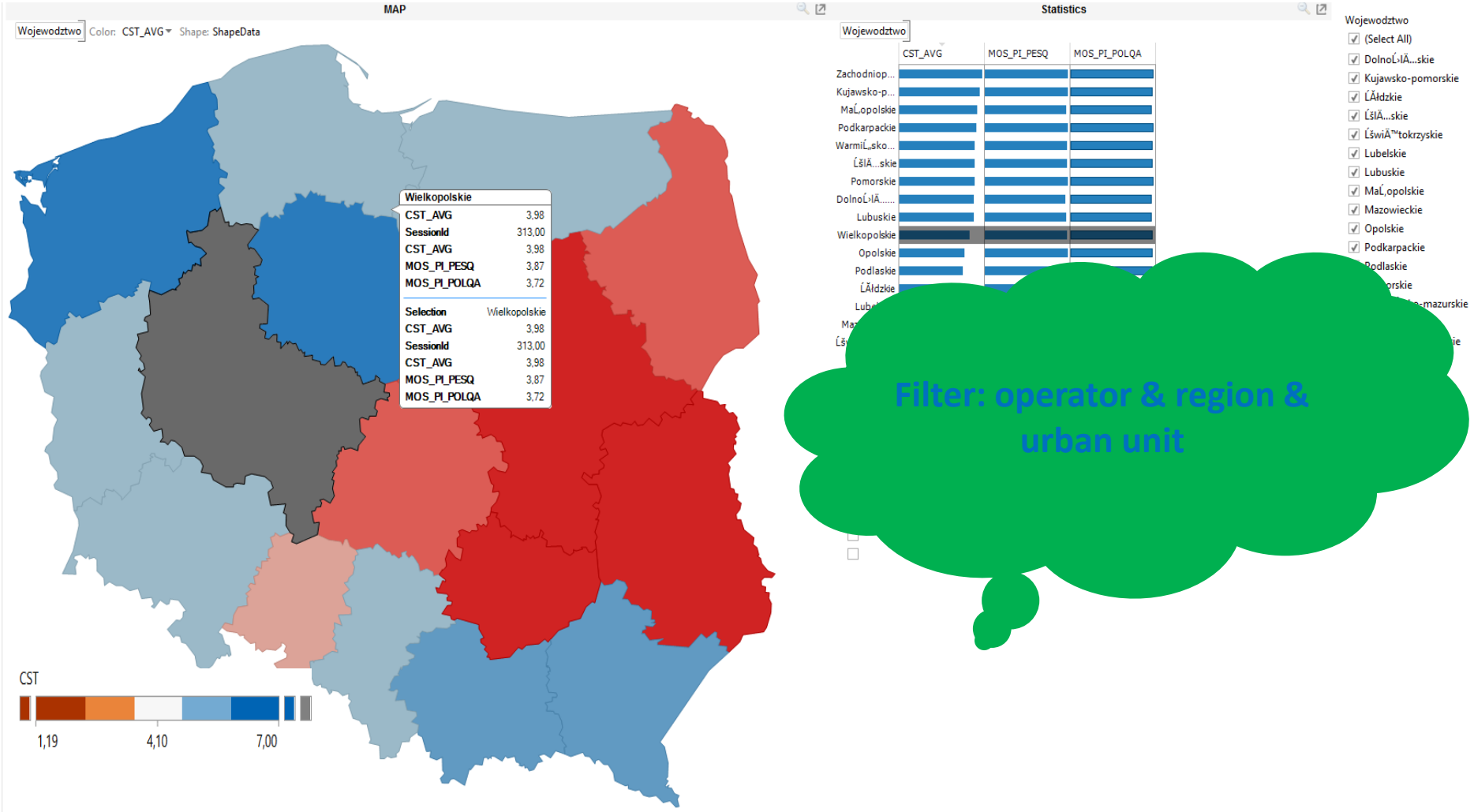
1) Starting from the loading of data through the selection of the variables and the hierarchical structures, by the analytical processing, one obtains the resultants of visualization, filtering, zooming and drilling (sometimes called slicing and dicing), to identify outliers, correlations and trends of QoS outcomes

2) Reports
   - ✓ profiled for QoS indicators:
     - Call Set Up Time (CST),
     - MOS (Mean Opinion Score) - PESQ (Perceptual Evaluation of Speech Quality),
     - MOS -POLQA (Perceptual Objective Listening Quality Assessment)
   - ✓ QoS indicators filtered by color, value, size and shape

3) Values on dashboards presented on the next few slides are based on the results of QoS drive tests. They are shown only for visualisation purposes.

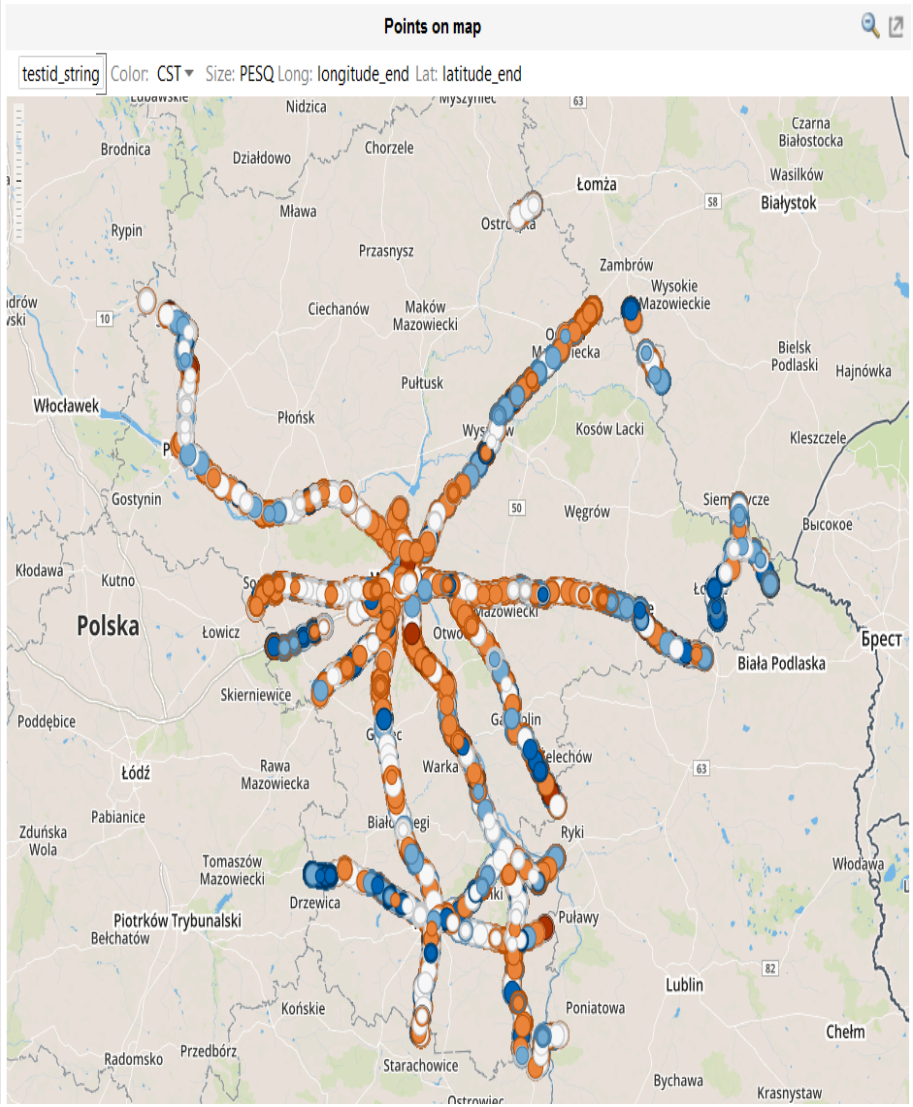
Dashboards for QoS analytical visualizations - case study in a nutshell

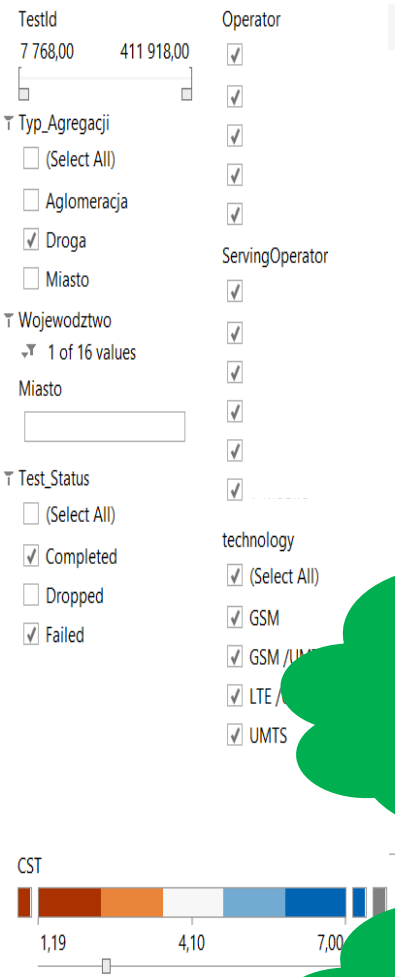
Indicators – CST (color), MOS-PESQ, MOS-POLQA (values) – by Voivodeship

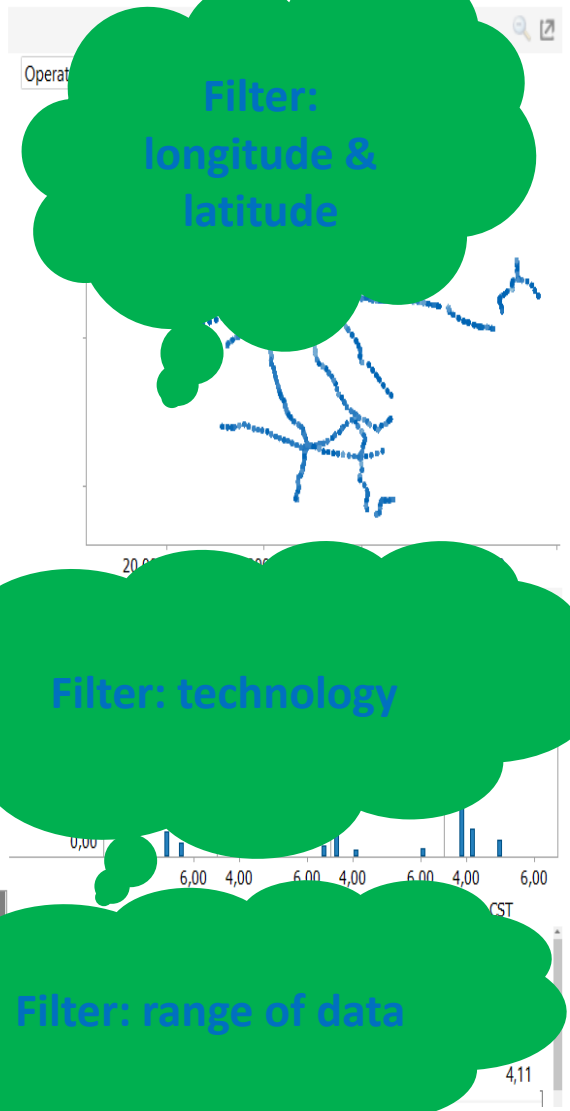


Dashboards for QoS analytical visualizations - case study in a nutshell

Indicators – CST (color), MOS-PESQ (size) – by urban unit & location







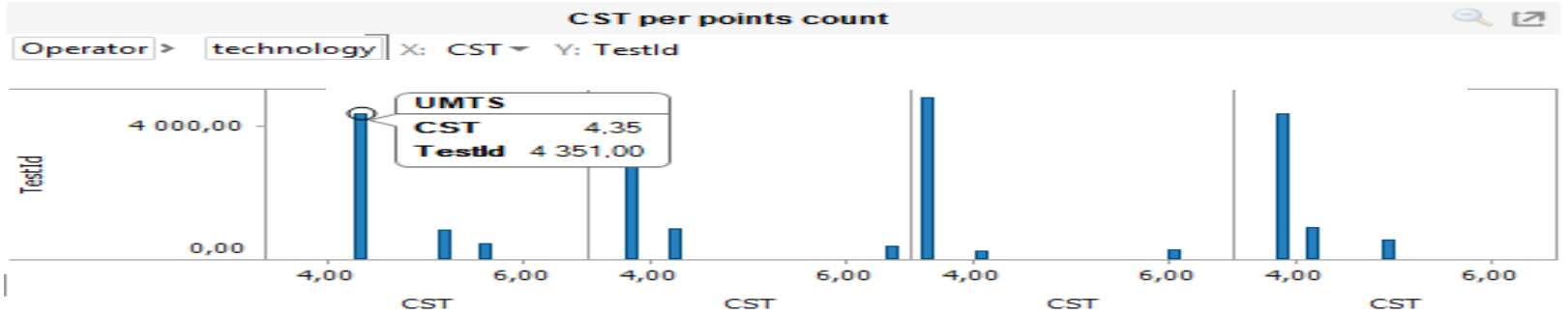
Filter: longitude & latitude

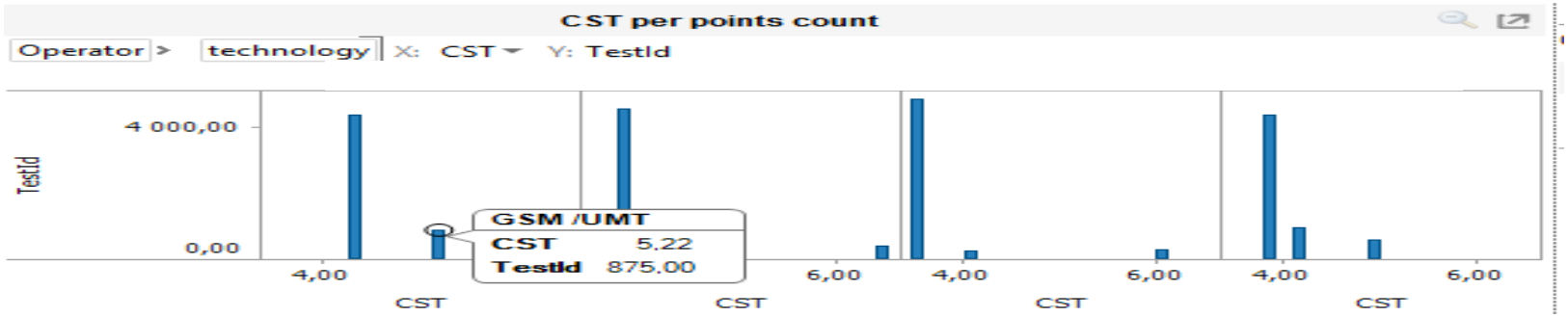
Filter: technology

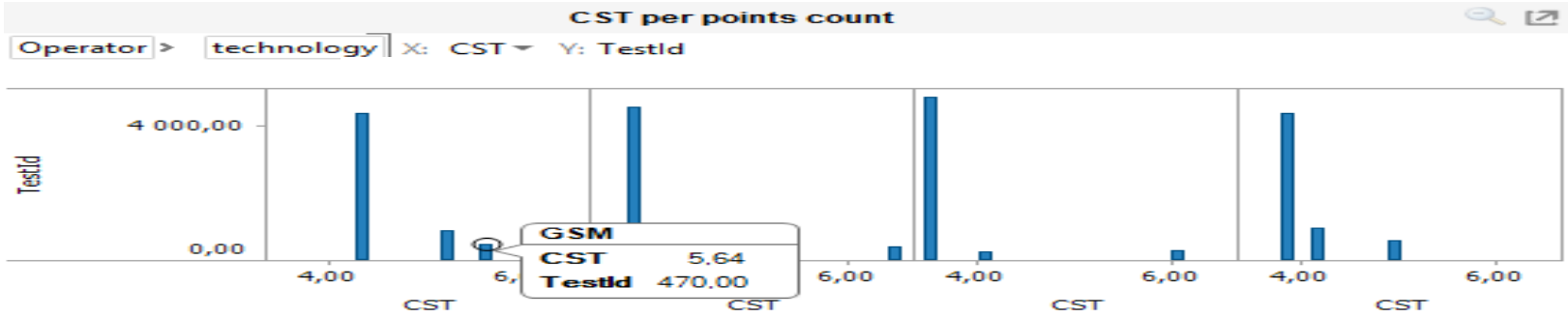
Filter: range of data

Dashboards for QoS analytical visualizations - case study in a nutshell

Indicator CST (bars) by operator & technology

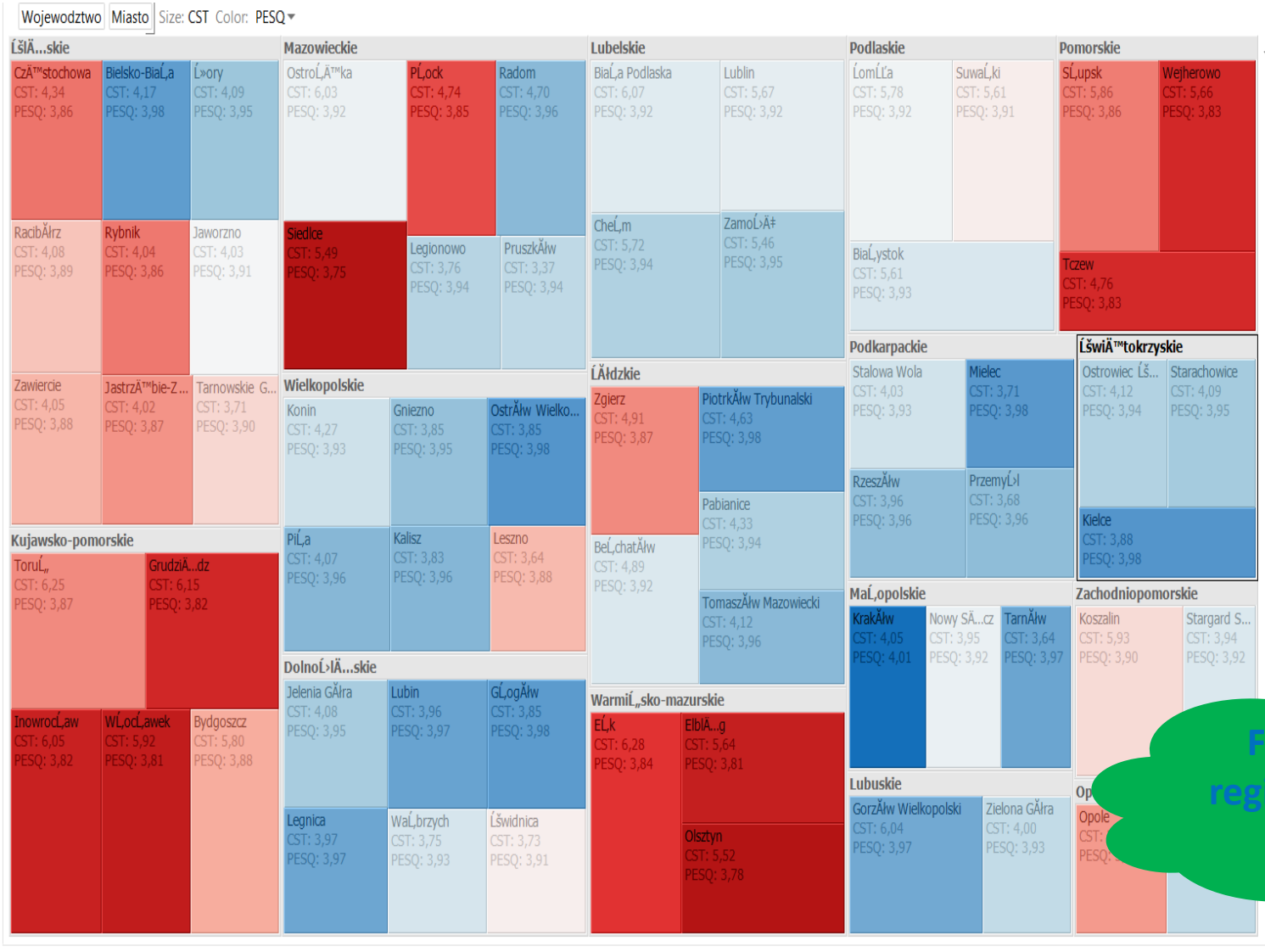






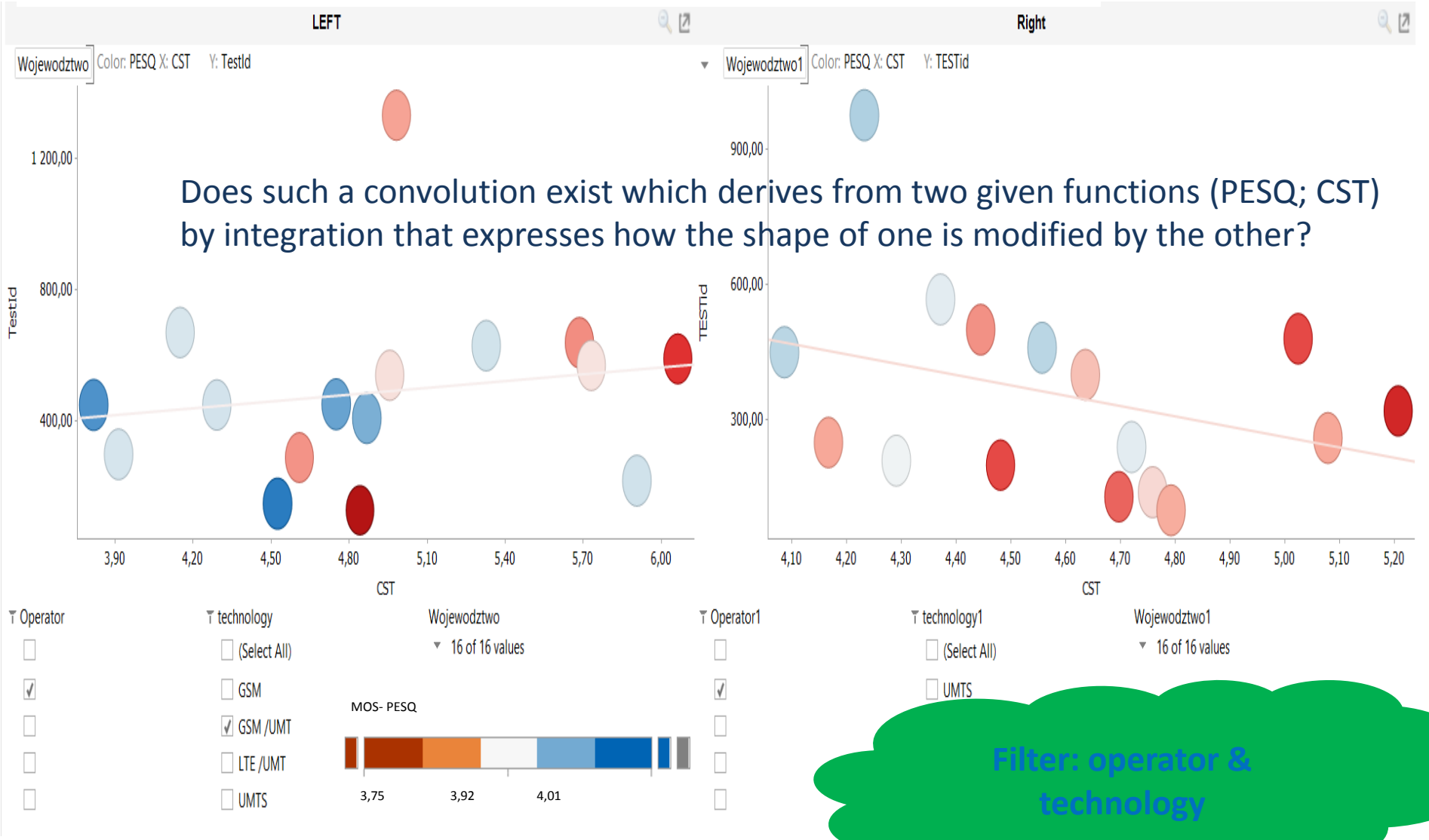
Dashboards for QoS analytical visualizations - case study in a nutshell

Indicators – CST (size), MOS-PESQ (color) – by urban unit



Dashboards for QoS analytical visualizations - case study in a nutshell

Indicators – MOS-PESQ (color), CST (value) – by urban unit



Thank you for your attention!

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