Crowdsourcing for regulators – Case study from Bahrain TRA

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Agenda

01 Overview of QoS initiatives in Bahrain

02 Crowdsourcing solution architecture

03 Mobile apps capabilities and types of measurements

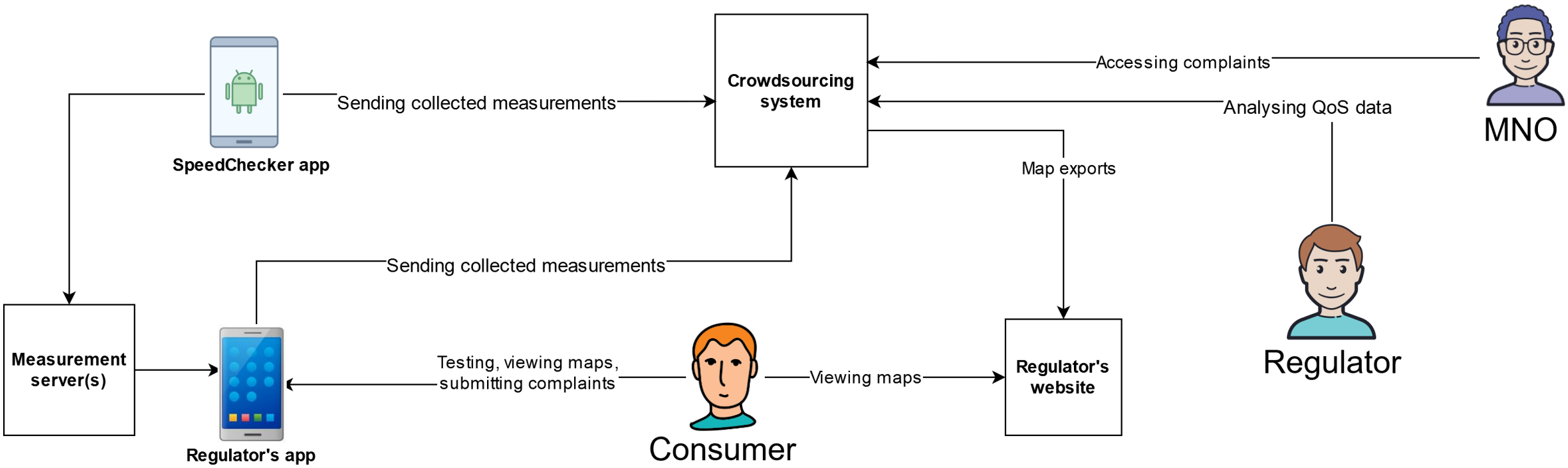
04 Data outputs

05 Key takeaways

Crowdsourcing system

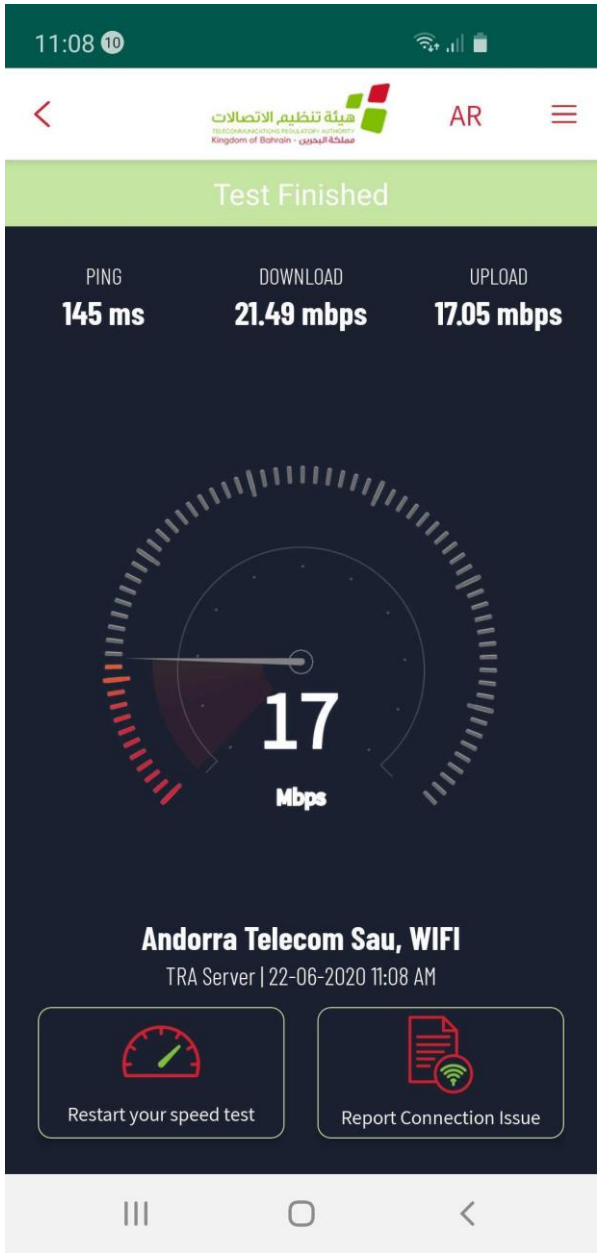
- Developed by SpeedChecker and following **ITU E.812** recommendations on crowdsourcing
- Data collected from mobile devices on Android / iOS systems
- Measurements are scheduled, processed, filtered and aggregated to allow for visualization
- Crowdsourced data can be analyzed in the regulator’s internal system as well as on the regulator’s website and app for consumers

Crowdsourcing solution architecture



Crowdsourcing mobile apps

- SpeedChecker jointly develops dedicated TRA app for iOS and Android.
- TRA commissions marketing campaign to raise awareness of the app
- SpeedChecker complements own measurements data to the system to ensure sufficient size for analysis



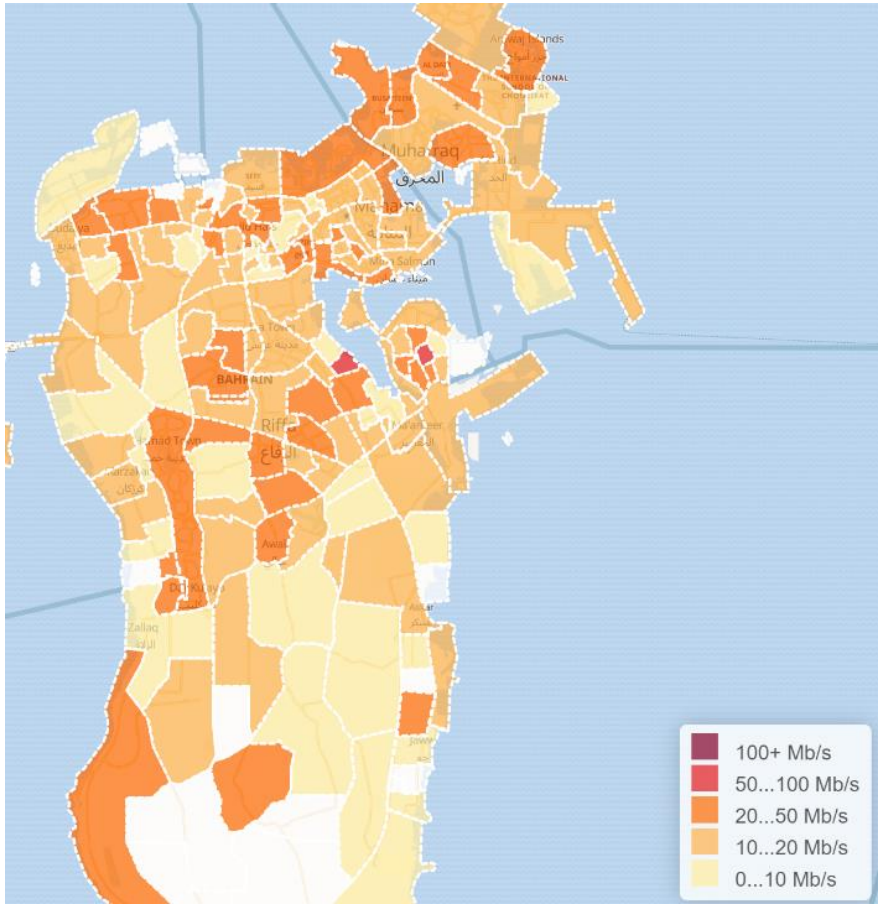
Active measurements

User initiated measurements

- Speed test feature which allows user to initiate a test

Background scheduled measurements

- Speed test measurements
- Web browsing tests
- YouTube video tests



Passive measurements

Signal measurements

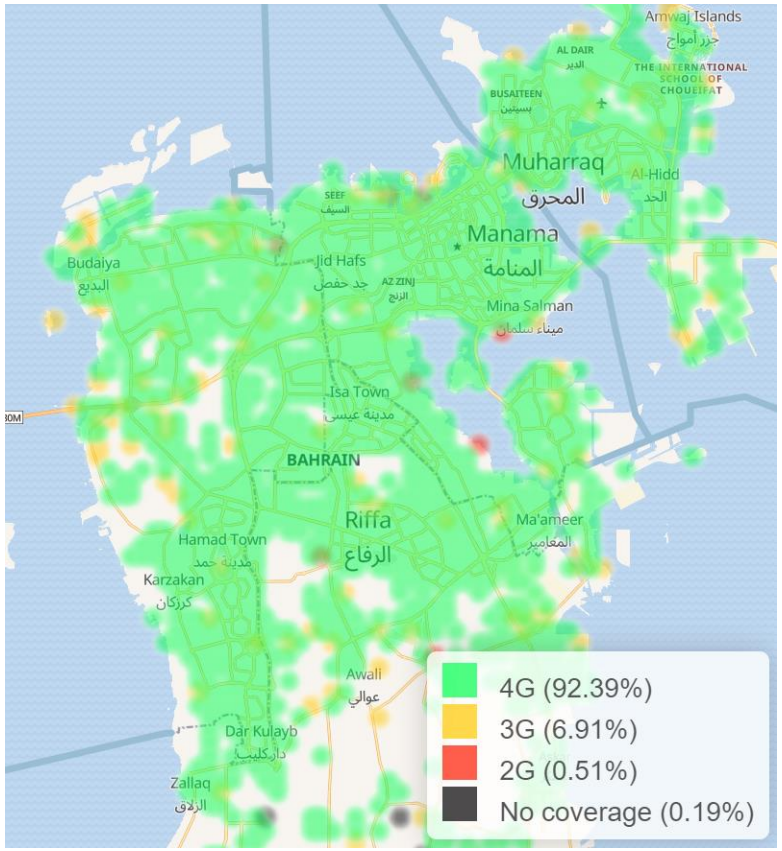
Mobile coverage for 2G, 3G, 4G, 5G and no coverage zones for all operators

Voice quality

Quality of the voice calls, % dropped calls, % successful calls

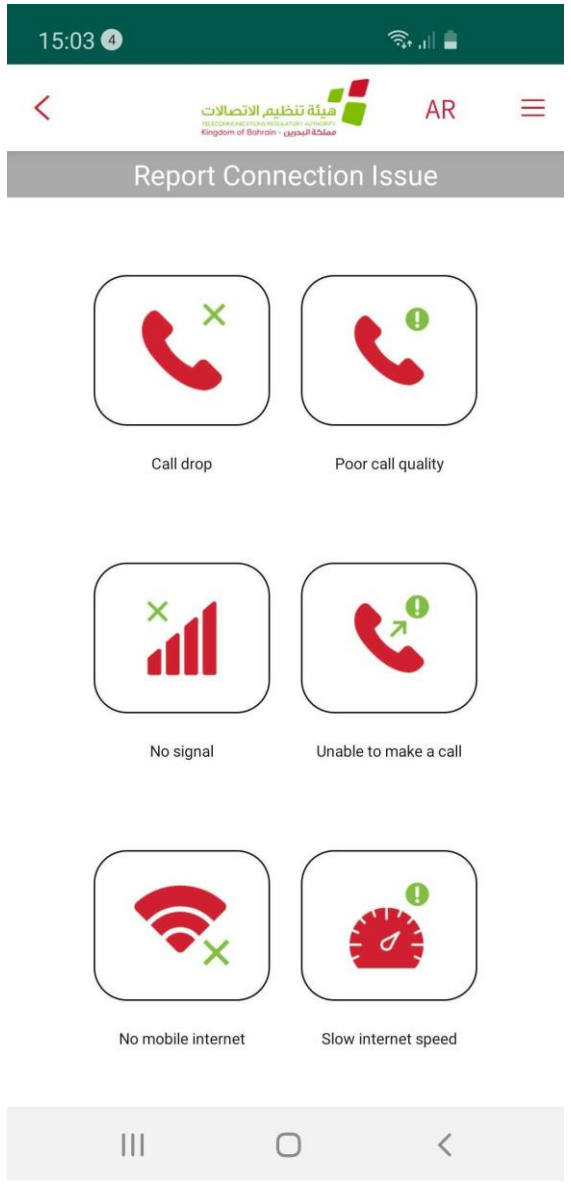
Throughput measurements

Download/upload throughput measurements which complement active throughput measurements

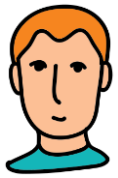


Reporting QoS issues

- Consumers have ability to report any issues with their connections using easy to use UI
- Permission is requested to get user's phone number as a way to identify the user (and potentially contact if necessary)
- Complaint information and other KPIs from the device sent to crowdsourcing system
- Regulator can analyze issues and decide which of them to forward to MNOs



Who can benefit?



Consumers

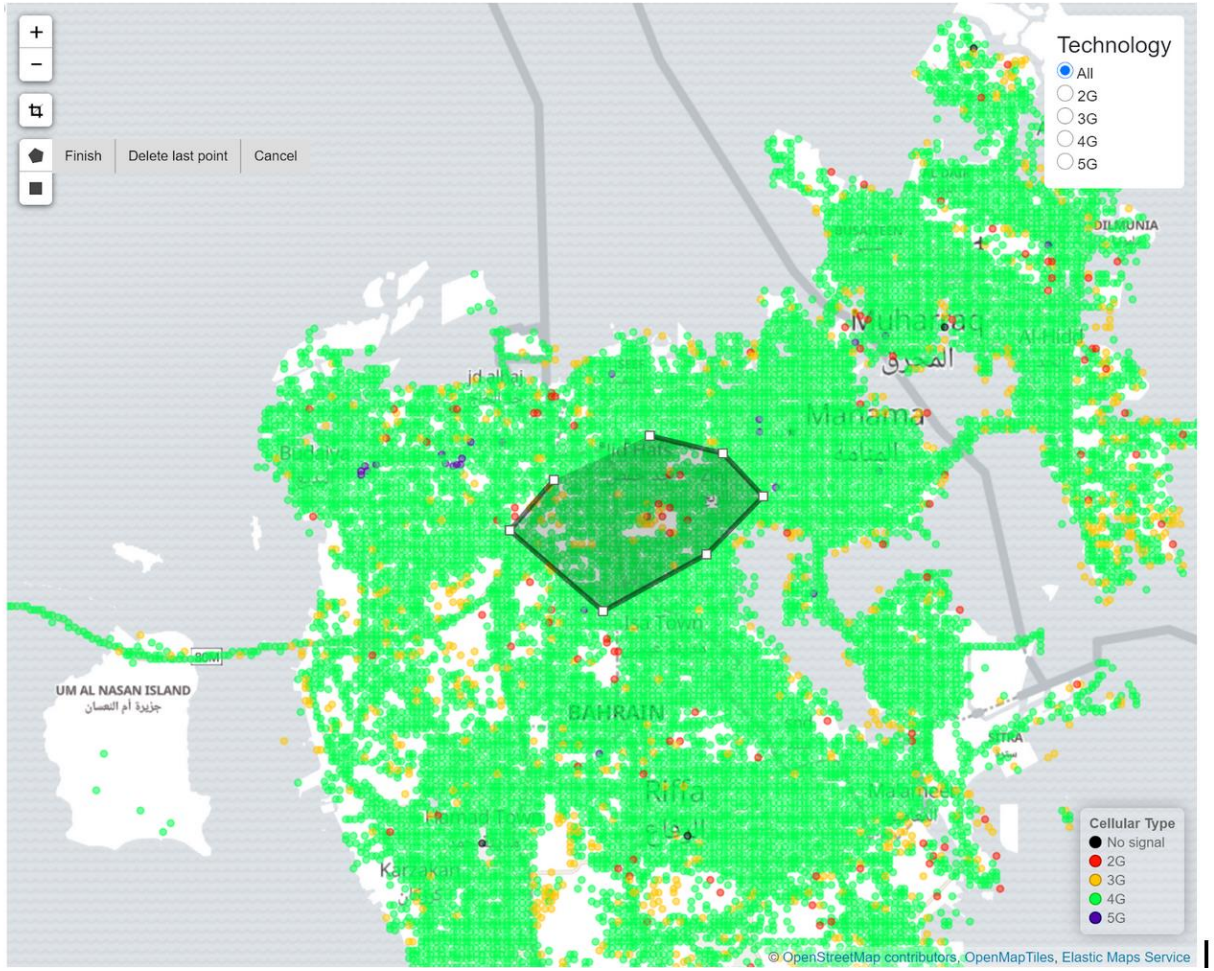
Easy to use and understand maps

Regulator

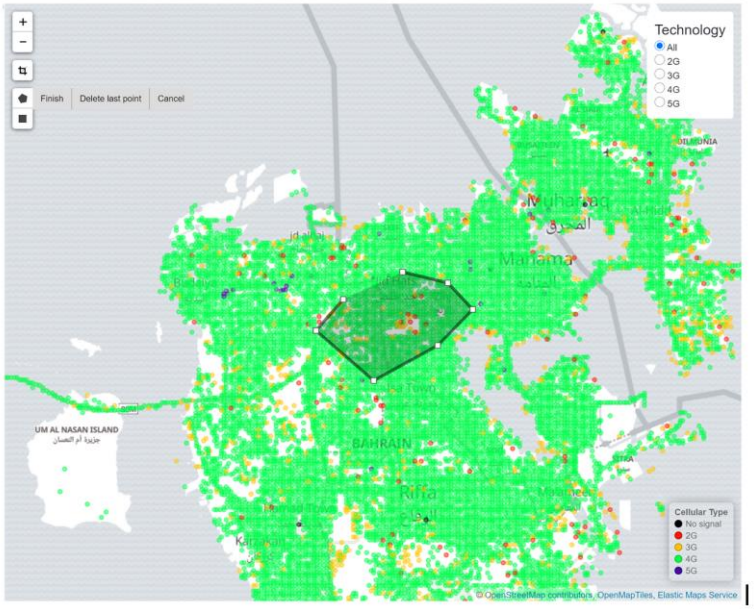
Detailed reporting system

MNOs

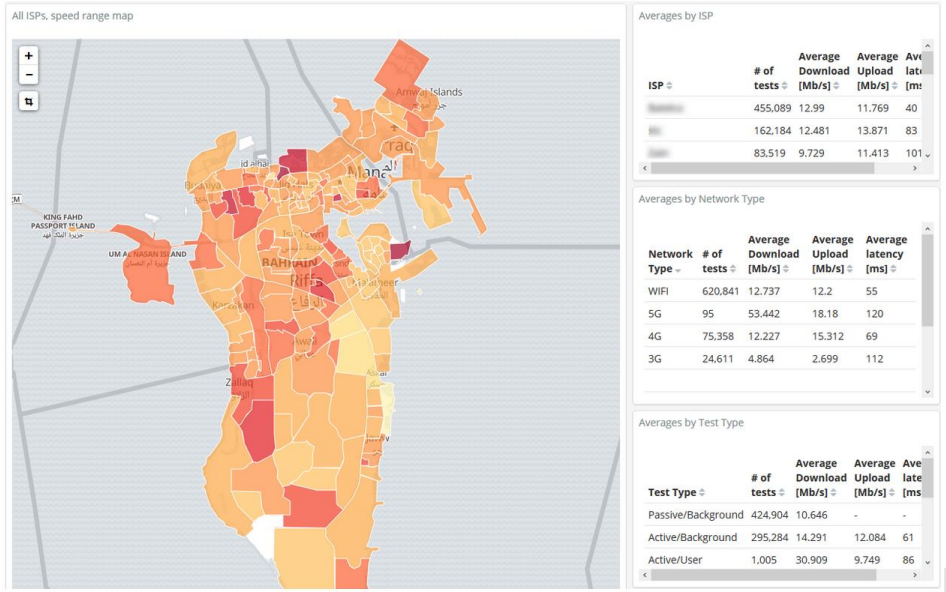
Selected data can be exported to action on the detected issues



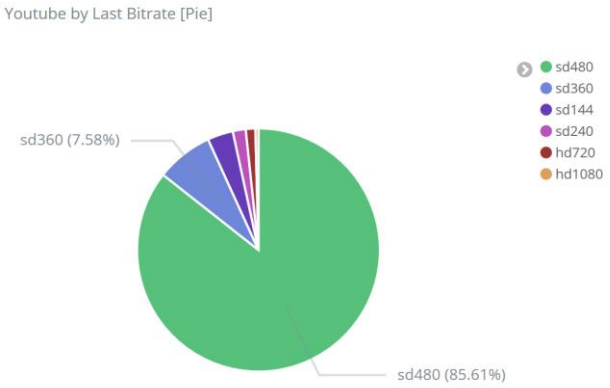
Coverage maps



Regional comparisons



Video streaming KPIs

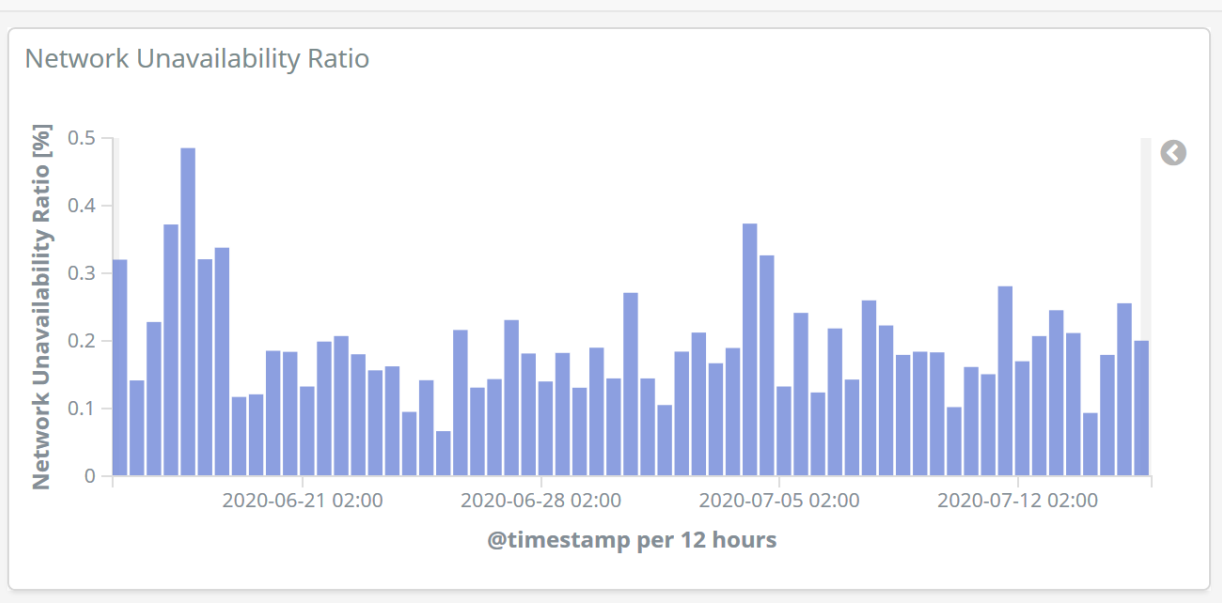


Social media KPIs

Social Media Experience by ISP

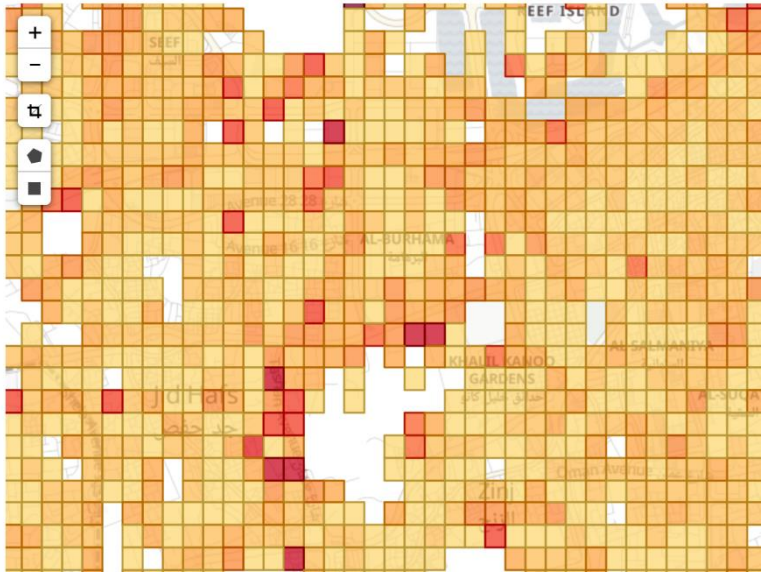
ISP	# of tests	Twitter pageload time [ms]	Facebook pageload time [ms]	Google pageload time [ms]
[redacted]	22,730	5692	4570	3590
[redacted]	19,254	6151	3694	3691
[redacted]	8,636	6571	3979	3819

MNO outage dashboard & alerts



Cell optimization dashboard

Pilot Polution LTE

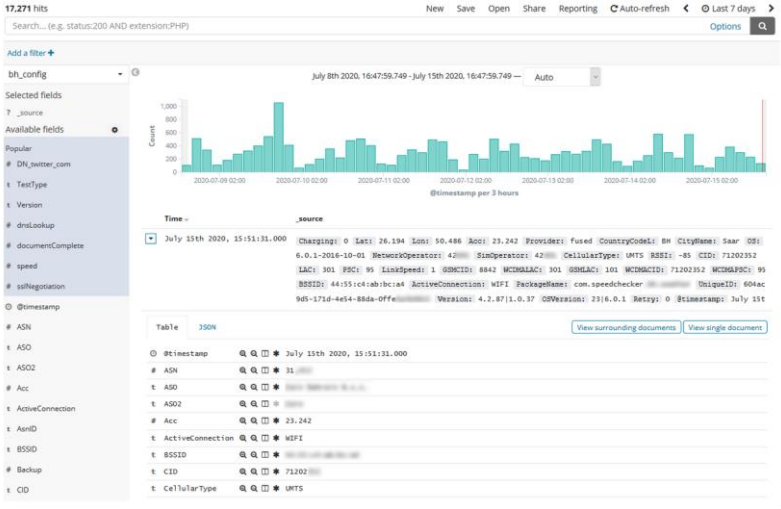


Used frequency bands dashboard

Frequency Bands - Table

Name	Network Type	Duplex Mode	Count
1800+	LTE	FDD	288,681
2100	LTE	FDD	205,361
800 DD	LTE	FDD	46,708
900 GSM	UMTS	FDD	35,910
2100	HSUPA	FDD	24,126

Raw data access



Key takeaways

- Crowdsourcing solution is easy to deploy even during the COVID-19 crisis since no hardware needs to be shipped
- Getting iOS working requires more effort due to Apple approvals and amount of actionable data is much lower in comparison with Android
- It is crucial for regulators to acquire 3rd party crowdsourcing data, especially during early stages of the project before the regulator app awareness grows
- Involving all the stakeholders including MNOs during the project is critical

Thank you!

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