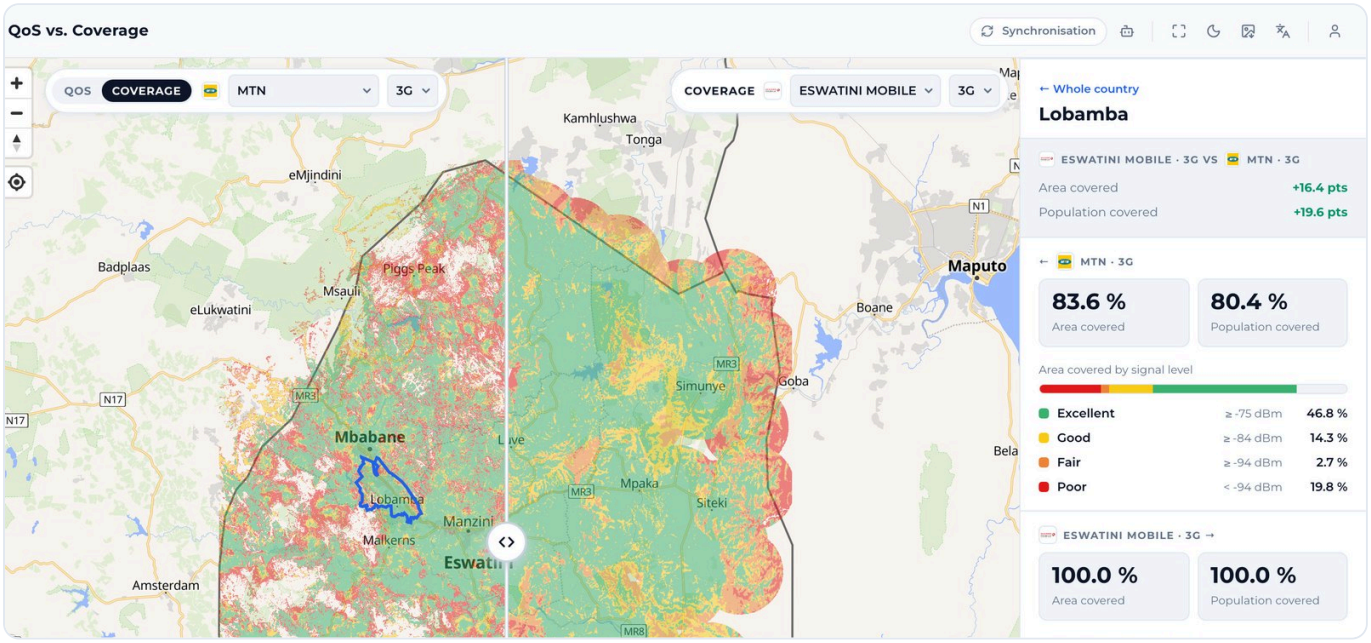
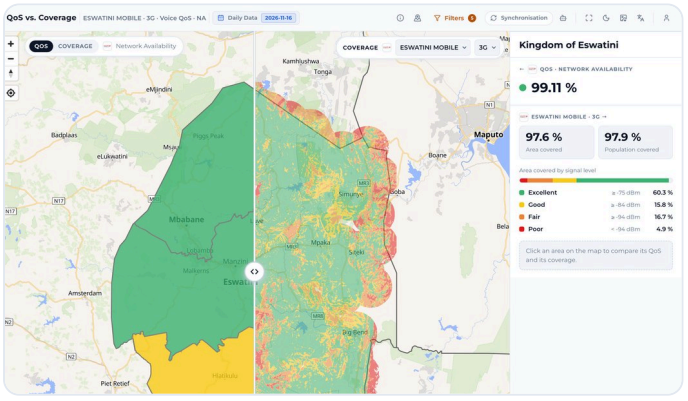
Coverage prediction

Each operator's signal, computed with the ITU-R model

D.QoS Coverage computes the radio coverage of each operator and technology from the cell data the operators submit, with the **ITU-R P.1812 propagation model**, terrain, land cover and population data. The result is a map by signal level, with the area and the population covered, from the whole country down to each administrative division.



Two operators' 3G coverage on either side of the handle, and the gap between them in the selected area (live screen)



QoS against coverage for the same operator (live screen)

ITU-R P.1812

The ITU's propagation model, run cell by cell over the terrain and land cover.

From the operators' own cell data

Coordinates, power, antenna height, azimuth and tilt, on the PNI topology template.

Area and population covered

Per signal level, for the country and each administrative division.

Your administrative divisions

Provinces and districts, regions and tinkhundla, departments and communes, states and LGAs.

One prediction, two readers

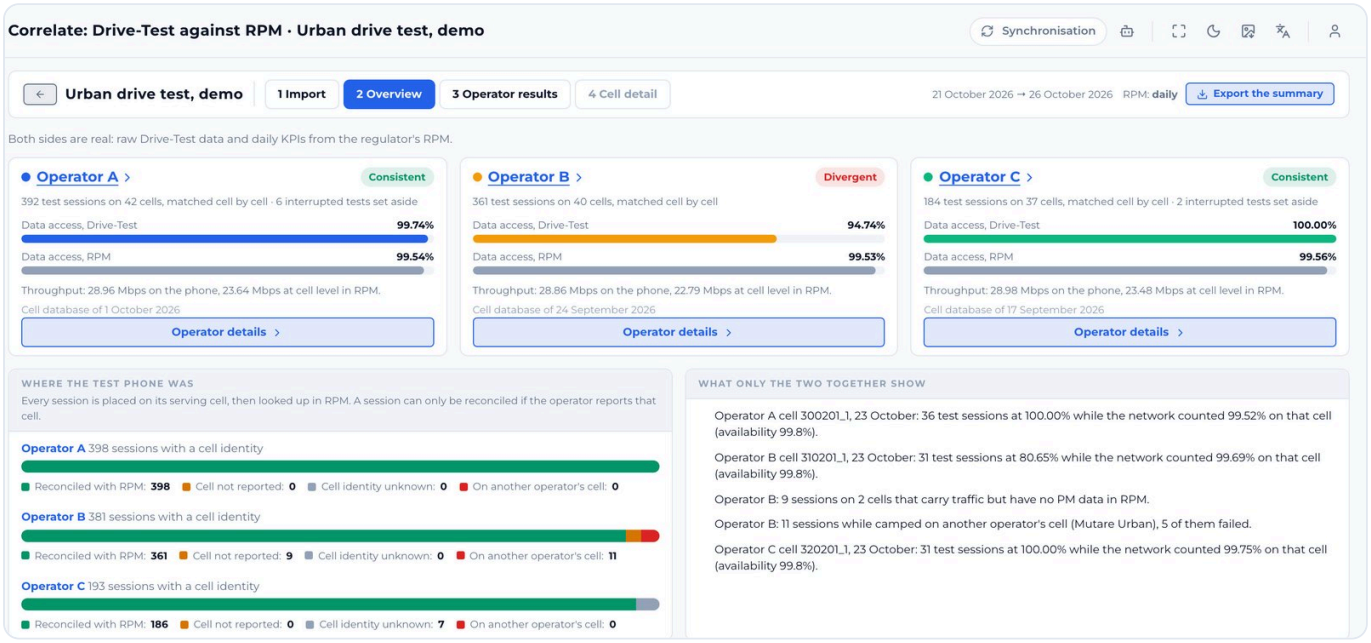
THE REGULATOR
A coverage atlas per operator and technology; on the portal, two coverages on a sliding handle.

THE PUBLIC
On the mobile app, each operator's coverage where they live, in the language of the country.

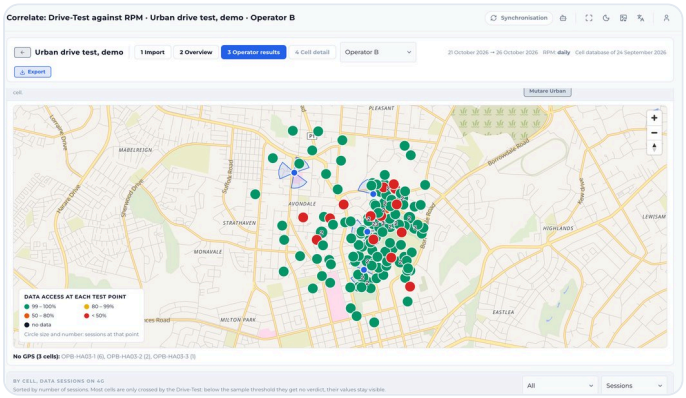
D.QoS Correlate

Drive-test log files checked against the PM data of the network

A drive test measures what a user gets: a test phone makes calls and data sessions through the towns, recorded in log files. The RPM System holds the PM data, the performance measurement files from the operators' OSS, for all users of the same cells on the same days. Correlate sets the two side by side, cell by cell, and flags where the phone did much worse than the PM data says.



Overview: each operator Consistent or Divergent, with what only the two sources together show (demonstration data)



Operator results: every test point on the map, and the verdict cell by cell (demonstration data)

Cell by cell

Each test session is placed on its serving cell, then looked up in the RPM System.

Consistent or Divergent

A verdict per cell, per town and per operator, on the same days.

Any drive-test log file

Operator cells come from the PNI topology template, 2G to 5G.

User-side KPIs

Call set-up time and speech quality (MOS), which PM data does not give.

Two views of the same service

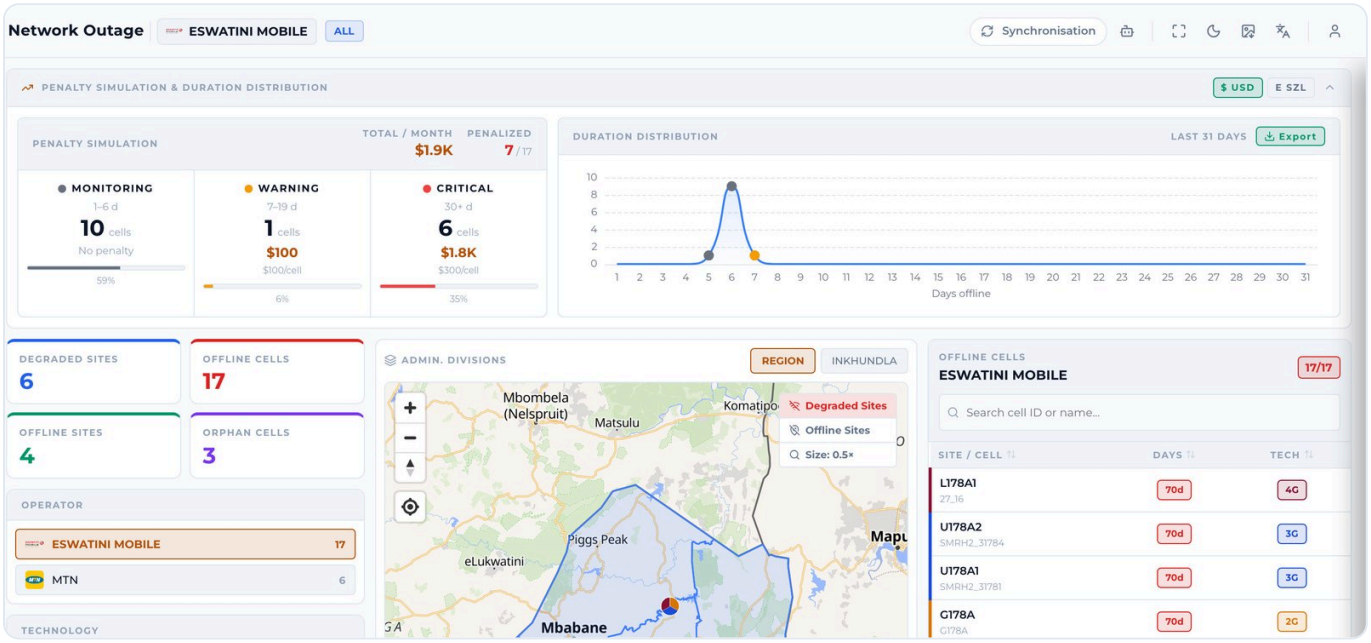
DRIVE-TEST LOG FILES
What one phone experiences, session by session, where the test was driven.

PM DATA (RPM SYSTEM)
What the network measured for every user of the same cells. A gap between them is evidence.

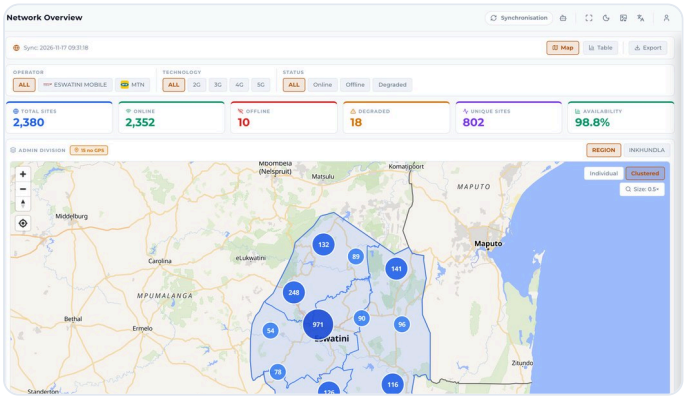
Outage notifications

Outages seen, measured, and told to the users

Network Outage lists the offline sites and cells of each operator, per technology, with the number of days offline. The duration tiers and the penalty simulation follow the **ITU-T E.800 Supplement 9** guidelines: enforcement that is graduated and proportional. The regulator then informs the public: a notification reaches every phone with the mobile app.



Network Outage: offline sites and cells, days offline and the penalty simulation (live screen)



Network Overview: every site online, degraded or offline (live screen)

Network overview

Every site of every operator on one map: online, degraded or offline, with the availability of the network.

Offline sites and cells

Degraded sites, offline sites and offline cells, per operator and technology.

Duration tiers

Monitoring, Warning, Escalation and Critical, by number of days offline.

Penalty simulation

The penalty each tier would carry, per cell and per month, in the regulator's currency.

From the network to the user's phone

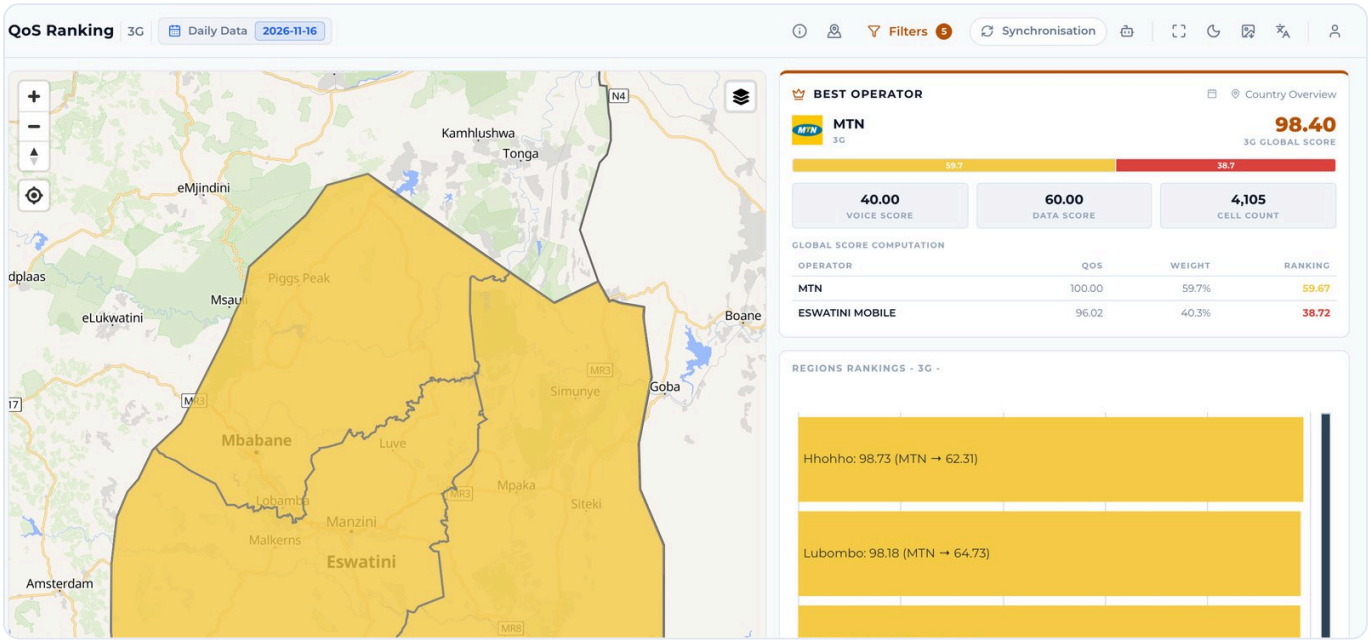
DETECTED
Outages come from the PM data, the same day the files arrive, cell by cell.

ANNOUNCED
The regulator writes a title, a text and a time; the app delivers it once to every phone, on iOS and Android.

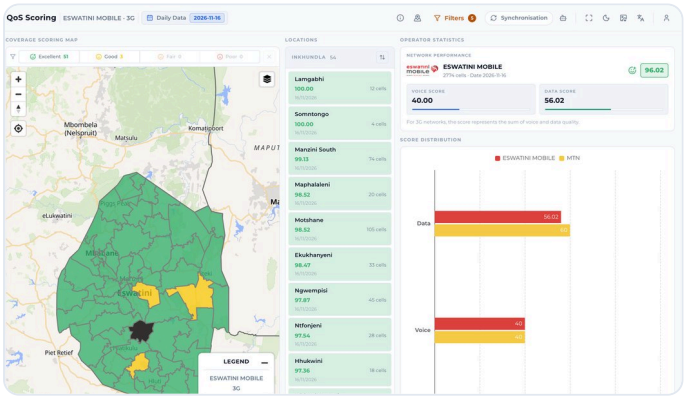
Scoring and ranking

One score out of 100 per operator, and who leads where

D.QoS sums up the indicators of each network into one score out of 100, per operator and per location, following **ETSI TR 103 559**, the ETSI best practices for network QoS benchmarking and scoring. Each indicator is placed between a bad and a good limit set by the regulator, then weighted; on 3G the score adds a voice part and a data part. The ranking follows, down to each administrative division.



QoS Ranking: the leading operator in each region, its score and the points each operator brings (live screen)



QoS Scoring: one operator's administrative divisions by score class, with its voice and data scores (live screen)

Best operator

The winner for the country or any location, with its voice score, data score and cell count.

Open computation

Each operator's QoS, its weight by cell count and its ranking points, side by side.

Score classes

Excellent, Good, Fair and Poor, on the map and in the list of locations.

History

Scores over the last 7 days or 7 months, for the country or one location.

The regulator sets the rules

LIMITS AND WEIGHTS

The bad and good limits of each indicator and their weights are set per country, in the regulator's own settings.

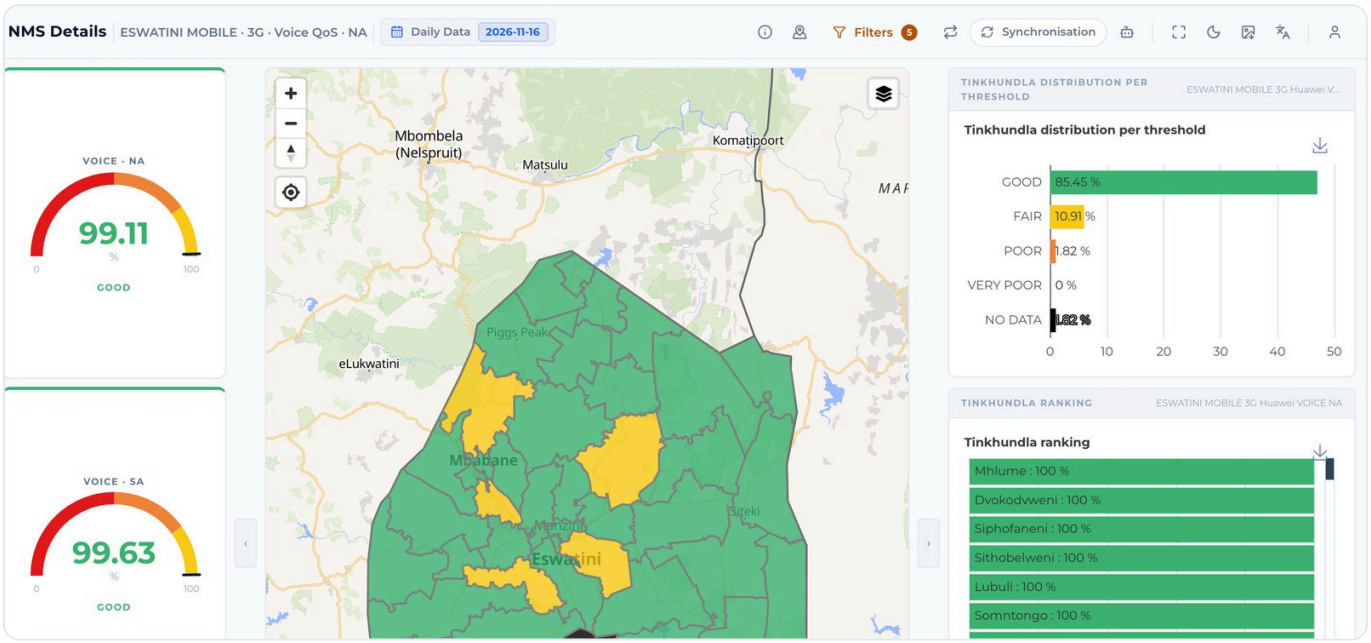
DAILY AND MONTHLY

Every score exists per day and per month, so a ranking can be read for a single day or a whole month.

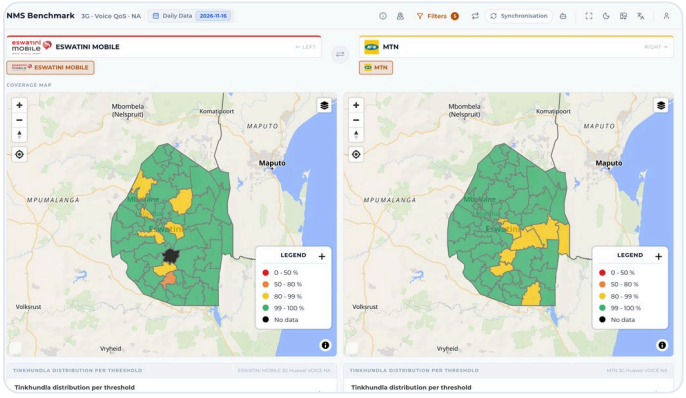
QoS delivered

The quality each network delivers, and two operators face to face

For each operator, technology and vendor, D.QoS shows the high-level KPIs of the **ITU-T QoS model for Serveability**, from the end user's perspective. The RPM System computes them with the **3GPP KPI formulas**, using each vendor's associated counters.



One operator's voice indicators: gauges, map, distribution by threshold and ranking of divisions (live screen)



Benchmark: two operators on the same 3G voice indicator, with linked maps (live screen)

Gauges, down to each division

Network Availability (NA), Service Accessibility (SA), Service Retainability (SR) and Service Integrity (SI), down to each division.

Face to face

Two operators on the same indicator, with linked maps; or every operator at once.

Monthly status report

Each KPI against its threshold, with the change against M-1.

One formula for every operator

3GPP TS 32.410, TS 32.450 and TS 28.554, with each vendor's counters: comparable across operators and countries.

Four QoS categories, one comparison

VOICE AND DATA

On 2G, 3G, 4G and 5G, per vendor, daily over 7 days or monthly over 6 months.

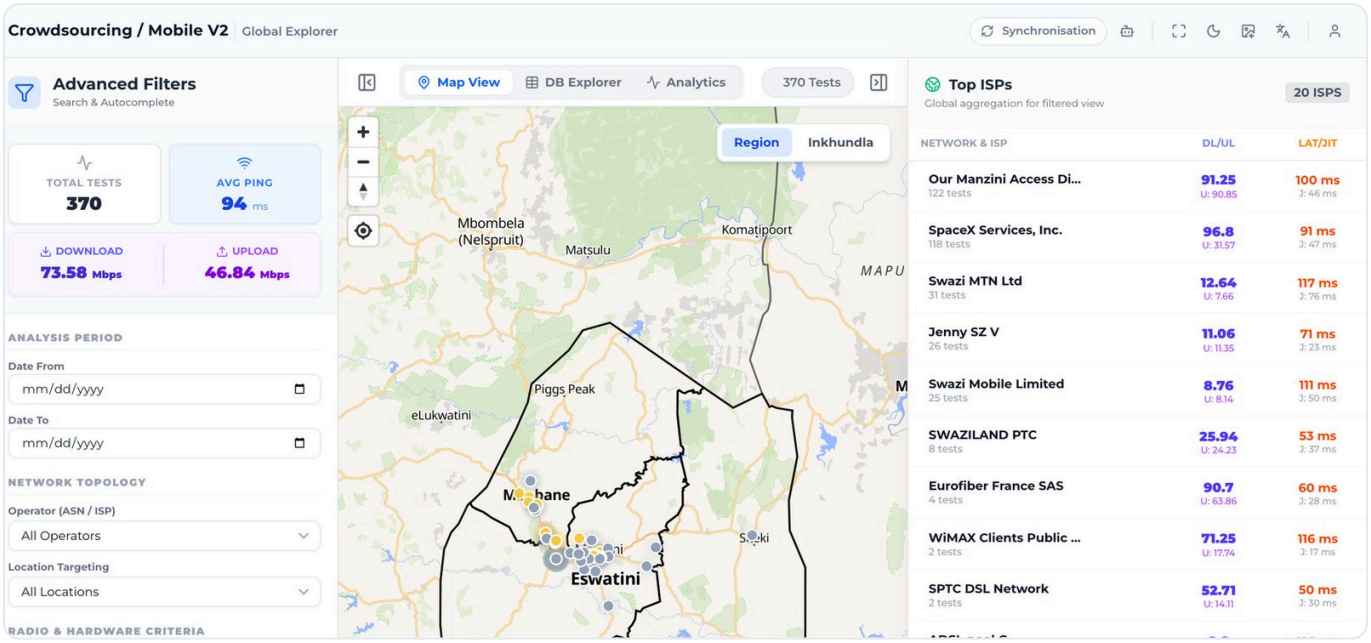
THE REGULATOR'S THRESHOLDS

Every value is coloured by the thresholds of the regulator's QoS guidelines, the same for every operator.

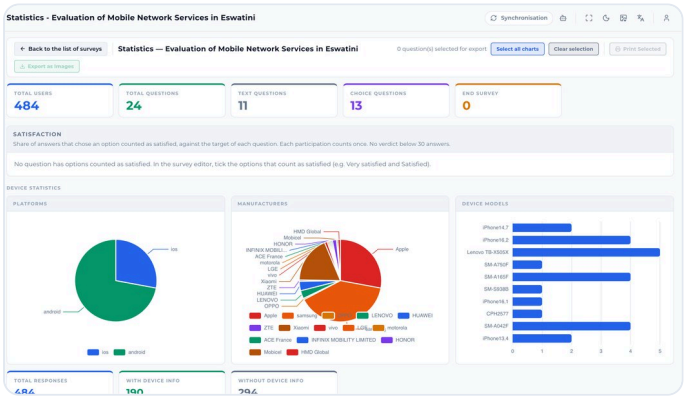
Surveys and feedback

The users' own experience, straight from their phone

From the mobile app, users report a network problem where it happens (dropped call, no signal, slow internet), run speed tests and answer the surveys the regulator publishes. The regulator follows each complaint up with the user and closes it once handled: complaint handling is among the parameters **ITU-T E.800 Supplement 9** proposes to regulators.



Crowdsourcing: speed tests run by users on the map, by operator and provider (live screen)



Survey statistics: how many people answered, and on which devices (live screen)

Speed tests

Download and upload speeds measured by users, on the map, per operator and provider.

Complaints on the map

Each report carries its problem type, operator, place and device.

Follow-up

The regulator answers the user, then closes the report.

Surveys

Conditional questions, published to the app, answers exported to Excel.

Measured quality, felt quality

PM DATA

What the networks measure for all of their users, every day.

USERS

What people say they get, where they are: the check that PM data alone cannot give.