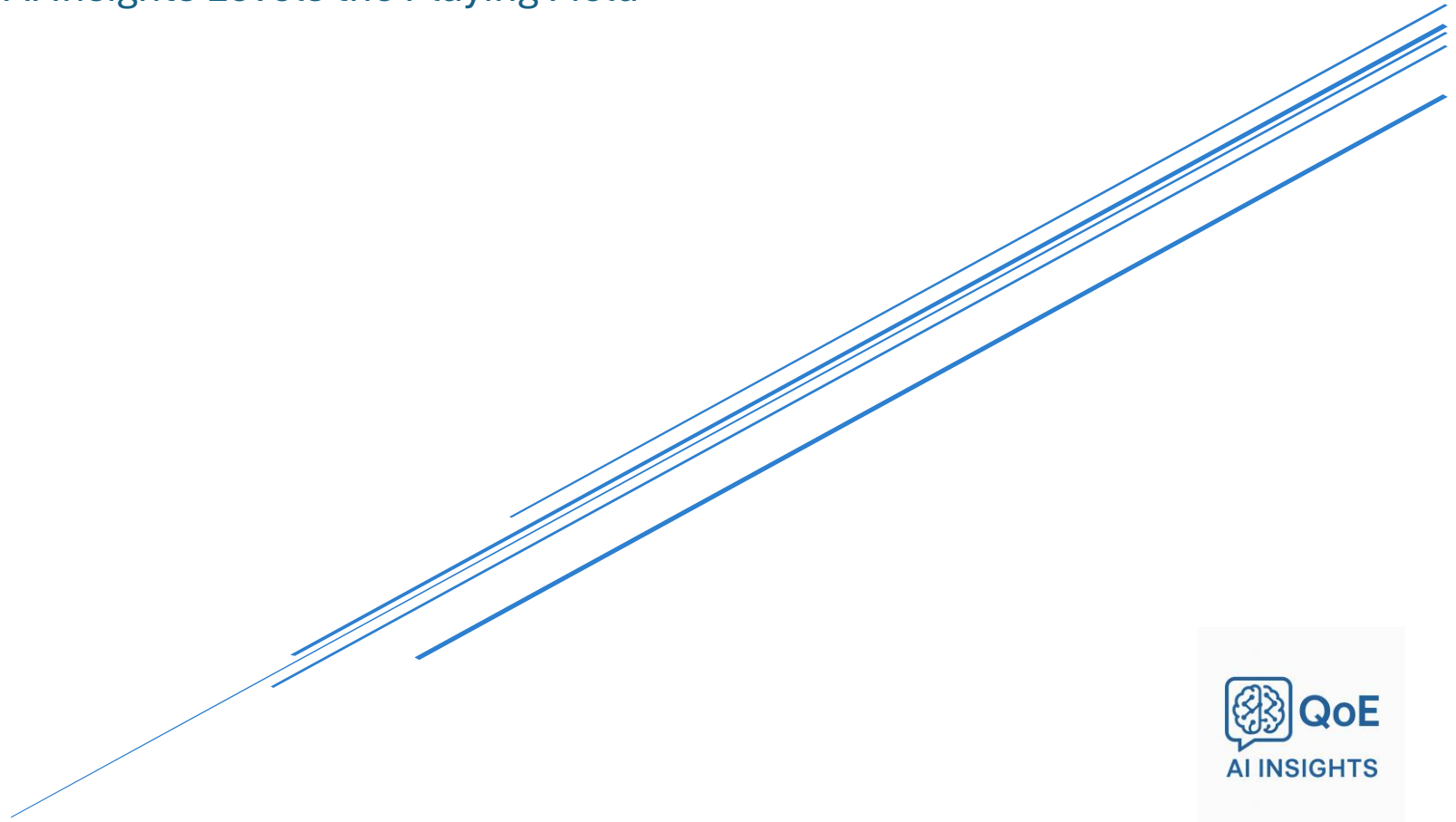


# EXPERIENCE-CENTRIC NETWORK AUTOMATION FOR MVNOS

How QoE AI Insights Levels the Playing Field



## Executive Summary

Mobile Virtual Network Operators (MVNOs) face a tough challenge: delivering top-notch customer experiences without owning the underlying network. Traditional KPIs miss what really matters to users. That's where Quality of Experience (QoE) comes in.

QoE AI Insights gives MVNOs the power to see, score, and act on real customer experience—across devices, regions, and apps.

With this intelligence, MVNOs can:

- Spot and fix QoE issues before customers churn.
- Select optimal roaming partner network based on QoE scoring.
- Build trust with customers.
- Benchmark and negotiate smarter with network partners.
- Automate support and remediation,
- Stand out with experience-driven marketing and enterprise reporting.

Ready to transform your MVNO's competitive edge?

Start leveraging QoE AI Insights today—turn raw data into actionable intelligence, retain customers, and negotiate from a position of strength



Poor Experience drives customer churn



# EXPERIENCE-CENTRIC NETWORK AUTOMATION FOR MVNOS

## Contents

Page	Section
1	Executive Summary
3	Chapter 1 — Why QoE Matters More Than KPIs for MVNOS
4	Chapter 2 — QoE-Driven Churn: The Hidden Cost MVNOS Can Finally Control
5	Chapter 3 — Measuring Experience: Passive Signals and Active Tests
5	Chapter 4 — Centralised QoE Intelligence: The MVNO Experience Map
6	Chapter 5 — Correlating Experience with Network Behaviour (Without RAN Access)
7	Chapter 6 — Experience-Aware Automation
8	Chapter 7 — MVNO Experience Visibility: Overcoming the RAN Blind Spot
8	Chapter 8 — Selecting the Best RAN Partner: Using QoE to Drive Wholesale Strategy
10	Chapter 9 — What QoE AI Insights Brings
12	Closing Summary — QoE as the MVNO Superpower

## Chapter 1 — Why QoE Matters More Than KPIs for MVNOs

MVNOs operate with a structural disadvantage: although they own the customer relationship, they lack control over the Radio Access Network (RAN), which is fundamental to the quality of service their subscribers experience. This means MVNOs are held responsible for customer satisfaction, yet they have limited visibility and influence over the actual network delivering that experience. As a result, when issues arise—such as dropped calls, slow data speeds, or unreliable connectivity—the customer’s frustration is directed at the MVNO, even though the underlying problem may reside with the host operator’s infrastructure.

Historically, MVNOs have relied on traditional Key Performance Indicators (KPIs) such as coverage maps, Service Level Agreement (SLA) summaries, and periodic wholesale reports to assess network quality. However, these metrics are often aggregated across broad geographies and time periods, making them somewhat abstract and removed from the day-to-day reality experienced by end users. Furthermore, these reports are typically delayed, arriving after issues have already impacted customers, and may not capture the nuances of localised congestion, peak-time degradation, or regional black spots. In essence, these traditional KPIs are disconnected from the actual perceptions and feelings of subscribers, leaving MVNOs reactive and exposed.

Quality of Experience (QoE) AI Insights marks a turning point for MVNOs, as it gives the first metric they can fully own and leverage to enhance both operational performance and customer satisfaction. Unlike legacy KPIs, QoE measures real-world network performance directly from subscriber devices, providing immediate and granular insight into how the network performs where and when it matters most. This approach enables MVNOs to access a range of critical indicators, including:

- Jitter, which affects the stability of voice and video calls
- Latency, impacting how quickly apps and web pages respond
- Packet loss, leading to interruptions in streaming and downloads
- App responsiveness, reflecting the speed and fluidity of user interactions
- Signal quality, indicating the strength and reliability of the connection
- Mobility events, such as handovers between cells that may cause disruptions
- Throughput indicators, showing actual downstream and upstream speeds

By harnessing these real-world performance metrics, MVNOs can bridge the gap between their brand promise—delivering reliable, high-quality connectivity—and the actual network experience that underpins customer loyalty.

QoE serves as the vital link, allowing MVNOs to proactively identify issues, steer traffic intelligently, and negotiate more effectively with RAN partners. Ultimately, this empowers MVNOs to deliver a differentiated and competitive mobile service, even within the constraints of not owning the underlying network.



## Chapter 2 — QoE-Driven Churn: The Hidden Cost MVNOs Can Finally Control

QoE AI Insights gives MVNOs the earliest possible warning of dissatisfaction — enabling proactive retention, targeted offers, and evidence-based escalation.

Independent research has consistently demonstrated that customer experience now stands as one of the most significant factors influencing churn rates among mobile users. Recent studies reveal that 44% of users across Europe are actively considering switching their mobile providers, with this figure rising to 51% in France, according to Oliver Wyman. Network performance has been identified as a principal churn driver, as highlighted by GSMA Intelligence. Furthermore, users who suffer from poor Quality of Experience (QoE) are two to three times more likely to leave their service provider, based on findings from OpenSignal, Tutela/Comlinkdata, and Ookla.



The implications for Mobile Virtual Network Operators (MVNOs) are particularly pronounced and challenging. When customers encounter poor network performance or unreliable connectivity, they tend to attribute these issues directly to the MVNO, rather than the underlying Mobile Network Operator (MNO) responsible for the infrastructure. This attribution amplifies the impact of QoE-related problems on MVNOs, as they are often left unable to diagnose the root cause or provide definitive proof of where the fault lies.

The lack of visibility into network-level metrics means that MVNO retention teams are forced to operate without the crucial insights needed to address customer concerns effectively. Similarly, marketing departments struggle to differentiate their services based on experience, since they lack the evidence and data to support claims of superior performance or reliability.

Even when considering a conservative financial model, the costs associated with QoE-driven churn can be staggering. For a mid-sized MVNO, the loss of dissatisfied customers could translate into hundreds of millions of pounds in revenue per year. This hidden cost can significantly impact the viability and competitiveness of MVNOs in a crowded marketplace.

### How poor QoE translates to real €€€ (conservative example)



- Assumptions (compact): 10M subs; €15 ARPU; 15% annual churn; 37% of churn attributable to QoE.
- Key calculations:

Metric	Calculation	Amount
Lost revenue from churn	$10,000,000 \times 15\% \times €15 \times 6 \text{ mth}$	€135,000,000
QoE-attributable revenue loss	$€135,000,000 \times 37\%$	€49,950,000
Replacement (CAC) impact (example CAC €100)	$1,500,000 \times €100$	€150,000,000
QoE portion of CAC	$€150,000,000 \times 37\%$	€55,500,000

Financial impact (illustrative)

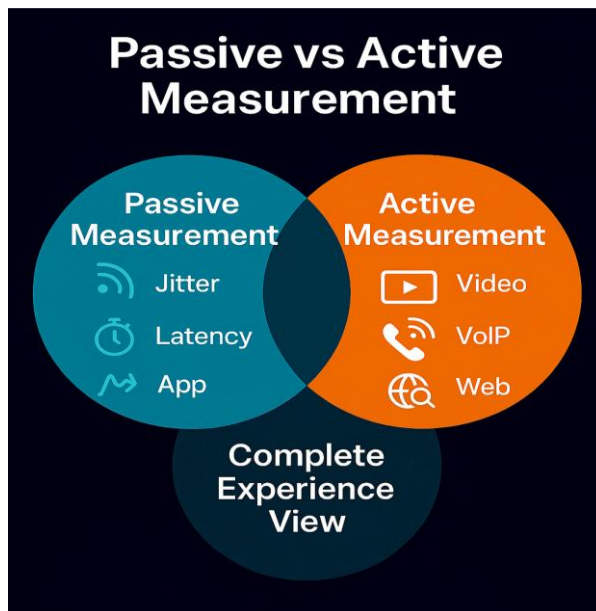
- Illustrative total QoE cost: ~€105M annually (revenue + CAC, conservative).

© 2026 by Price-Jones Partners Ltd

To combat this challenge, MVNOs can leverage advanced QoE AI Insights, which provide the earliest possible indication of customer dissatisfaction. By harnessing these actionable insights, MVNOs are empowered to take proactive steps in retaining customers, such as deploying targeted offers tailored to at-risk subscribers and escalating issues with clear, evidence-based documentation when negotiating with their RAN partners. This approach not only enables MVNOs to address problems before they escalate, but also strengthens their ability to provide differentiated and high-quality mobile services, thereby improving customer loyalty and reducing churn.

## Chapter 3 — Measuring Experience: Passive Signals and Active Tests

In order to truly understand and improve the Quality of Experience (QoE) offered to customers, MVNOs must adopt a comprehensive approach to measurement. This involves collecting both passive and active data signals, each offering unique insights into network performance and user satisfaction. Passive signals are gathered invisibly in the background, capturing real-world usage patterns as customers interact with their devices throughout the day. These signals include metrics such as web loading times, dropped calls, video streaming quality, and web browsing speed, all of which reflect the actual experience devices see in diverse scenarios and locations.



On the other hand, active test calls are intentionally initiated diagnostic checks, designed to probe specific aspects of the network under controlled conditions. By simulating real-world activities—such as making voice calls, sending data, or connecting to various apps—active testing enables MVNOs to pinpoint performance

bottlenecks, identify regions with persistent connectivity issues, and validate the effectiveness of recent infrastructure improvements. When combined, passive and active data create a robust framework for monitoring QoE, allowing operators to detect emerging problems, assess the impact of network upgrades, and benchmark their service against competitors.

Moreover, this dual measurement strategy enables MVNOs to make data-driven decisions, whether responding to customer complaints, designing marketing campaigns, or negotiating service levels with their host MNOs. By systematically capturing and analysing both passive signals and active test call results, MVNOs can move beyond anecdotal feedback, gaining the ability to quantify experience at scale and address issues with precision. Ultimately, this holistic approach empowers MVNOs to deliver consistently high standards of service, minimise churn, and build lasting trust with their customers.

## Chapter 4 — Centralised QoE Intelligence: The MVNO Experience Map

QoE AI Insights crowdsources the device collected data into a real-time, geo-aware experience map, giving MVNOs a comprehensive and dynamic view of their customers' network experiences across every location and usage scenario. This advanced platform continuously assimilates vast streams of QoE signals—such as web loading times, dropped calls, streaming start time and interruptions—as well as the results from active test calls, which probe network performance under controlled conditions.

By integrating these diverse data sources, QoE AI Insights generates an interactive and granular map that visualises the quality of experience in real time, down to specific neighbourhoods, cell sites, or even individual device types.

With this powerful intelligence, MVNOs can finally gain unprecedented visibility into:

- Geographical pain points: Precisely identify where customers experience poor coverage, dropped calls, or unreliable connectivity, enabling targeted interventions and resource allocation.
- Network congestion hotspots: Detect areas and times where high demand leads to congestion and performance degradation, supporting smarter network management and capacity planning.

- Which apps are degraded: Identify specific applications (e.g. video, VoIP, gaming, banking) where performance drops below acceptable thresholds due to jitter, buffering, or slow responsiveness.
- Which devices struggle: Detect patterns tied to device type, OS version, or chipset — revealing whether certain handsets consistently underperform or fail to deliver expected QoE.
- Which regions drive complaints: Pinpoint geographic hotspots where users experience poor service, enabling targeted support, marketing adjustments, or partner escalation.
- How does experience vary by host-MNO band, RAT, or cell: Correlate QoE with underlying network parameters — such as LTE vs 5G, specific frequency bands, or individual cells — to infer root causes and steer traffic intelligently.

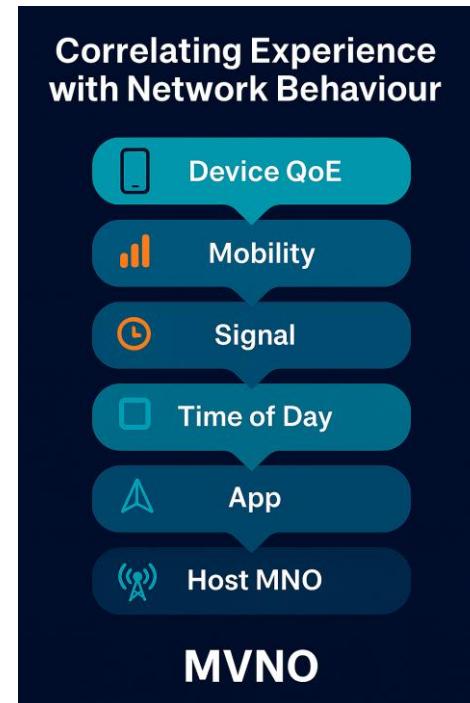
This intelligence supports customer care, retention, marketing, enterprise sales, network negotiations, SLA enforcement, and product design.

## Chapter 5 — Correlating Experience with Network Behaviour (Without RAN Access)

Mobile Virtual Network Operators (MVNOs) have traditionally lacked direct access to Radio Access Network (RAN) counters, unlike Mobile Network Operators (MNOs), which limits their ability to conduct detailed network analysis. However, by combining data from the MVNO core network, including GWCN and HPLMN elements, with advanced analytics, MVNOs can still create a comprehensive view of network performance and Quality of Experience (QoE).

Using QoE AI Insights in combination with Microsoft Fabric, MVNOs can effortlessly ingest core network performance metrics, logs, alarms, and tracing data. This unified data ingestion enables the correlation of QoE metrics with key factors such as:

- Mobility patterns and the effect of user movement on performance.
- Signal quality, reflecting the strength and reliability of network connections.
- Time-of-day congestion, identifying peak periods of network stress.
- App-specific degradation, highlighting performance impacts on individual applications.
- Device behaviour, examining how different devices interact with the network.
- Location clusters, pinpointing consistently underperforming areas.
- Fallback patterns, analysing transitions between coverage technologies.



By leveraging Fabric’s ingestion and analytics capabilities, all these data streams can be unified into the QoE AI Insights solution. This delivers a complete, AI-driven picture of network health, helping MVNOs to determine whether issues are:

- Localised or widespread.
- Device-specific or network-driven.
- Occurring over Wi-Fi or mobile networks.
- Linked to a particular partner network.
- Impacting enterprise customers.

The integration of MVNO core data with Microsoft Fabric’s scalable analytics empowers MVNOs with insights that were once exclusive to MNO engineering teams, enabling proactive diagnostics and enhanced customer experience.

## Chapter 6 — Experience-Aware Automation

Automation serves as a crucial bridge connecting experience intelligence with tangible real-world outcomes, enhancing the efficiency and effectiveness of various processes.



The automation loop consists of several key steps:

1. **Detect Degraded QoE Clusters:** The process begins by identifying clusters where the Quality of Experience (QoE) has fallen below acceptable levels. This involves monitoring network performance metrics to pinpoint areas that require attention.

2. **Diagnose Likely Root Cause:** Once the affected clusters are identified, the system delves deeper to determine the underlying causes of the degradation. This may involve analysing network traffic patterns, hardware performance, or other contributing factors.
3. **Remediate Through Customer, Operational, or Commercial Actions:** Based on the diagnosis, appropriate remediation actions are taken. These could involve direct customer interventions, operational adjustments, or commercial strategies to address the identified issues.
4. **Validate Improvement:** After implementing the remediation actions, the system validates the effectiveness of these measures by monitoring the QoE in the affected clusters to ensure that the desired improvements have been achieved.

### *Automated RAN-Partner Optimisation*

In markets with multiple Radio Access Networks (RANs), automation leverages QoE data to:

- **Detect Roaming Partner Underperformance:** It identifies any partners that are not meeting performance expectations, allowing for targeted improvements.
- **Identify Congestion Hotspots:** The system locates areas experiencing network congestion, enabling proactive measures to alleviate the issue.
- **Flag Poor-Experience Zones:** It highlights regions where customers are experiencing subpar service, prompting further investigation and resolution.
- **Highlight Churn-Risk Clusters:** The system identifies clusters of customers who are at risk of leaving due to dissatisfaction, allowing for retention strategies to be implemented.
- **Steer Devices to the Best Network:** It optimises the connectivity of devices with steering through preferred roaming list, directing them to the most suitable network.
- **Shift New Activations to the Strongest Partner:** New customer activations are directed to the network partner with the best performance, ensuring a positive experience from day 1.
- **Escalate Issues with Evidence:** When issues persist, the system escalates them with supporting evidence, facilitating swift and informed resolution.

This comprehensive approach transforms the Mobile Virtual Network Operator (MVNO) into a virtual multi-network operator, capable of managing and optimising network performance across multiple partners with precision and agility.

## Chapter 7 — MVNO Experience Visibility: Overcoming the RAN Blind Spot

QoE AI Insights provides Mobile Virtual Network Operators (MVNOs) with a comprehensive suite of advanced tools and capabilities that enhance their operational efficiency and competitive edge. These insights offer:

- RAN-like visibility without RAN access: MVNOs can gain detailed insights into the Radio Access Network (RAN) performance and user experience, allowing them to optimise their services without needing direct access to the RAN infrastructure.
- Experience-driven churn prediction: By analysing user experience data, MVNOs can predict customer churn more accurately, enabling them to take proactive measures to retain customers and improve satisfaction.
- Evidence for SLA enforcement: With robust data analytics, MVNOs can gather concrete evidence to enforce Service Level Agreements (SLAs) with their network providers, ensuring they receive the quality of service they are contractually entitled to.
- Support tools that reduce call times: Advanced support tools powered by AI insights help MVNOs streamline customer service processes, reducing average call times and improving overall customer service efficiency.
- Marketing differentiation based on real experience: MVNOs can leverage authentic user experience data to differentiate their marketing strategies, highlighting real-world benefits and customer satisfaction to attract and retain subscribers.
- Enterprise-grade assurance: The insights provided are of enterprise-grade quality, offering MVNOs the reliability and assurance needed to make informed business decisions and maintain high service standards.

These capabilities effectively level the playing field between MVNOs and Mobile Network Operators (MNOs), allowing MVNOs to compete more effectively in the telecommunications market.



## Chapter 8 — Selecting the Best RAN Partner: Using QoE to Drive Wholesale Strategy

Mobile Virtual Network Operators (MVNOs) are increasingly finding themselves operating in markets that are dominated by multiple host Mobile Network Operators (MNOs). Traditionally, the selection of Radio Access Networks (RANs) by MVNOs has been primarily influenced by factors such as price and commercial terms, rather than the actual performance of the networks.



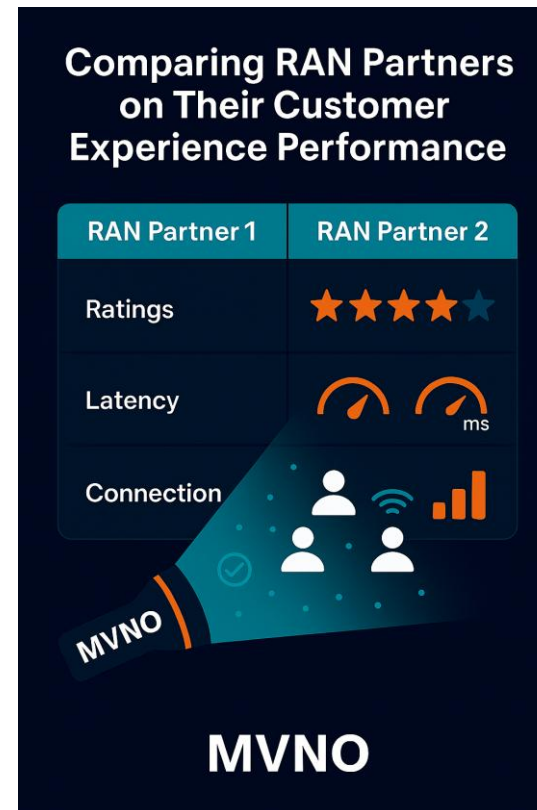
However, with the advent of Quality of Experience (QoE) AI Insights, MVNOs now have the capability to conduct a comprehensive comparison of their network partners based on a wide range of performance metrics. These metrics include:

- Coverage quality: Assessing the extent and reliability of network coverage in various areas.
- Congestion levels: Evaluating the frequency and severity of network congestion, which can impact data speeds and user experience.
- App-specific performance: Analysing how well different applications perform on the network, which is crucial for services that require high bandwidth or low latency.
- Jitter and latency: Measuring the variability in packet arrival times and the overall delay in data transmission, which are important for real-time applications like video calls and online gaming.
- Indoor vs outdoor experience: Comparing network performance in indoor and outdoor environments, as these can differ significantly.
- Device-level behaviour: Understanding how different devices interact with the network, which can affect overall network performance.
- Home/work/commute patterns: Tracking how network usage varies across different locations and times, providing insights into peak usage periods and areas.

With these insights, MVNOs are empowered to:

- Negotiate from a position of strength, as they have concrete data to support their demands for better terms and conditions.
- Steer customers towards the best-performing network, thereby enhancing customer satisfaction and loyalty.
- Differentiate themselves on the basis of the quality of experience they provide, setting them apart from competitors.
- Reduce customer churn by ensuring that customers are consistently connected to high-quality networks.
- Build enterprise-grade propositions by offering reliable and high-performance network services that meet the stringent requirements of business clients.

In essence, QoE becomes a strategic lever for wholesale optimisation, enabling MVNOs to optimise their network costs while simultaneously improving the quality of service they offer to their customers.



## Chapter 9 — What QoE AI Insights Brings

QoE AI Insights is a modular intelligence layer purpose-built for MVNOs. It transforms raw telemetry and customer signals into actionable experience metrics, enabling operators to see, score, and act on what users actually feel.

### Core Capabilities:

- Experience Scoring — Converts jitter, latency, responsiveness, and app-level friction into unified QoE scores across devices, regions, and time.
- Root-Cause Inference — Uses multi-layer correlation (mobility, signal, app, time of day) to diagnose likely causes of poor experience—even without direct RAN access.
- Automation Loop Integration — Powers detect → diagnose → remediate → validate workflows, enabling proactive support, steering, and retention.
- Partner Comparison — Benchmarks host MNOs on real experience metrics, supporting smarter wholesale negotiations and traffic steering.
- Enterprise & Support Visibility — Delivers experience dashboards for B2B clients, support teams, and marketing—turning QoE into a commercial asset.

### Strategic Impact

QoE AI Insights gives MVNOs the operational clarity they've lacked for years. It enables:

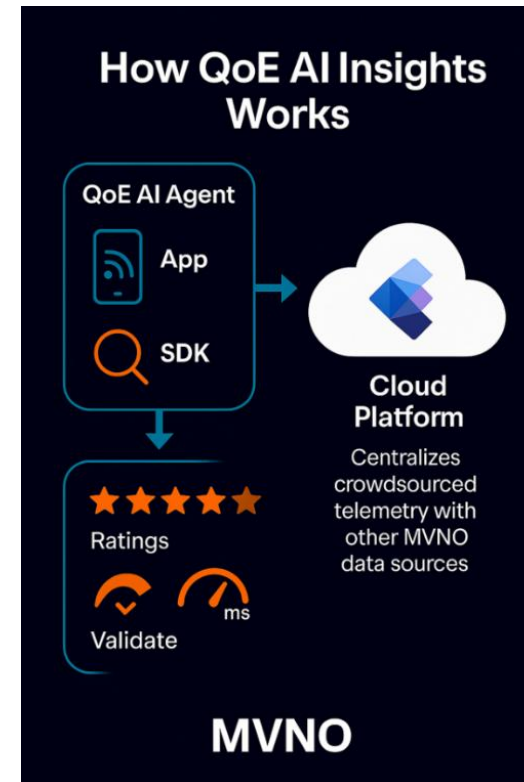
- Retention through experience-aware support
- Differentiation without RAN ownership
- Negotiation leverage with host networks
- Enterprise-grade reporting for B2B clients

It's not just analytics—it's a decision engine for MVNOs to compete on experience.

## QoE AI Insights: Core Components

### 1. QoE AI Agent (Smartphone-based)

- Form factor: Available as a standalone App or as an SDK for integration into existing MVNO customer apps.
- Function: Captures real-time telemetry from the user's device—jitter, latency, app responsiveness, signal quality, and contextual metadata (mobility, time of day, location, cellId).
- Purpose: Crowdsources experience data directly from the edge, enabling granular, user-centric visibility.



## 2. Cloud Platform (Built on Microsoft Fabric)

- Architecture: Scalable, modular backend leveraging Microsoft Fabric for data ingestion, processing, and visualization.
- Function: Aggregates telemetry from QoE AI Agents and fuses it with MVNO data sources—GWCN/HPLMN metrics, logs, alarms, and traces.
- Purpose: Provides a centralized, correlated view of customer experience across devices, regions, and network layers.

## 3. MVNO Data Integration Layer

- Sources: Includes performance metrics from MVNO networks (GWCN/HPLMN), alarm systems, trace logs, and support tickets.
- Function: Enriches agent telemetry with operational context, enabling root-cause inference and partner benchmarking.
- Purpose: Bridges the gap between customer-side experience and network-side behavior, even without direct RAN control.

## Strategic Value

Together, these components enable MVNOs to:

- See what customers actually experience, in real time.
- Diagnose issues with layered correlation.
- Act through automation, steering, and support.
- Validate improvements and benchmark partners.

## Closing Summary — QoE as the MVNO Superpower

QoE AI Insights delivers a groundbreaking advantage to MVNOs, offering unprecedented, independent, device-level visibility into the real experiences of their customers. This innovative capability marks a significant departure from traditional approaches, where MVNOs often lacked direct control or insight into the Radio Access Network (RAN), and relied heavily on host MNOs for information about network quality and customer service.

With QoE AI Insights, MVNOs gain actionable intelligence that empowers them across multiple dimensions:

- **Reduce churn:** By understanding exactly how customers perceive network performance and service quality, MVNOs can proactively address pain points, resolve issues faster and retain more subscribers.
- **Improve support:** Enhanced visibility enables customer support teams to diagnose problems swiftly, provide targeted solutions and deliver a more personalised service, boosting satisfaction and loyalty.
- **Negotiate with host MNOs:** Armed with independent, device-level data, MVNOs can engage in more informed and assertive negotiations with their host network operators, ensuring service level agreements are met and driving improvements where necessary.
- **Select the best RAN partner:** QoE data allows MVNOs to objectively compare different RAN providers, making it possible to choose partners who consistently deliver superior customer experiences.
- **Differentiation on experience:** In a crowded marketplace, the ability to demonstrate a better, more reliable customer experience becomes a powerful tool for standing out against competitors.
- **Win enterprise deals:** Enterprises demand transparency and reliability; MVNOs can use QoE insights to offer guaranteed service quality, attracting high-value business customers.

- **Build trust with customers:** When customers see that their MVNO is responsive to their actual needs and concerns, trust deepens, leading to higher retention rates and positive word-of-mouth.
- **Operate with confidence:** Real-time, layered correlation between customer-side experience and network-side behaviour means MVNOs can validate improvements, benchmark partners and steer their operations with greater certainty.

In today's telecom landscape, customer experience has overtaken traditional metrics as the most crucial factor in driving business success. For MVNOs, QoE is more than just a collection of insights—it represents a strategic superpower that transforms their ability to compete, innovate and grow. Leveraging this advantage, MVNOs can bridge the gap between their customers' expectations and the complex realities of network performance, ultimately securing their position as trusted, confident and forward-thinking providers.