

From Lab to Field:

HOW AI AND REMOTE MONITORING ARE REVOLUTIONISING QA FOR VIDEO SERVICES

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IN TODAY'S DYNAMIC STREAMING ENVIRONMENT, ENSURING CONSISTENT VIDEO QUALITY ACROSS MULTIPLE DEVICES AND NETWORKS HAS BECOME MORE COMPLEX. TRADITIONAL QA METHODS, WHICH RELIED ON PRELAUNCH LAB TESTING ARE NO LONGER SUFFICIENT TO ADDRESS REAL-WORLD PERFORMANCE CHALLENGES. THIS ARTICLE WILL EXPLORE HOW CONTINUOUS REAL-DEVICE MONITORING — COUPLED WITH AI-DRIVEN AUTOMATION AND REMOTE-MONITORING SOLUTIONS — IS TRANSFORMING QUALITY ASSURANCE IN THE VIDEO INDUSTRY.



THE STATE OF VIDEO DELIVERY AND QUALITY ASSURANCE

The digital video delivery landscape is now far more complex than in the days of cable or satellite, when service providers controlled both content and devices. Today, providers must support a vast array of devices and operating systems, many of which update independently. Devices and their software can change overnight without notice. The same is true for the cloud components and backend systems.

Even if streams are perfectly encoded and available, there's no guarantee that users will have a seamless experience. In a fiercely competitive market, users can easily switch services at the first sign of frustration. For example, if dynamic ad insertion misbehaves and causes a device to spontaneously reboot, users might simply give up and the provider loses both viewership and revenue. Traditional analytics might never capture such problems, underscoring the critical need for real-device, real-time monitoring to truly understand and ensure the quality of experience.

THE SHIFT TO REAL-TIME, IN-FIELD MONITORING

Traditional quality assurance for video services relies on lab testing every two weeks or before major releases using a small set of devices in a controlled environment. This method typically tests every feature, even ones that are rarely used, resulting in excessive, less useful testing data.

The traditional approach can miss real-world problems, and its periodic nature means critical issues can go undetected for weeks. As such, traditional prelaunch QA is no longer good enough.

That's why the industry is shifting to real-time, in-field QA monitoring. This method involves running daily automated tests on real devices and focusing on the most used features. This approach quickly uncovers subtle, real-world issues and yields more valuable testing data, making root-cause diagnosis much faster and easier.

Video service providers that have implemented continuous in-field device monitoring have seen significant reduction in time to detect and time to fix. Example of issues that lasted weeks are now fixed in hours.

AI MAKES REAL-TIME FIELD TESTING POSSIBLE

Unlike in the lab, conditions in real-time field testing are always changing. Content libraries shift, user interfaces update and device behaviours vary, making reliable test cases difficult to maintain. Managing these dynamic conditions requires an adaptable approach, which is where AI comes in.

AI-powered automation mimics user behaviour and automatically assesses audio and video quality based on what is visible on the screen. It maps interfaces and knows how to interact with each device, even as things change. AI and automation not only make large-scale, continuous testing possible, but they help catch issues faster, reducing costs and preventing viewers from abandoning the app.

In one recent example, a major service provider with 73 devices under test deployed AI-driven live field testing. In 2024 alone, that provider ran tests on 298 features to verify 73 services. It would have taken 95 full-time human testers 137,000 hours to conduct those tests manually.

Elsewhere, between its video and RVM environments, another provider live-monitored 1402 channels on more than 3100 devices 24/7 over the course of 2024, achieving more than 5 million automated checks per month and saving 500,000 hours — the equivalent of 5000 full-time testers.

THE POWER OF REMOTE ACCESS

Once AI-driven field testing uncovers an issue, remote-access solutions play a crucial role in getting it to the person who will fix it. Through remote access, teams can interact with devices located anywhere — no on-site presence or VPN required. Engineers and developers can see the problem directly on the affected device in its actual environment. Instead of lengthy back-and-forth and blind fixes, teams simply share a link to the device and the issue so the right person can troubleshoot and resolve it quickly — often reducing resolution time from months or weeks to days. This approach also eliminates the need for costly device shipments.

Remote-access QA testing is especially valuable for global providers, whose applications run on devices that might not even be available in their own country (such as an Orange set-top box that

cannot be installed in the U.S.). It's also useful for, say, a broadcaster in the Long Island region of New York who needs to test its application through Comcast, but Comcast isn't available there.

Some remote-access solutions even connect far-flung devices to a centralised system. For instance, a service provider could have a Vizio smart TV in Massachusetts, a Roku in New York, a Samsung TV in Paris, and so on — all accessible through a single interface. Users can select the device in question, remotely control it, view the screen, and even record video for troubleshooting. They can also test a reported issue and attempt a fix in real time.

Providers are using remote access for both development and troubleshooting, such as verifying channel lineups, investigating customer complaints, or ensuring that updates work as intended across different device models and regions.

Major cable providers in the U.S. and Canada are using this technology to operate their equipment remotely from India. They can also investigate and rule out set-top box issues remotely instead of defaulting to costly, needless swaps.

THE TAKEAWAY

For engineering, operations and development teams looking to increase service reliability and improve the viewer experience, continuous real-time monitoring on actual user devices is essential. This approach, enabled by remote-access solutions and AI-powered automation, makes it possible to detect and resolve issues much faster, reducing costly troubleshooting and customer churn. And by focusing on the most critical user journeys rather than exhaustive functional testing, video service providers can derive more value from their testing and achieve better results.

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