![Interra Systems logo]

White Paper

# Why Quality Assurance Matters Now, More Than Ever

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# 1. INTRODUCTION

***Consumer Expectations for Exceptional Quality on Every Screen is Driving the Need for Intelligent Video Insights***

Consumers today are watching more video than they ever have before. Research shows that more than 310 million connected households will have at least one OTT service by 2024, according to Parks Associates, validating that today's consumers enjoy watching content anytime, anywhere and on any screen.

OTT video consumption, in particular, has accelerated rapidly over the last few years. That has created a very promising financial outlook for the industry. According to Analyses Mason, the total spending on OTT video services worldwide will almost double between 2019 and 2024, from $67 billion to $130 billion. The researcher found increased adoption of subscription video on demand (SVOD) as a key growth driver.

The current situation is both an opportunity and a challenge for video service providers. With OTT, there's an opportunity to boost revenues. However, the OTT space has also become deeply crowded. Disney+, Apple TV+, Peacock, and HBO Max all launched in 2020, and more offerings are on the horizon.

Since there are so many different video services available today, it's important that they offer a unique selling point, whether it is exclusive content, aggregation, and high quality. Producing or acquiring exclusive content requires a significant capex investment. Aggregation can also be a challenge, as it requires licensing agreements, which take time to secure. That leaves quality as the most effective means of maintaining customer satisfaction with a video service.

Viewers expect a high quality of experience (QoE) on every screen, not just the main TV. Research suggests that if there is any buffering or issues with the audio/video,

consumers will seek a different service. However, creating and delivering OTT content is significantly more complex than linear broadcast.

This paper will explore the challenges of delivering exceptional video-audio quality on every screen, as well as why it's critical to invest in end-to-end QC and monitoring to ensure higher customer satisfaction and retention for broadcast and OTT services.

## 2. CHALLENGES OF HIGH-QUALITY VIDEO DISTRIBUTION

Delivering high-quality video on every screen is challenging for several key reasons. Service providers are dealing with increasing workflow complexity, a massive amount of content, viewership spikes, and lack of control over the delivery of video over unmanaged networks.

### Workflow complexity

Over the last few decades, video creation, preparation and delivery process has evolved from being simple to extremely complex. Errors can occur at any point of the workflow, from transcoding to packaging, origin server, and delivery. Service providers need tools that enable them to quickly detect QoE and QoS errors. Taking consistent measurements at all points of the OTT workflow will assure the delivery of flawless quality on every screen at all times.

### More content variations

Today's service providers are delivering content to an ever increasing number of screens, including TVs, smartphones, tablets, and PCs. Each device has a different screen size and supports different formats. Broadcasters and service providers must prepare content using different audio-video standards and formats, such as HEVC, AV1, VVC, HLS, and DASH. OTT content must also be encrypted with different digital rights management (DRM) protection schemes, such as Microsoft PlayReady, and Google Widevine.

Service providers are also expanding their global reach. They are preparing video content in a wide range of different languages, which requires accounting for national and regional regulations, dubbing, and captions. Having to maintain so many different variations of content increases the chance for errors that can impact service quality.

## Spikes in viewing

Video streaming consumption has been steadily rising in recent years, and the COVID-19 pandemic has driven a further spike in OTT engagement.

In the U.S., the number of households that streamed content on OTT devices grew from 44 million per month prior to March 9, 2020 to roughly 300 million after, and has stayed in the 300 million household range since then. Broadcasters have also seen an uptick in consumption since the pandemic started. As of August 2020, overall news consumption continues to remain higher than pre-pandemic levels.

Traffic spikes are hard to predict and can occur when millions of users are watching the same content at the same time. Spikes are common during popular TV shows, premieres, breaking news or live sports events. They put an additional load on infrastructure, and when networks are congested, it can result in drop in video quality and rebuffering.

## Lack of control

With traditional broadcast delivery, service providers have control over the video quality from ingest to distribution. OTT is different because it's delivered over the open internet, which is an unmanaged network. Service providers don't have control over certain factors that can affect the quality of OTT streams.

## 3. BENEFITS OF AUTOMATED MONITORING AND QC TOOLS

Traditionally, service providers have relied upon visual inspection methods to detect issues with the audio and video streams. But they didn't face the same challenges then as they do now. Today's service providers are handling a much higher volume of content. They're preparing content for viewing on a multitude of different devices in various encoding formats and resolutions. Furthermore, they're having to account for different variations of audio and captions in multiple languages, as well as multiple delivery mechanisms. Anymore, visual methods are too time-consuming and inconsistent.

Automated monitoring and QC tools have become an absolutely essential solution, enabling service providers to quickly detect and fix problems at many different points in the workflow. Here are a few key reasons why automated monitoring and QC is critical.

### Better speed and efficiency

Having an automated monitoring and QC brings increased efficiency and reliability to the video preparation and delivery process.  When service providers combine with a manual review process, they can significantly optimize productivity and improve quality. There are several ways that automated QC systems speed up operational efficiency and improve accuracy.

Using an automated QC system, broadcasters can quickly check the quality of baseband video and audio, as well as the quality of closed captions and subtitles. Auto QC systems also make it easy to comply with industry and government regulations, while addressing the wide range of OTT and on-demand delivery ecosystem requirements.

## Improved content quality

With an automated monitoring and QC solution, service providers can assure exceptional quality video experiences. This is important, as a poor experience will have a negative impact on ROI, customer retention, and reputation.

Television viewers today have sophisticated taste. They expect high-quality content on every screen. A recent study by research firm Sensum found that viewer's negative emotions increase 16% while engagement decreases nearly 20% as a result of poor quality streaming experiences. In addition, the survey found that 76% of participants would stop using a service if issues such as buffering occurred several times.

Errors can occur at any stage of the workflow, from ingest to post-transcode, post-origin server, CDN, and at the edge. End-to-end monitoring, in particular, allows service providers to perform root cause analysis at each phase of the workflow, eliminating any confusion about where the error is happening.

## Increased accuracy

A growing number of consumers are watching SVOD services. In fact, Digital TV Research predicts that the number of U.S. SVOD subscribers will increase from 203 million in 2019 to 317 million by 2025, an impressive feat considering that it is already the most mature OTT market in the world.

However, VOD and OTT delivery require a much faster and wider variety of metadata generation for content classification. Content classification is needed for a variety of reasons, including compliance with geo-specific local rules and regulations.

Automated QC tools, especially those powered by AI and ML technologies, combined with computer vision, allow service providers to classify content faster and more accurately, further improving content quality.

## 4. BENEFITS OF AUTOMATED MONITORING AND QC TOOLS

The television market has become highly competitive, and video preparation and distribution methods continue to increase in complexity. Service providers need to find ways to streamline content management, improve efficiencies, and provide exceptional audio-video quality on every device.

As a global provider of solutions that streamline media content classification, QC, and monitoring across the entire creation and distribution chain, Interra Systems has an up close and personal look at emerging video delivery trends and the challenges service providers face. Through innovations in software, cloud, ML, and AI, our solutions are enabling better video quality experiences on every screen.

### End-to-end, holistic QC and monitoring

Interra Systems is one of the only providers to offer a holistic, end-to-end QC and monitoring solution that is fully automated. Many video service providers today rely on different systems from different vendors to check content quality and monitor the delivery of video. The problem with that approach is that different systems are not designed to communicate with one another. They have a completely different user interface, different QoE and QoS measurements, and might interpret results differently, causing inconsistencies and confusion about where the error is taking place.

Our holistic, non-fragmented, end-to-end solution for QC and monitoring of traditional linear and OTT channels is more effective at detecting and resolving video streaming issues and delivering a superior QoE and QoS.

### Flexible software and cloud solutions

Many monitoring systems today are built on custom hardware. Interra Systems' QC and monitoring solutions are software-based, with the option for on-premises and cloud deployments. Having a software-based solution allows service providers to take advantage of newer, faster processors for optimum performance. By deploying our

end-to-end QC and monitoring solution in the cloud, service providers can gain additional flexibility.

## Centralized monitoring

The monitoring part of our solution is centralized, giving service providers insight into what's happening at each and every point of the workflow. Whenever an error occurs, our centralized monitoring system will provide all of the relevant details, enabling errors to be caught very quickly. Compared with traditional monitoring systems, a centralized approach increases the efficiency of troubleshooting and assures the delivery of flawless quality on every screen.

## Powerful ML, AI and data analytics

Service providers are creating and distributing a massive volume of content. Netflix alone offers at least 13,941 titles across all its international libraries as of April 2020. Each of those titles has been replicated into different variations to accommodate regional and other requirements. Service providers need smart tools for content categorization and classification to ensure content is in accordance with regulations in different countries, regions, and organizations.

Interra Systems is leading the charge toward faster, more accurate content classification with AI and ML technologies. Using a QC solution powered by AI and ML, service providers can automatically identify lip sync issues, violence, explicit content, alcohol, smoking, celebrities, the presence of certain brands or objects within content. AI and ML technologies also aid in facial recognition and collecting metadata. Ultimately, we are helping service providers to gain insights into viewing behaviors and enhance the end-user experience.

## 5. CONCLUSION

Having an end-to-end QC and monitoring solution, to assure quality, matters now more than ever. Streaming services are attracting a growing number of subscribers, and consumer's today demand exceptional QoE and QoS.

Video service providers today are managing a growing volume of content. In addition, the majority of service providers have limited visibility into their customers' QoE. As a result, they also have limited means to correct issues before they affect content quality.

Interra Systems is helping service providers deliver high quality video experiences on every screen so that they can maintain subscriber satisfaction and grow their revenues. With Interra Systems' automated, end-to-end QC and monitoring solution, service providers can detect and resolve video streaming issues in real time, improving service quality.

Interra Systems' solutions increase service providers' flexibility through a software-based architecture that is deployable in the cloud and on-premises. Featuring centralized monitoring and powerful AI/ML technologies, Interra Systems' solutions set the benchmark for workflow efficiency and accuracy. By providing our customers with intelligent video insights, we are enabling better video quality and better monetization of broadcast and OTT content.

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