



OTT video providers: The importance of Quality Assurance in delivering a seamless viewing experience

A Mindtree Media Industry Group Point of View

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Mindtree

A Larsen & Toubro Group Company

The OTT video state of affairs

There is a rising concern among traditional video service providers like broadcasters, cable operators and studios with the rapid success and growth of over-the-top (OTT) video platforms like Netflix and Amazon Prime Video. To remain competitive, traditional video service providers are shifting to direct-to-consumer models by launching their own OTT services, by embracing digital transformation and moving their infrastructure to the Cloud, to serve catch-up or live on-the-go content directly to consumers on multiple devices.

The rise in production and consumption of OTT digital video content has brought challenges. Increased consumer choice and low switching costs, lead to churn if the quality of viewing experience is bad. As per research done by Conviva*, a Silicon Valley headquartered firm offering solutions for online video optimization and online video analytics, advertisement delays of just 5 seconds caused 13.6% of viewers to abandon content. When consumers encounter buffering or stalling of a video, the problem may be due to multiple reasons - a single point failure within a component, an integration failure between independent components, Wi-Fi data being exhausted, or low internet speeds at the endpoint. Without an effective quality assurance (QA) strategy, video service providers are likely to have unnecessary development efforts, higher operational costs, and delays in issue resolution eventually leading to higher consumer churn.

Core guiding principles for OTT providers

Video providers need to consider the following guiding principles when building an OTT service.



Integration of systems

A variety of building blocks within the video ecosystem need to be seamlessly integrated, as a single failure can bring down the whole service. The performance of the building blocks play a crucial role in running the services smoothly. The OTT back end infrastructure must provide flexibility for the different ways of monetising content, supporting business rules like subscription, transaction and advertisement supported free content.



Varied endpoints

Consumers want the services to reach their endpoints at the desired place and time, delivering a great experience. OTT providers need to support a variety endpoints like smart TVs, mobile devices, and gaming consoles, running on multiple operating systems. Video content has to be delivered in multiple formats like HLS (HTTP Live Streaming), HDS (HTTP Dynamic Streaming) and MPEG-DASH. OTT services need to operate within various network architectures seamlessly.



Security & rights management

OTT providers need to conform to content protection systems such as digital rights management (DRM), conditional access system (CAS) or proprietary systems. Security systems need to ensure that they do not slow down the video service delivery. With increased Cloud adoption, OTT providers have to ensure that their content is delivered securely over Cloud using appropriate safety measures.

*Streaming TV Data Confirms Accelerating Industry Growth; Uncovers Surprises in Device Market Share, Ad Delivery, and Social Media Consumption, Conviva, Q1 2019



Spurts in demand

Occurrences of large numbers of consumers viewing content simultaneously have become very common, especially during sporting events or breaking news. At such times, the performance of content delivery infrastructure needs to be properly managed and monitored. The usage of content delivery networks (CDN) makes the architecture distributed and improves performance.



Consumer experience

Globally, broadcasters and pay TV providers have relied heavily on viewership data from a small sample of households. With OTT services, more accurate, detailed and timely information is available on viewership trends, patterns, consumer choices and behaviour. Viewership parameters like video stalling, buffering, pixilation, user interface and jerks are important factors to be considered for consumer experience.

On uncontrolled networks like the internet, it is difficult to guarantee quality of service (QoS). Consumer choices also vary, they may accept lower video quality for a cheaper price. Without proper QA, OTT can increase consumer churn rather than capturing it.

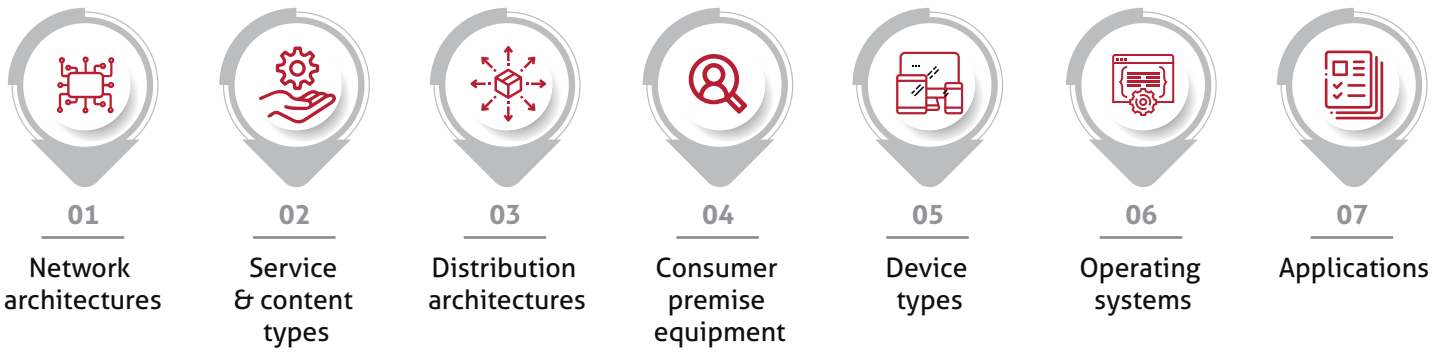
Approach for Quality Assurance

While executing quality assurance programs, OTT providers need to adopt the below best practises:

- **Test automation:** implement test automation coupled with continuous integration from the early phases of a project which will help uncover issues in a timely manner
- **Behavioural driven testing:** adopt behavioural driven testing using agile principles with close collaboration between product, development and testing teams
- **Iterative approach:** continuously ship new product features using an iterative approach that helps to test features quickly and efficiently
- **AI/ML based testing:** use AI/ML to identify consumer journeys and prioritise testing efforts based on the most important product features used by consumers

Mindtree's OTT QA services for the entire digital content pipeline

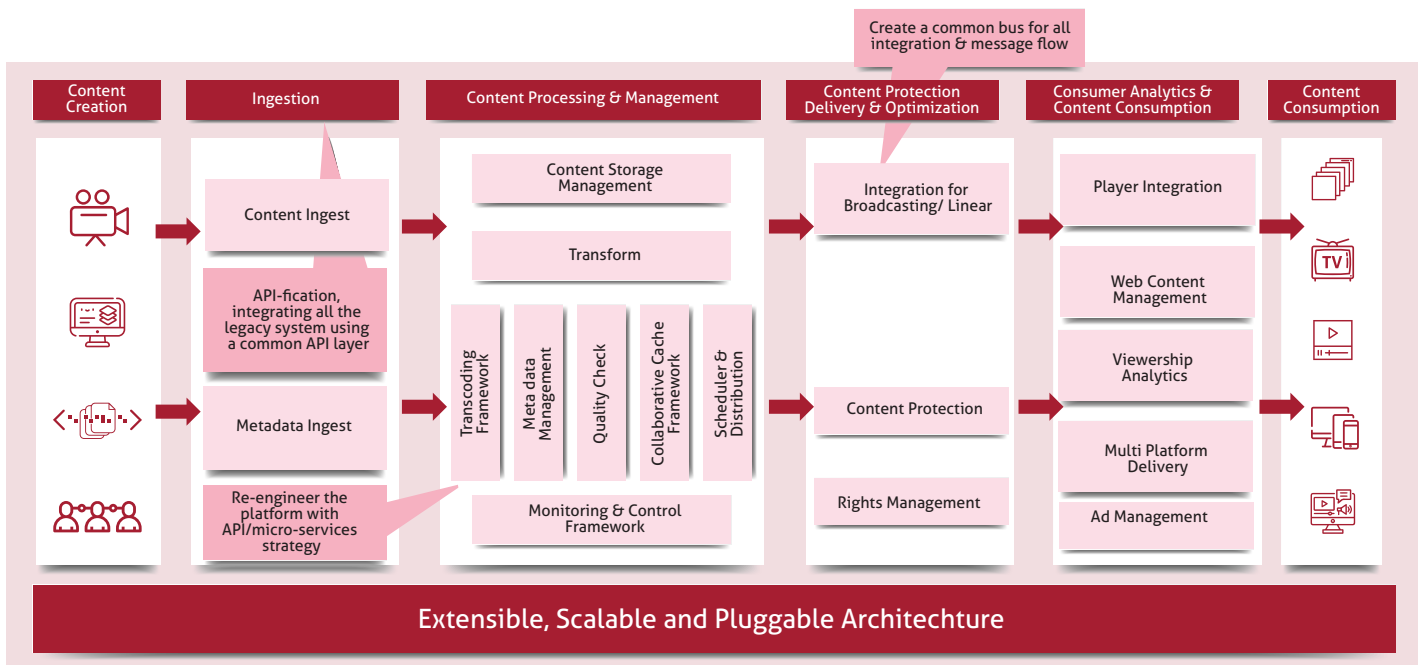
Mindtree's QA services are fit for any OTT scenario. Mindtree offers integrated monitoring solutions for the entire OTT pipeline right from content ingestion to consumption. Mindtree's QA stack tests the below components:



Mindtree’s QA services have pre-built test cases that cover end-to-end scenarios for any OTT platform. Each significant stage of the content life cycle is tested by Mindtree.

Mindtree offers the following key advantages:

- Scalability – through testing solutions across the digital value chain
- Accelerated testing – through AI enabled automation frameworks
- Innovation – using analytics/machine learning and bots
- Behavioural driven testing – using media business driven testing
- Continuous testing – testing in an iterative model through DevSecOps integrated continuous integration platform



Input Media Validation

Transcoded Media Validation

Side Assets Validation

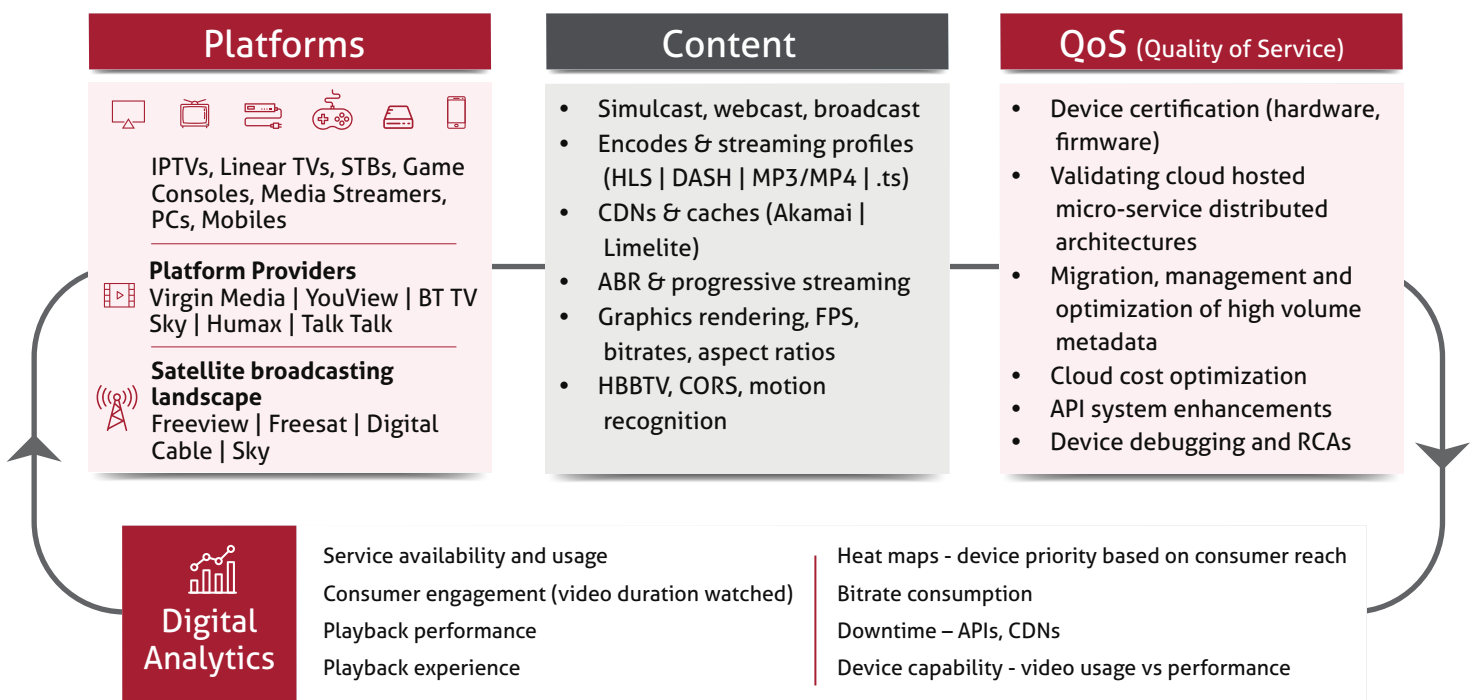
Micro-services Enabled Validation

Resilience, Load, Security, Performance Testing

Mindtree's Blueprint for OTT QA

A few examples of Mindtree's OTT QA services across the pipeline are:

- Input media validation to verify if the input video is as per expected bitrate/aspect ratio/resolution/sample rate etc. Automated scripts using open source stack to verify if transcoding has been done properly and for the required number of bitrates
- Scripts to ensure if transcoded media has been published at the correct location for distribution using open source stack on Cloud. These validations also include if the media file in Cloud storage has correct checksum value, and whether correct headers (such as cache time) are set on the media object
- Validate whether the supplementary assets like thumbnails and subtitles are accurately generated and uploaded at the correct location
- Use micro-service architecture for testing metadata, queues, logging and monitoring
- Design and run contract tests between various consuming and publishing services. Run automated continuous tests to check the integrity of specifications/data structure
- Run checks on the final output media using internal accelerators



Mindtree's end-to-end QA Services to ensure Seamless Consumer Experience

Mindtree has delivered great outcomes for clients

- Quality assurance and automation of the entire digital media supply chain (250+ services, 15+ workflows) leading to 50% effort savings for a UK based public broadcaster serving ~3.6 billion annual online program requests
- Increased efficiency among production teams in terms of content finalization and faster decision making by uplifting and testing a production management platform for a leading US-based \$13 billion broadcaster
- Quality assurance and automation for 19 web properties that led to 40% reductions in costs of quality and 50% acceleration in time-to-market for a large US-based magazine publisher

The Mindtree Media Industry Group

Established in 2006, Mindtree's Media Industry Group has 1000+ employees more commonly known as Mindtree Minds. Within Media, Mindtree works with broadcasters, cable networks, publishers, advertisers, business information services, new media and gaming companies. Mindtree has executed 100+ projects for over 50 clients across North America, Europe, Middle-East and Asia Pacific regions. Mindtree is serving 6 of the top 10 media & publishing companies with more than 50% of its revenue coming from digital services. Mindtree is positioned in Leadership Zone for Publishing, Broadcasting and Education in Zinnov Zones 2017 report.



About Mindtree

Mindtree [NSE: MINDTREE] is a global technology consulting and services company, helping enterprises marry scale with agility to achieve competitive advantage. "Born digital," in 1999 and now a Larsen & Toubro Group Company, Mindtree applies its deep domain knowledge to 350+ enterprise client engagements to break down silos, make sense of digital complexity and bring new initiatives to market faster. We enable IT to move at the speed of business, leveraging emerging technologies and the efficiencies of Continuous Delivery to spur business innovation. Operating in more than 15 countries across the world, we're consistently regarded as one of the best places to work, embodied every day by our winning culture made up of 21,000 entrepreneurial, collaborative and dedicated "Mindtree Minds."