



Demystifying Quality of Experience: Getting Inside your Customer's Head

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Demystifying Quality of Experience: Getting inside your customer's head

Recent years have witnessed the evolution of remarkably advanced video and audio services - such as Video on Demand (VoD) - streaming over highly improved network infrastructures. This has allowed customers to select and enjoy preferred viewing format, timeframe and even choose the delivery mode.

Customers now expect seamless, high quality services across managed / unmanaged networks and devices. Clearly, it is difficult for content and service providers to map user experiences on unmanaged systems and ensure absolute Quality of Service (QoS). It is also necessary to support multiple Adaptive Bit-rates (ABRs) so that customers can seamlessly make transition between different bandwidths and enjoy a consistent viewing quality.

Quality of Experience (QoE) helps organizations engineer an end-to-end roadmap for top notch service and recalibrated quality, defining cutting-edge measurement techniques and monitoring mechanisms.

This PoV identifies key consumer issues and discusses the principal areas for strategic QoE intervention. It is created in close confluence with end-user expectations and explains the fundamental ideas driving QoE as an approach.

Emerging Customer Expectations

As a modern telecommunications customer how often have you been concerned with service quality? As you gravitate between different delivery models, isn't your primary concern the precision and purity of audio and visual outputs?

Customers are consistently switching between managed / unmanaged devices (Refer Figure I.1) and networks. While managed systems allow greater control over navigation, regular usage monitoring and a set of SNMPs (Simple Network Management Protocols) that streamline delivery and unmanaged systems offer a simpler, plug-n-play approach, perfect when there are no advanced applications.

As we break down the levers in this discussion (rapid technological advancement, innovative, new systems, and evolving network management concepts) it is critical to factor in an extremely important element - the human factor.

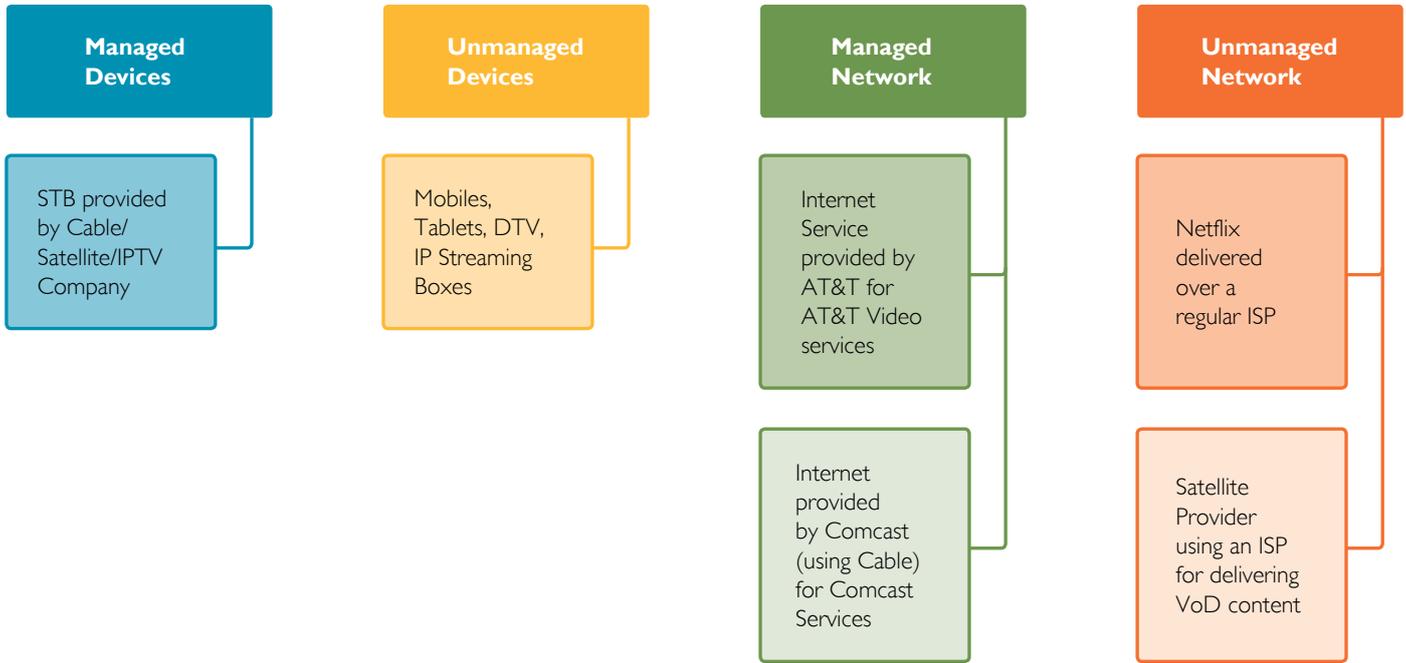


Figure I.1: Managed / Unmanaged Devices and Network Categories

For any service or product, customers are the true indicators for quality. The product engineering landscape is evolving and constantly aligning itself to consumer perception.

Also, modern businesses need to regularly monitor and take into account customer comments / views expressed across social media channels, creating positive or negative clouds around a particular product at lightning-fast speeds - at times even before a service provider can get around to addressing the criticism.

QoE as a fast-rising, multi-disciplinary science (combining social psychology, cognitive science, economics and engineering) is becoming more relevant by the day. In fact, with consumers expecting refined experiences, QoE helps to define several essential consumer-measurement characteristics.

Let's begin with a basic checklist of core customer expectations

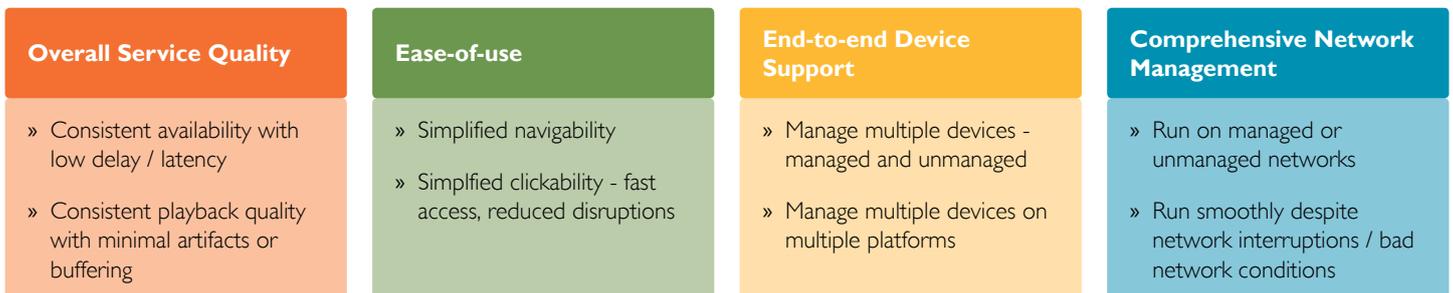


Figure I.2: Key Customer Expectations

Managing Expectations - Key Customer Challenges

As a customer, what matters the most is unhindered, uninterrupted service, regardless of the device, platform, network or availability.

As we understand it, some of the critical challenges include the following:

Technical Area	Challenges
UI, Device & Platform	Bad response time, UI blocking the playback screen, Service not available, Not supported in common platforms
Audio	Silence, Noise, Static / Loudness, Incorrect playback speed
Video Playback and AV	Frame Skip / freeze, Black / Blue screen, Video Blockiness / Blurriness, Video Blackout, Jerkiness, Unable to Play, Start-up delay, Skip delay, Lip sync, Sub-title sync issues or Not available
CRM / OSS / BSS	Purchased movie not seen in the list, Discounts and offers not getting applied or shown
Personalization	Irrelevant movies recommended, Favourites not getting updated, Loss of personal information

Table 2.1: Common Customer Issues

Demystifying QoE - Core Concepts and Ideas

Everyone wants stabilized systems and optimized performance. So, what does QoE mean to you and your business? How does it help your cause?

Most QoE models are built on a four pronged approach, viz., four domains regularly interacting with each other to create a paradigm - Human, Context, Technology and Business. Each domain is further segmented into a number of sub-factors determining response and / or expectations:

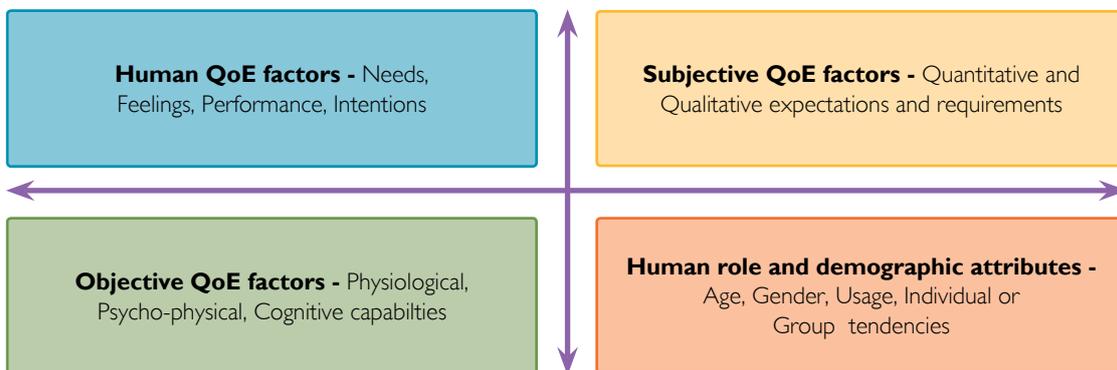


Figure 1.3: Common Customer Issues

As one analyzes the QoE blueprint, we must consider another element: customers very often source material on multiple devices (regularly interchanged / refreshed / renewed) with variable requirements and locations.

This has resulted in a large-scale migration in service engineering - from 'design and develop for each platform' to 'design once and deploy in many' by employing web technologies aiding rapid synchronization.

The four pillars pivotal to an end-to-end QoE report card are the following:

- » Applications
- » Devices
- » Network
- » Service

The Principal Causes for Customer Dissatisfaction

So, what's your biggest concern with the video and audio you stream? How can this be solved?

The following is a compilation of the most common customer complaints:

Customer Complaints	Technical issues	Possible Solution Area	Service segment affected
"It's unplayable on my device"	Not designed for multi-platform	Scalable Platform software	Application and Device
"My playback is continuously interrupted by buffering delays"	Non-optimal Buffering	Updates required in client player	Application and Device
	Content Delivery bottlenecks	CDN deployments (multi-CDN)	Backend Service
"I always face a substantial playback delay"	Non-optimal Buffering	Updates required in client player	Application and Device
	Content Delivery bottlenecks	CDN deployments (multi-CDN)	Backend Service
"My playback is challenged by issues like freeze, blockiness etc"	Adaptive Streaming not working as expected	Updates required in client player	Application and Device
	Packet delay / loss	Improved Bandwidth from ISP	Network Provider
	Transmission jitter	Improved QoS from ISP	Network Provider
"My playback takes a long time and the entire system exhibits a delayed response"	Post processing and Decoding quality	Hardware supported Decoding	Application and Device
"There's often no synchronization between audio and video"	AV sync handling incorrect	Updates required in client player	Application and Device
"I am worried about the security and safety of my personal details"	Device security	Device compliance tests	Application and Device
	Backend server security	Security tests	Backend Service

“It often takes a long while to list the content available - sometimes the system's down and I can't get it to work”	Server load or downtime	Service Scalability & Availability	Backend Service
	Backend Service level issues	Service Scalability & Availability	Backend Service
“I have no playback at all - there's a message saying - low bandwidth”	Bandwidth low for even the lowest b/w available in the server	More content formats to be supported	Backend Service
	Low Bandwidth	Improved Bandwidth from ISP	Network Provider
“ I have a message that says - Your device does not meet the security requirement”	License not applicable	Support for multiple types of licensing	Backend Service
“My screen shows a message saying - format not supported”	Content not available for different platform, Format not supported	More content formats to be supported	Backend Service
“When I search for content I keep getting incorrect results”	Backend Service Function issues	Functional test for all scenarios	Backend Service

Table 2.2: General Customer Complaints and Potential Solutions

Examining the above, draws attention to three essential considerations pivotal to re-wiring networks and strengthening service quality:

- ✓ Multi-bandwidth and device content availability
- ✓ Multi-platform application availability – with emphasis on popular devices for a specific region
- ✓ Sustained importance on content delivery – boosted by a strong ISP provider

The Road Ahead

Effectively, QoE must be able to deliver composite monitoring - a consolidated focus on all components and tools affecting customer experience, viz., devices, applications, network, backend services and the like. The real challenge is the ability to measure subjective “customer experiences” – with multiple vantage points and opinions.

So how do you measure subjective QoE aspects? Are there user-tests that are carried out for analysis? What are the costs and timelines involved? Are there innovative tools which can simplify this complex environment?

Part II of this series throws light on measurement principles and best practices underlying an effective QoE framework. It also discusses cutting-edge tools at the forefront of QoE applications.

About the Author

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