epitiro
Measure Manage Deliver

Customer Experience Management

A New Solution for Service Providers to Improve Revenues and Reduce Costs

WHITE PAPER

Abstract

In this paper Epitiro explores how new Customer Experience Management solutions can address the 'revenue gap' now facing operators as growth in traditional revenues decline.

Customer Experience Management is the process of understanding actual service performance, as delivered to the customer, for the purpose of ensuring those services meet customer expectations and requirements.

The benefits of effective Customer Experience management are;

- Customer retention through increased satisfaction with services
- Increased consumer take-up of new discretional-spend services such as pay-per-media
- Reduced operational costs through reduced customer complaints

Traditionally, operators have dedicated significant resources to managing network Quality of Service (QoS). While QoS management remains necessary, it stops short of understanding the actual customer experience, leaving operators without critical knowledge.

Customer Experience measurements are made at the point of delivery - directly from the subscriber's smartphone or PC. Epitiro's measurement technologies and solutions have not only made Customer Experience Management possible, but also practical on a very large scale.

The paper concludes by highlighting 3 key requirements for successful Customer Experience Management;

Comprehensive KPI data collection - detailed individual technical performance metrics (data) needs to be gathered from the end user computer or smartphone

Business Analysis – Data needs to be analysed in a format that brings obvious benefit to decision makers.

Efficiency - The value of the business intelligence gleaned decreases as the time to collect and analyse data increases.

Introduction

Service providers and industry analysts acknowledge that with the communications market maturing, revenue opportunities and growth in profits will increasingly depend on the uptake of new services by the subscriber base.

Yet many of the new services forecasted are subject to discretionary spend, as opposed to being stable revenue secured from annual subscriber contracts.

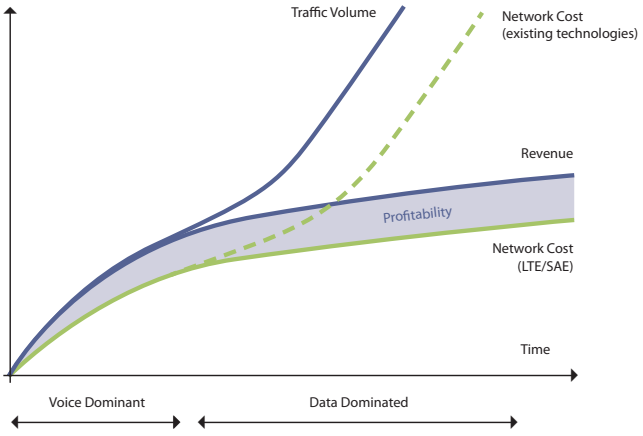
To ensure maximum uptake of fee-based additional services, such as over-the-top IPTV, service providers need to look beyond traditional network management and adopt Customer Experience Management practices.

Market Dynamics

Two market dynamics are driving market changes for both mobile and fixed line operators; rising operational costs and stagnating subscription revenue growth.

Rising operational costs are forecasted in both the areas of network infrastructure spend (Fiber, LTE and Backhaul) and customer support (support smartphones and operator-OTT services). Potential profit can be eroded if operational (OPEX) costs are excessive.

Further, *Subscription revenues* for home and mobile broadband have peaked in value and are now under price pressure, as with any common commodity that is available from multiple vendors. Operators are now looking for new sources of revenue such as over the top (OTT) services (e.g. pay-for-media).



The cost per bit must be reduced for operators to remain profitable
Source: Nokia Siemens Networks

However, even 'free' OTT applications such as Skype, YouTube, BBC iPlayer etc. are only used by subscribers based if the service is satisfactory. For operators to benefit from new pay-for-content services, assurances must be made to ensure acceptable customer experience is achieved.

That OTT pay-for services will be popular is in little doubt, according to evidence published by Sandvine.

NetFlix is a new-era OTT service company that provides movies and other TV services for a monthly fee. Available in the U.S. and recently Canada, NetFlix traffic has displaced BitTorrent (known for providing 'free' movies) as the number 1 source of internet traffic in North America, during peak periods. There trend is clear that subscribers will pay for OTT services if they are successfully delivered.

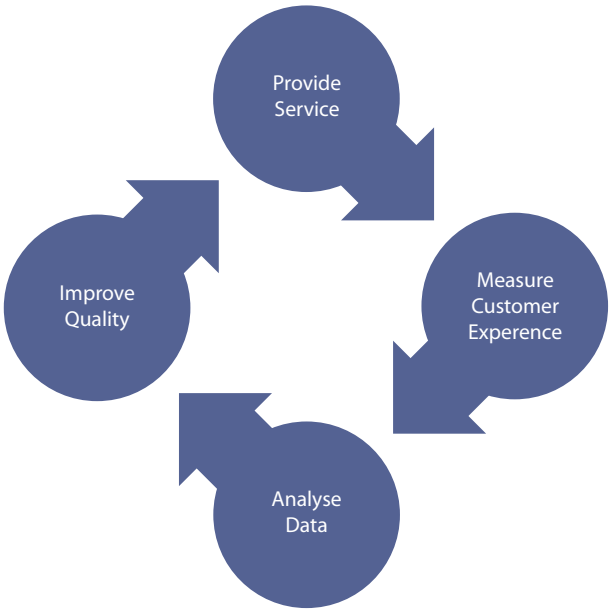
	Upstream		Downstream		Aggregate	
Rank	Application	Share	Application	Share	Application	Share
1	BitTorrent	52.01%	**Netflix**	**29.70%**	**Netflix**	**24.71%**
2	HTTP	8.31%	HTTP	18.36%	BitTorrent	17.23%
3	Skype	3.81%	YouTube	11.04%	HTTP	17.18%
4	**Netflix**	**3.59%**	BitTorrent	10.37%	YouTube	9.85%
5	PPStream	2.92%	Flash Video	4.88%	Flash Video	3.62%
6	MGCP	2.89%	iTunes	3.25%	iTunes	3.01%
7	RTP	2.85%	RTMP	2.92%	RTMP	2.46%
8	SSL	2.75%	Facebook	1.91%	Facebook	1.86%
9	Gnutella	2.12%	SSL	1.43%	SSL	1.68%
10	Facebook	2.00%	Hulu	1.09%	Skype	1.29%
	Top 10	83.25%	Top 10	84.95%	Top 10	82.89%

Source: Sandvine Ltd

What is Customer Experience Management?

In the context of this paper, Customer Experience Management is the practice of understanding how well a popular internet activity works from a subscriber viewpoint, then using that information to deliver a service that meets requirements in an efficient manner.

Customer experience measurement looks at how well applications such as web browsing, emailing, VoIP telephony, game playing and video streaming perform as a whole, in the hands of the subscriber. Underlying key performance indicators (KPIs) such as throughput, latency and packet loss are certainly measured and analysed. However these are assessed in terms of their combined effect on the subscriber's experience.



How does Customer Experience Intelligence differ from QoS metrics?

Quality of Service (QoS) management considers the network up to, but not including, individual subscribers. It's useful for understanding system-wide performance and 3rd party services which may include;

- DNS Resolution Services (3rd party service)
- Email services (3rd Party service)
- Traffic Management /Net Neutrality Policy

Customer Experience Intelligence is analysis from the customer inwards. Customer Experience mirrors the customer's actual experience in spite of how well (or poor) the core network handled the associated traffic.

Quality of Service

"How well does the network perform?"

Customer Experience

"Did the service meet customer expectations?"

What is the Effect of Unsatisfactory Customer Experience?

Service providers will inevitably be blamed by subscribers for poor experiences with the internet, whether the fault is on-net or a result of circumstances beyond their control. Worse, it's unlikely subscribers will complain about poor service – they will just leave.

An Accenture survey showed that 29 out of 30 dissatisfied customers never call to complain, and 90% of customers will not complain before defecting. Further, studies by EPSI (Extended Performance Satisfaction Index[1]), which covers over 20 European and Asian countries, indicates that subscribers are growing slightly more dissatisfied with mobile and broadband services.

1: http://www.epsi-rating.com/images/stories/results/Press_EPSI-10_economy.pdf

How is Customer Experience measured?

There are 5 areas to consider when measuring customer experience.

1. Measure at the Customer Device

   Customer experience must be measured at the ultimate point of delivery – the end user's computer or smartphone – typically using an embedded testing app. The further benefit of using an embedded test app is that it can scale practically and rapidly across an entire subscriber base.

2. Test the Application as a Whole Experience

   Customer experience test scripts go beyond individual technical measurements to analysis of KPIs that affect an application. For example, to measure how well video streaming works, metrics such as packet loss, latency and jitter are subjectively weighted through a video quality algorithm to determine their combined effect of the actual customer experience.

3. 'Real Life' Traffic

   The type of traffic used when testing customer experience needs to be representative of the application being analysed. For example, analysis of VoIP performance cannot be taken from general TCP traffic, commonly used for speed tests. VoIP uses UDP traffic thus understanding VoIP quality requires the use of this distinctive traffic during a test. While VoIP only requires very low bandwidth (speed), UDP traffic may be throttled by some ISPs.

   Further, when analysing a specific service such as BBC iPlayer, Skype or World of Warcraft, the signature of the traffic must be representative of that service. Basic Ping measurements do not conclusively determine if a specific on-line game works well.

4. Flexible and Large Scale Deployment

   Operators need to have the flexibility to rollout out customer experience measurement technology to selected groups or individuals, as required.

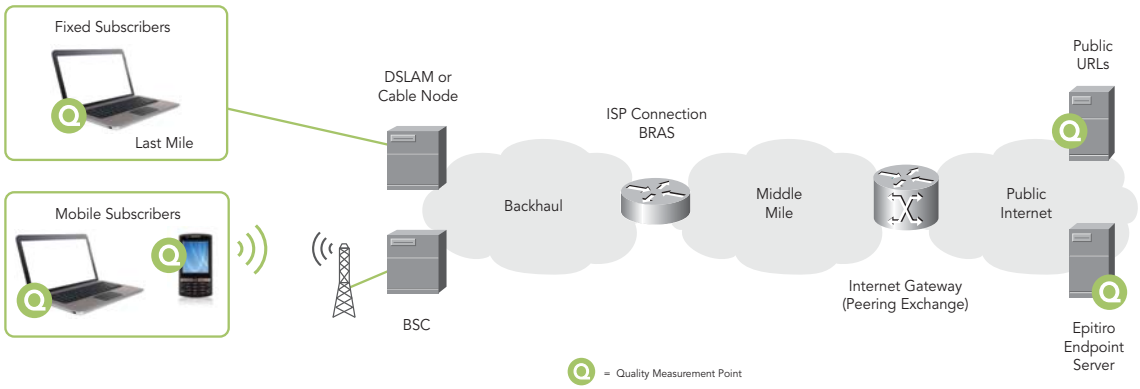
   Ideally thousands of subscribers are monitored on a continuous basis in order to understand trends and proactively manage experience through demographic analysis. A panel of thousands of users is preferred to identify and categorise user types, and address any issues common to all. Easy-to-deploy, non-invasive data collection and retrieval technology is required.

5. No Subscriber Impact

   When using people as part of a test strategy consideration needs to be given on the impact the testing may have to their normal use of broadband services. The embedded test app needs to ensure it does not interfere with the subscriber's ability to use their service or inadvertently compromise the subscriber's phone or computer.

Test script design needs to consider the impact of data caps and battery usage for mobile panellists, or avoid appearing as an “unfair usage” subscriber through excessive P2P testing (for example) for fixed lines.

Customer Experience Measurement from end user devices: PC, laptop, tablet or smartphone



Who can benefit and how?

Knowledge of customer experience intelligence empowers service providers to focus company functions on initiatives that have impact of subscribers. Moreover, customer experience intelligence enables more informed strategic business decisions concerning new services and infrastructure expansion.

Who	Area of Benefit	Result
Customer Support Agents	Embedded test apps give subscribers the ability to self diagnose issues, which leads to reduced calls and increased first call resolution rates. Making the test apps available on a web page and promoting that option while a subscriber is ‘on hold’ in a customer support queue can immediately reduce the number of a calls. For callers that do require contact with an agent, agents can quickly see subscriber faults on their screens, acknowledge the fault and immediately action a remedy.	**OPEX Saving** Fewer repeat calls, less escalation, faster resolution of faults all result in less support resources being required. **Revenue Assurance** Many customers choose to churn during or directly after a negative experience with a Customer Support experience. Rectifying an issue during the first call will greatly reduce churn.

Who	Area of Benefit	Result
Network Operations Centre	NOC engineers usually have on-going indications that there are aspects of the network operating out of tolerance. Often the dilemma they face is choosing which faults should be prioritised for repair. Customer Experience allows NOC staff to prioritise subscriber-affecting faults over general network faults.	**OPEX Saving** Resources can be managed efficiently, focused on subscriber-affecting faults. Unimportant faults can be delayed until resources are available. No need for overtime, outside resources etc.
Quality Management	With Customer Experience intelligence to hand, Quality Managers can now use a meaningful metric to ensure minimum quality levels are provided to subscribers. The ability to have this information means brand values are maintained, and discretionary spend OTT services are more readily adopted.	**Revenue Generation** Subscribers are more likely to receive a satisfactory service, purchase pay-per services and recommend the service
Marketing	Customer Experience intelligence provides marketers with the analysis required to create people-focused campaigns. “Our customers enjoy the fastest web surfing over any other major provider” may be a claim based on competitive insight through like-for-like performance measurement.	**Revenue Generation** Marketers can execute subscriber recruitment campaigns based on proof of superior performance to their competitors. Competitor advantages can be readily identified and steps taken to redress the balance. Business decisions can be undertaken to make Customer Experience quality improvements compared to competitors, and promote the advantage accordingly.
Capacity Planning	Customer Experience intelligence canassist operators in accurately predicting the need for adequate capacity. For example, the amount of wholesale bandwidth purchased can be done so to ensure it meets minimum subscriber quality targets. i.e. 95% of subscribers will always get a service of 2Mbps or more throughput the day.	**OPEX Saving** Without knowing the speeds being delivered operators have to over-spend on wholesale bandwidth.
Infrastructure Planning	Historical Customer Experience data can be used for accurate forecasting of infrastructure requirements as a result of the introduction of new services, new subscribers (a new estate for example), or changes to policy etc.	**CAPEX Saving** Adequate but not excessive infrastructure can be added, as required, when required leading to more controlled CAPEX.

Visualising the Data

Customer experience data can be viewed at a network-wide level and then subsequently mined to understand further detail. It may be best illustrated by a typical example.

A network operator (fixed or mobile) wants to understand the amount of dropped connections to investigate if there are common issues.

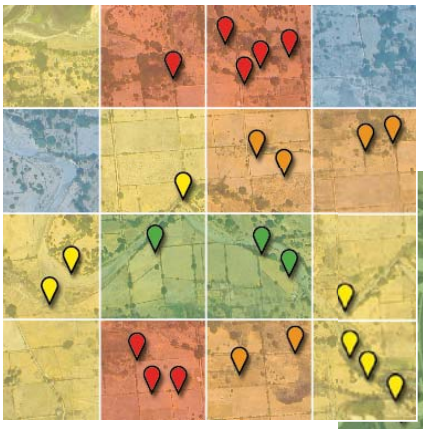
1. Initially a whole network view is taken, illustrated by the red grid tiles on the map of the UK. Each red tile indicates a higher-than-acceptable rate of dropped connections is occurring.

2. Drilling down into a single tile shows the number of occurrences and the physical location of each subscriber.

3. Now, individual analysis can be taken on each subscriber to find out if there are common issues or a local network problem affecting these users.

In this illustrative example this approach could be applied to fixed or mobile networks. For fixed lines it could be that their CPE needs upgrading, or there is a computer compatibility issue. If it were a mobile network being analysed the drops may indicate 'black spots'.

Regardless, network QoS testing would not likely have detected these issues, and subscribers would have had a negative experience.



Step: 1

Step: 2

Step: 3

Analysis of Customer Experience Data

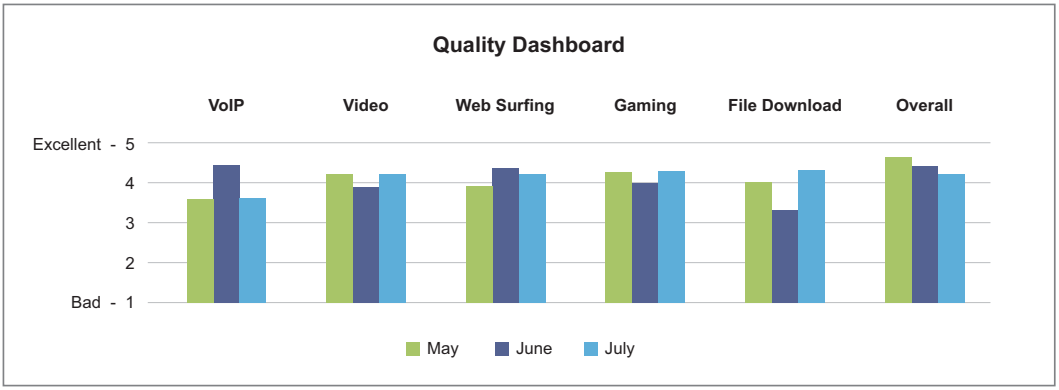
Analysis of the data needs to go beyond simple averaging to arrive at view that reflects Customer Experience.

For example, technical QoS analysis usually reports packet loss as an average, in per cent, over a period of time. The average packet loss over an hour may be very low at 0.5%.

However, packet loss normally occurs as a 'burst' where virtually all packets – over a very thin time slice – are lost. 'Bursty' packet loss results in lost video frames and dropped words in VoIP calls. Thus average packet loss may not be a meaningful metric whereas knowing the frequency of packet loss bursts would be quite informative as to actual customer experience.

The same could apply to a basic analysis of speed.

A trick question; 'Which is better – an average speed of 8Mbps or 10 Mbps? '. The answer would depend on whether the question was from a customer experience or technical performance viewpoint. Customers may prefer a service that reliably and continuously provides an 8mbps speed service. Yet they may complain about a service that unpredictably varies from being dead slow to lightning fast, but on average delivers 10Mbps.



Of course the main obstacle to analysing customer experience data is the handling the sheer volume of information collected from thousands of subscribers posting results. Specialist data storage and retrieval systems are required for analysis to be completed in a timely fashion.

What Factors Affect the Values of the Customer Experience Analysis?

The main reason for measuring Customer Experience is to obtain the Business Intelligence required to make swift, informed business decisions.

Thus the data collected needs to be relevant and of breadth that provides valid statistical and analytical insight. The analysis of the data and subsequent presentation needs to be meaningful to the eventual decision makers. Finally, the time it takes to collect and analyse the data affects the overall value of the intelligence.

$$\frac{\text{Data + Integrity}}{\text{Time}} = \text{Valuable Business Intelligence}$$

The Value of Business Intelligence is driven by the Data and Analysis subject to the time taken to present conclusions in such a format that a business decision may be undertaken.

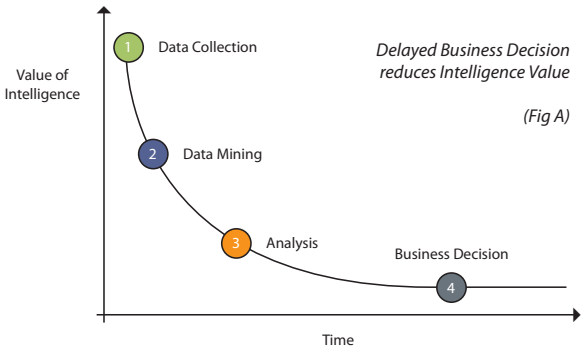


Fig A – Business decision is made using accurate data and analysis, however the excessive time taken reduces the Intelligence Value.

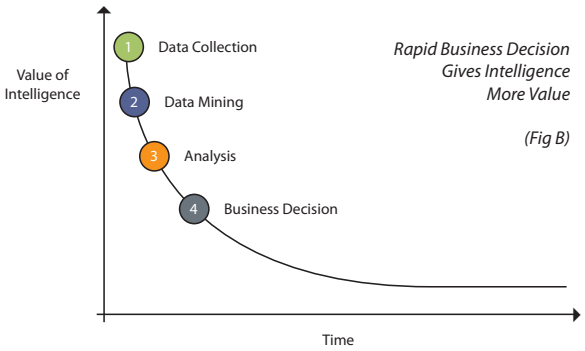


Fig B – A faster data collection, mining and analysis process increases the Intelligence Value.

Getting Started with Customer Experience Management

Being customer aware is not a new ideal for broadband service providers who are driven by subscriber trends, demands and behaviour. Using customer experience intelligence as a centre-point for managing business operations is an evolutionary step however, and the transition process needs to be considered.

Becoming customer-centric is a philosophy that best works top-down. Executive commitment to setting and meeting customer quality targets which can be simply and accurately measured is fundamental for supporting departments to in turn establish a new modus operandi.

Departments tasked with invoking customer experience management practices then need to develop (or have developed) reporting processes that are applicable and add value to resolving the core challenges they routinely face.

Only then can a test plan be designed to collect the type of data required, to the demographic standard and scale that meets business-wide requirements.

Yet quick wins using customer experience management can be expected. Service providers that have initially invoked programs in Marketing, Network Operations Centres or Customer Care centres have benefitted.

Regardless, the increasing importance of securing discretional spend from subscribers will continue as traditional subscription revenues level. With new capabilities in data capture directly from the end user devices, service providers finally have a practical solution to realise the benefits of Customer Experience Management.

About Epitiro

Epitiro uses embedded test applications that measures Customer Experience from the actual device. The test applications can be downloaded to smartphones or computers thus enabling monitoring of both mobile and fixed line services as they are delivered to subscribers.

The results are gathered centrally and made accessible for data mining and analysis via an on-line web interface.

Epitiro also collects data using hardware probes from all key aggregation points within the network. This provides comprehensive Quality of Service insight.

What makes Epitiro different from other sources of Customer Experience intelligence?

Epitiro has been measuring the technical aspects that affect consumer quality of experience since 2000 and has developed a significant insight into IP network performance, as delivered to subscribers.

While many companies are proficient at either providing measurement equipment or survey analysis, Epitiro is unusual in that it provides not just the technology to collect and automatically collect Customer Experience KPIs, but a full analytical and support team to advise operators.

Consequently, Epitiro's provides all three essential areas that lead to Valuable Business Intelligence: Comprehension Data & KPIs, Analysis Tools and Expertise, all working in concert to quickly provide the information operators need to manage customer experience.

ipQ – The Customer Experience Solution

ipQ is a scalable, end user device-based broadband measurement solution that allows network operators to 'see' IP service quality as experienced by fixed and mobile customers. Using embedded software apps that download to smartphones and PC's, ipQ provides real-time insight into the performance of services from a customer viewpoint.

For mobile networks, both radio (coverage) and IP performance is measured from Android-based smartphones or PC's equipped with dongles. No other solution available today matches this ability to understand all aspects of mobile broadband.

Fixed network operators can readily see 'past the CPE' and understand how services are experienced in the home to PC's that are wired or connected via WiFi. Used for network management or solving a single subscriber's fault, ipQ puts quality of experience data at your fingertips.

ipQ easily scales to provide national coverage and information about service quality that is out of reach with conventional testing and measurement methods.

For more information see www.epitiro.com/products/ipq

Epitiro (UK)
Epitiro House, 10 Raleigh Walk
Waterfront 2000, Brigantine Place
Cardiff CF10 4LN

Tel: +44 (0) 870 850 6563

info@epitiro.com | www.epitiro.com