Make the most of your network

White Paper

Driving Customer Experience

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Abstracts:

Customer Experience Management is certainly one of the biggest current buzz words in the mobile arena. A lot has been said and written around CEM but still there is no unique industry consensus about what CEM actually includes. From managing the brand's perception across websites or street-shops to subscribers' actual appreciation about the services and applications they pay for, Customer Experience Management is claimed to be a part of every business process.

In this paper, we analyze why this focus on subscribers is so important now and what the main drivers are for this shift in operator' focus from being mostly network oriented to customer centric. In the second part we analyze what the requirements are to adequately align subscribers' expectations with the Operator's key asset: the network.

4 Main reasons for Mobile Operators to focus on subscribers

Mobile telephony has been around for decades. Up to now operators have put their focus on the network and more recently on services. This implies delivering service correctly (i.e. good Quality of Service) by ensuring the network remains robust in terms of capacity and coverage amongst other things. This network-centric approach has given pretty good results so far in terms of offering to the end users. Operators have recently redirected their focus on the subscriber in order to drive service perception: the Customer Experience Management.

The transformation of the mobile industry has been broadly analyzed and documented. In the context of this paper, we analyze how drastic transformations such as the massive emergence of content and services offers via the Web (Facebook, Youtube), or Over-The-Top services (such as Skype, Netflix …), affect the way operators anticipate the management of their network.

> Average daily traffic usage per user: from 15MB in 2011 to 1GB by 2020

1. Increase profits through subscriber loyalty

Competition in the mobile industry is fierce with on average more than 3 MNOs in almost every country (not to mention many MVNOs on top of this). Many countries have a penetration rate above 100%. In such a competitive market, churn has become the major concern of operators who have changed their priorities from customer acquisition to customer retention.

> Fierce competition 3+ operators per country

Operators' financial reports show that, for a medium sized operator the average cost of retaining an existing subscriber amounts to tens of dollars per subscriber per year. Comparing this with "Cost Of Acquisition" for new subscribers (COA), often worth several hundreds of dollars per new subscriber, operators are inclined to pamper their existing subscribers, especially those generating higher Average Revenue Per User (ARPU). In this context it is key for operators to understand user expectations and adapt mobile data plans to their needs.

> Customer acquisition 5x more expensive than retention

2.   Keep control over quality

But this is not all! Back in 2009, in an article that was scrutinized by the industry, the New York Times mentioned that the largest operators in the world were no longer China Mobile, Vodafone or Verizon but rather Ericsson and NSN. Managed Services have become a strategic option for operators to lower their OPEX. But, if some operators are moving away from running their own networks, they are not giving up on the relationship with their subscribers since this represents a critical asset: They want to follow up and understand how their subscribers experience the services they offer.

3.   Manage the increasing complexity of data services

One important aspect of CEM is more technical. It is linked to the migration from circuit-based Voice to packet-based Mobile Internet. For circuit-based services, once a communication enters the pipe, it is guaranteed to be correctly delivered as long as "the pipe is in good shape". Network-focused monitoring is actually meant to give operators a clear picture of the integrity of the so called "pipe".

Now, that traffic is mainly packet-based, the equation is much more complex. Mobile application service perception can not only be altered by irregularities inside the network but also by the expending range of smartphones. Each service and application has its own constraint towards QoS fluctuation: Some applications such as video require high throughputs, others like online gaming need very low latency…
This highlights the necessity to measure QoE per application based on different criteria.

A recent study from Business Insider* showed that in 2011 the number of Smartphones shipped was bigger than those of personal computers and expected to overtake the number of feature phones by 2013.
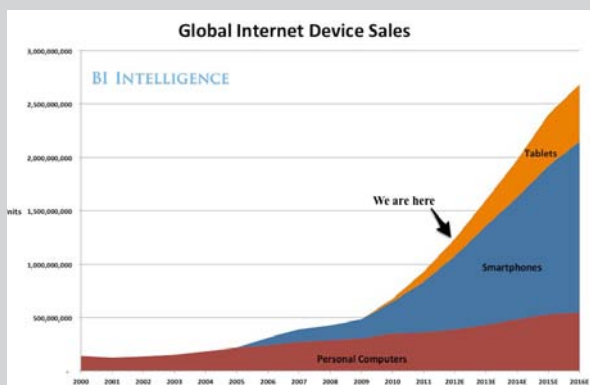
Global Internet Device Sales, Business Insider, "The Future Of Mobile", Alex Cocotas, March 2012

Global Smartphone Penetration Forecasts, Business Insider, "The Future Of Mobile", Alex Cocotas, March 2012

4.   Monetize network and traffic

The reasons to focus on customers are numerous. One is particularly important to justify the move towards CEM: Reshape the business model. As the list of different services, applications and contents grows significantly, operators need to rethink the way to monetise their added value. It is critical for them to review how they can avoid being just a «dump pipe» by adapting their service offering in a response to external OTT players. They can differentiate themselves by having a clear understanding of subscribers' usage and requirements, their real experience of the services and by being able to enhance the quality perceived by each and every subscriber for any service.

[1] http://www.businessinsider.com/the-future-of-mobile-deck-2012-3?utm_source=twbutton&utm_medium=social&utm_campaign=sai#-10

Astellia CEM Vision

Deliver consistent user experience anytyme anywhere

Astellia defines the Customer Experience Management as the way to understand, report, visualize and improve the experience perceived by subscribers by optimizing network performance.

While many actors restrict the role of CEM solutions to the reporting layer, Astellia considers fundamental to associate the reporting and visualization capabilities to proper end-to-end investigations and troubleshooting solutions from radio to core network. End-to-end view is of particular importance for wireless networks as airwave interfaces and associated mobility imply that high levels of performance degradations are linked to RAN issues (cell saturation, bad handovers, cell neighbor declarations …). Some degradation in performance can be observed from the Core side of the network (lower throughputs, packet loss …) but there is no way to identify the causes from the core interfaces alone. In many cases, correlation with information from the RAN is the only way to identify the root cause of the problem.

Impact on Organization
From an organization point of view, this new focus on Customer Experience is going to induce some changes. Most operators today have their operational teams organized in silos, RAN, Core CS, Core PS, … In order to push this focus on subscribers, some operators have created dedicated Customer Experience teams empowered to ensure that service level agreements are met across the silos, enforcing a 360° vision and action capabilities across the different segments of the network. These teams dedicated to subscriber satisfaction are a good way to complement network based orientation and ensure clear focus on the Subscriber's experience across the various segments of the network.
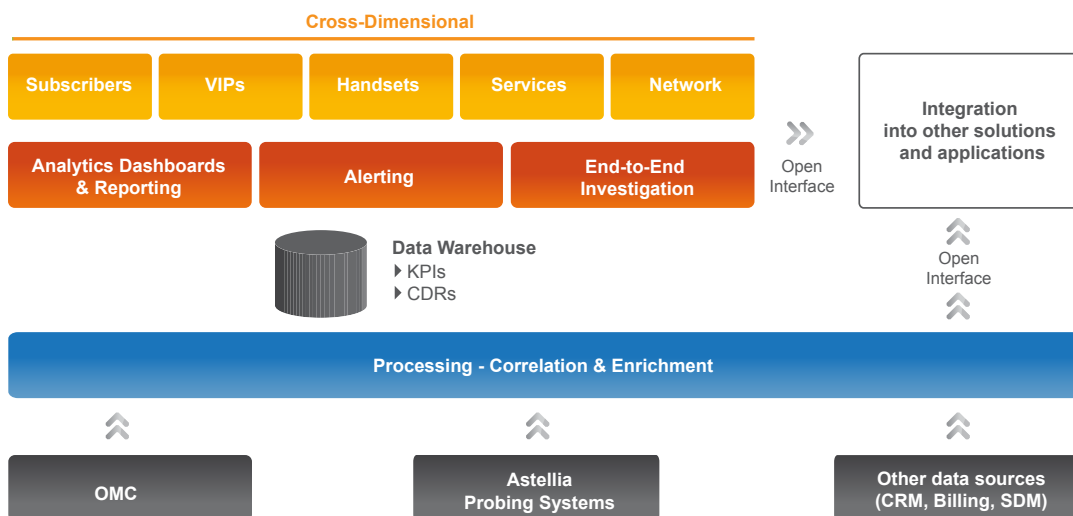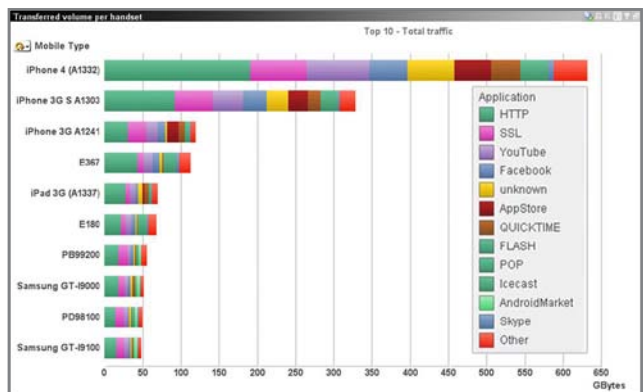

Astellia CEM solution architecture

Regardless of whether the organization is still network-centric or already subscriber-centric (i.e. CEM oriented), it is clear that providing the assurance of a good level of quality relies on the following 5 sets of actions:

- **Detect** any abnormal situation, incident or quality degradation through KPI trend analysis, customer complaints, threshold-based alarms, …

- **Analyze** usage and performance across multiple dimensions such as Subscriber, Handset, Services, Applications, or RAN / Core technologies.

  - Get a clear picture of usage and consumption patterns. Set-up relevant customer segmentation.

  - Understand subscriber expectations, usage and experience.

  - Being able to design and measure the effectiveness of a new plan or package.

- **Correlate** information from multiple interfaces of the network from RAN to Core as well as from user to control plane. For instance, the correlation between user plane performance (such as throughputs) and signaling causes of failure (including Radio) is the only way to have a proper understanding of the interaction between the subscribers data perception and the network.

  Correlation of multiple sources of information is required to answer basic questions such as: "What is the impact of the new iPhone (or Galaxy) traffic on the network?" "Are there radio condition changes alined with variations in throughput?".

- **Report** the related information in a comprehensive way. On top of traditional network-based reporting, CEM focuses on subscribers. For instance, it gives visibility over a satisfaction index based on Key Quality Indicators for each subscriber and identifies the most (/less) happy subscribers as well as those who are at risk of churning. This enables to ensure that each subscriber receives the best quality level in line with its subscription requirements.

- **Troubleshoot** problems. Because CEM is also meant to increase efficiency, powerful investigation and optimization tools reduce the number of customer complaints to be handled at customer care level, minimize time of investigation and shorten problem resolution turnaround. This is where a deep dive into detailed information is necessary. In particular, with growing complexity of data traffic led by wider set of smartphones and tablets, it is necessary to have access to rich Data Records and KQI husking in each session.

Use case 1
Create new premium data service offer

Top 10 most popular wireless devices -Traffic usage per application

This report identifies the most popular handset models generating the most traffic and gives a clear picture of data usage per application. Using this information, operators are able to define innovative service packages tailored to new mobile data users, gamers, music lovers or professionals.
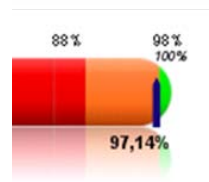
In the presented case, the operator should make sure that its premium package is bundling high-end smartphones and tablets delivering the best user experience (iPhone, iPad, E367) and access to Internet browsing, You-Tube and Facebook apps.

Key Quality Indicator & Global Service Indicator

Measure customer experience through advanced KQIs

With advanced KQI such as time to transfer emails or MMS of a given size, it is easier for technical staff to pinpoint causes of dissatisfaction as they have precise view of the subscriber's quality of Experience.

In many cases throughput is used as the main KQI to measure video QoE. Finer KQI's such as identifying users for which video takes more than 5 seconds to start helps to better analyze customer experience.

In this spirit Astellia has created innovative ways to evaluate customer's perception throughout measurements made from the Network. Reports includes measurements such as:

- Portal Page Access Time (including and excluding PDP Context Activation),
- Streaming Session Setup Delay,
- HTTP average throughputs for large files.

Use case 2:
Pinpointing network performance issues through the eyes of the subscribers

At a medium sized mobile operator, network oriented KPIs showed no anomaly; in particular the paging_success_rate was well above the minimum value required.

Taking a subscriber focused approach, however, showed that the list of users for which the rate was below the acceptable limit contained a significant number of users with unacceptable success rate.

Further investigations showed a problem in parameter settings leading the network to randomly reject specific users. Changing some timer settings easily fixed the problem. This example, totally impossible to detect from OMC counters, illustrates how looking at performance from the angle of the subscriber, and liaising it with proper investigation capabilities helps to efficiently increase customer satisfaction with a minimum effort.

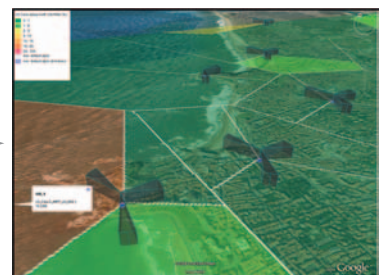## Typical investigation scenario

①
Calls impacted by a specific failure
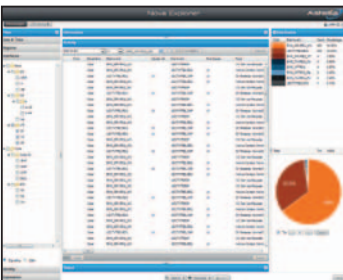
②
End-to-end call trace from access to core network

③
In-depth investigation

Radio Access

Core / Service

Take Care of high value subscribers

On top of what has been presented in the previous paragraphs which propose the basics to offer good quality of experience to the overall customer base, it is necessary to pay special attention to the most valuable subscribers, from care monitoring to SLA management

VIPs

An important step toward CEM is the close monitoring of VIPs. Whether it is corporate accounts contractually linked with SLAs, high spenders for which top quality is critical or simply particular individuals, there are numerous populations requiring particular care. Dedicated analysis and repor-ting helps to analyze usage, QoS and QoE for each category. This is of great help for marketing departments to understand usage and behavior of different groups. It also serves operator's corporate account managers to verify and report whether SLAs are respected. Finally it provides VIP-focused investigation capabilities for proactive actions and high reactivity to complaints towards those valuable subscribers.

Example of VIP QoS & QoE dashboard

Roamers

Roamers are worth to be mentioned as a population to be taken care of. They generaly represent from 10% to 20% of operators' revenue. To secure this source of incomes and understand roamers' QoE, it is important to get end-to-end view from core-to-ac-cess. While monitoring from the core brings information on outbound roamers helping for instance to identify steering of roamers, access interfaces, provides valuable information to understand inbound roamers. Locating the areas where roamers are trying to enter the network and making sure that cells are fine-tuned to maximize roaming capture, or pinpointing cells where inbound roa-mers are lost because of poor radio coverage, lack of capacity, or interference. These are minimum features brought by an efficient roaming monitoring and improvement system.
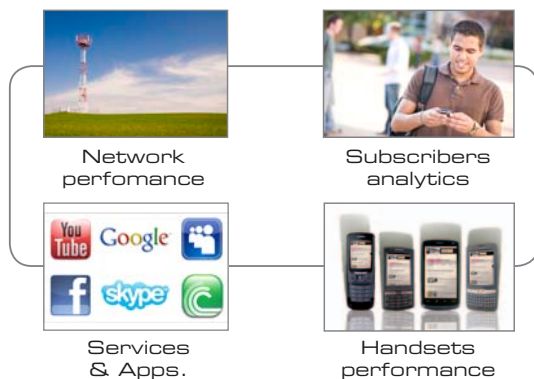
Conclusion

The new concept spread across the industry is that operators are moving from being service providers to being experience providers with a customer-centric approach. While the traffic is changing over the years, operator's aim remains the same: improve revenue by making sure customers get the highest possible level of satisfaction possible. CEM must be aligned with these objectives: serve the best performance at the most reasonable cost.

Astellia Probe-based monitoring solutions are being developed with this exact goal of providing operators with capabilities to detect, analyze, correlate, report and troubleshoot their issues. Producing complex measurements coming from mobile networks, manipulating high volumes of information to propose comprehensive visualization adapted to operator's requirement is at the heart of Astellia's know-how developed over the past 10 years for more than 180 mobile operators across the globe.

The new item in the equation is that operators can't rely anymore on just securing the quality from the network level. As the spread and the complexity of different applications and terminals is growing, operators now need to start their assessment from understanding subscriber feeling. Coupling the CEM oriented reporting layer with investigation and optimization solutions is the best way to ensure consistency between those different steps.

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