Alcatel·Lucent

STRATEGIC WHITE PAPER

Customer Experience Transformation via Analytics

Analytics enables actionable real-time customer insight

Communications service providers (CSPs) are facing fierce competition as they strive to win consumer and enterprise business with their fixed and mobile services. Intense economic pressures, escalating consumer demands and increasingly complex technologies are raising the stakes, forcing service providers to work harder than ever to attract customers and keep them happy.

Service providers can keep customers on board and spur long-term success by putting more focus on improving the overall customer experience. Although they hold vast amounts of data about their network and subscribers, CSPs are not effectively managing it today. By effectively mining and analyzing this data at every customer touch point, they can gather valuable insights about customers' experiences, preferences and predicted behaviors.

Analytics that address customer, service, device and network data provide real-time business intelligence that can be applied at every customer touch point. Insights gathered from analytics can drive strategic initiatives to improve retention rates and customer lifetime value. Real-time capabilities enable service providers to react quickly to changing conditions and enable timely interaction with customers. With analytics that produce real-time intelligence and invoke appropriate actions, service providers can transform the customer experience.

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Introduction

Today there is fierce competition for customers in established and emerging telecommunications markets around the globe. In almost every case, consumers and enterprises have the choice of many options that can meet their communications services needs. Fixed and mobile services have become commoditized, and local market competition has driven tariffs lower and lower in a race to the bottom. At the same time, exponential increases in data traffic, device proliferation, and service complexity have driven costs up. These factors have combined to create a perfect storm that is exerting sustained pressure on communications service provider (CSP) profitability.

Gartner suggests that, to remain viable, CSPs must choose at least one of three possible paths that diverge from the traditional CSP business plan.[1] The first option is to become diversified service providers by moving into adjacent industries. The second option is to focus on providing platforms that can enable delivery of third-party content and applications. The third option is for CSPs to leverage their existing network capabilities and become wholesale providers of smart utilities, allowing them to optimize their operational costs.

The first option (diversified service provider) and second option (platform provider and enabler) require a deep understanding of the customer experience and capabilities that can manage it. Gartner calls this "customer intimacy."

Competitive pressures and a changing communications market are forcing CSPs to reinvent their business strategies. Customer experience management enabled by analytics is a required asset for successful transformation. The risks associated with avoiding or delaying an effective customer experience transformation include loss of mind share with customers, lower revenue growth and profitability, and possible acquisition by larger CSPs.

"Customer experience" defined

Facing a rapidly maturing and increasingly competitive market, more and more service providers are evaluating customer experience as a means to enhance and differentiate their service offerings. But what is "customer experience" and why should CSPs care about it?

The TeleManagement Forum offers help, calling customer experience "the result of the sum of observations, perceptions, thoughts and feelings arising from interactions and relationships between customers and their service providers." It suggests that "every customer touch point, whether directly or indirectly linked to service providers and their partners, contributes to the customer's perception, satisfaction, loyalty, and ultimately profitability."[2] Heavy Reading likens customer experience management to a continuous balancing act, stating that "if an element or activity goes wrong and starts to obtrude, the customer experience breaks down, interrupting the illusion of what is happening right now for the customer."[3]

Ideas like these have important implications for CSPs, since they suggest that success with customers is directly linked to delivering a customer experience that is perceived as attractive and valuable.

[1] "Market Insight: Determining the Appropriate Strategic Option for Communications Service Providers," Gartner, October 2010.
[2] "Exploiting Analytics: How to improve customers' experience," TeleManagement Forum Insights Research, September 2010.
[3] "Beyond CRM: Customer Experience Management," Heavy Reading Services Software Insider, Volume 6, Number 1, February 2010.

Sustaining this perception isn't easy: Customers have lofty expectations when it comes to their experience with telecom services. As long as the experience lives up to expectations, customers will remain satisfied with their services and be more willing to continue doing business with their service providers. But if the experience fails to measure up for any significant period, customers may become frustrated. Their frustration can have dramatic impact on service providers. For example, research by Convergys suggests that four in ten customers consider switching service providers after a bad experience.[4]

Customer expectations are continuously evolving, and it's critically important for CSPs to understand the current customer experience across every customer touch point. This is the primary distinction between customer relationship management (CRM) and customer experience management (CEM). CRM focuses on capturing the history of customer interactions, and on using this information after the fact. CEM focuses on managing the customer experience during interactions with customers across every touch point.[5]

Analytics is the key

Analytics is defined as a method of logical analysis.[6] In the context of communications services, analytics is the logical analysis of data that corresponds to customers and customer behavior, as well as data that corresponds to service provider infrastructures and service delivery capabilities.

A vast and rich set of data exists within service provider domains. Some of this data is found in various data stores; other transient transactional data flows continuously through the network. The process of data mining extracts meaningful patterns from large data sets using statistical tools or machine learning techniques.[7]

Business intelligence (BI) combines data mining, analytics and other computer-based techniques to identify, extract and analyze raw information. The intent of BI is to provide historical, current and future predictive views of business performance. This paper uses the term "analytics" to refer to logical analysis of technical performance data, which shows how well the technology is working, and business data, which shows how well the business is working. Both data types are mined from the service provider infrastructure. The output of this logical analysis is observations that enable BI and business optimization.

Analytics is the key to improving the customer experience. Many industries have successfully applied analytics to enhance the customer experience and produce positive business outcomes.[8] But the communications industry has been slower to adopt analytics. Yankee Group sees a requirement for "an intelligence infrastructure that communicates across internal functions such as ordering, billing, care and network operations simultaneously, in real-time, to make the experience more dynamic and responsive."[9]

[4] "New perspectives on the customer experience," Convergys Executive Briefing, 2008.
[5] "Understanding Customer Experience," Christopher Meyer and André Schwager, Harvard Business Review, February 2007.
[6] http://www.merriam-webster.com/dictionary/analytics
[7] http://www.britannica.com/EBchecked/topic/1056150/data-mining
[8] "Competing on Analytics," Thomas H. Davenport, Harvard Business Review, January 2006.
[9] "Delivering a World-Class Customer Experience: Transformation from the Outside In," Yankee Group, March 2011.

The communications industry faces many challenges as it seeks to implement analytics. Historical organizational structures have created functional silos (including IT, network operations, network planning, marketing and customer care) and services silos (such as fixed, mobile, wholesale, pre-paid and postpaid). The extent of these silos makes it difficult to find stakeholders for analytics solutions that cover the customer experience across the complete customer lifecycle and all customer touch points.

Customer experience data exists in architectural silos across the domains these organizations manage. In many cases, interesting data that is relevant to the customer experience is locked inside proprietary network elements or systems that were not designed to expose this data. Recognizing the importance of analytics to their business, many CSPs are beginning to break down these silos.[10, 11]

Real-time business intelligence: A spectrum of timeliness

For service providers, real-time BI means having the ability to recognize and react to current business conditions in real-time. By understanding subscribers' current quality of experience (QoE) and interactions through specific touch points and addressing them with instant and appropriate actions, service providers can improve the customer experience. Yankee Group defines real-time analytics as "the ability to shorten time to act by allowing CSPs to automate the next-best action based on business objectives."[12]

What, exactly, is real-time? In computer science, real-time computing refers to computer processing that is subject to strict time constraints. Often, these time constraints are very short, such as with real-time control systems for mission critical applications. For communication services, there is a spectrum of real-timeliness, where different use cases have different requirements for timeliness of observations and time to react.

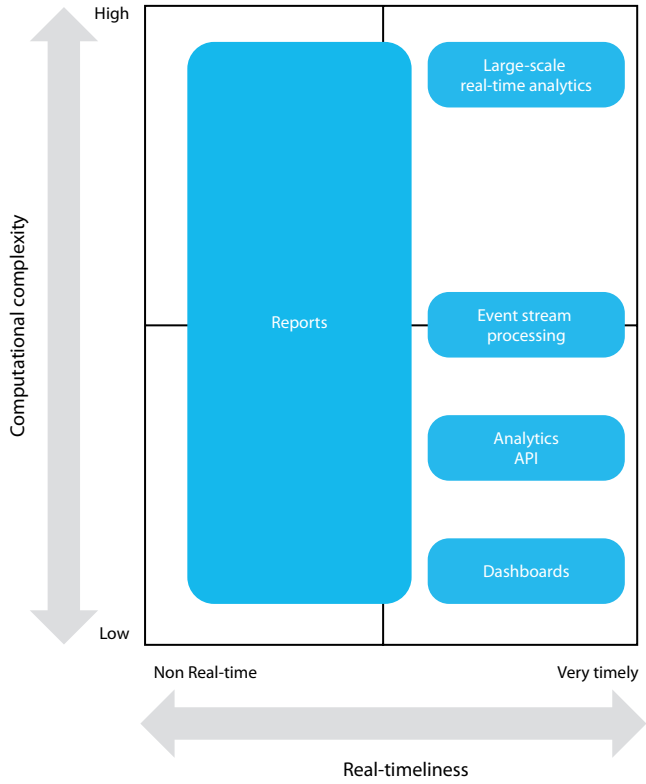
When it comes to the customer experience, each communication services use case has an acceptable degree of timeliness. For example, it may be important to send a reminder notification to a postpaid subscriber a few days in advance of a billing due date. Here, timeliness is measured in days. Conversely, the best time to notify a pre-paid subscriber about a loyalty promotion is shortly after a top-up event. In this case, timeliness is measured in minutes.

Analytics algorithms can be characterized by their computational complexity. More complex algorithms put greater demand on computing resources. They cost more to implement if they are intended to produce real-time results. This calls for a cost trade-off in which simpler algorithms provide timely results and complex algorithms provide results without real-time constraints. This kind of trade-off could enable CSPs to deploy cost-effective analytics solutions that support most use cases while still meeting customers' expectations for timeliness.

Figure 1 depicts the spectrum of real-timeliness for several key analytics capabilities, including reports, dashboards, analytics application programming interfaces (APIs), event stream processing and large-scale real-time analytics.

[10] "Survey: Support Issues Continue To Be a Drag on Customer Experience," Yankee Group, March 2011.
[11] "Revamping Your BI Toolset to Improve Customer Experience," Yankee Group, March 2010.
[12] "The Need for Speed Drives CSP Analytics," Yankee Group, January 2011.

Figure 1. The real-timeliness spectrum for analytics capabilities



Reports

Analytics can help CSPs create simple or elaborate visual reports to summarize dataset analysis. Simple reports can plot one set of data values against an independent variable, such as download speed by handset type. These reports have low computational complexity.

More elaborate reports — for example, reports that show the subscribers with the highest propensity to churn in the next month — may have high computational complexity. These reports consume computing resources but may not be required in real-time. For instance, a churn report may only need to be generated weekly or monthly.

Dashboards

Dashboards give CSPs a window into current technical and business performance metrics. A dashboard can provide a visual summary of the current state of a CSP based on analysis of constantly ingested real-time data. Although the calculation of metrics involves low computational complexity, a timely response is required so that business decisions can be made in rapid response to changing conditions or adverse events. For example, timely awareness of impending network or radio frequency (RF) congestion can help a CSP take action to avert a negative effect on the customer experience.

Analytics API

Applications use analytics solutions to collect information about CSP networks or subscribers. An analytics solution can expose this information through an API. For example, a loyalty management application could use an API to query the current QoE and profitability of a given subscriber. Or, it could receive notifications when the analytics solution determines that a subscriber poses a high churn risk. The API transaction response time must be very timely, and the information exchanged must be based on data that has previously been analyzed. As a result, the API service must have low computational complexity.

Event stream processing

Some use cases require very timely responses to subscriber interactions. For example, the appropriate time to notify a pre-paid subscriber of a loyalty promotion is immediately following an account top-up, content download or similar subscriber interaction. Event stream processing can detect interaction events as real-time usage data streams into the analytics system. Also known as streaming analytics, it can be used to detect preset conditions and trigger actions in real-time.

Event stream processing can be combined with analytics algorithms of high computational complexity to deliver real-time responses to conditions that have been characterized by complex algorithm use. For example, once a subscriber has been identified as highly valuable but also highly likely to churn, event stream processing can be configured to offer a specific loyalty reward the next time the subscriber accesses the network.

Large-scale real-time analytics

Use cases that demand high computational complexity and real-time results often require specific computing infrastructures, such as columnar databases and massively parallel architectures. This paper does not focus on these use cases, as the implementation costs are high. Use cases that can affordably improve customer experience do not typically require large-scale real-time analytics capabilities.

Use cases

Many applications and use cases can use analytics and real-time business intelligence to improve the customer experience. This section describes some sample use cases. Many others are not covered here, including network operations performance management, campaign management, targeted cross-selling and up-selling of CSP services, and device performance analysis.

Anomaly detection and troubleshooting

Reports and dashboards that visualize and summarize analytics results can be used by CSPs to detect anomalies and troubleshoot problems. Reporting capabilities allow users to drill down to identify the primary contributors to, or root cause of, a given issue.

Each dashboard should be tailored to a specific CSP organization (for example, operations, marketing or customer service) so that it can present relevant customer experience metrics in an effective manner. Pre-configured standard report types can also be tailored for different organizational roles. But each user should have the ability to view any report type and create custom reports. Applying a common analytics and business intelligence system across all CSP organizations is critical for realizing the benefits of customer experience transformation.

An operations dashboard presents QoE as end-to-end technical performance metrics related to service fulfillment and service assurance. Using these metrics, an operations team can identify subscribers who are experiencing a poor QoE. They can then inspect the underlying key quality indicators (KQIs) and key performance indicators (KPIs) to isolate the root cause of this poor QoE. For individual subscribers, root causes can include problems with device configuration, network coverage or network congestion. For groups of subscribers, root causes can include issues with particular device types or applications, or location-specific network problems.

A marketing dashboard presents QoE relative to the overall customer lifecycle across all customer touch points. For each customer segment, a dashboard can help marketing departments understand subscriber QoE and profitability and the key trends and factors that influence them. For example, if pre-service marketing is delivering a poor QoE in certain customer segments, a marketing team can use dashboard insights to adjust specific marketing campaigns. If subscriber segments are unprofitable for some services, a marketing team can use dashboard insights to drive rate plan changes or service bundling promotions.

Customer retention and loyalty management

For marketing departments, the value of analytics extends beyond dashboards and reports. For example, analytics can help manage customer churn and loyalty. Churn management and loyalty programs are related in that they are two sides of the process of improving customer experience.[13] Analytics enables the marketing department to understand the customer experience from the end customer's point of view. Moreover, it provides information on subscriber spend and profitability, propensity to churn, and social group influence. These are critical inputs that can help marketers design effective retention and loyalty campaigns.

Customer lifetime value (CLV) is a key metric determined through analytics. Used to measure the profitability of customers over their service lifetime, CLV is widely applied in the retail industry but relatively new to the telecommunications market. Ovum suggests that CLV is a key metric linked to the customer experience.[14] By making incremental investments to improve CLV, a CSP can improve overall company business performance and corporate valuation.

The concept of CLV can help define customer segmentation. By building a customer segmentation model around clusters of CLV, a marketing team can focus on retaining and growing high-CLV segments, rather than focusing on subscriber groups that generate high average revenue per user (ARPU) but may offer lower profitability or loyalty. Up-selling and cross-selling campaigns are designed to move subscribers to higher-value CLV segments by increasing the spending of loyal customers. Loyalty campaigns are designed to move subscribers to higher-value CLV segments by increasing their service lifetime. Over time, a CLV-based segmentation approach can help increase the proportion of customers in higher-value segments.

Analytics also supports real-time targeting of subscribers for marketing campaigns. For example, an analytics system can use algorithms to determine subscribers' propensity to churn, apply social network analysis (SNA) techniques to determine a usage-based social influence score, or determine the likelihood that subscribers will purchase an additional service.

Algorithms like these identify subscribers that can be targeted for different campaigns. Once a subscriber is targeted, an analytics event stream processing capability can trigger an automated action at an appropriate time when the subscriber interacts with a service. For example, an action could deliver an SMS message containing an offer or reward by triggering an online charging or service activation system. From the subscriber's point of view these real-time interactions are perceived as positive influences on the customer experience.

Together, a marketing dashboard and CLV-based customer segmentation approach can help identify marketing opportunities, predict the performance of marketing campaigns, and track the performance of campaigns in the field.

Yield management

Yield management is the process of influencing customer behavior to maximize the sales and profitability of a perishable resource. Used for years in the transportation, hotel and retail industries, yield management is still relatively new to the telecommunications market. In these other industries, the perishable resources are airline seats and hotel rooms. In the communications industry, the perishable resource is underutilized or excess capacity for delivering communications services. The natural patterns of customer usage mean that, while some of the communications infrastructure is highly utilized in some places some of the time, most of the infrastructure remains underutilized.

[13] "Churn management: the operational challenge for service providers," Ovum, March 2009.
[14] "What do transforming telcos measure?" Ovum, June 2010.

Historically, service providers have offered time-of-day discounts to manage yield. This is a very limited approach that does not accurately reflect real network occupancy. Some CSPs have begun successfully deploying yield management solutions that combine dynamic pricing with discounts based on current local network conditions.[15] While these first deployments have been with mobile service providers in emerging markets, yield management techniques have applications in all markets as well as with wireline service providers.[16] With the emergence and rapid growth of machine-to-machine (M2M) communications and devices, yield management will become increasingly important in managing the customer experience and maximizing service provider profitability.

Yield management offers two main value propositions that can enhance the customer experience. The first is that customers can receive discounts when they use communications services when and where the communications infrastructure has excess capacity. These discounts can be enabled with a dynamic pricing policy that accounts for current local network occupancy. Discounts have a positive effect on the customer experience, since customers perceive that they are getting more value from the CSP. They also benefit the CSP, since they encourage additional usage at times and locations that were previously underutilized, and shift some usage away from points of congestion.

The second value proposition can be created through superior congestion management. When CSP infrastructures are congested, customer QoE is reduced by factors such as dropped calls, slow internet connections, and unavailable services. By combining dynamic pricing with intelligent policy management — the practice of using a predefined policy to dynamically adjust QoS (bandwidth) for mobile services — CSPs can improve the aggregate customer experience. With dynamic pricing, subscribers who are price sensitive will help ease congestion by waiting until they receive a discount. With intelligent policy management that factors each customer's CLV and QoE, CSPs can prioritize services for customers who are most profitable or have been experiencing problems. The end result is a fair policy for managing congestion.

Analytics can help communications service providers deploy effective yield management solutions. By providing access to customer QoE, CLV, CLV-based segmentation, price elasticity, and other scoring functions through an analytics API, providers' yield management solutions can implement better targeting of dynamic pricing and more intelligent policy management.

Personalization

Marketers have long been aware of the uplift that personalization can create in marketing and advertising. Now, CSPs can use personalization in new ways to differentiate and monetize their offerings. By understanding subscribers down to the individual level — for example, their calling patterns, billing history, data usage, location, content preferences and availability — service providers can begin to offer personalized services that stand out from those offered by other providers.

Personalized services can help service providers develop new revenue streams. Studies show that demand for personalized services is growing at a tremendous rate. For example, a recent global survey by Nielsen Research showed that 63 percent of consumers would use services tailored to personal preferences, location, time of day and social setting.[17]

Personalized services let customers choose communications services according to their preferences. Some customers may want services to be presented in a simple manner. Others may want to tailor their services and rate plans by selecting individual components from a wide range of choices.

[15] "Dynamic Pricing: Yield Management Solutions and Strategies," Ovum, March 2011.
[16] "Wireline Service Provider Profitability & Customer Centricity Depend on Real-Time Analytics," Heavy Reading, December 2010.
[17] "Operators Need to Move Faster, Says Tellabs," David Murphy, Mobile Marketing, February 2010.

Analytics is the key to enabling personalization, since it can distill customer insights from a broad range of sources, including usage, billing, demographic, application and device data. These insights form implicit preferences that can be combined with explicit preferences set by subscribers. Preference data can support many different personalization use cases, including personalized offers and personalized advertising.[18] Having the ability to opt in to personalized services helps subscribers worry less about data privacy.

Analytics can enable personalized advertising where customer insights and preferences determine which advertisements are welcome and which are most likely to be successful. Knowledge of the customer's current location can add a positive element to the customer experience. For example, customers who opt in to a restaurant coupon service will be happy to receive coupons for restaurants located where they are, even when they are on vacation.

Another important aspect of personalization is that new technologies are bringing new touch points that enable a higher degree of personalization. The Apple iPhone and App Store are prime examples. Before the iPhone, consumers had access to a fixed set of capabilities on their mobile phones. The iPhone brought consumers the ability to choose applications and personalize the user experience. Analytics that address customer data across existing touch points can help service providers understand and react to new trends related to personalization.

Maximizing the return on analytics investment

Communications service providers have made huge investments in business and operations support systems (BSS/OSS), including customer care and CRM systems. Many CSPs have also invested in analytics capabilities, such as revenue assurance and marketing tools and data warehousing solutions for subscriber usage data. While these investments have delivered important capabilities, they have fallen short of providing a comprehensive understanding of the customer experience — or an effective vehicle for improving it.

Service providers can maximize return on investment (ROI) for analytics-based customer experience transformation by adopting a transformation strategy based around three key steps.

The first step for CSPs is to make a top-level executive responsible for customer experience and business intelligence. This is critical, since the data required to manage the customer experience comes from all customer touch points and cuts across all groups within the CSP organization.[19] A chief experience officer who is empowered to break through organizational silos can promote a corporate-wide vision of CEM that spurs the company's transformation towards customer centricity.

The second step is to implement a comprehensive analytics platform that can underpin a customer experience transformation solution. This platform must support state-of-the-art technical capabilities that can facilitate real-time business intelligence.[20] Essential capabilities include:

- Flexible extract, transform and load (ETL) processing
- Data warehouse technologies that can support columnar databases
- Telecom-specific data modeling
- Data mining and predictive analytics algorithms
- Flexible reporting and visualization
- Event stream processing
- API access from real-time applications

[18] "Business Intelligence Strategies for 4G Operators," Heavy Reading, September 2010.
[19] "Dataquest Insight: Superior BI is the Key to Communications Service Providers' Future Competitiveness," Gartner, July 2009.
[20] "Business Intelligence – technology and industry trends," Ovum, April 2011.

The third step is to take advantage of expert consulting in the area of customer experience. With consulting based on broad industry knowledge, CSPs can gain an objective view of their pain points and key gaps in the customer experience. This view can help them prioritize use cases that can improve customer experience and provide the most benefit for the least investment.

Service providers can benefit from customer experience consulting throughout the transformation life cycle. For example, consultants can help by modeling the business case and ROI of each customer experience initiative, and can continue their support after deployment to measure results and identify opportunities for improvement. They can also direct primary market research that produces insight into areas of customer experience that can be analyzed and addressed using analytics and business intelligence. Finally, consultants can help define a tailored QoE metric framework that effectively measures customer experience for each customer segment.

Conclusion

Today's competitive communications market is characterized by rapidly changing technologies and customer expectations. It's more important than ever for CSPs to adopt a customer centric view of their service offerings. Service providers have vast stores of data about customers, services, devices, business systems and network elements. To transform the customer experience, CSPs need to make sense of this raw data, produce meaningful and actionable real-time intelligence, and take the appropriate action at every customer touch point. Analytics can play a key role in generating this intelligence, and can be a mechanism for taking timely action to enhance the customer experience.

Customer experience use cases can leverage information provided by analytics. The analytics algorithms and capabilities that support these use cases can be characterized using a spectrum of real-timeliness and computational complexity. Combining analytics capabilities with a solution-based approach can help CSPs deliver real-time customer interaction and real-time visibility that transform the customer experience. Consulting services can help identify which use cases can have the greatest impact on the customer experience, and can help minimize expenditures and maximize ROI.

The Alcatel-Lucent Customer Experience Transformation program combines our global services expertise, leading communications products, Bell Labs analytics algorithms, and best-of-breed partner solutions. This program includes several different solutions, all supported by our strong understanding of IT and communications network environments and unmatched experience as a trusted partner, advisor, integrator and implementer to service providers around the world. Offering global reach, deep communications network capabilities, and program management experience, Alcatel-Lucent can support service providers from vision to execution and transform the customer experience.

CMO2023110603 (08)

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