



How U.S. Telecoms Can More Effectively Convert Data to Foresight

Executive Summary

The business environment has never been more challenging for communication services providers (CSPs). Buffeted by a growing threat from non-traditional players, pressure to reduce costs, drifting customer loyalties and a dynamic technological landscape, they must also deal with the perennial issues of billing abnormalities, subscriber churn, revenue leakage and call failures, among other issues. Above all, intense competition has CSPs venturing outside their comfort zones to improve customer experience and avoid being outmaneuvered by competitors.

CSPs are banking on the customer data generated by operational systems day-in, day-out to provide valuable insights about their customers' tastes and preferences. However, this data is complex and runs into terabytes, putting intense pressure on existing systems and processes. The end result: CSPs often have little or no clue about their customers' actual requirements. With increasing customer demands and the availability of facilities that provide easy movement to the competition, CSPs need to undertake proactive measures to minimize customer attrition.

Advanced analytical solutions can help CSPs understand and predict customer behavior and make quick and effective decisions. Combined with network analytics, which help in utilizing networks more efficiently, CSPs can benefit from

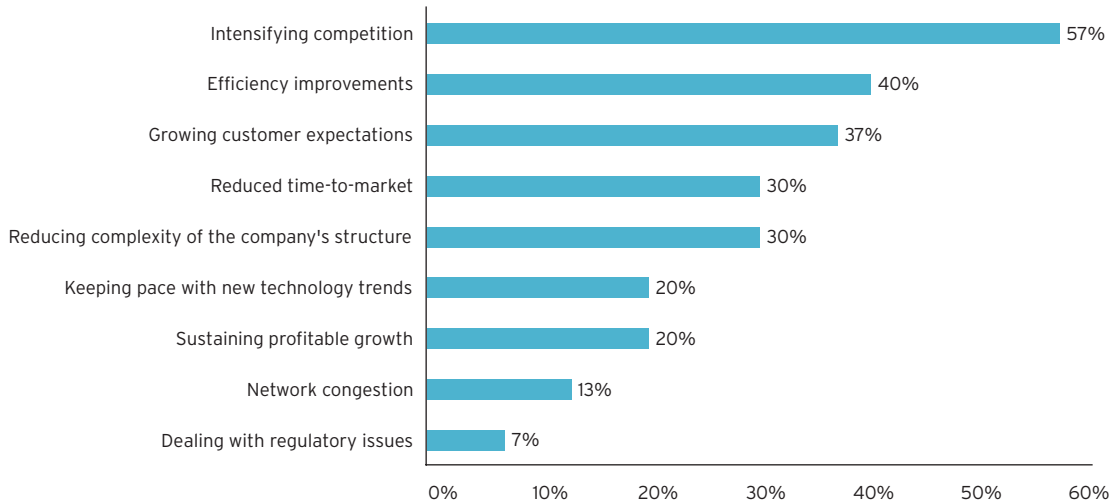
a more programmatic use of advanced analytics to provide superior customer service, resulting in improved customer retention. This requires the backing of the organization's leaders and a cultural shift toward fact-based decision-making. As part of the due diligence process, CSPs should consider working with partners capable of providing analytics as a service, which not only delivers cost advantages but also leverages experts who can jump-start the process and accelerate time to value.

Driving Forces

CSPs operate in an increasingly tough environment. The industry is characterized by intense competition, a growing threat from non-traditional competitors, a rapidly changing technological landscape and increasing customer demands (see Figure 1, next page). Among the challenges:

- The U.S. market is highly competitive, with CSPs vying for customer affection by offering services at competitive prices, resulting in reduced margins. Average revenue per user (ARPU) from traditional voice services is steadily declining, countervailing the increase in data ARPU¹ (see Figure 2, next page).
- The rise of over-the-top (OTT) players such as Google, Yahoo and Skype, which use CSP networks to provide voice, video, messaging and other services freely to consumers, directly impacts CSP revenues.

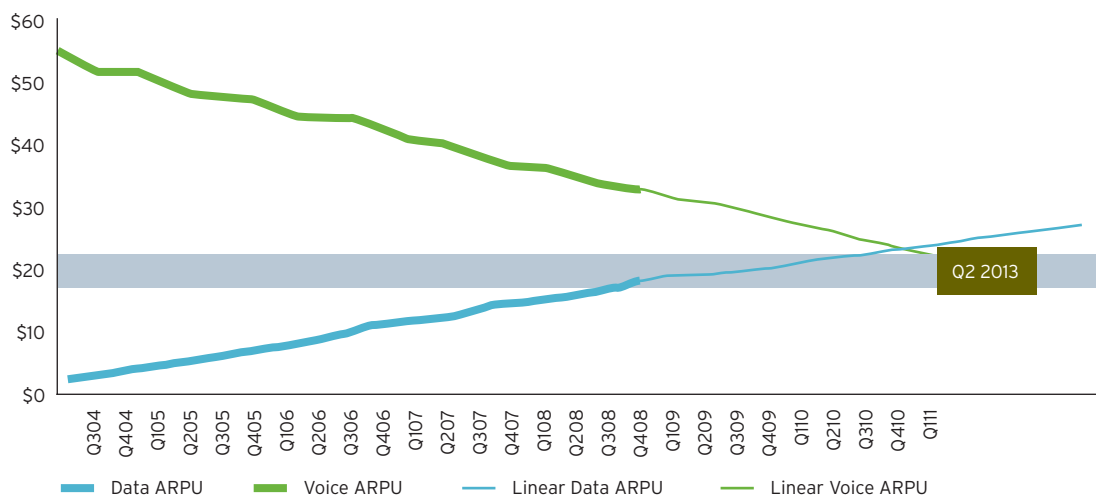
CSP Challenges



Source: Frost & Sullivan

Figure 1

Average Revenue Per User Deep-Dive



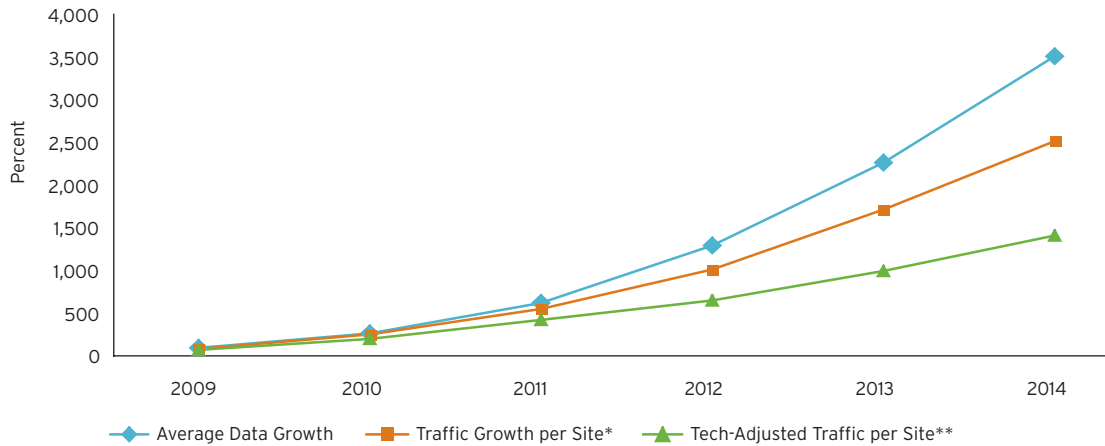
Source: "U.S. Wireless Data Market, Q1 2011 Update," Chetan Sharma Consulting

Figure 2

- CSPs must keep pace with growing technology complexity and equip themselves to meet the growing demands of their subscribers. The convergence of IT, telecom and media has led to the development of new products (e.g., smartphones, tablets, etc.) that are driving demand for both data and personalized services. For instance, data will account for 51% of overall wireless spending by 2014, according to the Telecom Industry Association (see Figure 3, next page). This requires CSPs to plan and invest in infrastructure to accommodate increased demand for network bandwidth.
- Following the global downturn, CSPs have been under immense pressure to improve operational efficiencies and cut costs, while ensuring quality of service.

In addition, CSPs must regularly contend with maintaining customer loyalty, a challenge made more difficult with the introduction of portable mobile numbers. Other challenges include billing abnormalities, revenue leakage and call failure, among other issues, which need to be addressed to protect revenues. Under pressure to improve profitability and quality of service, CSPs have placed

Traffic Growth



Source: "TIA 2011 Playbook," Telecommunications Industry Association, and "FCC Report - Mobile Broadband: The Benefits of Additional Spectrum," October 2010.

* Data demand adjusted for additional cell sites.

** Data demand adjusted for special efficiency improvements.

Figure 3

renewed focus on customer retention and, along with it, the tools to improve customer service.

Customer-Centricity Imperative

According to a Bain & Co. study, a 5% increase in customer retention can improve profitability by 75% for a company across many industries. With traditional communications services being increasingly commoditized by the emergence of IP-based networks, CSPs have put greater emphasis on improving the customer experience in a bid to extend customer retention. Achieving this requires a greater understanding of customer behavior and needs, as well as superior service.

The good news is that CSPs already possess rich and abundant customer data. Leveraging this data through advanced analytics will enable CSPs to develop deeper insights into customer usage and preferences, predict their future requirements and make more effective business decisions. CSPs should also ensure that customers are connected and have access to persistent services around-the-clock, which requires efficient network capabilities.

Networks are the key to CSPs' business strategy, and their performance is vital to customer satisfaction. That's why CSPs focus on network health as their top priority in order to avoid sudden outages. Network analytics allow CSPs to continuously monitor network performance, identify

bottlenecks, address capacity concerns and utilize network infrastructure intelligently. Further, by deploying analytics to streamline business operations, CSPs can reap sustainable efficiencies, which could prove to be a game-changer.

Analytics for Improved Customer Relationship Management

Building long-term profitable relationships with customers is the key for any organization. Considering CSPs' huge, diversified customer bases, with their varying service requirements, customer relationship management becomes an arduous task.

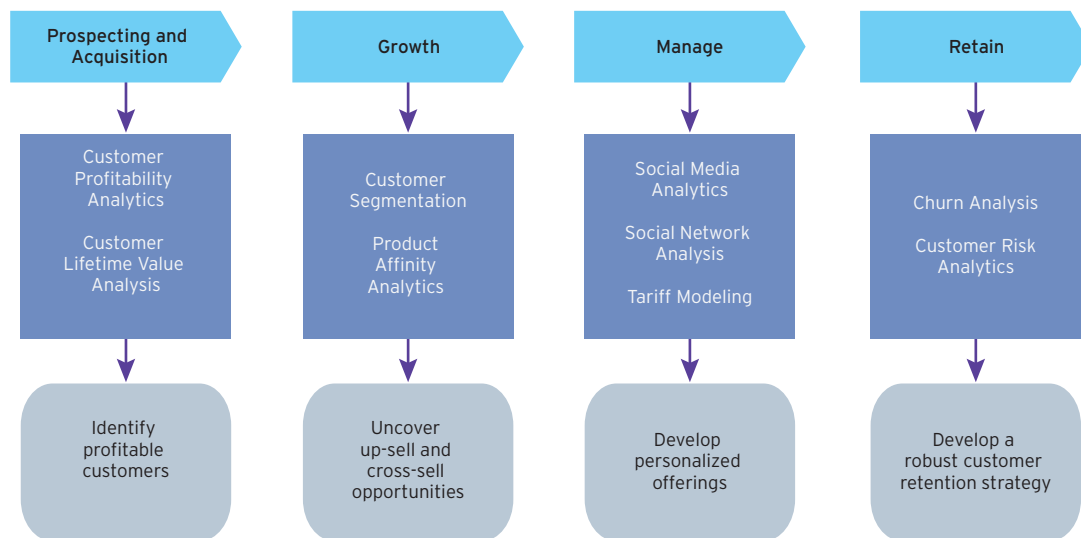
Prohibitively high customer churn rates in the early 2000s forced CSPs to invest significantly in CRM systems, with the hope of achieving radical improvements in customer relationships and profitability. However, a majority of these CRM initiatives failed to realize their full potential, as CSPs struggled to mine the insights contained within these systems.

Merely collecting customer information through CRM systems does not aid in decision-making. Consolidating and analyzing data related to sales, marketing and service provides deep insights into what customers want. Analytics provide CSPs with the power to analyze enterprise-wide data and make effective tactical decisions that can improve customer satisfaction at various stages of the customer relationship, from acquisition,

to improving customer spend and retention. If properly configured, CRM systems provide a 360-degree view of customers and enable different groups in an organization to leverage a single version of the truth.

Further, marketers can identify prospective customers, predict customer needs in advance, design targeted marketing campaigns and provide customized services, which will improve customer experience, ultimately increasing customer loyalty and profitability (see Figure 4).

Embedding Analytics Across the Customer Lifecycle



Source: Cognizant Research Center
Figure 4

Customer Lifetime Value

Customer lifetime value (CLV) is the profit or loss generated by a customer during a business relationship. It reveals how much a new customer is worth based on specific inputs – for example, how long the customer will stay with a company (estimated value), a customer’s purchase behavior and profitability. Based on the CLV, the CSP’s marketing departments can decide how much can be spent on acquiring a particular customer type. By calculating segment-wise CLV, CSPs can understand which segments provide better opportunities and direct their customer acquisition and retention strategies. For instance, CSPs can focus on providing better services to a few high-value (post-paid) customers vs. many less-valuable customers, although the latter could be targeted later to buy more services.

Customer Profitability Analytics

Based on the Pareto Principle – which states that 80% of a company’s revenues is derived from 20% of customers – identifying the most

profitable customers and retaining them is important to sustain and also gain referrals.

Customer profitability analytics allow CSPs to determine who their most profitable customers are by comparing the revenues generated from these customers with the cost of providing services to them during a particular period. This is useful for understanding what causes the lack of profitability of some customers, as well as how to convert them into more profitable ones by developing new products or tweaking existing ones and developing targeted marketing campaigns.

Targeted Marketing Campaigns

Competitors’ marketing campaigns are one of the prime factors for customer defection. It is, therefore, important to consistently engage customers with timely and relevant marketing campaigns.

The first step is to break down complex customer data. By analyzing customer calling patterns – including the operator services they use, their

demographics and other personal information – the subscriber base can be divided into segments based on behavioral patterns. Such segmentation allows CSPs to understand issues unique to each group and address the group as a whole.

Customer segmentation analysis allows CSPs to design marketing campaigns tailor-made to addressing the needs of each segment. For example, high-value customers who account for a major chunk of revenues or consume higher profit services can be offered special tariffs and other services that incent them to stay longer without compromising profitability. Further, predictive analytics can be used to understand which customer segment is most likely to buy a product and during which period, resulting in better ROI for campaigns.

Campaign Analysis

CSPs apply huge amounts of resources to marketing their offerings across various channels. With the growing cost and complexity of marketing, it is important that CSPs understand how effective their marketing campaigns are. Campaign analysis can be used to study the efficacy of a marketing campaign in generating sales against the costs incurred, based on key success criteria for a campaign through a channel. It is also useful for understanding the impact on other related products and design efficient future campaigns. Real-time campaign analysis allows marketers to measure each and every aspect of a marketing campaign and take immediate corrective actions, resulting in efficient utilization of budget and resources.

Cross-Selling and Up-Selling

Affinity analytics or market-basket analytics enable CSPs to understand products that are often bought together. It also provides the right combination of services for customers. By identifying customers who have not bought any of these services, CSPs can offer bundled services (up-selling) or new services (cross-sell). This will not only lead to improved customer spending (increased ARPU), but it will also reduce campaign costs, as the right customers are targeted.

Churn Management

Retaining customers is a challenge, but not as much as acquiring new ones. According to studies, acquiring new customers is five times more expensive than retaining existing customers. High customer attrition affects profitability, especially

in the case of new customers from whom the company is yet to gain return on investment.

Customers depart for a number of reasons, ranging from poor customer service and inappropriate billing, to lucrative offers from competitors. New offerings such as mobile number portability have eased defection to a competitor's service, making it possible to complete the move in a matter of hours. It is, therefore, important for CSPs to understand the current level of satisfaction of their customers and identify in advance customers who are most likely to switch loyalties.

Churn management solutions, including social network analysis, allow organizations to identify customers who are most likely to defect based on their behavior. Further, by combining and analyzing the data of defected customers, CSPs can understand the factors that influenced these departures and take steps to prevent further churn.

Social Network Analysis

Customers share varying degrees of relationships with other members in a group. Social network analytics help in identifying proximities and relationships between people, groups, organizations and related systems. It reveals the strength of the relationships, how information flows within the groups and who the influencers are in the group. It is observed that influencers can cause mass churn within four to seven days of their movement to another service provider. By appeasing group influencers via customized and innovative tariffs, CSPs can prevent mass churn and attract new customers, including those from competitors. Further, group influencers can be used to quickly spread the news about a new service or a product.

Social Media Analytics

Social networking sites have emerged as a major channel for customer engagement. Two out of three people in the U.S. use social networking sites; about 63.7% (147.8 million) of Internet users are members of social networking sites, and that number will increase to 67% by 2013, according to eMarketer.

Tracking of social media (using tools such as text analytics) allows CSPs to understand current customer sentiment and obtain a deeper understanding of their products and services.

For example, by analyzing the chatter created on social media about a new advertising campaign or special offer, CSPs can know which features the customers liked or disliked and, based on this information, make adjustments to their offering.

Analytics for Efficient Network Management

Network operating costs account for 45% of CSPs' total Op-Ex, which itself is about 50% of revenues. But networks are utilized only at 30% of their capacity, as traditional solutions employed by CSPs provide limited insights into network utilization, hindering their ability to utilize capacity optimally, according to Yankee Group. With the proliferation of smart devices driving the demand for more network bandwidth, CSPs need to not only utilize their current network capacities more efficiently but also predict future capacity additions accurately. Network analytics help address capacity utilization issues and predict future requirements accurately, allowing CSPs to provision bandwidth more efficiently.

Capacity Planning

The emergence of new technologies (3G, LTE, etc.) is driving the demand for more bandwidth, as CSPs have to support wireless, VoIP, video, high-speed data, a host of digital media applications and other services across numerous consumer and business devices. This requires CSPs to invest in building new capacities. However, they must ensure not to overbuild, which would lead to increased Cap-Ex and Op-Ex, nor under-build, which often leads to poor quality of service. CSPs should first understand their current network utilization and then plan capacity expansion.

Real-time network analytics allow CSPs to understand current network usage – capacity utilized at various locations at different time periods – and identify regions where network usage is expected to grow vis-à-vis others due to a new marketing campaign or a change in tariffs, among other influences. This allows CSPs to plan in advance and provision the right amount of bandwidth at the right place and at the right time, leading to cost savings. By combining this with dynamic

traffic routing, free capacity can be identified and used elsewhere, driving down Op-Ex.

Network Monitoring

In a hypercompetitive arena, providing uninterrupted connectivity is of paramount importance to CSPs, and doing so requires providers to maintain network health, identify glitches that impact network performance and proactively address them.

Network monitoring tools track network behavior and help in identifying stress points before they impact the network and connectivity. Further, by conducting root cause analysis of past network breakdowns using correlation techniques, future disturbances can be averted, resulting in improved quality of service.

Analytics for Revenue Assurance

Fraud Management

Global communications fraud – the practice of using telecommunications products or services with no intention of paying, according to the Communications Fraud Control Association² – results in the loss of \$72 billion to \$80 billion (about 4.5% of revenues) annually. Fraud analytics tools use customer bill payment schedules, demographic details, calling patterns and other information to proactively identify customers who are likely to exhibit fraudulent behavior. For example, the tools generate alerts upon finding a sudden abnormality in the usage or payment patterns of customers, which can be used to plan remedial measures.

Customer Risk Management

Some customers may not be able to pay their bills, resulting in bad debt. An increase in the number of such customers puts pressure on revenues and margins. CSPs need to be careful when imposing credit limits, in order to minimize the impact on customers in good standing. Blanket policies can and often do negatively impact satisfaction levels. Analytics help identify risky accounts proactively and design less expensive tariffs, which lessen the burden on such customers without affecting CSP profitability. This will not only reduce potential revenue loss but also improve customer retention.

Revenue Leakage

CSPs globally lose about \$100 billion annually in revenue leakage, primarily due to inter-carrier settlements, which is among the major revenue sources for some CSPs. According to Frost and Sullivan, inter-carrier revenue leakage accounts for 3% to 5% of total costs for traditional voice products and 7% to 11% for broadband services.

Moreover, the increase in traffic, combined with the huge variety of services that CSPs provide, has resulted in increased billing complexity. This, in turn, puts pressure on legacy systems when analyzing huge volumes of call detail records (CDRs), hindering the accurate capture of relevant data that is required to charge customers for their network usage.

Advanced analytics can be used to filter billions of CDRs quickly and efficiently, identify and plug revenue leakage sources across the revenue chain and enable more accurate billing and inter-carrier settlements.

Lastly, the benefits of customer and network analytics cannot be fully realized if internal processes are not efficient. Often, there is a huge time lag between data capture, analysis and action, which costs CSPs dearly. By measuring operational performance against key business drivers, process optimization analytics help CSPs identify areas where capacity is unused or underutilized, or where changes in staffing and budget can yield better results, etc. For instance, the sales department can check whether the sales force assigned to a particular area is sufficient to handle the volumes and make changes to the team if necessary.

Roadblocks

CSPs need to analyze huge volumes of data that is generated continuously, such as CDR, SNMP (Simple Network Management Protocol) and IPDR (Internet Protocol Detail Record) data. With millions of subscribers utilizing a range of voice, video and data services, there has been an exponential growth in such data. However, very little has been done on the database management front to handle such an explosion, putting pressure on existing systems.

Data at many CSPs typically resides in disparate databases running on numerous independent legacy systems, which often results in data inconsistency. In this situation, even advanced analytics cannot aid in identifying problem areas or the root cause of a problem. It is, therefore, important that data structures across the organization be standardized and data issues resolved. Resolving data issues forms 70% to 80% of the effort in implementing an analytics project, according to research firm IDC.

To leverage the benefits of analytics, CSPs need to focus on new approaches to data manage-

ment that can effectively deal with data overflow. Efficient data management, combined with powerful predictive and real-time analytics that consider customer, network and other critical aspects of the business, can result in just-in-time understanding of operational issues, effective forecasting and more meaningful and timely decisions.

Analytics for Competitive Advantage

Through the mid-2000s, analytics was synonymous with reporting. This has changed as data proliferated and competition grew, which is forcing CSPs to adopt data-driven decision-making. Further, the rapid development of IT and the availability of industry-specific analytics are enabling organizations to embrace analytics to make tactical, operational and strategic decisions.

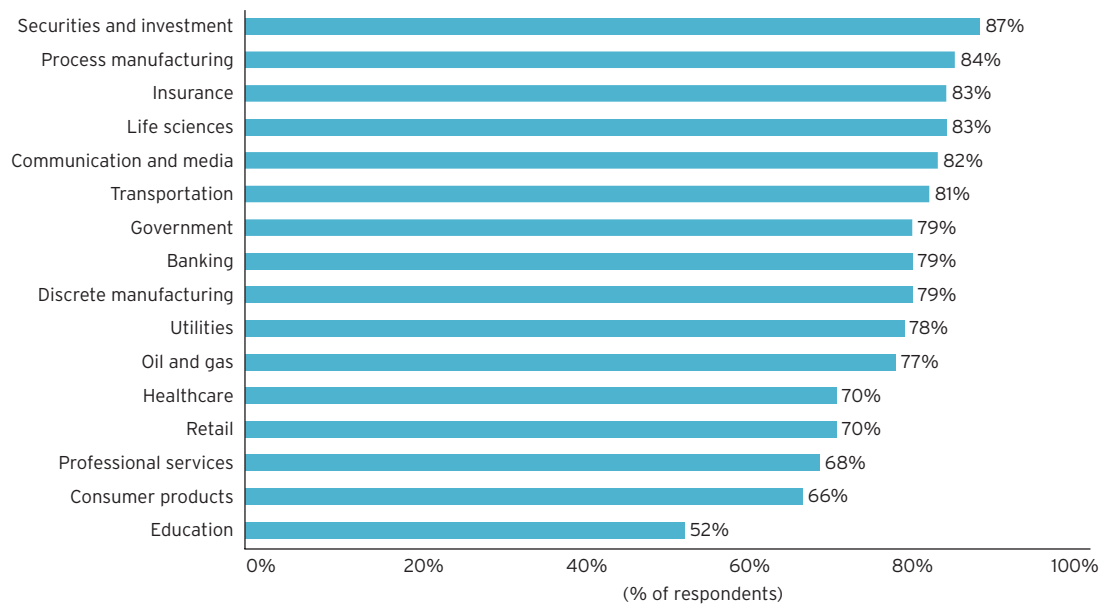
CSPs acknowledge the benefits of analytics. In fact, the telecom industry leads many others in the adoption of analytics (see Figure 5). CSPs are in an enviable position when it comes to knowing their customers when compared with many other industries. However, the information is not typically harnessed or used to inform more

proactive decision-making the way it should be. The existing analytics infrastructure (legacy systems) at a number of CSPs has resulted in huge storage and related infrastructure costs, long lead times for loading data and running queries and

an inability to cope with today's dynamic market conditions. In an ultra-competitive era, future success will depend on how effectively CSPs leverage analytics to exploit data and build sustainable competitive advantage.

Analytics: An Industry Scorecard

Q: Has your organization implemented a business intelligence/analytics solution?



Source: IDC's Vertical Research Survey, 2010

Base: 2,771 respondents

Figure 5

It is often debated whether analytics can provide sustainable competitive advantage when the technology can be easily replicated by the competition. While competitors can duplicate the data collection process and the kind of data collected, the key lies in how much more quickly and effectively the organization can gain unique insights into its subscriber base vis-à-vis the competition. Further, applying analytics to improve operational efficiencies is unique to each CSP.

It is, therefore, important that analytics adoption be driven by top management and defined by specific goals, such as improving profitability or reducing errors by a certain percentage. Top management must focus on creating a strong organizational culture that emphasizes data-driven decision-making. This can be achieved by closely aligning the business units with the teams handling analytics, which creates a collaborative environment that can have a ripple effect across the enterprise.

Embracing Analytics as a Service

Telecom data is complex. Analytics, with its wide application and the ability to meet the increasingly complex decision-making needs of telecoms, will play a crucial role in addressing the issues. However, handling such huge volumes of data poses a significant challenge for telecommunications providers and requires them to invest in people, process, IT tools and infrastructure.

A partner with the ability to handle complex analytics tasks can help CSPs more quickly leverage the promise of advanced analytics. With virtualization and cloud computing, opportunities now exist for cost-cutting through an emerging service delivery model called business process as a service (BPaaS).³ This approach makes available on-demand telecom analytics applications, such as revenue assurance, fraud management and customer experience management, which can save critical Cap-Ex by eliminating the cost

of acquiring expensive hardware, software and key talent. Moreover, enterprises pay only for results achieved through outcomes-based and/or pay-for-use fee models.

In this context, analytics are delivered as a knowledge process outsourcing (KPO) service, eliminating key technology barriers (continuous application development, deployment and maintenance issues), as well as talent-related obstacles that can often hinder performance. KPO allows CSPs to deploy resources tailored to their needs that can be increased or decreased as business requirements dictate, providing Op-Ex flexibility.

When delivered as a service, analytics KPO presents options that are more extensive than traditional business process outsourcing (BPO), which focuses primarily on labor, cost arbitrage and continuous process improvement to elevate business performance. As analytics processes become standardized and can be uniformly delivered via the cloud, we believe

that CSPs stand to benefit greatly by associating with partners that have mature cloud computing capabilities.

To realize the full potential of analytics services, CSPs need to do the following:

- Develop an enterprise-wide data architecture.
- Identify key areas for deploying analytics.
- Design a comprehensive strategy for adoption and implementation of analytics, including information technology.
- Develop a fact-based decision-making culture focusing on achieving specific goals.
- Formulate customized strategies to capitalize on unique data, instead of copying the competition.
- Continuously renovate and renew analytics implementation.
- Enter into relationships with partners that are capable of providing mature analytics services to aid in their attempts to gain competitive advantage.

Footnotes

- ¹ Wireless ARPU decreased \$0.46 in 2010. While data ARPU increased by \$2.37, voice ARPU fell by \$2.86 per user.
- ² The Communications Fraud Control Association (CFCA), headquartered in Roseland, N.J., is a not-for-profit global educational association that is working to combat communications fraud. The global fraud loss figures cited are based on the initial results of a CFCA survey conducted in 2009. The figures represent a 34% increase over 2005 survey results.
- ³ BPaaS refers to the provision of business services encompassing underlying IT infrastructure, platform and skilled manpower to run specific business processes in a virtual, globalized and distributed operating model.

References

- Swati Sinha, "Improve Customer Retention with CRM Analytics," *The Decision Factor*, June 28, 2011.
- Kalyan Hariharan, "Revenue Assurance - Why This is a Critical Function in a Telecommunication Industry," *India Telecom Online*, May 12, 2011.
- Eric Chan, "Five Ways to Win Back the Voice Market," *Wireless Week*, April 26, 2011.
- "Decision Analytics for Operational Excellence," *TM Forum*, March 31, 2011.
- Ari Banerjee, "BI Critical for Network Planning," *Telecomasia.net*, March 21, 2011.
- Michael S. Hopkins, "Interview: What's IT's Role in Analytics Adoption?" *MIT Sloan Management Review*, Jan. 12, 2011.
- "Big Data Integration Solutions: Turbocharge Analytics with Data Virtualization," *Composite Software*, 2011.

"TIA 2011 Playbook," Telecommunications Industry Association, 2011.

"Using Data as a Hidden Asset," Bain & Co., August 16, 2010.

R. Venkateswaran, "Innovative uses of Analytics in Telecom," B-eyeNetwork, September 28, 2010.

Henry D. Morris, "Business Analytics and the Path to Better Decisions," IDC, September 2010.

"Exploiting Analytics," TM Forum Research Insights, September 2010.

Olivier Serrat, "Social Network Analysis," Asian Development Bank, February 2009.

Arindam Banerjee, "Communication Service Providers Must Adopt a Customer-Centric Service Assurance Strategy," Yankee Group, May 2009.

"Business Intelligence for the Telecommunications Industry: Improving the Bottom Line and Controlling Expenses," Ingress.com, 2008.

"Business Analytics: Six Questions to Ask About Information and Competition," nGenera Corp., 2008.

"Beyond Commoditization: The Way Forward for Traditional Telecom Operators," www.booz.com, August 27, 2007.

"Telecom - Marketing Analytics," dnbtransunion.com.

Author

Vinaya Kumar Mylavarapu
Cognizant Research Center

Subject Matter Expert

Jayendra Ramesan
Director and Practice Leader
Cognizant Enterprise Analytics Practice

About Cognizant

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting, and business process outsourcing services. Cognizant's single-minded passion is to dedicate our global technology and innovation know-how, our industry expertise and worldwide resources to working together with clients to make their businesses stronger. With over 50 global delivery centers and more than 118,000 employees as of June 30, 2011, we combine a unique global delivery model infused with a distinct culture of customer satisfaction. A member of the NASDAQ-100 Index and S&P 500 Index, Cognizant is a Forbes Global 2000 company and a member of the Fortune 1000 and is ranked among the top information technology companies in BusinessWeek's Hot Growth and Top 50 Performers listings.

Visit us online at www.cognizant.com for more information.



World Headquarters

500 Frank W. Burr Blvd.
Teaneck, NJ 07666 USA
Phone: +1 201 801 0233
Fax: +1 201 801 0243
Toll Free: +1 888 937 3277
Email: inquiry@cognizant.com

European Headquarters

Haymarket House
28-29 Haymarket
London SW1Y 4SP UK
Phone: +44 (0) 20 7321 4888
Fax: +44 (0) 20 7321 4890
Email: infouk@cognizant.com

India Operations Headquarters

#5/535, Old Mahabalipuram Road
Okkiyam Pettai, Thoraipakkam
Chennai, 600 096 India
Phone: +91 (0) 44 4209 6000
Fax: +91 (0) 44 4209 6060
Email: inquiryindia@cognizant.com