The Digital Age is in full gear and completely re-imaging the human experience—the way we live, work and play—and how we consume content and connect with the world. And with millions of terabytes of digital information flowing every second of every day, Communications Service Providers (CSPs) have access to a staggering amount of this data, more than any business or industry in the world. On average, a typical CSP generates over one billion call data records every single day, creating more than half a petabyte of data each month.
According to a recent Accenture survey, 90% of business leaders expect big data to dramatically change how they do business, having a landmark affect similar to the development of the Internet.\textsuperscript{1}

But while Communications Service Providers (CSPs) should be at the vanguard of the big data movement, many fail to effectively aggregate, organize and analyze data in real-time—preventing them from fully optimizing and streamlining operations, improving customer engagement or creating new revenues streams. Compounding this, data silos, regulatory constraints, privacy and security issues, talent gap concerns and inflexible legacy business models mean that big data, so far, has been a big pain point for telcos.

Big data is very important to most organizations across all industries (Figure 1). But in order to help drive value from big data and analytics, telcos must develop analytics strategies based on data-driven decisions, and unlock new opportunities for themselves, their industries and their customers.

\textbf{FIGURE 1* | How important is big data to your organization?}
Becoming big data mature

Big data has been the “it” in IT for nearly half a decade. However, few CSPs have truly developed in-house expertise at the level of their technology counterparts, Google and Facebook, who were at the forefront of big data adoption and are now reaping the benefits.

Although CSPs operate at different levels of maturity, high performing organizations are using real-time insights from big data to improve customer experience and help drive personalized engagement. Accenture has been working with the world’s leading CSPs and studying the trends helping drive the proliferation of big data and analytics across all industries, especially communications.

Following is a view of the road ahead and three signposts CSPs need to recognize in order to accelerate performance using big data.

1 | Focus on the customer journey

The buck starts and stops here. The customer is not merely king—but the entire kingdom and the driving force of today’s digital economy. Because loyalty is a fragile commodity, it is critical that CSPs first focus on understanding the omni-channel behavior of their customers in order to create unique experiences and personalized offerings, fluidly across all channels.

One area where CSPs are investing heavy focus and funding to enhance the customer journey is “Next Best Action”. A customer-centric marketing model based on advanced analytics, Next Best Action considers different actions that can be taken for a specific customer and decides on the ‘best’ one. In sharp contrast to traditional marketing approaches—that start with a product or service, and then attempt to find interested and eligible prospects—Next Best Action is a predictive tool that analyzes the customer’s wants and needs in concert with the marketing organization’s business objectives. Similar organizations will begin to reap the benefits of gathering and, more importantly, understanding these vital pieces, with the help of advance analytics leading the way forward.

Organizations must master big data analytics—tackling security, privacy and talent gap concerns along the way—to transform their enterprise digitally, anticipate their customer needs.
As one approach, CSPs can draw on data segmentation techniques to assess their customers in more granular detail and develop highly personalized offers based on their interests. In fact, some telcos have started analyzing customer device and location data to uncover insights that enable them to offer premium services in real time. For example, offering a particular data plan to sports fans, but a different package to film buffs. Customer demographics, purchasing behavior and click-streams are being combined with attributes such as location and content preferences to anticipate the “customer journey”. By leveraging real-time analytics that map this journey, CSPs can quickly respond with a “next-best offer” and convert interested prospects into customers.

This also enables CSPs to map specific customer interactions at various stages of the lifecycle, promoting tailored offerings and campaigns based on: recent interactions, overall lifetime value, and where they belong in the customer lifecycle. These journey-based insights can also allow operators to identify customers with waning loyalty, or who are at risk of defecting to another service provider. Once this finding is uncovered, CSPs can formulate a strategy to deliver on their needs—providing them with an improved customer experience that can earn back their loyalty.

Customer loyalty in the Digital Age is the art of NOW!—it goes beyond attracting consumers with an apt promotion or offering; winning them by obtaining an order; and, converting them to a lifelong bond by delivering a consistent customer experience. To attract and retain customers in the face of today’s rapid change, a truly differentiated experience is required. It is essential that CSPs engage consumers with tailored “experience-led design”—capturing individual customer personas, the archetypes of the users around whom the customer experience should be designed, and then delivering a unique, unparalleled and flawless customer journey in real time, without any downtime.

The key to helping drive this engine is customer insight enabled by big data, and agility in deploying content and tailoring the customer experience across multiple channels. This differs radically from CSPs past approach to the customer, which was largely based on reactive vertical functions, such as creating a trouble ticket system based on the business requirements—instead of proactively engaging with the customers based on granular, personalized and consistently maintained insights. Today’s digital consumers are much smarter, more informed and have access to more knowledge than ever before in recorded history. They want more personalized engagement across all channels—that is authentic and tailored to their needs—just as much as companies want to know them well enough to convert every opportunity into a sale.
The communications industry has experienced a paradigm shift in the past 12 months, with analytics and big data moving to the center of business strategy—especially at the C-suite level. And while the customer is at the wheel, steering through this curve, CSPs must be under the hood—ensuring that their internal core is accelerating the ROI of big data and customer analytics. Specifically, effective enterprise operations management—from infrastructure to network to system investments—is the difference between achieving high performance and being left in the dust. For most organizations, the race to maintain competitiveness is the driving force to getting big data, and getting it right (Figure 2).

FIGURE 2* | Which of the following statements best describes the impetus for big data in your organization?
However, as the use of smartphones and other mobile devices continues to proliferate globally, many CSPs are struggling to cope with the growing pressure on their infrastructure. They are also constantly battling to prevent network outages and service quality issues that can potentially arise from increased consumer demand for video and audio services. But by analyzing how and when consumers are using their different devices, it becomes much easier to identify pressure points and areas that might be vulnerable in an operator’s infrastructure.

For large global CSPs, operations produces a vast amount of data from service, billing and customer premise systems alone. Yet most of this data is generated, captured and maintained by individual silos. Data within these disparate, often antiquated, legacy systems are rarely consolidated and reconciled on an on-going basis. In order for CSPs to gain a holistic view of operations, including customer and enterprise insights, data from these silos must be integrated into a single analytical domain. These insights not only have the potential to improve decision-making, but also streamline business operations enabling the creation of new opportunities.

Insights from network data can be also used to help drive much more effective decisions at the end-consumer level to help CSPs effectively optimize their network resources and minimize their overall capex and opex. Theses insights can then be used to guide customers based on their usage habits, for example, advising them to avoid bandwidth-consuming activity at certain times of the day to improve the utilization of network resources. By examining consumption and usage data flowing through the network, CSPs can provide real-time recommendations to customers—such as upgrades based on, or bundled by, consumption patterns (social, video, and SMS)—increasing profitability while giving customers something they can really use.

Moreover, CSPs can also monitor devices to maintain a real-time, 360-degree view of their networks. By triangulating and analyzing traffic forecast data with age and health of devices, operators can determine which part of the network is at risk of imminent failure and make recommendations on what the network engineers need to do to prevent and abate future outages. This type of “fall prediction management” is essential to ensure CSPs optimize their workforce, reduce maintenance costs and keep their networks up and running. Needless to say, a healthy network is the most essential—but often overlooked—necessity to improving the customer experience.
In much the same way that analytics are sought for network planning and enhancing the customer experience, they are also being used to help guide investments in marketing and operations. Analytics can help determine where and how to allocate marketing dollars for the greatest return on investment, as well as to streamline workforce management; for example, scheduling call centers based on predicted call volumes. CSPs are leveraging this data to help decide where to make big capital investments for rolling out offerings such as 4G and LTE, for instance, as well as what segments should be upgraded, refurbished, or reevaluated based on forecasting of customer profitability, business opportunity, and network traffic data.

Fundamental to optimizing operations and understanding network data is developing a deep pool of expert talent, tools and platforms to enable big data maturity and growth. Both Google and Facebook, for instance, employ data scientists and big data technologists tasked with solving challenges using data. These tech giants identified a business need and subsequently invested in developing technology to solve this need. CSPs need to follow suit in order to produce tangible insights and return on investment from big data.

Lastly, because a majority of CSPs are built on a centralized “hub and spoke” operations model, it is also critical that an effective corporate analytics structure be created to lead the strategy—with a Chief Analytics Officer, CEO or CFO at the center the hub (depending on the organizational structure)—and with the spokes supporting deployment across geographies. The right analytics organization not only assists talent retention and capability development, but also holistically enhances customer engagement, network optimization and internal buy-in and support. The right leadership and organizational support can enable analytics centers of excellence to be established, increase investment across the organization, and help telcos dive deeper into their data to enhance engagement.
Companies are becoming increasingly aware that they are sitting on huge amounts of under-utilized data and looking for ways to increase its value. The conditions for data monetization are ripe: massive volumes of structure and unstructured data; decreasing storage costs; data-driven marketing campaigns that create relevant customer experiences; and improving business intelligence and processes by applying data analytics.

The consumer data presents an enormous monetization opportunity as these insights can offer a huge value to other organizations, across myriad industries. For example, retailers are working with CSPs to produce more targeted cross-promotions and store openings, based on an enhanced, data-driven understanding of consumer habits in urban centers and shopping malls. Additionally, CSPs have the opportunity to generate new revenue streams through the rapid evolution and proliferation of the Internet of Things (IoT) and the creation of digitally connected services, such as: the connected home, vehicle, building, farmer, and worker. By leveraging machine-to-machine data and applying analytical insights, CSPs can establish new business models and deliver new digital services to their customer base.

For instance, by installing agricultural sensors around their fields, farmers can see real-time weather information, crop data and equipment flow through network pipes. CSPs, in turn, can partner with third-party agricultural consulting companies to analyze this data and provide recommendations to farmers via mobile devices. This service can serve to enhance productivity, increase yield, and reducing waste (of water and fertilizer), all as it happens in real time. Likewise, through the connected vehicle, for example, CSPs can monetize their data by helping organizations leverage data-driven telematics to create targeted communications and offers to drivers, on everything from traffic information, to service station locations, to reduced insurance premiums for safe driving.

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What’s more, big data is fueling the rapid rise of “shared economy” based businesses, such as Airbnb, Uber and Lyft. Each of these organizations is constantly cross-referencing various sources of data to solve real business challenges. Likewise, companies such as Google, Amazon and Uber all leverage data, internally and externally, to provide services and create opportunities that did not previously exist just a few years ago. For instance, Uber simultaneously taps into driver location data, customer location data, map data, and real-time traffic information to optimize for lowest pick-up time and highest rating. And more and more, consumers expect companies to provide smarter, data-driven services.

CSPs are also collecting more and more detail on user location data, call data, browsing history, application usage, customer preferences and so on—navigating the complexities of how to use this data in intelligent ways without violating consumer privacy laws. But, on the flip side, this data is the essential real-time customer information that CSPs can provide to other businesses, for example, to help banks or retailers prevent fraud. It is a delicate balance, but gaining more equilibrium as CSPs acquire big data sophistication and begin to include regulatory authorities in the initial stages of business model development.

Given the communications industry’s immersion into nearly every aspect of digital life, access to big data could become the value-generating lifeblood to fuel the industry’s continued health and expansion. As a resource, data represents multiple opportunities for CSPs to materially impact their business performance—unlocking real-time insights that can drive revenue growth, cost efficiency and reduce churn.

The power of big data analytics, IoT and real-time machine-to-machine communication is the future of both the customer and company journey. CSPs that take advantage of these data-driven possibilities would be well positioned to compete and help achieve high performance in an increasingly demanding digital marketplace.
Conclusion

Big data is rapidly evolving every day, and with it, so are the best practices and processes to convert vast amounts of information into valuable customer insights. Big data offers CSPs an opportunity to gain a complete picture of their operations and their customers, and to further their innovation efforts.

CSPs are embarking on their own journeys—marked by varying levels of sophistication and big data mastery—while navigating complex issues of data privacy and regulation, security, talent gaps and legacy systems. While CSPs look at implementing the big data use cases, it’s important to look at the end-to-end processes, integration points, analytics tools, storage and above all, applying advanced analytics to derive intelligence out of data.

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About the authors

Arnab Chakraborty is a managing director at Accenture Analytics, which is part of Accenture Digital. He is the global analytics lead for Accenture’s communications, media and entertainment industry and is responsible for Accenture’s analytics business in Europe across Austria, Switzerland and Germany. With more than 18 years of experience in consulting and business analytics across diverse industry sectors, Arnab has significant leadership experience in strategy formulation, business solutions, client management, business development, service delivery and operations management. His email address is arnab.d.chakraborty@accenture.com.

Marco Vernocchi is a senior managing director at Accenture. He is the Accenture Digital Lead for the Communications, Media and Technology Operating Group. His mission is to help CMT’s clients accelerate their digital transformation, drive growth and create value. He is responsible for Accenture’s market leadership in the digital market, building upon Accenture’s digital consulting capabilities, technology services, platforms and operations. Marco has more than 25 years of international business management and consulting experience, and held several industry and management roles. His email address is marco.vernocchi@accenture.com.

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