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Big Data and the Telecom Industry

The potential of big insights through deep data analysis.

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Introduction

We are progressing towards an era of information which can and must be converted into real time actionable acumen, to enable the companies respond in real-time to behavioral changes in the customer mindset or to swiftly respond to threats from the market competition. This is exactly where the Big Data and its analysis can win the battle against the traditional BI tools.

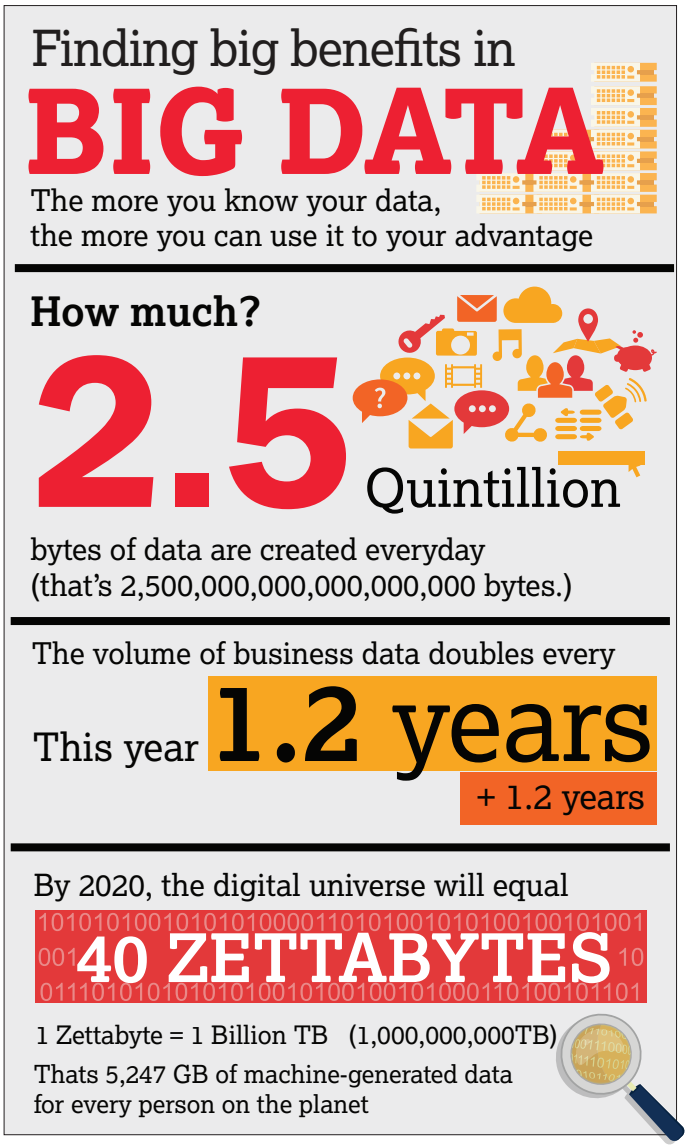
Meanwhile, Telecom companies are unaware about the volume of data which could, on proper analysis can get deeper insights into customer behavior, preferences, interests and their service usage patterns. This is what Big Data is for Telcos.

With the increasing adoption of smartphones and growth in mobile internet, Telcos today have access to exceptional amounts of data sources including – customer profiles, device data, network data, customer usage patterns, location data, apps downloaded, etc.. All this data combined together becomes the Big Data.

Big data has the potential to place the telcos in a position to win the battle to earn more customers and create new revenue streams. It provides them with a wealth of information about their customers' behaviors, preferences and movements. Yet, many telcos still struggle to fully derive the greatest value of big data.

How much can companies in the telecommunications industry benefit from "big data"? That's a critical question.

Most operators conduct analytic programs which enable them to use their internal data and boost the efficiency of their networks and drive profitability with some success. The potential of big data also comes with a different challenge of combining larger amounts of information so as to increase revenues and profits across the entire telecom value chain - from network operations to product development to marketing, sales, and customer service.



Probable Benefits from Big Data

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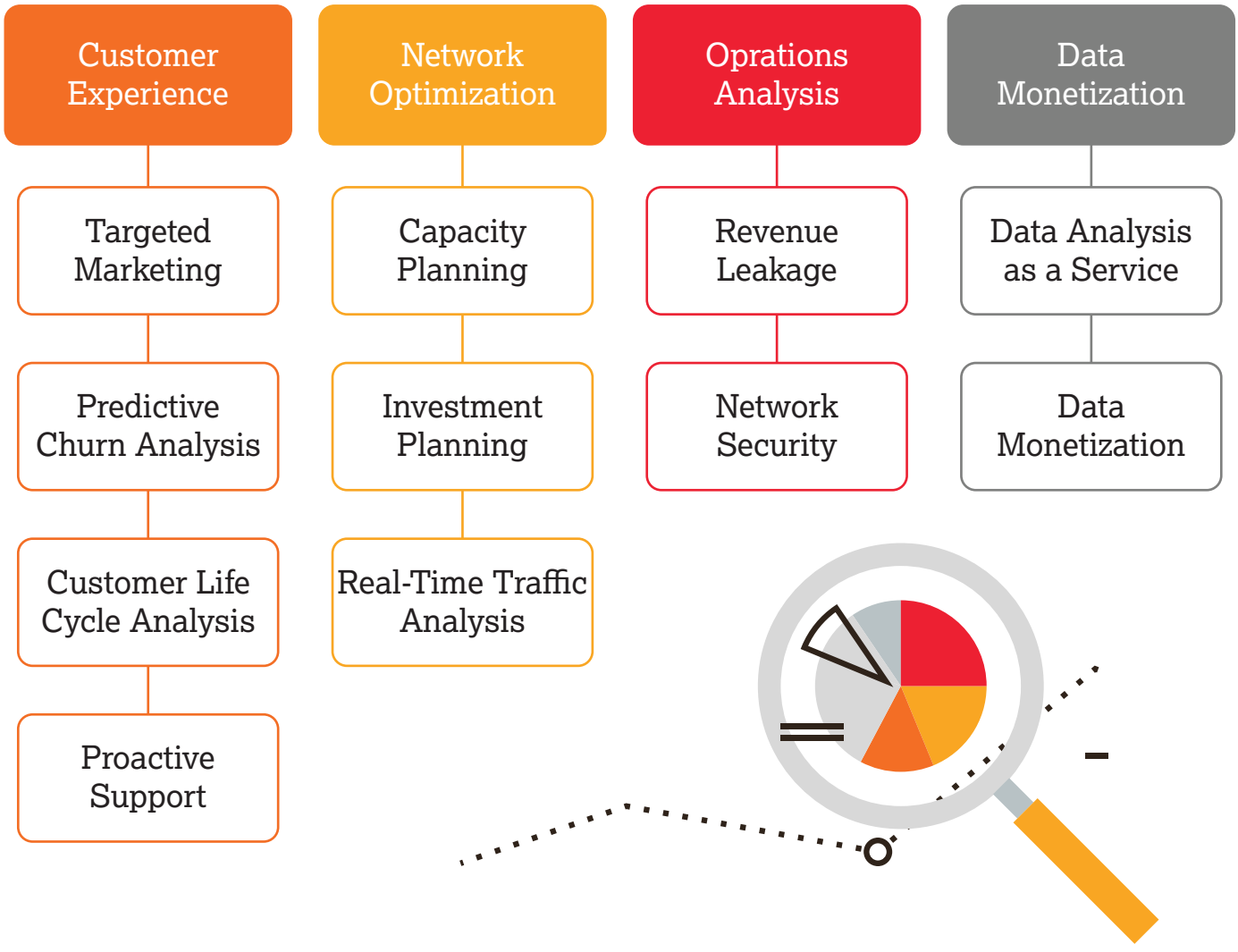
While talking about the Big Data strategy, the telecom industry has an advantage due to the absolute breadth and depth of data it collects in the course of normal business. A telco serving 8 million prepaid mobile subscribers generates approximate 30 million CDRs daily, amounting to 11 billion records annually. If the same operator also provides postpaid and fixed lines services, then there is even more volume and variety of data at the ready.

Data is definitely one of the most strategic assets for a telco today. With an treasure of data at their fingertips, telcos are practically sitting on a goldmine of information and have an immense opportunity to capitalize on these valuable data sets.

There are various types of information that can be enhanced with a sound Big Data strategy. So what could an operator do? Based on a Telecoms.com industry survey, big data is poised to bring most value to telcos in the areas of customer retention, customer segmentation, network optimization & planning and delivering upsell/cross sell opportunities. Looking at Big Data through a customer perspective four strong opportunities appear.



Customer experience

Telcos today are refining & optimizing the customer experience which is a key to sustaining a market differentiation and reducing churn. Telcos are leveraging Hadoop and big data analytics to gain a true 360-degree view of their customers along with their lifecycle. Basis the detailed customer profiles, Telcos would then do targeted micro-segmentation of their consumer base, offer a compelling customer experience, develop personalized offer recommendations and predict/prevent churn. Example of the same is as below:

Targeted marketing

Customized product offerings basis the characteristics like –usage patterns, billing data, support requests, purchase history, service preferences demographic information, location, etc. This also enables a telco to proactively present the right offer at the right time, in the right context to the right customer in order to improve conversion rates. Examples – offer top-up plans or up-sell recommendations based on data usage, discounts or offers based on recent purchases or enquiries or calls into the call center.

Predictive churn

Given the impact of customer churn affecting the Telco industry today, they are effectively using big data analytics to bring together various data points including – quality of service, network performance, subscriber billing information, details on calls to the customer care centers centers, and social media sentiment analysis to build an effective model to predict and prevent churn. For example telcos would be able to proactively reach out to high value customers, who have experienced a series of Quality of Service (QoS) issues or who shared a negative sentiment regarding the service in social media, and address those issues and offer them discounts or service credits to prevent customers from defecting.

Customer lifecycle

Real-time analytics that map the user journey and generates actionable insights that can allow Telcos to respond quickly with a “next-best offer” and convert interested prospects into customers. Data such as customer demographics, purchasing behavior and clickstreams are being combined with attributes such as location and content preferences to for next best offers. This also enables telcos to map specific customer’s interactions with the Telco at various stages of the lifecycle to promote tailored offerings and campaigns.

Proactive support

Using big data, Telcos are building intelligence and analytics tools so as to proactively identify issues

and fix it or offer a solution before it impacts the customer. Based on a recent survey conducted by Coleman Parkes focused on the Telco industry it found that 84 percent of respondents were more likely to recommend their service provider if the provider was able to identify and pre-emptively resolve potential issues affecting them. Given the impacts, Service Providers are proactively fixing issues or reaching out to customers to help resolve issues before they negatively impact the experience.

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Network optimization

Network capacity is a highly valuable resource and Telcos are starting to leverage big data & analytics to effectively monitor and manage network capacity, build predictive capacity models and use it for prioritizing and planning network expansion decisions.

Capacity planning

By correlating network usage and using real-time capacity data highly congested areas can be pinpointed where network usage is nearing its capacity thresholds, in order to prioritize expansion for new capacity roll out. For areas with excess network capacity, they can run specific customer campaigns or promotions to increase usage. Based on real-time analytics and traffic, they can also develop predictive capacity forecasting models, track actual versus forecasted traffic to fine-tune the model and plan for supplemental capacity in case of outages.

Investment planning

With so many considerations, telcos need to be able to effectively prioritize their investments and resources based on – future connectivity needs, strategic objectives, projected RoI, forecasted traffic, customer experience etc. all while ensuring that the highest valued customers get to benefit from these investments as well. Hence the need to be able to effectively combine network traffic data, customer experience metrics, revenue potential and location data along with customer value data to ensure they are investing their CAPEX in the right spots.

Real Time analytics

Telcos used to rely on historical data for their network management although they have now started using big data and analytical tools to build real time capacity heat maps to monitor the quality of user experience and send alerts on network congestion or potential outages. Big data analytics can enhance these processes by enabling real-time processing of network data to continuously monitor and manage the network and help them model network activity and map future demand. Telcos can now model the potential impact, in real-time, of a particular cell site goes down based on the number of subscriber and capacity in the adjacent sites. Similarly based on real-time data collected from the cell towers, engineers can monitor any drop in service performance at a specific location and send in crews, if need be, for a proactive resolution.

Operational analysis

Telcos use the big data around driving internal efficiencies, process improvements and cost savings around the core Telco operations. They are starting to adopt big data solutions powered by Hadoop for everything from plugging and minimizing revenue leakage, managing network and cyber security, driving down order-to-activation lead-times to proactively identifying and fixing customer issues in order to minimize truck rolls.

Revenue leakage

Based on industry estimates, telcos lose approx. 2.8% of their revenues to leakage & fraud annually – costing the industry approximately US $40 Billion every year, which means Telcos could be adding $ 40 Billion to their bottom-line without selling any

additional products or services. Hadoop based solutions can help telcos process and analyze both structured & unstructured data going back several years, rather than just a few months, enabling them to gain a better understanding of the behavior of customers.

Network / Cyber security

Telcos need to ensure their networks and associated systems are secure from malicious attacks. Legacy event detection capabilities are unable to analyze all the data sources necessary for identifying & responding to advanced threats due to the sheer cost & complexity. Security professionals need to be able to access and analyze an avalanche of data (including logs, events, packets, flow data, asset data, configuration data etc.) in real-time in order to mitigate risk, detect incidents, and respond to breaches.

Data monetization

Telcos have unique advantage about having access to subscriber demographics, subscriber location, network usage, devise, application usage, preferences etc. Given all the data telcos are starting to mine, model, aggregate and anonymize these data sets to create powerful statistics that can be of significant value to other businesses and verticals.

Data analysis

By combining the customer location information with customer demographics and preferences, telcos are starting to provide Data Analytics as a Service (DAaaS) to other key verticals including: retail, financial services, advertising, healthcare, public services and other customer-facing businesses. There is a wide variety of application and use cases for data centric analytics ranging from - customer footfall analytics to assisting cities understand their traffic patterns and bottlenecks.

Even though the data analytics market opportunities are still in a nascent stage, telcos are looking to accelerate their revenue share from analytics services in the future. Though privacy is still a concern, if executed right, telcos have an opportunity to effectively monetize customer insights by making it relevant to other businesses and verticals without compromising on subscriber privacy and rights.

IoT / M2M analytics

Telcos are trying to leverage the IoT opportunity to move up the value chain from providing just connectivity services, to providing end-to-end M2M solutions. Telcos have the ability to add location based and geo-spatial elements to the streaming data to enrich the insights of the data coming so that it can provide valuable insights to the enterprise verticals. With petabytes of data streaming in multiple formats in real-time from sensors across multiple geographies, telcos are leveraging Hadoop as the ideal platform to collect, store, secure, manage and analyze these data sets in real-time.

Today customers want aggressive pricing, value for money and a high quality service. They don't hesitate to switch between providers if they don't get what they're looking for. So particularly in developed markets it is absolutely crucial to put in place a sustainable and robust strategy for customer retention to preserve customer lifetime value.

The telecom market today knows why the high acquisition costs and slim profit margins for each customer make churn analysis vital to help companies identify and retain the most profitable among them.

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Network Infrastructure	Product	Marketing & Sales	Customer Care	Billing
• Network events • Call records (on and off network) • Number of text and multimedia messages • Volume of data traffic • Location-specific data • User handset data • Technical fault data	• Product catalog • Product life-cycle data • Product and platform costs • Innovation road map • Product usage • Critical products • Product delivery management	• Customer devices • Option preferences • Sales channel data • ARPU classification • Response rate of marketing campaigns • Segmentation data • Usage patterns • Subsidy levels	• Order data • Contact data • Fault handling data - Problem type - Resolution time and rates - Repeated faults • Call center logs • Termination reasons	• Call duration records • Tariff data • Usage history • Customer account data

Potential Data Availability & Use

Big data promises to stimulate growth and increase efficiency & profitability across the entire telecom value chain.

- Enhancing routing and QoS by analyzing network traffic in real time
- Analyzing call records in real time to identify fraudulent behavior immediately
- Allowing call center agents to flexibly & profitably modify subscriber plans immediately
- Customizing marketing campaigns to individual customers by location-based and social networking technologies
- Using insights into customer behavior & usage to develop new products

Big data can even open up new sources of revenue, such as selling insights about customers to third parties.

The analysis of Big Data also contributes to decrease the CAPEX or OPEX associated with the business operations.

RoI of big data

Peppers & Rogers Group recently worked with a mobile operator to improve its marketing effectiveness and ROI. The client did not have detailed data for its mobile subscribers, and the average time to market for a targeted marketing campaign was one month. It was simply not interacting with customers fast enough or with the right messages.

The team constructed a data mart containing a summary of all detailed international usage information for each mobile subscriber and used this data mart to determine target subscriber groups. The team then designed and launched several below-the-line campaign waves based on best practices in the industry to the relevant customer groups. For example, some campaigns were designed

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to boost revenues by adjusting product offerings based on customer usage patterns by country.

Over the course of one year, the operator launched more than 250 targeted outreach campaigns, which achieved a 33-percent response rate, on average. The time to market for those campaigns dropped from 30 days to one week. And the biggest improvement was seen in customer interactions. Network traffic increased by 64 percent, daily active subscribers jumped by 17 percent, and revenues grew by 2 percent.

These results are not unusual for companies with a keen balance of data strategy and the customer experience. Yet many operators are at different points along the data maturity spectrum. In our experience, most operators fall into one of three data environments:

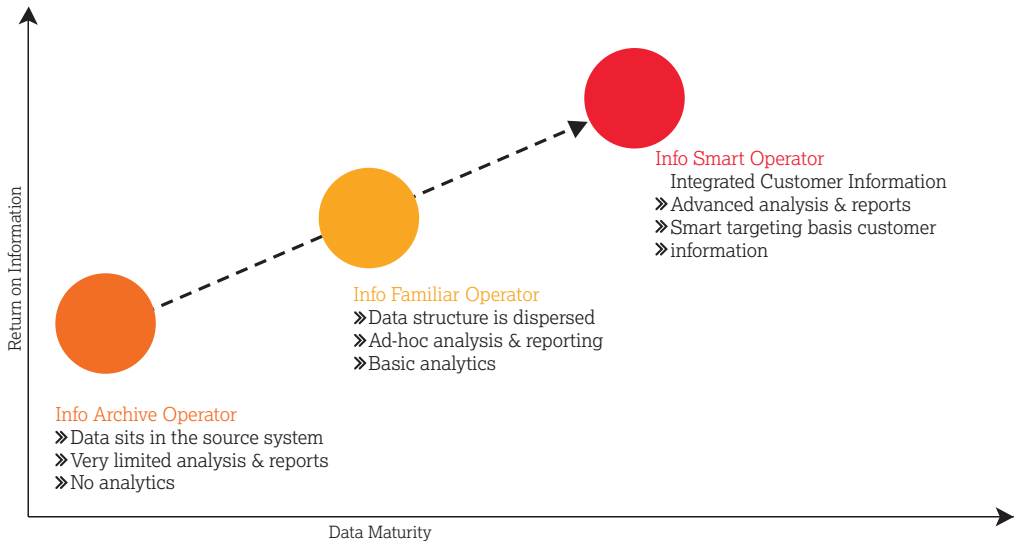
- Info-archive: Operators that have yet to start initiatives to leverage Big Data. They have limited or no analytics capabilities.
- Info-familiar: Those who have already embarked on the data journey but have not implemented a full-fledged solution. Any analytics they do have are ad-hoc and not coordinated.
- Info-smart: Operators that have created a robust Big Data environment. Customer information is aligned and shared across the business and advanced analytics are used.

The concluding goal is to combine and correlate every information source to generate a complete and transparent view of all the interactions every customer has with the operator. But to really utilize big data, telcos must radically change how they compile and make use of the information at their disposal.

“Operators should realize from companies such as Google and Facebook, where data is king and virtually every product decision flows from what the available data says about customers and how it can be used.” - PwC

Big data poses a real opportunity to gain much more of a Telco operation and its customers and to add to their innovation efforts. The industry as a whole spends too less on R&D than any other technology-oriented industry and its efforts to change its ways have not yet proven successful.

The operators that can incorporate new agile strategies into their organizational DNA fastest will gain a real competitive advantage over their slower rivals.



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