Big Data Opportunities in Telecommunication Industry

Transforming Telecommunication Industry through the use of Big Data Analytics

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VIRGO - is a subsidiary of DevBatch INC focusing on Data Sciences.

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Introduction

Thanks to countless services in the telecom sector, massive volumes of data is being generated every second. Not only the volume of data is swelling up but their nature and types are also growing with each new enhancement being introduced by the services. Decades ago it was just

call data, then came along various forms of written communication - wire, telex, facsimile, text / SMS, etc. - and rich media joined the fray. The more the data is varying the more it is becoming a challenge for the system to organize it in a meaningful manner.

Telecom Industry has a history of collecting and maintaining massive amount of data from call detail records to server logs, from social networks and mobile usage to network equipment and billing transactions. Industry's major challenge was to deal with massive data in order to gain powerful insights of their customers, brands, products, and services till the recent time. Data volumes outran the computing power, while high costs prevented companies from carrying out in-depth study on data to generate useful and actionable insights.
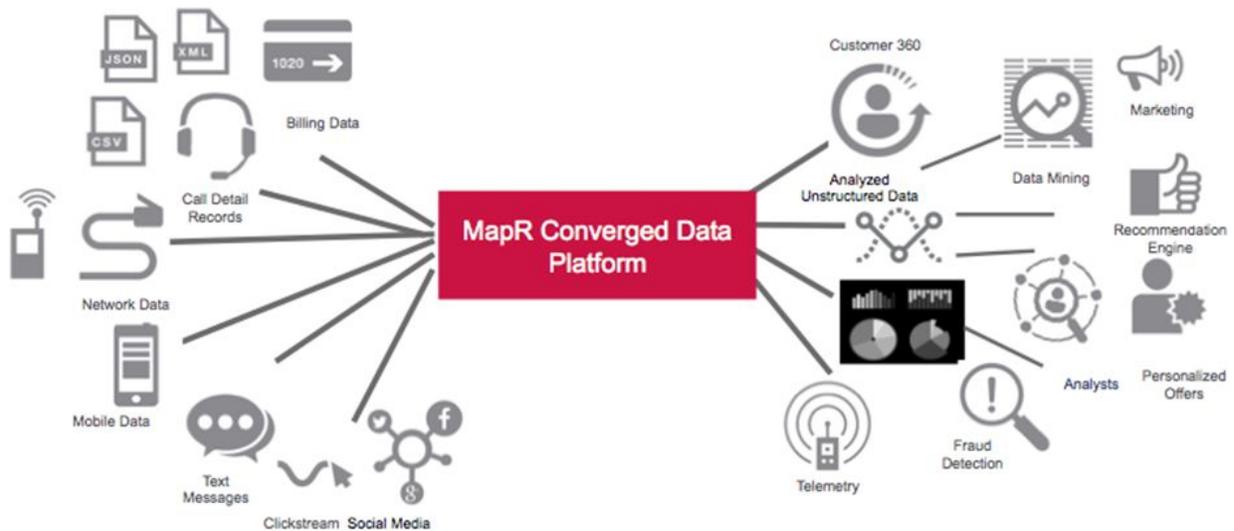

Figure 1. Telecommunication Big Data

Time has changed
In 2012, the term of data science, big data or predictive analytics – all same but different terms, started appearing everywhere and became very famous by the end of 2014. With the invention and expansion of this field, the whole perspective of viewing and investigating a problem has changed. Data analytics guide on complete trail of success by letting the business leaders know what must be considered and what precautions should be taken up to attain strategic goals.

Figure 2. Shift towards Prescriptive Analytics

As time changed, all traditional computation issues resolved such as:

- Decline of storage cost
- Computing power has grown exponentially
- Fast access to cloud computing
- Low-cost analysis tools are now available

Analytics lead to Actionable Decision

Analytics without action tend to generate nothing more than an interesting finding. To gain the true value of analytics, organizations have set the focus on data to set business strategy, manage operations and understand their market across the globe. With the integration of data, insight and logical reasoning, organizations are now able to set data driven goals. This spurs on the rise of insight driven organizations and promote a culture of data-driven decision making. Insight driven organization injects analytics insight in everyday life decision. They equip their employees to deliver targeted services. This result in gaining ability to mitigate risk, reduce cost and increase revenue.

Time Changed – Game Changed

In the era of big data analytics, telecommunication industry is focusing on improving the user experience. They are creating sophisticated 360-degree profiles based on:

- Behavior
- Demographic aspects
- Geography
- Psychographic analyses.

Scope of Big Data Implementation

Telecommunication industry has started using advanced data analytics to correlate and deduce customer, and network data to generate and analyze customer preferences and network efficiency in almost real-time. They are collaborating with big data solution providers to gain the extended benefits of big data with the aim to increase revenue. Big data analytics promise to promote growth and increase efficiency and profitability across the entire telecommunication value chain.

Following is the roadmap of big data analytics opportunities that leads to create additional values for telecom industry from customer segmentation to network optimization and workforce management.
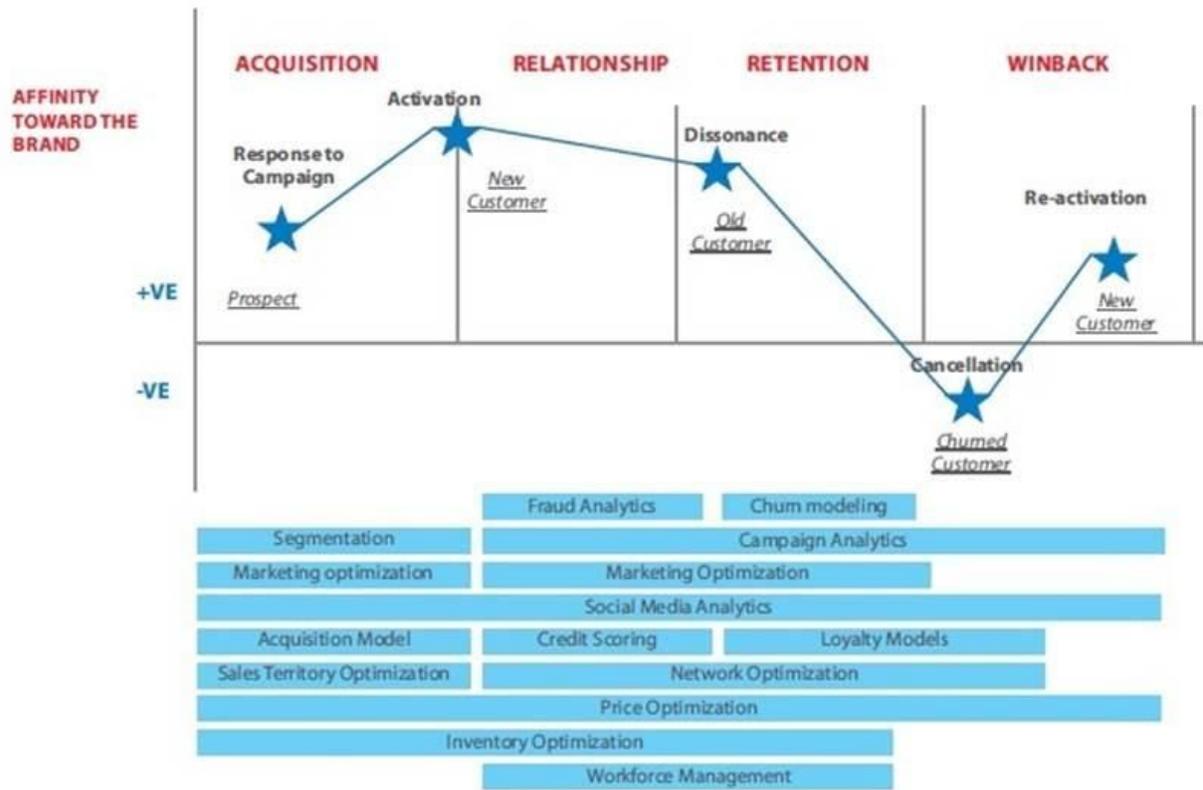
Example of Predictive Analytics Opportunities in Telecom

Figure 4. Scope of Big Data

Big Data Process

To help you maximize the return on your analytics investments, DevBatch has identified five key analytic modules to change the way telecommunication industry will compete in the years ahead.
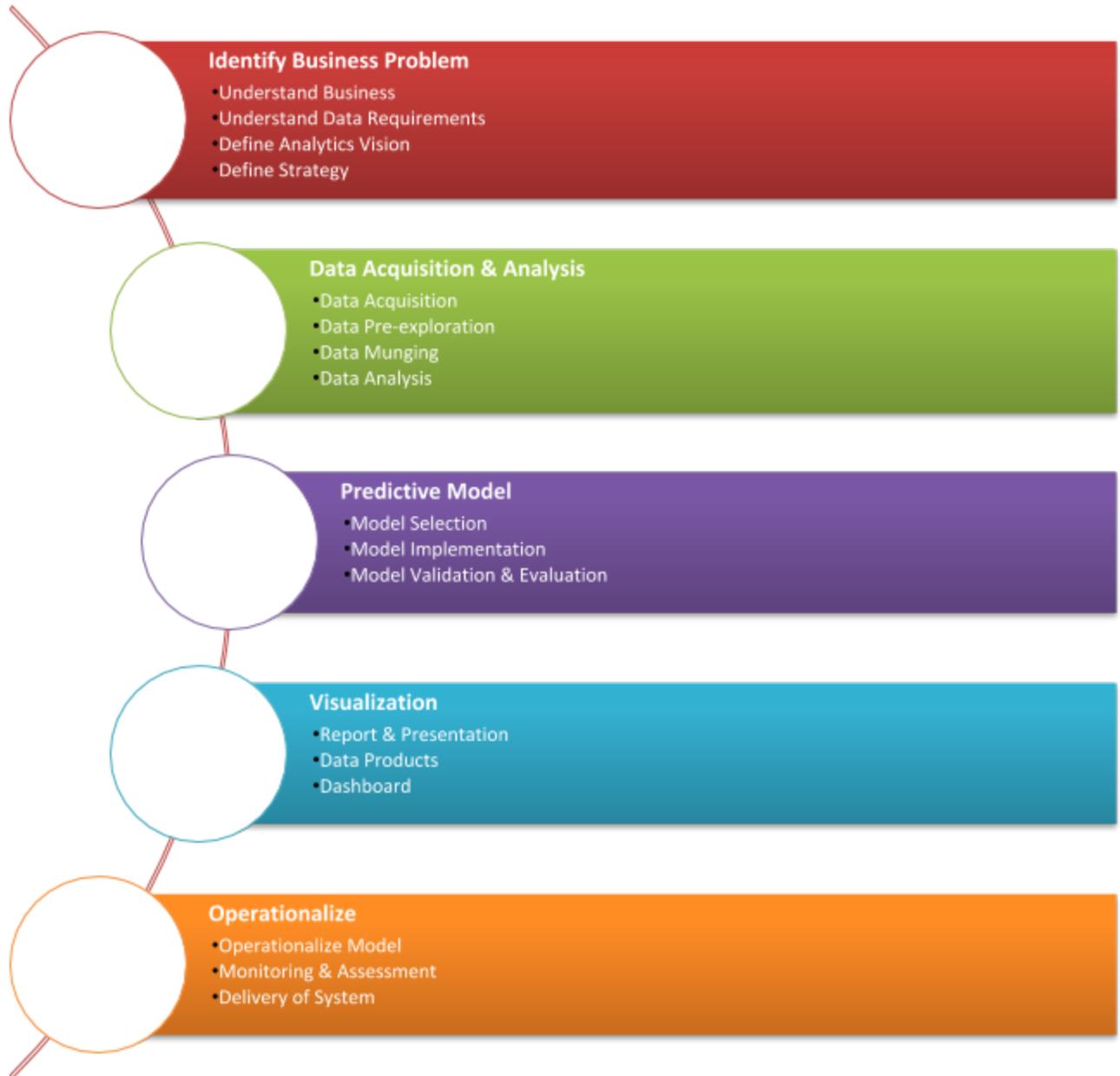
Identify Business Problem
- Understand Business
- Understand Data Requirements
- Define Analytics Vision
- Define Strategy

Data Acquisition & Analysis
- Data Acquisition
- Data Pre-exploration
- Data Munging
- Data Analysis

Predictive Model
- Model Selection
- Model Implementation
- Model Validation & Evaluation

Visualization
- Report & Presentation
- Data Products
- Dashboard

Operationalize
- Operationalize Model
- Monitoring & Assessment
- Delivery of System

Figure 5. Five building blocks of DevBatch

Case Studies of Telecommunication

1. 360-Degree Customer View

The 360-degree customer view enables to create an on-demand analytical view across key customer touch points. To complete and extend 360-degree view, we support internal and external customer-related data to gain more specific and powerful insights of customers' behavior and interests. It provides a complete 360-degree view to sales and services teams which empowers them to grow upsell/cross-sell revenue opportunities and to better serve the customer.

Big data analytics help to better comprehend and foresee customers' behavior in an iterative process, which involves:

1. Data discovery or acquisition
2. Hindsight from historical data.
3. Identifying and integration of publically available data sources
4. Collecting, analyzing and correlating data across multiple data sources.
5. Selection and building of right models/machine learning algorithms
6. Model validation and results sharing for final kickoff.
7. Dashboard or data product
8. Operationalization of model
9. Verification, finalization and delivery of model with real time data.
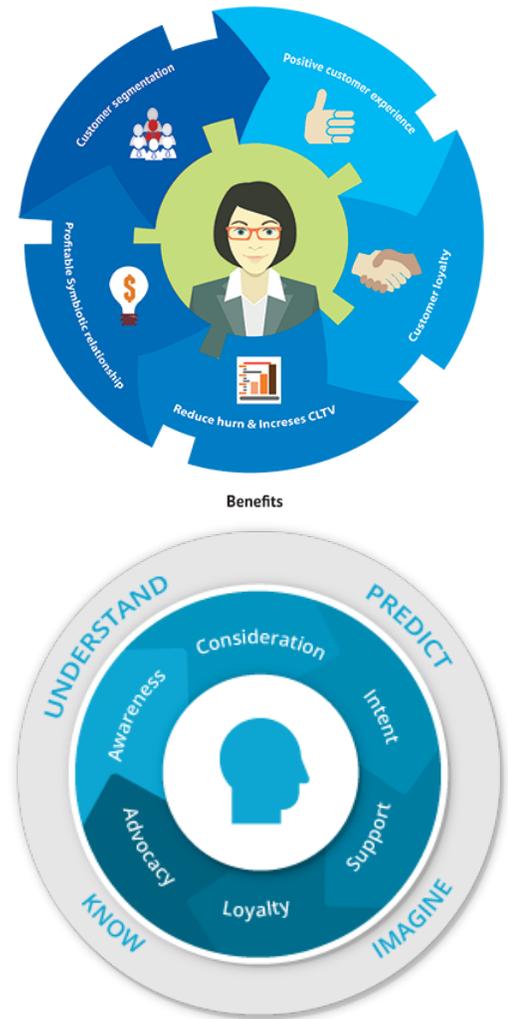
Figure 6. 360-Degree Customer View

2. Call Drop

Customers cannot avoid making calls no matter how much they like to utilize the messaging facilities. The most probable situation is when they are in the face of some emergency or professionalism. In such a situation call dropping can cause some sheer disappointment. It can even make a golden customer switch to another company in adversity. Majority of customers do not even file a complaint, but straightly switch the network. For the very reason it has become an unsolicited part at company's end to inquire the cause of call drop on its own.

Due to the high volume of voice data, it becomes difficult to analyze the reason for call drops, but it's essential to analysis. Following could be the possible reasons of call drops:

- Weak or failed network
- High network traffic
- Incompatibility of customer's' device
- Credit limitation
- Handover disruptions
- Outstanding balance

The analysis of call drops assists in capturing lost revenue. It can be further extended with the analysis of location and time to identify the specific problem. Moreover, through the proactive gaps analysis of service, propensity of churn can be reduced by improving customer satisfaction.

3. Sentiment Analysis:

Sentiment Analysis is as important to Telecom as the process of diagnosis is to doctors before treatment. Everyday companies are trying to put across new ways to take feedback and ratings from the customers pertaining of their services. Moreover, it gauges:

- The natural language discourses on different web forum
- Reviews and comments on website, social media pages,
- Services Survey and Campaigns Reviews via web or SMS

It gleans out the potential requirements of the users, their complaints, expectations, ease, level of satisfaction and dissatisfaction. It leads to better understand how customers perceive your products & services, while decreasing customer churn. It helps them drive their end in a better way towards the permanence of customers' association.

4. Location Based Services:

Geographical location data is a great source of providing real-time information. Organizations are shifting to collect location based data and connect it with their data to address tough business challenges. Accessed geographical data from device sensors i.e. Wi-Fi, Bluetooth, GPS, etc. and convert into user profile, it originates new ways to expedite with this data, such as:

- Assert real-time geography data
- Smart billboard advertising
- Location based mobile advertisements
- Geo-advertising search

Figure 9. Location Based Services

Conclusion

Big data analytics is becoming an increasingly important part of telecommunication industry. Big data techniques have a wide scope of implementation therein. It can become a great foundation of identification in precise segmentations, reducing failure rates, optimization of resources and increase in sales and revenue. The tools of big data analytics are essential solution that do not only address industry requirements, but also provides influential insights and actionable business intelligence. Their falling rates and expanding functionalities are enabling telecommunication industry to make smarter decisions on an ever-growing datasets.

Big data analytics defines the path of business success!

Our Working Areas

Category	Domain Specific	Description	DevBatch Services	
			Online Model/Data Product	Statistic/ Vis Report
Marketing	Churn Analysis & Prediction	Working out the characteristics of churners, allows a company to product adjustments	Y	Y
	Predicting Lifetime Value (LTV)	what for: if you can predict the characteristics of high LTV customers, this supports customer segmentation, identifies upsell opportunities and supports other marketing initiatives	Y	Y
	Customer Segmentation	If you can understand qualitatively different customer groups, then we can give them different treatments (perhaps even by different groups in the company). Answers questions like: what makes people buy, stop buying etc	N	Y
	Wallet Share Estimation	working out the proportion of a customer's spend in a category accrues to a company allows that company to identify upsell and cross-sell opportunities	Y	Y
	Target market	Understanding the target helps you determine exactly what your products or services will be, and what kind of customer service tactics work best	N	Y
Network	Fraud detection	To detect and prevent Call and SMS spamming, and subscription fraud	Y	Y
	Network optimization	To Analyze the sensor data installed in various parts of the city to predict whether problems that could lead to a network disruption	Y	N
Customer Support	Call centers	Call routing (i.e. determining wait times) based on caller id history, time of day, call volumes, products owned, churn risk, LTV, etc.	Y	Y
Human Resource	Employee churn	predicts which employees are most likely to leave	Y	Y
	Training recommendation	recommends specific training based of performance review data	Y	Y
Other	Sentiment Analysis	To analyze the feedback information, complaints and social feeds	N	Y