PwC's telecom analytics solutions







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PwC India's telecom analytics: An overview

Our telecom analytics solutions can help clients gain a competitive advantage by getting valuable insights about their operations and customers and taking the right decisions at the right time.

Telecom companies are constantly faced with many difficult questions concerning the best course of action. These can include:

- How do we increase the average revenue per user (ARPU)?
- Who are our **most valuable** customers?
- Whom should we **target** for the next promotion?
- How do we find the **ideal bundle** of products?
- How do we enhance **customer loyalty**?

Churn prediction	Revenue forecasting
Social network analysis	Customer segmentation



Telecom analytical framework



Our solutions

- The solutions comprise **predictive** and **prescriptive modelling techniques** which are capable of capturing various decision-influencing factors and their interrelations and of discovering hidden relationships.
- Retail analytics solutions can be offered as **analytics as a service** to clients or as **off-the-shelf products**.
- Our solutions are designed to enable telecom clients to achieve a **low total cost of ownership (TCO)** and **high return on investment (RoI)**.



How our solutions work...

Advanced next best offer



Business challenges

• To recommend products or services to customers based on their purchasing behaviour

Analytics solution and results

• A collaborative filtering model/singular value decomposition (SVD) is used to make automatic predictions about the interests of a customer by collecting preferences information from similar customers.

Results: Targeted product recommendations to customers

• Recommendation of products/services to increase customers' wallet share

Product recommendations

• Increased customer loyalty and satisfaction

Sample snapshots and reports

1. Identifying product associations

Product associations

Current customer services

2. Recommending products to customers

Affinity analysis

Business challenges

- To analyse products and services which are sold together so that suitable marketing strategies can be developed to cross-sell and upsell
- To improve customer experience by identifying products which are most relevant to customers

Analytics solution and results

- An association rule algorithm is run which identifies the items purchased together by customers.
- The Apriori algorithm detects the purchase of products by the same customer **across the entire customer population.**

Results:

• The associated products **are incorporated into loyalty programmes and discount plans** to boost sales.



Sample snapshots and reports

1. Identifying product affinity

2. Inducing cross-selling and upselling in addition to influencing sales promotions



Profit-based customer segmentation



Business challenges

- To identify profitable customers based on their purchase history to develop suitable marketing strategies to reward them appropriately and at the same time increase their wallet share
- To develop loyalty campaigns to improve the customer profitability of non-loyal but high-potential customers

Sample snapshots and reports

1. Identifying customer clusters



Churn prediction

Business challenges

- High customer churn every month as compared to industry, resulting in loss in revenue and shrinking margins
- To identify which customer behaviours will trigger churn events and predict the likelihood of customer attrition
- To identify the key reasons for customer churn

Analytics solution and results

- Customer segments were created using advanced segmentation algorithms on the basis of their purchase behaviour, lifestyle, media consumption and other data.
- The highest-value segments were identified to generate increased revenue from existing customers while attracting new ones.

Results: Enhanced customer profitability

- Rewards and loyalty points given to customers act as strong incentives for them to continue their relationship and help ward off competition.
- Increase in the lifetime value of customers

2. Targeting customers

Customer type	Next best action
Best	Provide exclusive deals
High potential	Suggest premium products
Fast trackers	Send latest product catalogues
New	Increase loyalty through long-term offers

Analytics solution and results

- A survival analysis model was built to predict the time when a particular customer may churn.
- Based on customers' usage patterns, billing records, etc., the model can identify the probability of churn at the subscriber level.

Results: Reduce customer churn

- Appropriate retention incentives can be offered to the customer to retain him/her.
- Business processes that are identified as the reason for customers opting out of services can be modified.

Sample snapshots and reports

1. Estimating churn probability

Variable groups for churn analysis				
Voice call usage	Customer care details			
SMS usage	Location			
Data and VAS usage	Network age			
Recharge pattern				



2. Retaining customers through incentives



Social network analytics



Business challenges

- To use social network analysis (SNA) to understand customers and their communities better
- To define targeted treatments based on the network roles of an individual to encourage/discourage specific events (churn, acquisition, product adoption)

Sample snapshots and reports

1. SNA is focused on relations between subscribers (customers).

CDRs (Call	Detail	Records)	are	generated	for	each call:	

Node1	Node 2	Date	Class	Duration
705 626 2002	416 414 6454	1 Dec 07	Voice	00:04:22
778 388 4363	604 805 5682	1 Dec 07	SMS	00:00:12
Ser. Milling			14.4	القند

Revenue forecasting

Business challenges

- To forecast the cost of services to the subscriber and avoid billing shocks at the end of the month
- Telecom services are data intensive and can inflate the cost for a subscriber, leading to discontent and churn.

Analytics solution and results

- The social network helps classify 'leaders' who influence subscribers around them.
- Ties between two subscribers can be identified using voice, calls, SMS, MMS, etc.
- SNA provides more targeted upsell opportunities and tracks customers and their social circle and community.

Results: Customising service offerings

- New product adoption can be monitored by studying diffusion within a social network.
- Unusual behaviours (fraud detection) can be identified.
- 2. Using the billions of call records, social networks of users can be identified.



Analytics solution and results

• Develop a robust demand forecasting model through aggregation and statistical analysis of data based on a **customer's** usage profile, service requirements, value to operator, types of services, network capability, etc.

Results: Improved planning

- Real-time recommendations to subscriber if there is an unexpected spike in his/her usage pattern.
- Forecasting of estimated bills based on current usage pattern can help the subscriber manage his/her services better.



Sample snapshots and reports

1. Identify the key events and causal factors that impact demand.



2. Develop model-driven scenario analysis to analyse impact on demand.



Fraud detection



Business challenges

- To reduce leakage losses through preemptive fraud detection
- To enhance customer trust and increase brand loyalty
- To identify factors which lead to telecom fraud

Analytics solution and results

• A predictive analytics model can be built using network event data (mediation devices), billing data (billing system), customer data (CRM) and payments data (**accounts** receivable) to predict the likelihood of potential fraud in the future.

Results:

• The recommendations from the **model can not only** help protect operators against losses due to fraud but also enhance customer trust and prevent potential damage to brand image arising from revenue leakage incidents.

Sample snapshots and reports

1. Types of fraud in telecom

Fraud categories	
Subscription fraud	Dealer fraud
SMS/MMS fraud	Payment fraud
Call forwarding/diversion fraud	Internal fraud
Voicemail fraud	Roaming fraud

Pricing recommendation

Business challenges

- To understand the impact of a given change in price (pricing elasticity) on sales across products as well as the impact on contribution margin
- To ensure a consistent scientific methodology is being applied to pricing decisions across categories/outlets

Sample snapshots and reports

1. Establish price elasticity across the product portfolio.



2. Fraud management curve



Analytics solution and results

- A pricing model was built to set up an effective pricing structure for the various telecom products/services.
- Pricing was optimised to improve margins and bottom-line profitability.

Results: Improved planning

• Data-driven pricing suggestions that promote sales and incremental contribution margin



2. Suggest optimal pricing to drive immediate contribution margin.



Campaign targeting



Business challenges

Sample snapshots and reports

1. Determining the likelihood of a customer

- To identify which customers should be targeted and how much discount should be offered to them
- To increase ARPU and frequency of customers' visits

Analytics solution and results

• Based on customers' demographics and purchase behaviour, an analytical model can predict the **potential response of a customer**—average ticket size, percentage discount availed, etc.

Results: Enhanced response to campaigns

- Targeted campaigns lead to more effective response and reduced cost.
- Customised promotion offers for different clusters of customers increase their satisfaction.
- 2. Sending coupons, SMS to the selected set of customers

• Δ

- Incom
- Location
- Previous billing history

responding to campaigns

• Previous campaign response

Marketing mix modelling

Business challenges

- To understand consumer behaviour with respect to exposure to advertising
- To calculate the RoI of various marketing initiatives

Analytics solution and results

- A linear regression model showing the impact of various marketing campaigns on sales was developed.
- Media effectiveness and RoI were evaluated to simulate what-if scenarios.

Results: Media channel effectiveness

- Prioritising of advertising and promotion spend in favour of channels that provide better RoI
- Reduction in overall ad and promo spend

Sample snapshots and reports

1. Identify channels, campaigns and causal factors that impact sales.

2. Develop model-driven scenario analysis to analyse impact on sales.





Media spending

Customer lifetime value



Business challenges

- To calculate the revenue expected from the customer over the lifetime of his/her association with the company
- To allocate marketing costs on the basis of relative value of customers

Analytics solution and results

- A survival model is used to estimate the lifespan of a customer.
- A regression model is used to estimate the lifetime value of a customer.

Results: Customise marketing strategy

- The solution not only analyses the value of a customer based on the purchases done in the past but also estimates his future value.
- The marketing spend can be optimised according to customer value.

Sample snapshots and reports

1. Calculate customer lifetime value (CLV).

Customer segmentation based on RFM model Customer profiling based on past purchase behaviour in terms of recency, frequency and monetary value. Probability of customer having active relationship with business for the defined time period Cost estimation of each segment Cost estimation of each segment Customer taking profiling based on past purchase behaviour in terms Customer profiling based on past purchase behaviour in terms of recency, frequency and monetary value. Probability of customer having active relationship with business for the defined time period Customer taking profiling based on past purchase behaviour in terms of recency, frequency and monetary value. Probability of customer having active relationship with business for the defined time period Customer taking profiling based on past purchase behaviour in terms of recency, frequency and monetary value. Probability of customer having active relationship with business for the defined time period Probability of customer having active relationship with business for the defined time period Probability of customer having active relationship with business for the defined time period Probability of customer having active relationship with business for the defined time period Probability of customer having active relationship with business

Sentiment analysis

Business challenges

- To capture customer feedback across various social media platforms and derive meaningful conclusions from it which can be sent to relevant functions within the organisation
- To improve brand strength and engage customers in a meaningful way

Sample snapshots and reports

1. Capture customer conversation on social media platforms.

2. Use CLV results to optimise marketing spends.

Before CLV calculation			After CLV calculation			
Segment	Revenue	Spend	Segment	Revenue	Spend	
Premium	500 USD	15 USD	Premium	500 USD	50 USD	
Medium	200 USD	10 USD	Medium	200 USD	15 USD	
Low value	80 USD	5 USD	Low value	800 USD	8 USD	

Analytics solution and results

- Web crawlers can capture the unstructured data across various social media platforms.
- A text mining model parses the conversations into positive, neutral and negative buckets.

Results: Instant customer feedback

• Sentiment analysis can help to track consumer behaviour in real time across channels, monitor the **brand's health** online and uncover the levers that can have a significant business impact.



2. Develop sentiment analysis for business insights.



PwC's telecom analytics solutions 9



PwC's approach involves a well-defined process of using analytics to identify opportunities for value creation, demonstrate quick wins and scale solutions to meet the needs of the business.



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