Data Mining for Customer Service Delivery Optimization

White Paper

Introduction

In today's hypercompetitive scenario, it is a significant challenge to retain existing customers and to attract new customers. The only way to achieve both is to learn what customers want and how well they want to be serviced. While there are many sales & marketing analytics solutions to target and attract new customers, there are not many analytics solutions for customer service delivery optimization. To retain the existing customers, their experience with the company should be made smooth and pleasant. All their interactions with the company must be recorded and analyzed to uncover the hidden sources of poor customer experience that leads to dissatisfaction and attrition. It is important to identify the patterns of behavior that customers exhibit to resolve their problems, regardless of channel, reason or time of contact.

Unified Customer Experience Management: The Next Battleground

CEOs across the industries have just begun focusing on the critical role that customer experience plays in keeping their companies competitive and profitable. There has been a tremendous pressure on the companies to move beyond CRM (an operations/marketing centric, transactional, inside-out approach) to Customer Experience Management, which is a customer centric, holistic, outside-in approach to drive customer advocacy. The purpose of CEM is to provide pleasant experience to all the customers every time across all channels of contact. In the last 5 years, a new role called 'Chief Experience Officer (CXO)' has been created in hundreds of organizations. While CRM tools are highly leveraged by CMOs, CEM tools are heavily leveraged by CXOs. CEM is a strategic differentiator since it can not be copied by the competitors. Hence, the CXO ensures that the board room pays enough attention to the CEM programs.

A Google search for the term 'Chief Experience Officer' will reveal the growing importance of CXOs across the industries.

Analyst Views

"Forrester recently surveyed 287 customer experience decision-makers from large US firms about their 2008 plans. Almost all — 91% — said customer experience will be either very important or critical to their 2008 efforts

……as momentum behind customer experience builds, companies will soon be fighting to prove the superiority of the experience they provide. Companies must look "beyond the browser" and invest in the quality of improving cross-channel interactions, something 78 percent of respondents claim is a higher priority for 2008" "Obstacles To Customer Experience Success, 2008" Forrester Report; February 7, 2008.

"Most firms today struggle to measure the quality of their customer experience. To establish a framework for measuring customer experience quality, firms should identify key customers, the most important moments of truth in the customer experience continuum, the criteria customers use to evaluate those critical interactions, and metrics — both subjective and objective — that capture how well the organization met customer expectations in each area" The Customer Experience Quality Framework" Forrester Report; May 23, 2007.

Which of the following best describes your understanding of the term "customer experience management" (CEM)?

	% respondents
Process to improve customer interactions at every touch point	56%
Strategy to influence positive customer behaviour	27%
The same as customer relationship management (CRM)	7%
The term is unfamiliar	7%
Other	3%

- *81 percent of organizations agree that the customer experience impacts loyalty and advocacy; 73 percent concur that it impacts satisfaction and spend.*
- *Less than one third of organizations use analytics to understand what is happening in customer interactions; most rely on subjective, irregular, and delayed feedback from agents and customers.*
- *Less than two thirds have documented processes to govern the customer experiences they deliver; and less than a third has processes for handling multi-channel interactions*

."Measuring and Managing Customer Experience" Survey Results by Vedanta Research, March 2008

Impediments to Superior CEM

There are several challenges in ensuring a differentiated and consistently superior customer experience all the time.

Some of these challenges are:

Ignorance, Assumptions & Complacency

These are the most important impediments. The management believes that they are providing superior customer experience. As per a study by Bain & Co, 80% of the companies believe that they provide superior customer experience whereas only 8% of their customers agree to that. This 80/8 customer service delivery gap is still common among several large B2C companies.

Moreover, many companies assume that Quality Monitoring (QM) is the ultimate step in monitoring customer satisfaction. In fact, QM indicates only how well the customer was handled rather than if the customer was really satisfied or not. QM as well as speech analytics techniques can show only less than 50% of the true customer experience story.

Operational complexity

It is a big operational challenge to manage a multi-channel, multi-site, multi-time zone, multi-lingual, multi-business and multi-partner customer service delivery operations. Ensuring consistency in customer experience in such environments is a daunting task.

Lack of appropriate systems, processes and standards can further complicate the service delivery.

Technological Complexity

Customer service delivery is technology intensive. It requires more complex and expensive IT infrastructure and systems. Typical IT systems required are: ACD, IVR, Dialer, Quality Monitoring system, CTI server, SMS server, WFM, CRM, Website, MIS / BI and other support systems. These systems generate huge amount of raw customer interactions data every hour. In fact, the same copy of raw data is generated by many of these systems which makes the data volume growth exponential. Almost all of this data is trapped in disparate systems which makes it very difficult for managers to discover how the customers are treated in the Contact Center, IVR, Website, and Back-office channels.

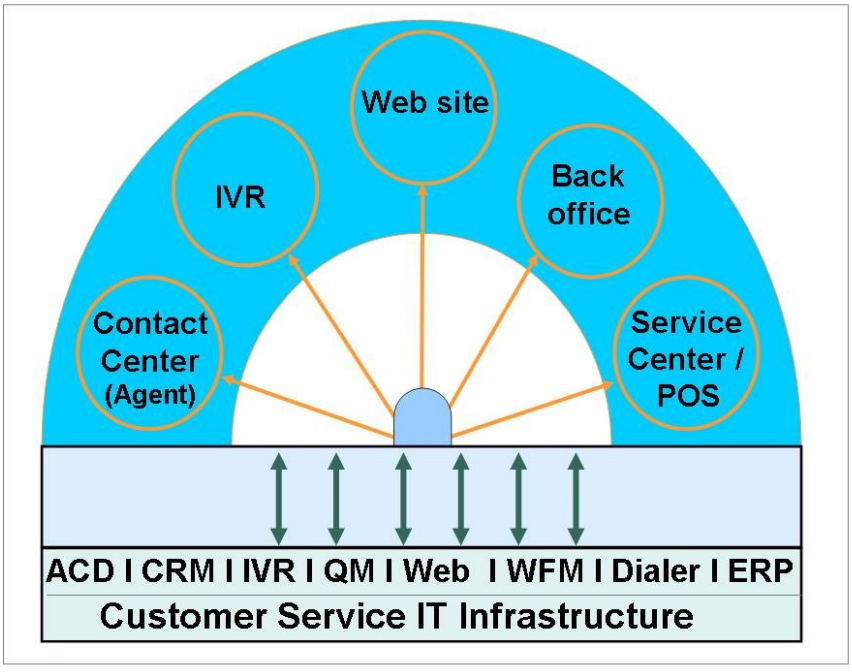
The MIS data that is presented to the managers is very superficial and tell only a fraction of the truth. The managers have no access to deeper actionable intelligence to manage and improve customer experience holistically across all the customer touch points.

Inadequate Budget

Customer service delivery requires substantial budgets as the cost of technology infrastructure and people resources is very high. Often managers are left with managing conflicting goals like improving CSAT and reducing the cost of operations. Many times, a perfect balance between these two goals is practically not possible to achieve.

Data Mining Techniques for CEM

The goal of data mining is to discover new knowledge and facts from huge volumes of data. The new knowledge and facts discovered can be used for taking critical business decisions that can improve both bottom-line as well as top line. Data mining helps business managers discriminate between what is relevant and what is not by using a broad range of tools from statistics, database technologies and visualization.



The business objectives of using data mining tools and techniques in customer service function are:

- Measuring, monitoring and improving customer experience holistically across all the customer touch points
- Detection of behavioral patterns which customers exhibit prior to terminating relationship with the company early enough to avert attrition
- Identification of internal organization and technology issues that impact customer experience

There are several data mining techniques that can be used effectively to monitor the customer experience and satisfaction levels continuously. The following table gives an idea of what data mining techniques are available and how they can be leveraged to address the pain points in delivering superior customer experience.

Data Mining Terminology	Description	Technique (Statistical Algorithm)	Applications in Customer Experience Management
Predictive Analytics			
Regression	Predict an output or value based on an input record or values	Neural Networks, Linear Regression, Regression Trees	Prediction of performance, next action by a customer, revenues, spares demand, CC staffing, staff attrition and other KPIs
Classification	Predict a class that an input record belongs to	Neural Networks, Bayes Networks, Support Vector Machines (SVM), k- NN, Decision Trees	CC staff attrition analysis, Root cause analysis
Forecasting (Time series)		Neural Networks, Gene Expression Programming (GEP)	KPI trend Analysis, Forecasting of future revenues, CC staffing requirements, # of calls, website visitors, spares demand , inventory levels, reorder points, stock outs, production levels etc
'What if' analysis (Deterministic simulation)	Sensitivity analysis	Regression Algorithms	Scenario planning (examples of KPI analysis): • What if the call volume goes up by 15% next week? How will it affect ASA, Service Level, Average No. of Calls Waiting,, # Agents required, Agent Utilization etc? • How much improvement in efficiency (# of agents required, Service Level etc) can be achieved if AUX time is reduced by 10%? • How much of impact CSAT has on customer attrition? • How sensitive is CSAT to FTR? • How CSAT will be impacted if the call volume goes up by 15% next week? • How CSAT will be impacted if AHT is reduced by 10%? • How the agent's training & quality scores impact FTR and hence CSAT? • How staff attrition rate will affect my SLAs like ASA, Abandon rate etc? • How addition of trainee CC staff will impact CSAT,

			FTR, Revenues etc?
Descriptive Analytics			
Clustering (Segmentation)	Grouping based on the similarity of the behavioral attributes. There is no specific output to predict.	Self Organizing Maps (SOM), Fuzzy Logic, K-Means	• Identifying customers with similar patterns of issues / behaviour • Identifying customers requiring similar type of assistance • Website & IVR users with similar usage pattern • Identifying agents with similar problems / training needs / specialty
Association & Sequencing	How frequently an event is happening and in what combination	Association Rules	Customer Complaints & Spare parts consumption analysis E.g: 60 % of the customers who contacted for Complaint A, also contacted for Complaint X within 5 days.
Artificial Intelligence / Pattern Recognition / Machine Learning	Non-linear method that searches and 'learns' hidden patterns and their relationship to the desired behavior	Neural Networks (NN modified for heterogeneous data (numeric, string and text)) , Decision Trees, SVM, SOM	• Website usage pattern analysis • IVR menu usage pattern analysis • Identification of customers requiring special assistance • Recommendations for making the experience smoother & friendlier • Network log analysis for better IT infrastructure security & availability
Text Analytics	Extraction of key words & patterns, Indexing	Neural Networks, SVM	Qualitative customer survey analysis, complaints analysis, Sentiment analysis
Speech Analytics	Extraction of key words & patterns from recorded speech	Bayesian, Neural Networks & Pattern Recognition Techniques	Customer experience analysis, Complaints analysis, emotion & sentiment detection

Note: While there are many different definitions available for the various techniques, the table here contains terms & their descriptions that are commonly used in CEM. Other experts or articles may define these terms and groups slightly differently. Moreover, the terms Data mining, Predictive analytics, AI, Pattern Recognition, Machine learning etc are used interchangeably sometimes because of the similarity of the statistical techniques behind them.

Conclusion

Use of data mining tools help managers uncover the systemic relationships that they were not aware of or they could not recognize before. These tools allow them to see critical patterns of customer experiences that would have normally escaped their attention if they had relied on traditional MIS reports only.

Metrica Systems' PredicaWorks is a data mining tool with a comprehensive set of data mining techniques custom designed for holistic customer experience management. The nuggets distilled by PredicaWorks from large volumes of complex customer interaction datasets help fine tune the customer service delivery channels to deliver superior customer experience consistently across all the channels.