White Paper

Voice of Customer: Using Customer Actions That Speak

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Executive Summary

Companies have been using Voice of Customer (VoC) analytics to understand and predict customer behavior for a long time. For example, to know if there are any dissatisfied customers likely to opt out of their product or service, or how readily customers might switch to their new offering.

Traditional VoC analytics relies on two types of data sources - structured data from customer feedback surveys, focus groups, individual interviews and phone inquiries, and unstructured data from blogs, forums, call center logs and social media sites.

Data from these sources is then organized and analyzed such that it can be used by diverse teams across the organization, like product engineering, manufacturing, sales and marketing, quality and customer support.

In this paper, we will discuss how companies can use data captured from customer actions, such as clickstream data or data from on-board diagnostic (OBD) systems and employ that for VoC analytics.

Voice of Customer: Traditional Data Sources

Structured data collection and analysis techniques such as feedback surveys, interviews, product failure data and phone inquiries have been in use for a long time. Business intelligence and analytics obtained from structured data can help improve customer experience and satisfaction in many ways, but at the same time has certain limitations.

The following graph shows the collection and action performance on structured data.

The feedback derived from structured data is partially shared within the organization and nominally used for improvement. Even with a correct sample of customers and the right kind of survey, the information gathered using such methods is inherently biased. It is biased due to the fact that customers know they are involved in a feedback process, and that can subconsciously affect their answers. It might be biased by the timing of data collection since customers are likely to give more weightage to the most recent experiences. Moreover, it only represents what the customers perceive to be wanting, and may not correctly predict their actions and responses to real situations.
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Radical Intelligence: Experiencing Customer Experience

Gartner carried out a research on customer experience management in 2008 and found that only 1% customers rely on direct interaction with the enterprise to provide feedback on their products and services, while 99% customers rely on self-service and social networks.

Companies do not have much control over customer feedback data on community forums, blogs and social media sites, and this kind of data is largely unstructured. The more recent use of unstructured data to get to the voice of customer provides relatively unbiased and timelier information.

However, use of unstructured data requires sophisticated text analysis methods to ensure accuracy and traceability, and knowledge of language syntax and sentiment analysis using Natural Language Processing (NLP) methods. These methods are complex and heavily dependent on industry-specific terminology and jargons.

Other sources can be used if they can help collate data on actual customer actions in an automated and repeated way. One form of it is clickstream data that online retailers have been using for a long time to provide recommendations and other useful features based on prior purchases of the same customer. Social networking sites also use clickstream data by collecting information from a user’s profile to suggest further actions for the user. This kind of data is directed to an individual customer by making use of that user’s past behavior.

The other form of such data is where a collective view of user actions is taken for a much larger sample of customers, and need not be limited to companies in the Internet space.

Customer behavioral data can be a useful source of information if it can be collected in an automated and repeated way.

Key benefits:

> Offers anonymity and privacy of customer data
> Due to larger base availability, allows to employ suitable sampling techniques rather than convenient samples
> Allows for continuous and timely analysis
> Provides conclusions based on real user actions instead of user perception or biased feedback
As an example, mobile service providers can use data on usage patterns of their various services to provide better suited plans to their customers, and can further study usage patterns by demographics to provide unique services directed at strategically important demographics. Television and radio networks can get the most accurate information on top rated shows if the information is derived from actual user behavior and a huge sample of users.

The collection of viewership data by Digital Video Recorder (DVR) companies, for example, can keep the data anonymous and still use a huge sample of users to arrive at television ratings. The possibility to use a random and bigger sample ensures higher accuracy, especially for networks targeting a niche audience that could otherwise not be measured at all.

If the method of data collection is inherent to a product or service, like mobile service providers or DVR example, or if it can be built to collect data without interfering with user experience like vehicle health and OBD, the value of such data is enormous. In addition costs associated with costly market research techniques that rely on structured data based on user engagement and feedback can be avoided or reduced to a great extent.

**Actionable Insights: Before You Lose Them!**

The insights derived from data collected by user actions are unique and often times the traditional approaches to gather customer feedback will not be equipped to replace it.

To extend to the example of using DVR data for calculating program and commercial rating, this data is unique due to the granularity it offers. It allows to study what portions of the program were watched more than once (repeat viewership), for example, certain portions of the Super Bowl telecast, or what portions were skipped (fast forwarded) by most viewers, for example, some portions of late night talk shows on broadcast networks or performance by a particular American Idol contestant. It also allows for more accurate demographic breakdown of viewership and top rated shows and commercials.

The benefits of recording and studying user actions in this manner can be applied to other industries as well. For instance, for smartphone manufacturers, data showing what features are most popular among users and in what fashion do they use the interface can help companies innovate and prioritize their offerings. This is especially relevant for products and technologies in initial stages to help study the usage pattern of early adopters, and with new product versions that radically experiment with the way users had been using the prior versions of the product.

Taking example of original equipment manufacturers (OEMs); data from warranty claims is an indirect wealth of information to analyze product performance in the field. It helps OEMs understand the failure patterns in products, and can be analyzed for specific demographics and environmental conditions. An increasing number of warranty claims reflect increasing product downtime affecting customer satisfaction. But if the emerging issues are foreseen, analyzed and acted upon proactively, significant amount of money can be saved for OEMs with the future warranty cost avoidances.
The customer usage data also provides insights into performing root cause analysis for defects, and can be used as early as product development phase and continued through defect testing, beta testing and on field product versions. It can help perform better cause-and-effect analysis since it is generated based on real rather than perceived actions. Moreover, the increased volume of data availability further helps improve the accuracy of root cause detection. Lastly, data is available in a more timely fashion and eliminates manual processes of field recording and sending failure data to engineering.

Such faster and more accurate defect detection can help reduce development and quality costs as well as warranty costs. Most often, the warranty costs spike due to chronic defects that could have been caught much earlier if data collected through in-built diagnostics and logging is parsed and BI is built around it on time.

Sub-verticals in the transportation industry such as Automobiles, Aerospace, Rail and Marine have a high degree of on-board diagnostics that can be leveraged for health monitoring and diagnostic practices. This real time information can be derived from sensory electronics built into equipment for legislation related safety and emissions standards, and usually has many data points that are available but not used for analysis. This data can be transferred periodically or during maintenance and act as a storehouse of information for product engineering, quality and service operation teams for defects and warranty related diagnostics. With intelligence derived through equipment condition monitoring, deterioration of the product can be tracked in real time to provide invaluable inputs to OEMs’ product engineering group. Engineers can foresee upcoming maintenance issues and take corrective actions timely, which can save millions of dollars to OEMs by reducing or eliminating product recalls and fleet upgrades under warranty.

This intelligence not only helps root cause detection, but also triggers more prognostic approach to drive precise and timely engineering changes. This data can also be used in engineering design initiatives such as ‘design for self-repair’ to help customers diagnose and fix issues remotely on their own, and ‘design for serviceability’ to make the repair process simpler and quicker for technicians.

**Key Challenges**

Clickstream and OBD data analytics come with their own sets of challenges. Invariably, the biggest challenge with any BI project is data itself. This is because data is seldom available in a standard format or from a single source. In the examples discussed above, data will need to be collected from different platforms, and hardware and software versions, and this adds to the challenges associated with standardizing data to be fed to the analytics solution. Additionally if source data itself is the output of some software, for example, a piece of code that generates data logs rather than manually collected data, then it is more important to define rigorous clean up and quality measures before that data can be used.
Very often, data requirements extend beyond data generated internally to external sources of public data, and require further merge and standardization techniques. Underestimation of data cleansing requirements will lead to inaccurate and inconsistent data that can defeat the business objective altogether.

On the business side, skilled resources are needed that can define the correct KPIs to measure, perform what-if and cause-and-effect analyses, and develop methodologies to study data trends. On the technical side BI projects are quite different from other enterprise Online Transaction Processing (OLTP) solutions. The biggest constrained resource in BI projects, especially with high volume solutions dealing with user actions, can be the hardware itself and needs skilled database administrators to define data load, data storage and retrieval procedure suitable for the project.

Lastly, in order to derive real value out of such analytics, it is important to get timely and continuous access to data and typical BI solutions could be loading and testing data continually. The operations teams responsible for such systems always need to be on alert. Also, such systems need end-to-end automation not only for data loads and transformation but also for data quality. Proper statistical tests, trends and alerts need to be defined to continuously meet quality and time requirements for data availability.

**Conclusion**

Clickstream and OBD diagnostics data has many data points that if observed closely can be used to generate valuable analytics and insights, and can touch various teams across an organization. Many of these benefits involve understanding the customer using real customer actions, and we discussed cases where it can be translated to faster and accurate root cause detection for defects, focus on the right set of features, better customer service using on-board equipment condition monitoring and diagnostics to reduce warranty costs.

OBD systems can provide rich data that can not only solve the limitations of other data collection methods but also provide information that may otherwise be lost. Using clickstream analytics techniques on this data would provide intelligence which traditional VoC approaches lack. This kind of dynamic field diagnostics and warranty intelligence can help OEMs identify emerging issues sooner and take timely actions in the areas of product design, manufacturing, quality and reliability, customer service, training, and sales.

**References**

[http://www.gartner.com/it/content/776100/776114/3dec08_customerexperiencewebinar.pdf](http://www.gartner.com/it/content/776100/776114/3dec08_customerexperiencewebinar.pdf)

Cross-functional Warranty Management: A Closed Loop Approach to Boost Profitability
About Tavant Technologies

Tavant Technologies is a specialized IT solutions & services provider that leverages its expertise to provide impactful results to its customers. We have leveraged our unrivaled capabilities and domain insights to create game changing results for leading businesses across chosen industry micro-verticals. We are known for our long-lasting customer relationships, engineering excellence and passionate employees. Founded in 2000, we are headquartered in Santa Clara, California and service customers across North America, Europe, and Asia-Pacific.

About the Authors

Devendra Malekar has over 11 years of experience in warranty management and after-market services, primarily in the Aerospace and Automotive industries. Through his career, Devendra has played diverse roles across the warranty chain. A Business Architect at Tavant Technologies, Devendra specializes in re-engineering of warranty business processes and technologies to develop multifaceted and customized warranty management solutions.

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