



Deliver Innovation by Understanding
Customer Sentiments



Analyzing product and customer behavior provides valuable insights into what consumers want, how they interact with products, and where they encounter usability issues. These insights can lead to new feature designs and development, or even new products.

Understanding customer sentiment and knowing what consumers truly think about products or a brand are traditional pain points. Customer journey analytics provide insights into these areas, yet these solutions are not all designed to integrate vital sources of unstructured data such as call center notes or social media feedback.

In today's world, unstructured notes are part of core communications in virtually every industry. For example:

- Medical professionals record patient observations.
- Auto technicians write down safety information.
- Retailers track social media for consumer comments.
- Call centers monitor customer feedback and take notes.

Bringing together notes, which are usually available as free-form text, with other data for analysis has been difficult. That's because each industry has its own unique terms, slang, shorthand, and acronyms embedded in the data. Finding meaning and business insights first requires the text to be changed into a structured form. This manual process is expensive, time consuming, and prone to errors, especially as data scales to ever-increasing volumes.

One way companies can leverage notes without codifying the text is to use text clustering. This analytic technique quickly identifies common words or phrases for rapid insights.

Grouping Words Isolates Issues

Clustering words or phrases allows companies to identify trends or popular themes. Analytics can be performed on a variety of text, including:

- Employee e-mails.
- Customer complaints.
- Call center notes.
- Business forms.
- Social media posts.

Think Big Analytics, a Teradata company, recently performed a Teradata® Rapid Analytic Consulting Engagement™ (RACE™) for an automobile manufacturer. Data scientists and business consultants leveraged RACE because it allows high-value outcomes in just six weeks or less.

Data scientists used Term Frequency-Inverse Document Frequency (TF-IDF) and Cosine Similarity to analyze text information related to automobile safety issues. TF-IDF determines how important an individual word is compared to other words in the document. Cosine Similarity brings together and compares the document against another document for similarities. This helps identify common phrases. Together, TF-IDF and Cosine Similarity are a powerful combination that identify important phrases or themes that are commonly seen in a large corpus of customer notes.

Both TF-IDF and Cosine Similarity are part of the larger effort to include natural language processing (NLP) capabilities to cluster phrases and then identify the

underlying sentiments. Clustering helps isolate important areas of discussion. NLP provides an understanding into the nature of these discussions (e.g, positive, negative, neutral). With the auto manufacturer, the analytics isolated unique topics taken from call center and safety notes. The company could see specific issues and customer concerns. For example, the clusters showed customers with brake problems, power steering leaks, and other safety issues. Buckets could also refer to a safety problem at a specific factory. The manufacturer could then determine the origin of the problem and take corrective action.

Text and Notes Can Lead to New and Improved Products

Leveraging the insights and customer sentiment uncovered during a text and sentiment analysis can spark innovation. Companies such as vehicle manufacturers can use the intelligence to improve customer service and deliver an elevated customer experience. By learning what customers like and dislike about current products, companies can improve their design, such as adding new features to a car to enhance the driving experience.

Forming word clusters also allows companies to identify safety issues. If an auto manufacturer sees that numerous customers are expressing negative sentiment about black smoke coming from their cars, the company can respond. Likewise, manufacturers can address safety issues that are a concern to customers.

With comments grouped into buckets, companies have the ability to focus on specific customers who experienced a similar problem. This allows a company to, for instance, offer a rebate or special promotion to those who experienced black smoke.

Understanding sentiments can better inform a car manufacturer's policies. For example, customers have different lifetime values. A customer who complains just once but has a very large lifetime value can be a more urgent candidate for complaint redressal than a customer with a lower lifetime value with multiple issues. One may have spent \$5,000 buying the vehicle from a used car lot. Another may have a history of buying new cars from the manufacturer, and spent \$30,000 to buy the car off the showroom floor.

Using a Teradata analytical platform, companies can create a campaign that segments customers based on their value. This could allow repeat customers to get a \$500 rebate, with low value customers receiving a discount on their next service.

Companies can also segment customers by location. A manufacturer may want to take action with customers complaining of black smoke who live in California immediately because of the state's stringent laws, whereas the company can wait until the next scheduled service for customers with the same issue in Nebraska.

Every Industry Can Benefit from Text and Sentiment Analysis

All industries can use text clustering and analytics to innovate, address quality or safety issues, or improve customer service. Physician offices and hospitals can analyze medical transcriptions to uncover medical issues with a particular group of patients. Companies with call centers can identify common complains by monitoring customer calls. Financial advisors can review emails to ensure compliance. Utility companies can identify safety issues with a utility grid.

Text clustering also allows retailers to quickly understand what product lines their customers are excited about on social media, such as a new line of luxury good products. A retailer can drill down into a cluster to see specific issues, which can reveal that customers are raving about a new men's cologne that was just released.

Understanding customer sentiments, patient issues, or product safety considerations empowers companies to make more informed decisions. This can result in creating or refining products, enacting new policies or procedures, or developing solutions that meet customers' evolving needs.

Analyzing Notes Enables High-Value Business Outcomes

Managing the lifecycle of products and services continues to be a struggle for most companies. The massive volumes of data now available have complicated lifecycle management, creating new challenges for innovation.

At the same time, the rapid rise of consumer feedback through social media has left businesses without a strategy for digesting, measuring, or incorporating it into their product innovation cycle—meaning they miss a crucial amount of intelligence that reflects a customer’s actual thoughts, feelings, and emotions.

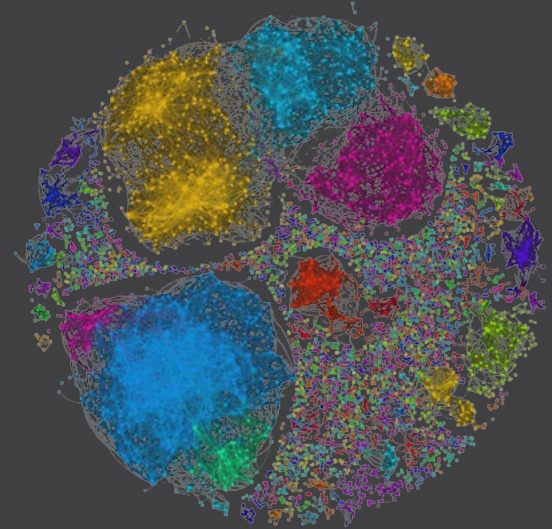
Text and sentiment analysis is one solution. Deconstructing topics from masses of text allows companies to see what common issues, complaints, or positive or negative sentiment customers have about products. These insights can lead to high-value outcomes, such as improving or creating new products that deliver a better user experience, responding timely to safety issues, and identifying which product lines are most popular with consumers.

Text Clustering Helps Solve Business Problems

Karthik Guruswamy, principal consultant and data scientist for Think Big Analytics, a Teradata company, explains how text clustering can quickly alert companies to potential customer service problems, manufacturing defects, or negative sentiment.



Watch the video.



Visualizing Auto Issues with “The Safety Cloud”

The Teradata Art of Analytics uses data science, Teradata® Aster® Analytics, and visualization techniques to turn data into one-of-a-kind artworks. To demonstrate the unique insights offered by text clustering, data scientists used the Art of Analytics to create “The Safety Cloud.”

Advanced analytic algorithms were used on safety inspector and call center notes from an automobile manufacturer. The analytics identified and systematically extracted common words and phrases embedded in the data volumes. The blue cluster represents power steering failure. The pink is engine stalls. Yellow is black smoke in the exhaust. Orange is brake failure. The manufacturer can use this information to gauge how big the problem is and if it’s safety related, then take actions to fix it.

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