

Speech Analytics – Use cases in Service Centers

Mr. Surya Putchala
CEO, ZettaMine Labs, Hyderabad
surya.putchala@zettamine.com

Ms. Sreshta Putchala
3rd Year B.Tech, CBIT, Hyderabad
rushya.putchala@gmail.com

Customer Experience

Providing exceptional Customer Experience is a bed rock of Businesses and one of the most important factors for its success. The customers interact with the Enterprise through variety of channels. In order to make this touch points impactful, contextual and interactive yet cost effective, the Enterprises are increasingly resorting to self-service based services that leverages Big Data and Artificial Intelligence based solutions.

Managing Customer relationships and sentiment through traditional CRM systems are inadequate in the age of multi-channel, open market and accelerated decision-making scenarios in which the current customers operate. The trends, tastes and preferences are changing more dramatically with the advent of B2B e-commerce platforms and business operations 24x7.

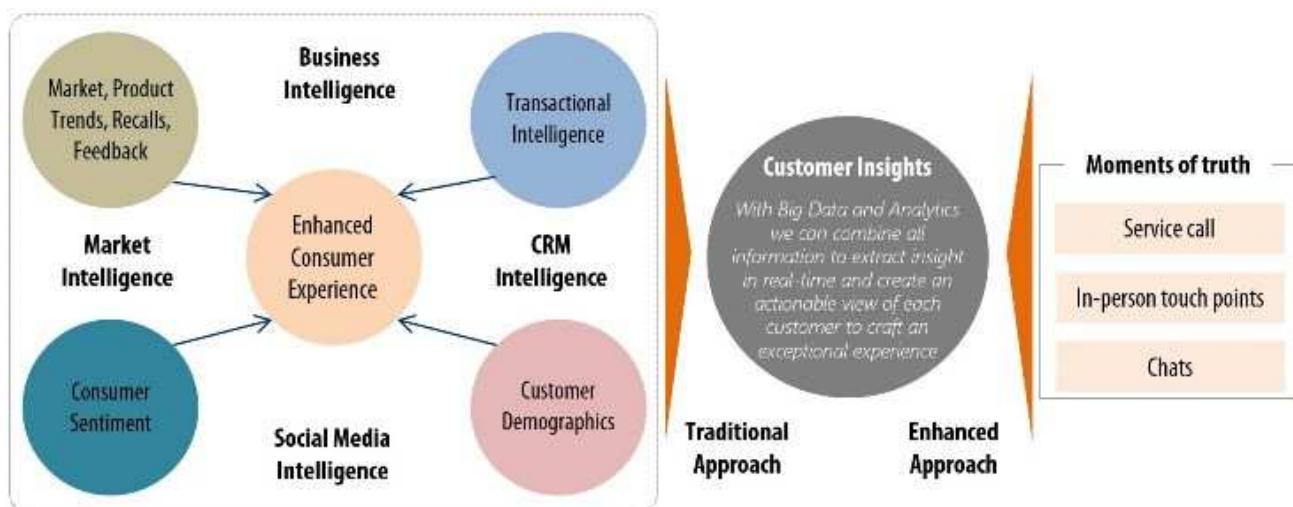


Fig1: Customer Experience and the role of Intelligences

The key pillars of Customer Intelligence come from the four pillars of

1. Market Intelligence: This gives the signals from the market
2. Business Intelligence: Gives out the past behavior of the consumers
3. Social Intelligence: Indicates the sentiments and current thinking of the customers
4. CRM Intelligence: Provides customer transactions for a rich context of their behavior.

These four pillars are traditional and retrospective and hence needs to be enhanced to leverage rich information emanating from all the sources by integrating multi-Intelligence data. Increasingly, more intelligence data is unstructured in text formats, video and audio. The technologies of Big Data and Artificial Intelligence paves way to innovative solutions to build solutions that could deliver exceptional Customer experience.

The Role of Customer Service Centers

Most enterprises experience the “moments of truth” at the time of customer service (for instance, a lost or stolen credit cards, inbound sales call, feedback on products/service, a canceled flight, a damaged piece of clothing, or investment advice) when customers invest a high amount of emotional energy in the outcome. These interactions have a dramatic impact on the Customer experience. Analyzing these interactions can give deeper insights into process, performance, and customer experience issues.

Customer service centers are dominated by voice interactions between customers and service center agents, who are the face of the company. In general, the audio call data is archived for reference and not mined for customer interactions and extract value from them. It is exhausting to hear the tapes; hence this source of rich data is routinely ignored. Often this data is never accessed, unless there is a special situation such as an escalation or a dispute. Most information is hidden and should be mustered from the customer call data.

Typically, conversations such as below dialogues are lost forever due to not utilizing the speech to text conversion solutions.

- Repeat interactions where the customer indicated they reached before
Sample phrases: “*called earlier*,” “*called twice already*,” “*third time I called*,” “*spoke to someone yesterday*,” “*couldn't get through*,” “*had to call back*,” “*have to keep calling*”
- Repeat calls where the customer indicated their issue had gone unresolved
Sample phrases: “*keeps happening*,” “*never heard back*,” “*hasn't resolved it*,” “*having the same issue*,” “*been more than a week*,” “*I've been waiting*,” “*was supposed to call/email me*”
- Interactions where customers complain or express dissatisfaction
Sample phrases: “*frustrating*,” “*you people*,” “*ridiculous*,” “*misleading*,” “*annoying*”
- Interactions where customers express appreciation
Sample phrases: “*you've been so helpful*,” “*thank you for caring*,” “*you deserve a raise*”
- Interactions where agents were unwilling to help the customer
Sample phrases: “*end of my shift*,” “*not my problem*,” “*I don't handle that*,” “*that's our policy*,” “*can't give that out*”

Speech Analytics

Speech Analytics should help organizations enrich customer interactions, improve business processes, and optimize their work forces to enhance loyalty, increase revenue, mitigate risk, and manage operational costs.

Of all the cognitive senses - Vision, Speech, Smell, Touch and Taste do not lend themselves for equally for analysis by Computers. The signals that can be measured, captured and stored in some digital format - Vision, Speech are detected, sensed and recorded and are currently being computationally handled. Various human systems are modelled. Vision has innumerable applications.

Speech and Voice Analytics are also exciting fields ripe with opportunities for the application of Natural Language Programming and Neural Networks. The enterprises are rapidly finding use cases that could leverage Speech Analytics.

The process of Speech Analytics starts with speech recognition, identifying various phonetics, accents, tone, mood, mixed language; which creates very challenging problems for Research. The traditional models of speech transcription are slow, labor intensive, error prone and cumbersome. Speech Analytics can be of two variants:

Archival Analysis:

This is accomplished by mining intelligence from thousands of recorded calls/chats essential for pinpointing cost drivers, trends, and opportunities; identifying strengths and weaknesses with processes and products; and understanding how the products/services are perceived by the marketplace.

It helps in identifying trending inquiries and provides a very rich “sandbox” to uncover various scenarios to develop triggers as well as identifying common pain points of the customers.

Many archival analytics were deployed successfully over the years in Enterprises. To enhance these applications to include real-time speech analytics allows much deeper insights and ability to respond to market conditions more appropriate.

Synchronous Analysis:

This may be considered as Real-time speech analytics. It can leverage indicators within the call conversations and analyzes them to proactively identify opportunities and guide these conversations towards the desired outcome that are beneficial to both the customer and the business – as the calls are in progress. These analytical solutions may guide the contact center agents by providing contextual guidance just at the right instance – when they need it, in real-time. Presenting actionable information in real-time with the right context provides a clear and significant competitive advantage. The solution is especially critical when dealing with compliance, regulations and industry mandates. Increasing customer retention and First Contact Resolution.

This is accomplished real-time and continuously monitored and tracked; which allows the service center the ability to provide superior customer engagement, handle situations at the right time to mitigate attrition and escalations.

The Architecture of a Speech Analytics solution

The Speech Analytics solution has is an intricately connected heterogenous software platforms, streaming and APIs. It also uses Machine Learning Artificial Neural Networks and NLP. The enabling components of this solution are illustrated in the diagram below:

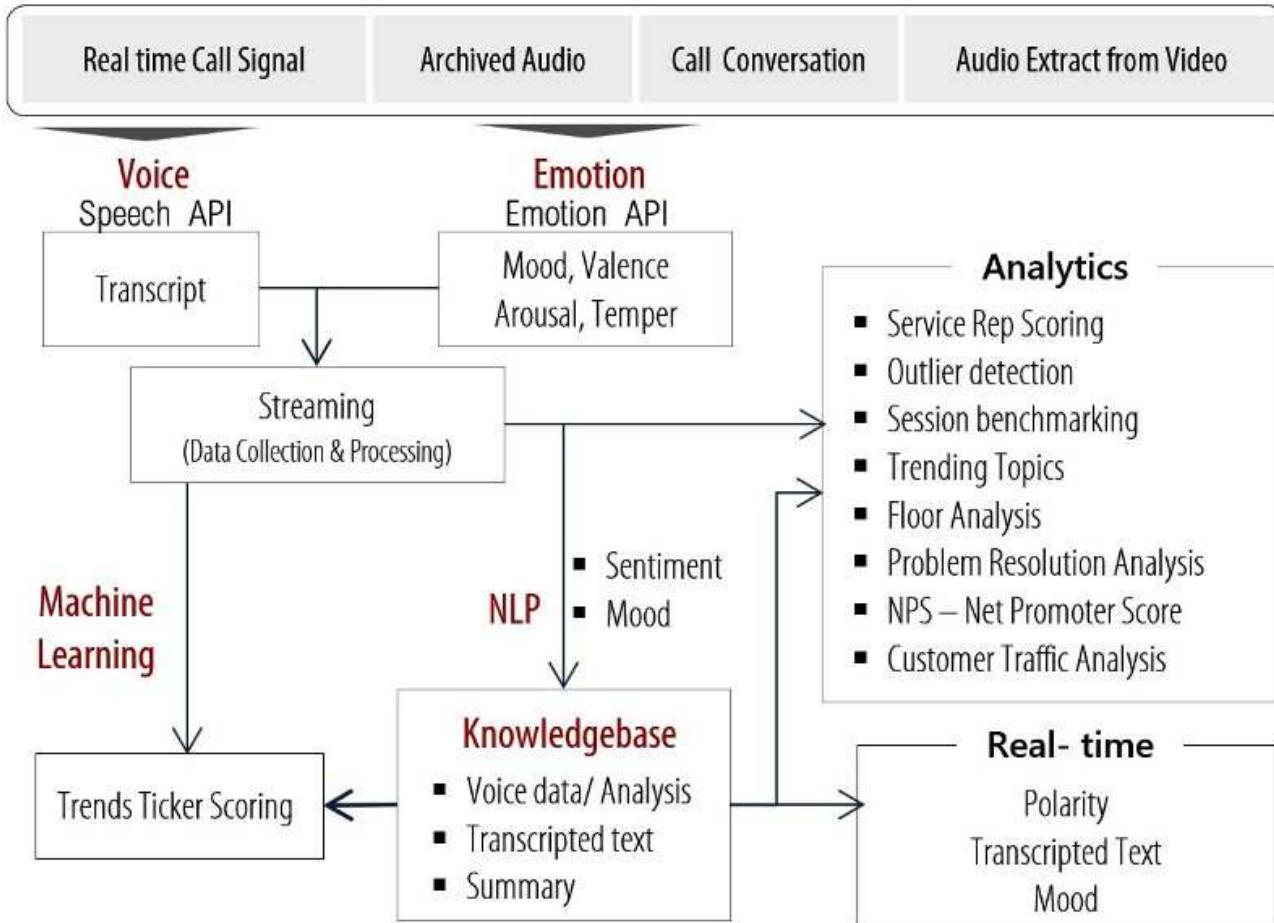


Fig2: Components of a Speech Analytics System

Streaming:

The Streaming module is handling by a Big Data infrastructure like Spark and will employ two APIs.

Voice Transcription

Convert voice to text using Statistical machine translation techniques and Sentiment of the customer (Meaning). *Capture the voice stream by applying various text and audio processing techniques. Understand the sentiments as well as mood of the conversation for a customer service call.*

One to transcribe the audio chat and the other to extract the mood or emotion. This functionality is achieved through Emotion API. It also deciphers the feelings and the meaning of a conversation.

Monitor calls as they happen by detecting words phrases and key topics of conversation. Audio sniffer with configurable keywords can also be used for escalations.

Creating and enhancing the Knowledgebase

- Two-way voice data (Customer and Support Executive)
- Results of voice analysis (quantitative and qualitative)
- Transcribed Text
- Polarity, Sentiment, Word cloud
- Summary and conclusions

Analytics

- *Agent Quality Scoring* – Score service center agent on various compliance parameters to enhance the quality assurance practices. This will also help to identify training and resource re-allocation requirements.

- *Topic Detection*: Provide sophisticated conversational analytics to automatically identify, group, and organize the words and phrases spoken during calls into themes, helping to reveal rising trends and areas of opportunity or concern. The solution should identify themes automatically, continually refine them, and add new themes over time.
- *Performance Analysis of the Service center*: Should process thousands of unstructured data rapidly. Analysis of this information should provide information about customer sentiment, up-sell and cross-sell opportunities.
- *Real-time Mood Analysis* – Analyze mood (Emotions) of the customer in a conversation. Customer service will enhance tremendously by knowing the moods of the customer and intensity of conversation which will allow taking necessary actions to provide better service for the customer.

AI and ML Techniques in Speech Analytics

Various AI, ML and NLP techniques are used in this solution. The flow of Analysis of a Speech Analysis system is represented in the diagram below:

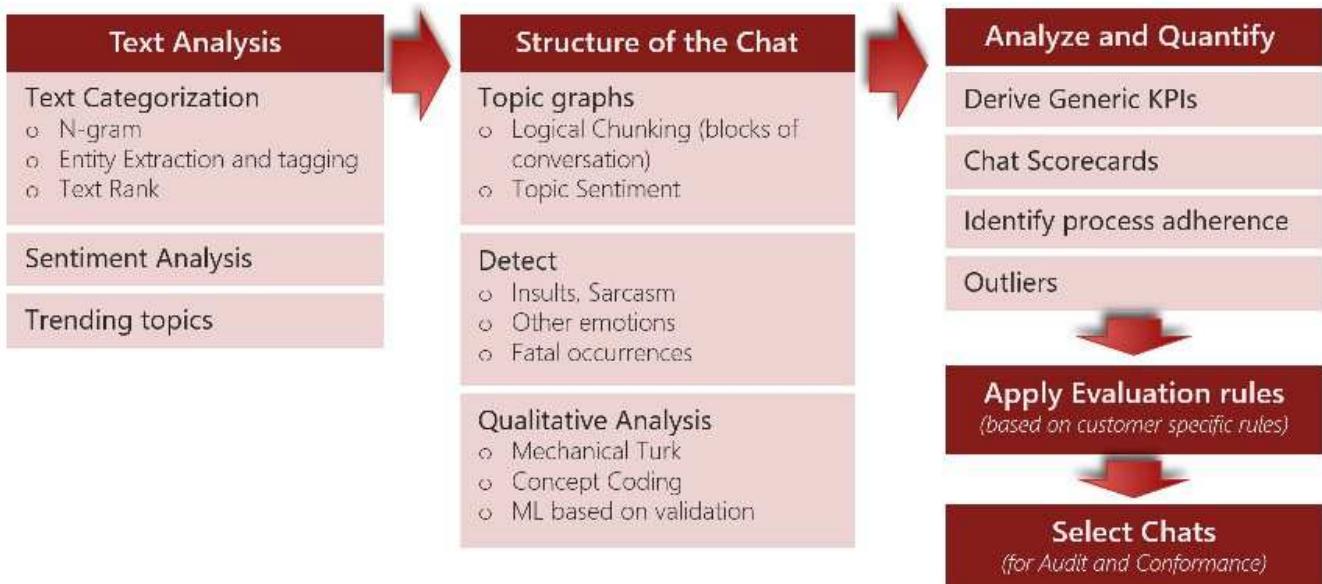


Fig3: Text Analysis Components for a Conversation

Major benefits for a Service Center:

Analytics has a great potential to enhance customer perception by pre-emptive actions that will result in preventing customer dissatisfaction and increase customer delight; achieving a superior service center performance. The following are some tangible benefits of the system:

Enhanced Customer Handling

Customer service will enhance tremendously by knowing the moods of the customer and intensity of conversation which will allow taking necessary actions to provide better service for the customer.

- Quickly resolve customer issues thus improving Customer Experience. Analytics can be used to predict “Call Reason” or identify the “Next Best Action”
- Proactively address needs thus arresting Customer Attrition by tracking the trending issues and access most relevant answers
- Predict consumer demand: Prevent- Prepare- Respond - Recover Structure through anticipated future behaviors
- Adapt recommendations through 80% Recommended Resolutions achieved through Information Retrieval, Content Management and Wikis
- Recommend and help fine-tune products and services thus help enhance revenue by up-selling and cross selling. Speech analytics may enable the agents to handle customer resistance while selling. The solution may identify a customer’s eligibility, the potential product of his interest.

Smooth Operations

The efficiencies will further improve by knowing the trending call center enquiries and deploying the right person for answering the right issue.

- Call Forwarding to most appropriate Staff
- Help to Identified Most Efficient Employee to take up the calls
- The Best CSR handling a given customer: Recommender and matching
- Create Lasting relationships by improving Service Quality
- Implement effective self-service and help reduce Operating expenses
- Ensure incoming calls are retained, engaged and serviced: Adaptive and Smart IVR

Final thoughts:

Competitive advantage of a company often depends on anticipating and addressing market needs faster than the competitors. Calls received by the service center can give a telling indicator about your business and market.

- Serves as an early warning system to identify issues before they escalate and impact a large cross-section of customers. Speech analytics can be used successfully to identify if escalation was required during a call and effectively guide the agents to transfer the call to a supervisor if the situation warranted.
- Speech Analytics can be a great transformational agent not only for the contact center but across sales, marketing, compliance, IT and any other customer-facing departments.
- Helps you optimize customer engagement and service strategies by revealing trends and opportunities
- Drives adherence to compliance by quickly revealing regulatory breaches and failure to adhere to internal policies.

The combination of post call and real-time speech analytics significantly improves pre-emptive actions that will result in preventing customer dissatisfaction and increase customer delight; and achieving a superior contact center performance.

About the authors



Surya Puchala is CEO, ZettaMine Labs. He provided thought leading consulting solutions to Fortune 500 Clients for over 2 decades. He is passionate about areas related to Data Science, Machine Learning, High Performance Cluster Computing and Algorithms. He held senior leadership roles with large IT service providers. He graduated from IIT Kharagpur.



Sreshta Puchala interns with ZettaMine Labs. She has used various Emotion and Speech APIs to pre-process audio files and builds streaming for real-time processing. Her interests are in the fields of Big Data, Machine Learning and Artificial Intelligence. She is currently pursuing her Bachelor's degree in Computer Science from Chaitanya Bharati Institute of Technology, Hyderabad (Osmania University).

