Problem area – customer loyalty and satisfaction (Net Promoter Score)

Net Promoter Score (NPS) is a widely used measure of business customer satisfaction. It is calculated by subtracting the percentage of customers who would recommend your company to others from the percentage who would not. The resulting score ranges from -100 to 100, with 0 being neutral.

High-level architecture of the initial System

To realize the ultimate goal of delivering proper actions to improve the performance of every single agent, in other words, improve its NPS rating with the given dataset, a Hierarchical Agglomerative Methodology for Improving NPS (HAMIS) was initially designed to accept queries from customers regarding how to score customer’s loyalty and going among relevant suggestions to resolve such queries.

Inputs:
- FQAS
- Unstructured survey
- Structured survey

Output:
- Hierarchically structured recommender system

Approach: Granular Computing (reduces + Visualization)

HAMIS is proposed to eventually extend the dataset representing each client to the entire data of some neighboring clients having better NPS. This shows that the action rules obtained from the extended dataset are more accurate than the original dataset as they provide more options to search.

Domain-specific feature dictionary

Examples of Comments with Sentiment Orientation

Examples of selected terms with sentiment orientations:
- Strong positive: outstanding job, exceptional
- Strong negative: terrible, bad

Visualization Recommender System (demo)

Developed for 33 clients across the United States and southern Canada, for different types of surveys.

Classification

To test the accuracy of the models built on the yearly client data, we performed classification experiments on each client's dataset for each year. Each classification was performed with different cross-validation techniques. The results showed that classification accuracy, coverage, and reducts were much lower than the original dataset as they provide more options to search.

Clustering

In order to make sense of actions to improve the service, products, we need to consider not only historical feedback of customers for each client, but also the actions taken by clients in the past, as well as the potential actions that could be taken in the future.

Interface to Recommender System Engine

Clients from the domain for the agglomerative clustering algorithm based on their semantic distance. The algorithm is based on a hierarchy of fuzzy terms representing the meaning of a term, allowing us to group clients with similar characteristics and preferences.

Natural Language Processing – Sentiment Analysis

The visualization shows how sentiment orientation of the comments is analyzed to determine the sentiment score for each client.