

SAS® GLOBALFORUM 2015

The Journey Is Yours

Kaiser Permanente Member Complaints Text Mining Project

Data and Information Management
Enhancement





Abstract

- Kaiser Permanente NW has a regional goal of reducing member complaints by 25% over two years (2014-2015).
- The goal of this project was to utilize SAS Enterprise Miner’s Text Mining tools to evaluate member complaints and provide actionable analytical insights into their causes.
- A six month sample of complaints received by telephone or email were included in this study.
- Text Mining results revealed many key themes of the member complaints. For example, difficulties related to a newly implemented telephone system was a major area of concern. A deep-dive into this topic showed that complaints related to the new telephone system involved the system having too many options, being difficult to navigate, having long wait times, and not being user friendly.
- Overall, text mining was an excellent tool for revealing the “member’s voice” and identifying areas of member complaints that were not visible in the structure data categories.

Objectives

- Identify a sample of complaints for text mining.
- Utilize SAS Enterprise Guide and SAS Enterprise Miner to clean-up the complaint text field and prepare for text mining.
- Utilize the Text Topic node in SAS Enterprise Miner to identify key themes in member complaints.
- Subset complaints within certain text topics and repeat the text mining process for more detailed results.
- Review text topics in-depth and provide a meaningful label and summary for communication with business partners.
- Highlight themes emerging from text mining that were not visible using structured data analysis.

Methods

- Member complaints received by phone or email were extracted into a .csv file and imported into SAS Enterprise Guide. Initial data clean-up and integration was performed in Enterprise Guide.
- SAS Enterprise Miner’s Text Parsing and Text Filtering nodes were used to further prepare the data for text mining.
- The Text Topic node was used to produce text “topics” summarizing the member complaints.
- The Interactive Topic Viewer was used to evaluate and refine the topics generated by the Text Topic node.
- Deep Dive: Results from the Text Topic node were used to subset complaints associated with specific topics. The text mining process was repeated on these subsets in order to gain more detailed and nuanced results.

Results

- The table below provides example topics produced by the Text Topic node. (Topic have be modified slightly for compliance purposes).
- Topic 1: Complaints within this topic expressed members’ dissatisfaction with the new IVR telephone system.
- Topic 2: Complaints within this topic related to dissatisfaction with bills received and, in some cases, being turned over to collections.
- Topic 3: Complaints within this topic expressed members dissatisfaction with their benefit plan being changed without their knowledge.
- Topic 4: Complaints within this topic expressed members’ dissatisfaction related to appointment cancelations and wait times to reschedule.

	Topics
1	+call, +phone, +auto, +recognize, +voice
2	+pay,+coverage,+bill,+collection,+visit
3	+beneft,+plan,+understand,+coverage, +inform
4	+reschedule,+wait,+cancel,+appointment,+inform
5	health, +mental,+visit,+schedule,+wait

- Topic 1 Deep Dive: Subset complaints associated with Topic 1 and performed additional Text Mining for more detailed results.

	Topics
1	+choice,+many,+IVR,+system,+difficult
2	+recognize,+voice,+IVR,+call,+frustrate
3	+wait,+call,+difficult,+IVR,+disconnect

- Results indicated that the new phone system had too many choices, was difficult to navigate, couldn’t recognize members’ voices, had long wait times, and was not user friendly.

Conclusions

- Text mining revealed major topics of complaints that were not visible in the structured data.
- Subsetting the complaints in the high-level Text Topics and repeating the text mining process provided more detailed and nuanced results.
- Text mining was an excellent tool for revealing the “member’s voice” and providing insight into key areas to focus improvement efforts.

Kaiser Permanente Member Complaint Text Mining Project
Amanda Pasch
Kaiser Permanente



Example Complaints

Email Complaint:

“MRN-HRN: \#####\Email Address: \kpmember@aol.com\Subject: \Other questions or comments\Message: \ **I tried to make an appointment today but I was put on hold for a long time and then the phone line was cut. Why won’t your phone system work? This should be fixed.** First Name: \KPMember\Last Name: \KPMember\Region: \KNW\Audience: \Member\Date Submitted: \01/1/2014\Time Submitted: \01:14:48 PM PST\Request Type: \Contact the Web Manager\ \End of Member Submission”

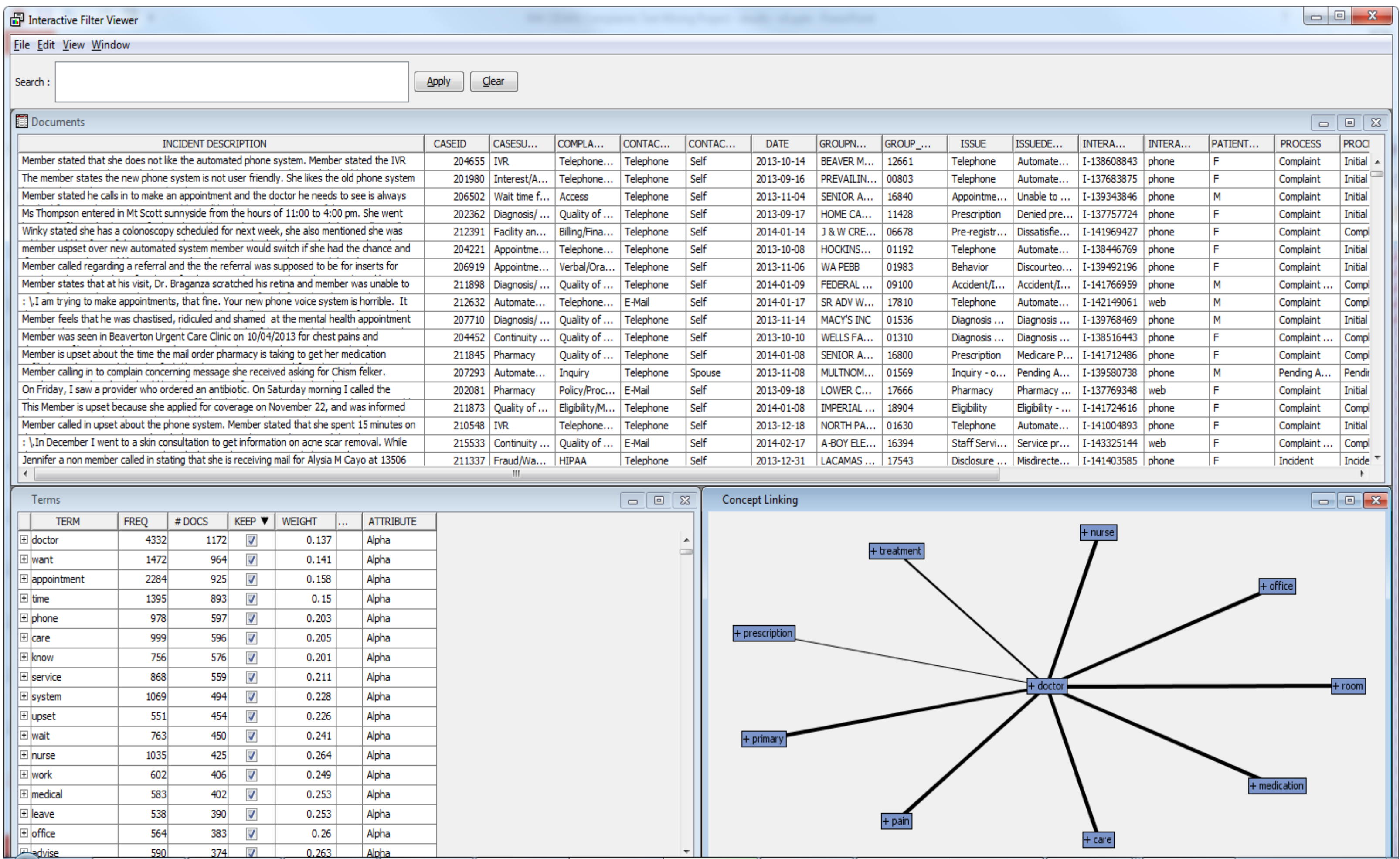
Telephone Complaint:

“Member is upset because she was scheduled for an appointment today and was called to be informed that her appointment was canceled. This member scheduled this appointment a month out and said she won’t be able to get in for another 6 weeks. Member is very upset that she was canceled and can’t get a sooner appointment.”

Text Parse and Text Filter

- Text Parsing Node: This node identifies every word in every complaint. Goal is to keep only those terms that are most informative for the analysis.
 - Stem terms – used to find the root term and consolidate different versions of this term (singular vs. plural).
 - Ignore Parts of Speech – used SAS default setting to exclude less informative parts of speech (pronouns, prepositions, etc.)
 - Stop List – used SAS default stop list to remove terms with little or no informative value.
- Text Filter Node: This node provides additional tools for data clean-up.
 - Spell Check
 - Term Filters – Minimum Number of Documents a term must be in to be included in the analysis.
 - Interactive Filter Viewer – Allows additional manual data clean-up (i.e. combining synonyms, removing non-informative terms).
 - Concept Linking diagram shows relationships between terms.

Interactive Filter Viewer





Text Topic Node

- Member complaints often involve multiple different issues (i.e. cancelation and appt. wait time). The text topic node allows each complaint to fall into multiple topics.
- The Text Topic node computes the singular value decomposition of the term-by-document matrix.
- Document and Term weights are assigned for each topic produced, and thresholds are used to determine if the association is strong enough to consider the document or term to “belong” to the topic.
- The five terms with the highest topic weights are used to describe each topic. These topics summarize the main ideas of the document collection.
- The Interactive Topic Viewer was used to:
 - Refine topics – make adjustments to document or term cutoffs.
 - Review full-text complaints associated with each topic and to generate a meaningful label and summary of each

Text Topics with Labels and Summary

Topic Label	SAS Topic	Summary
New Telephone System Complaints	+call, +phone, +auto, +recognize, +voice	Complaints within this topic expressed members’ dissatisfaction with the new IVR telephone system. Members indicated that the new system had too many choices, was difficult to navigate, couldn’t recognize their voice, had long wait times, was not user friendly, and required multiple calls before the member received the service they required.
Billing and Collections Complaints	+pay, +coverage, +bill, +collection, +visit	Complaints within this topic highlighted members’ frustration with billing-related issues including being turned over to collections without warning, receiving bills for services that were already paid, and not being informed of charges for services.
Complaints related to Benefit Plan Changes	+benefit, +plan, +understand, +coverage, +inform	Complaints within this topic expressed members’ dissatisfaction with their benefit plan being changed without their knowledge or approval. Members indicated that they were charged much more for services than expected due to these unknown plan changes. Many of these complaints appear to be related to CoverOregon issues.
Complaints related to Canceled Appointments and Wait Times	+reschedule, +wait, +cancel, +appointment, +inform	Complaints within this topic highlighted members’ dissatisfaction with long wait times for appointments, particularly when their original appointment was canceled by Kaiser.



April 26-29
Dallas, TX

