A Sentiment Analysis of Customers Reviews of Airlines

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Abstract

This paper reports the results of an extensive analysis of ratings and reviews provided by airlines passengers.

Keywords: Customer surveys, Opinion mining, Natural language processing, Sentiment analysis,

1 Introduction

Traditional methods of soliciting information from the customers and consumers of a product or service are based on consumer surveys. In a typical survey, a (random) sample from the population of consumers is selected and they are asked to respond to a bunch of questions. This may be done through a personal interview such as in a door-to-door survey, through a phone survey or through an electronic communication. The traditional surveys are usually focused on some specific issues and are therefore, very useful for collecting information about those issues and concerns. However, these kind of surveys are quite expensive and time consuming. Typically, the business or service provider hires the services of a third party such as professional pollsters or a calling centre to conduct the survey study. It may take too long to collect, compile and analyse the information from these surveys to be useful for any decision making.

With the availability of online electronic platforms, collecting information from willing (or disgruntled) customers has become feasible on a large scale. Customer reviews are recognized as fruitful information sources for monitoring customer satisfaction levels, particularly as

they convey the real voices of actual customers. Actual customer reviews are starkly revealing as to the positive and negative aspects of a given service expressing relatively unambiguous opinions. However, deciphering the text reviews is a monumental task for a machine. As a methodological means of customer review analysis, sentiment analysis has come to the fore.

SKYTRAX World Airline Star Rating (`www.airlinequality.com/ratings/`) is a global airline rating system that rates the world airlines by the quality of their front-line product and staff service standards. The airline passenger review section provides an online space for the public to write and share their personal review of any airline based on their personal experience. These public reviews also provide the opportunity to assign an airline rating score in the range 1 to 10.

Textual reviews provided airline passengers is an example of user-generated content published online. Opinion mining and sentiment analysis tools can be used to gauge the sentiments expressed in these reviews.

The "keywords" or "bag-of-words" approach is the most commonly used because it underlies a simplistic representation of how opinions and sentiments can be expressed. It would consist, in its most simplistic form, in detecting and counting words from a set of words labeled as "positive" or "negative". This method, however, is unable to solve most of the ambiguity problems.

This type of analysis uses the real power of social media, its vast amount of data, to generate "sentiment indicator" with respect to a product or service. This can help track changes in the users opinion over time, help to identify the events responsible for these changes.

Sentiment Analysis is highly domain centered. This means that a solution developed for one domain (e.g. movies) will not automatically work on other domains. The phrases and patterns used to express sentiment varies across domains and need to be adapted when switching between domains. There are several techniques for that, mainly applying a small general seed of phrases and patterns and using bootstrapping on the new domain to find out more.

1. using a vocabulary: looking at important keywords (usually verbs and adjectives) along with modifiers like negation words

2. using rules: look at presence of vocabulary words in sentences, use rules to categorise

them by sentiment

2. applying ML techniques: treat this as a classification problem, amass a dataset and set up features (which could be the keywords in the vocabulary), and train to identify sentiment

2 Data Acquisition and Processing

All the customer reviews data used were gathered from the webpage

Raw data acquired from various sources often needs to be preprocessed before launching a fully fledged analysis. Some popular preprocessing steps are: tokenization, stop word removal, stemming, parts of speech (POS) tagging, and feature extraction and representation. Tokenization is used to break a sentence into words, phrases, symbols or other meaningful tokens by removing punctuation marks. Stop words do not contribute to analysis and hence are dropped during preprocessing step.

Sentiment classification is the determination of orientation of sentiment of given text in two or more classes. Sentiment classification is concerned with determining polarity of a sentence, whether a sentence is expressing positive, negative or neutral sentiment towards the subject. Hence, Sentiment classification is also termed as polarity determination.

Opinion words are employed in many sentiment classification tasks. Positive opinion words are used to express some desired states, while negative opinion words are used to express some undesired states. There are also opinion phrases and idioms which together are called opinion lexicon. The dictionary based approach has a major disadvantage which is the inability to find opinion words with domain and context specific orientations. Qiu and He [12] used dictionary-based approach to identify sentiment sentences in contextual advertising.

It is noticed that working on domain-specific corpus gives better results than working on the domain-independent corpus. There is still lack of research in the field of domain-specific SA which is sometimes called context-based SA. This is because building the domain-specific corpus is more complicated than using the domain-independent one.

3 Statistical Models

4 Discussion

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