Sentiment Analysis of College Reviews

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***Abstract*—The use of reviews has created many opportunities for people topublicly voice their opinions. Reviews in the internet could be in millions forservices which make it difficult to track and understand customer opinions.Sentiment analysis is an emerging area of research to extract the subjectiveinformation to track and understand customer opinions. The reviews provideaccessible and plentiful data for relatively easy analysis for a range of applications.This system seeks to apply and extend the current work in the field sentimentanalysis on college reviews data retrieved from another websites using web miningtechnique. Naive Bayes and decision list classifiers are used to tag a given reviewas positive or negative. The features, such as bag-of- words and bigrams, arecompared to one another in their effectiveness in correctly tagging reviews. Recentstudies analyzed this reviews and found that it includes information useful forcollege, such as user requirements, ideas for improvements, user sentiments about specific features, and descriptions of experiences with these features.**

IndexTerms*—Review, Sentiment Analysis, Naïve Bayes.(keywords)*

I. INTRODUCTION

Reviews means the text which is given by user related with our system service. This review is useful for get detail about our system means what is better in our system and which changes is require for make our system better. Using these reviews we can take opinion of the user of our system. A user review refers to a review written by a user for a product or a service based on her experience as a user of the reviewed service or product. Most of college website gets reviews from users so the college system see view services is better and which services is require changes. Using this reviews college can make changes in services. Popular sources for consumer reviews are e-commerce sites like Amazon or Zappos, and social media sites like Trip Advisor and Yelp. E-commerce sites often have consumer reviews for products and sellers separately. Usually, consumer reviews are in the form of several lines of texts accompanied by a numerical rating. This text is meant to aid in shopping decision of a prospective buyer. A consumer review of a product usually comments on how well the product measures up to expectations based on the specifications provided by the manufacturer or seller. It talks about performance, reliability,quality defects, if any, and value for money.

Sentiment analysis can be defined as a process that automates mining of attitudes, opinions, views and emotions from text, speech, tweets and database sources through Natural Language Processing (NLP). Sentiment analysis involves classifying opinions in text into categories like "positive" or "negative" or "neutral". It's also referred as subjectivity analysis, opinion mining, and appraisal extraction. The words opinion, sentiment, view and belief are used interchangeably but there are differences between them.

- Opinion: A conclusion open to dispute (because different experts have different opinions)
- View: subjective opinion
- Belief: deliberate acceptance and intellectual assent
- Sentiment: opinion representingone's feelings

II. LITERATURE SURVEY

The bag-of- words model is one of the most widely used feature model for almost all textclassification tasks due to its simplicity coupled with good performance. The model representsthe text to be classified as a bag or collection of individual words with no link or dependence ofone word with the other, i.e. it completely disregards grammar and order of words within the text. This model is also very popular in sentiment analysis and has been used by variousresearchers. The simplest way to incorporate this model in our classifier is by using unigrams asfeatures. Generally speaking n-grams is a contiguous sequence of "n" words in our text, which iscompletely independent of any other words or grams in the text. So unigrams is just a collection of individual words in the text to be classified, and we assume that the probability of occurrenceof one word will not be affected by the presence or absence of any other word in the text. This isa very simplifying assumption but it has been shown to provide rather good performance.. Onesimple way to use unigrams as features is to assign them with a certain prior polarity, and take the average of the overall polarity of the text, where the overall polarity of the text could simplybe calculated by summing the prior polarities of

individual unigrams. Prior polarity of the wordwould be positive if the word is generally used as an indication of positivity, for example theword "sweet"; while it would be negative if the word is generally associated with negative connotations, for example "evil". There can also be degrees of polarity in the model, which means how much indicative is that word for that particular class. A word like "awesome" wouldprobably have strong subjective polarity along with positivity, while the word "decent" would although have positive prior polarity but probably with weak subjectivity.There are three ways of using prior polarity of words as features. The simpler un-supervised approach is to use publicly available online lexicons/dictionaries which map a wordto its prior polarity. The Multi-Perspective- Question-Answering (MPQA) is an online resourcewith such a subjectivity lexicon which maps a total of 4,850 words according to whether they are"positive" or "negative" and whether they have "strong" or "weak" subjectivity. TheSentiWordNet 3.0 is another such resource which gives probability of each word belonging to positive, negative and neutral classes. The second approach is to construct a custom priorpolarity dictionary from our training data according to the occurrence of each word in eachparticular class. For example if a certain word is occurring more often in the positive labeled phrases in our training dataset (as compared to other classes) then we can calculate theprobability of that word belonging to positive class to be higher than the probability of occurringin any other class

$$(\boldsymbol{phrase}) = \boldsymbol{log2h}(\boldsymbol{phraseNEAR}\"excellent\").(\"poor\")$$

$$(\boldsymbol{phraseNEAR}\"poor\").(\"\boldsymbol{excellent}\")$$

Where hits(phrase NEAR "excellent") means the number documents returned by the searchengine in which the phrase (whose polarity is to be calculated) and word "excellent" are co-occurring. While hits("excellent") means the number of documents retuned which contain theword "excellent". Prabowo et al. have gone ahead with this idea and used a seed of 120 positivewords and 120 negative to perform the internet searches. So the overall semantic orientation ofthe word under consideration can be found by calculating the closeness of that word with eachone of the seed words and taking and average of it. Another graphical way of calculating polarityof adjectives has been discussed by **Hatzivassiloglou et al**. The process involves first identifyingall conjunctions of adjectives from the corpus and using a supervised algorithm to mark everypair of adjectives as belonging to the same semantic orientation or different. A graph isconstructed in which the nodes are the adjectives and links indicate same or different semanticorientation. Finally a clustering algorithm is applied which divides the graph into two subsetssuch that nodes within a subset mainly contain links of same orientation and links between thetwo subsets mainly contain links of different orientation. One of the subsets would containpositive adjectives and the other would contain negative.

Lina Zhou et al., investigated movie review mining using machine learning andsemantic orientation. Supervised classification and text classification techniques are used in theproposed machine learning approach to classify the movie review. A corpus is formed torepresent the data in the documents and all the classifiers are trained using this corpus. Thus,the proposed technique is more efficient. Though, the machine learning approach usessupervised learning, the proposed semantic orientation approach uses "unsupervised learning"because it does not require prior training in order to mine the data. Experimental results showedthat the supervised approach achieved 84.49% accuracy in three-fold cross validation and66.27% accuracy on hold-out samples. The proposed semantic orientation approach achieved77% accuracy of movie reviews. Thus, the study concludes that the supervised machinelearning is more efficient but requires a considerable amount of time to train the model. On theother hand, the semantic orientation approach is slightly less accurate but is more efficient touse in real time applications. The results confirm that it is practicable to automatically mineopinions from unstructured data.

Bo Pang et al., used machine learning techniques to investigate the effectiveness ofclassification of documents by overall sentiment. Experiments demonstrated that the machinelearning techniques are better than human produced baseline for sentiment analysis on moviereview data. The experimental setup consists of movie-review corpus with randomly selected700 positive sentiment and 700 negative sentiment reviews. Features based on unigrams andbigrams are used for classification. Learning methods Naïve Bayes, maximum entropyclassification and support vector machines were employed. Inferences made by Pang et al., isthat machine learning techniques are better than human baselines for sentiment classification.Whereas the accuracy achieved in sentiment classification is much lower when compared totopic based categorization.

Zhu et al., proposed aspect based opinion polling from free form textual customersreviews. The aspect related terms used for aspect identification was learnt using a multi-aspectbootstrapping method. A proposed aspect-based segmentation model, segments the multi aspectsentence into single aspect units which was used for opinion polling. Using a opinion pollingalgorithm, they tested on real Chinese restaurant reviews achieving 75.5 percent accuracy inaspect-based opinion polling tasks. This method is easy to implement and are applicable toother domains like product or movie reviews.

Jeonghee Yi et al., proposed a Sentiment Analyzer to extract opinions about asubject from online data documents. Sentiment analyzer uses natural language processingtechniques. The Sentiment analyzer finds out all the references on the subject and sentimentpolarity of each reference is determined. The sentiment analysis conducted by the researchersutilized the sentiment lexicon and sentiment pattern database for extraction and associationpurposes. Online product review articles for digital camera and music were analyzed using thesystem with good results.

I. PROBLEM DEFINITION

Searching problem

- We have to find a particular word in about 2500 files.
- All words are weighted same for example good and best belongs to same Category.

• The sequence in which words come in test data is neglected.
Other issues- –Efficiency provided from this implementation is only 40-50%.

Existing System

In the existing system with the evolution of web technology, there is a huge amount ofdata present in the web for the internet users. These users not only use the available resources inthe web, but also give their reviews, thus generating additional useful information. Due tooverwhelming amount of user's reviews available through the web resources but using thisreviews we cannot find which changes is require for better college system. In this existingsystem we will get only reviews form users but not analyze the reviews.

Disadvantages of existing system
• Not get all reviews from another websites.

• There are not reviews analysis only get reviews from user.

• Cannot idea for which changes is require for system.

II. PROPOSED SOLUTION

To overcome the existing drawbacks we can proposed system that can be extract the college reviews information from another websites using web mining technique and analyze this reviews using sentiment analysis. Sentiment analysis is a very relevant technique nowadays for analysis. Sentiment analysis or web mining is the process of automatically extracting knowledge from sentiments or reviews of others about some topic or problem. We can identify reviews in a large unstructured/structured data and analyze polarity of reviews.

In this proposed system we can use Naive Bayes algorithm for analyze college reviews and to tag a given review as positive or negative. The results can be used for various purposes such as guiding decisions to improve the college system.

Advantages of Proposed system

1. Easily gets reviews from various college interacts websites.

2. Sentiment analysis gives a proper result of positive or negative reviews.

3. Using this analysis we can easily get what is our system plus point and which sector

require changes.

4. Gives better services for user.

III. METHODOLOGY

Naive-Bayes Classification Algorithm

The Bayesian Classification represents a supervised learning method as well as a statistical method for classification. Assumes an underlying probabilistic model and it allows us to capture uncertainty about the model in a principled way by determining probabilities of the outcomes. It can solve diagnostic and predictive problems.

Bayesian classification provides practical learning algorithms and prior knowledge and observed data can be combined. Bayesian Classification provides a useful perspective for understanding and evaluating many learning algorithms. It calculates explicit probabilities for hypothesis and it is robust to noise in input data.

1. Dictionary Generation:-Count occurrence of all word in our whole data set and make a dictionary of some mostfrequent words.

2. Feature set Generation- All documents is represented as a feature vector over the space of dictionary words.

- For each document, keep track of dictionary words along with their number ofoccurrence in that document.Calculate Probability of occurrence of each label .Here label is negative and positive.

3. Training :-In this phase we have to generate training data (words with probability of occurrence inpositive/negative train datafiles).Calculate for each label.Calculate for each dictionary words and store the result (Here: label will be negativeandpositive).Now we have word and corresponding probability for each of the defined label.

Module Description

1. Login - In this module using username and password user login into system. In this login systemauthentication of user so only valid person login into the system.

2. Data Collection - In this user select one college name from a college list and click on submit aftersubmitting our system get reviews of this college using web mining technique. In web miningtechnique the system get data from another websites where college reviews are present relatedwith this college.

3. Sentiment Analysis - The reviews retrieved using web mining technique from another websites which can beanalyzed using Naive Bayes algorithm and get result as positive and negative reviews.

Output

In this module we can display out for user. The output display college information,Placement, Teaching or faculty, Crowd and display pie chart of positive and negative percentageand maximum 10 comments.

IV. REQUIREMNETS

Hardware:

1. Processor: Pentium 4 , RAM: 2GB or more, Hard disk: 16 GB or more

Software:

1. Apache tomcat Server, Windows Operating System, Eclipse, Java, MYSQL

V. FUTURE ASPECTS

Here this kind of a system is in the developing phase and lots of future enhancements are planned and are undergoing 1st level analysis. This application can be expanded with many new other building schemes and areas. Due to the time constraint we were not able to provide various enhancements such as:

This is a Reference Model of share trading Application for Education Institute. You can add following Futures. Change the share price directly through internet.

-Login only those users there have account in any bank system.

-Admin can put various advertisements

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