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Counselling For Students Using Sentiment Analysis

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Abstract: Now-a-days in colleges, students counselling plays a vital role that is done manually. Students interest in studies is getting decreased day by day. This is due to the distractions caused by electronics gadgets and personal problems. Majority of the Students of this generation are not having responsibility and self interest.Counselling need to be done for the students in different views. For rectifying these problems encouragement and motivation are best solution when compared to the punishment. There is a need to create online counselling for counselling the students. Now the work is student counselling that is done through sentence level sentiment analysis using Joint segmentation model for identification of polarity.

Keywords: Student, Counselling, Sentiment Analysis, Joint Segmentation, Opinion Mining

I. INTRODUCTION

Sentiment analysis is used for analyzing the text into positive or negative emotion .Sentiment analysis is used in E-commerce for rating the products by getting and analyzing the old customers reviews. In recent trends E-commerce is used by several people for minimizing their manual work ,that is going to shopping centre situated at farer location and buying their needs. By sitting at home itself they can able to do online shopping. Like that in Educational side also Professors can answer the queries of various students[5].Online lecture is also available given by teachers for different subjects irrespective of the fields. So Question –Answering in online is familiar in the emerging field. Likewise for improving the performance of the students, counselling can be done for them. This is for finding positive and negative things from students and to take further remedial actions for the students[2].Students in current world are very sensitive and hyperactive. They are committing suicides for very silly reasons. They are getting corrupted due to advancement in technology[1].The time that is spent for reading the book is getting decreased. Reading also done in mobiles and in laptops.

II. RELATED WORK

2.1 Purpose of Sentiment Analysis

Sentiment classification can be done in politics field .During election, there will be a confusion that which political party will be winning the election. For finding the winning political party ,feedback from all the people will be collected and analysed using sentiment analysis. Suppose Customers want to buy a product without knowing the quality or any other information of the product. They won't have satisfaction to buy unknown product. In this case opinion mining plays a vital role for analyzing the reviews or feedbacks of already existing customers. Ratings of the product given in means of *.(i.e) five stars means excellent product. Now-a-days feature based ranking came into existence[11].For example if mobile is the product that the customer wants to buy means, based on battery chargewise the best mobile can be identified with the help of ranking or ratings for different products based on aspects.

Many people are using blogs and microblogs such as facebook ,twitter to share their views or messages to their friends and relatives. There may be happy or sad messages shared between one another[4].But the person who has heart disease reading the sad messages means, it will be affecting his health. So if sentiment analysis is done , for those messages before reaching destiny, messages are denoted as positive happy smileys and sad negative smileys [3].Several people are members of

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newsgroups sites. They want to know currently, what is happening in and around the world. These news information can be analyzed using sentiment analysis for identifying positive or negative incidents or emotions. Many people are going for tour in and around the world. They are in need of finding best hotels or best tourist places. Sentiment analysis analyze feedback of old customers and rank the hotels and tourist places by star rating or any other forms. Here feature based opinion mining is done for Customers feedback with various aspects of hotels such as number of rooms available, swimming pool and food .Also in online movie recommendation , sentiment analysis is used for analyzing the viewers feedback those who have seen the movie, the star rating and points are given[9].Then for the registered users the movie is recommended that if it is a good movie. For sentiment analysis when compared to support vector machines ,Joint Segmentation model is better.

2.2 Support Vector Machines

Support Vector Machine" (SVM) is a supervised machine learning algorithm which can be used for both classification and regression challenges. However, it is mostly used in classification problems. In this algorithm, we plot each data item as a point in n-dimensional space (in the case where n is number of features) with the value of each feature being the value of a particular coordinate. Then, we perform classification by finding the hyper-plane that differentiate the two classes very well (look at the below snapshot)[12].This classification algorithm separates into two classes (i.e) positive class L1(y=+1) and negative class L2(y=-1).Support Vectors are simply the co-ordinates of individual observation. Support Vector Machine is a frontier which best segregates the two classes (hyper-plane/ line) [15].

III. The Proposed Approach

3.1 Stemming

This algorithm is used for the removal of suffixes present in the words in English language. This removal Retrieval a document is represented by a vector of words or terms. Terms that have a common of suffixes is an operation that can be used in Information retrieval field. In the environment of Information stem will have similar synonyms.

Connect
Connecting
Connected
Connections
Connection

The suffixes removed are -ION,-ED,-ING,-IONS to keep single term as Connect. The process of removal of suffixes reduces the total number of terms in Information Retrieval and hence reduce complexity and size of data .Porter Stemming algorithm is having advantage of speed and also simplicit. It is process of mapping of all the alternatives to the ROOT word. It will identify the tense of the word. For example, the root word "go" has the following variations – go, went, gone. Remove suffices and/or prefixes in an attempt to reduce a word to its stem. An iterative stemming algorithm will remove suffices one at a time, starting at the end of the word and working towards the beginning. It will parse the data and tag the parts-of speech for every word. Stemming is one technique to provide ways of finding morphological variants of search terms. This stemming is used to improve retrieval effectiveness and to reduce the size of indexing files.

3.2 Stop word Removal

Common techniques for removing words that occur frequently but has no meaning(Conjunctions, articles and so on)are considered as stopword removal [8].Some of the stopwords keywords are is,of,are, the,to and from. Pattern Bootstrapping algorithm is used for stopword removal.

3.3 Parts of Speech Tagging

Tagging is the task of labelling (or tagging)each word in a sentence with its appropriate part of speech. Parts of speech tagging is the process of assigning a part of speech or other lexical class marker to each word in a corpus. Tags are also usually applied to punctuation markers, thus tagging for natural language is the process as tokenization for computer languages, although tags for natural language are much more ambiguous. Tagging means the text can be identified and marked as noun, verb, adverb or adjective[16].The process of classifying words into their parts of speech and labeling them accordingly is known as part-of-speech tagging, POS-tagging or simply tagging. Parts of speech are also known as word classes or lexical categories. The collection of tags used for a particular task is known as a tag set. A Maxent tagger is used for the classification. A class for end users to part of speech tag text using an already trained and saved maxent tagger [10].Tagging of things can be done through the Java API or from the command line. A Maxent tagger can be made with a constructor taking as argument the location of parameter files for a trained tagger. Also by using OpenNLP.Tools.PosTagger ,having obtained an array of tokens from the tokenization process, giving that array to the part-of-speech tagger .The POS tags are returned in an array

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of the same length as the tokens array, where the tag at each index of the array matches the token found at the same index in the tokens array. The Open NLP chunker tool will group the tokens of a sentence into larger chunks, each chunk corresponding to a syntactic unit such as a noun phrase or a verb phrase. This is the next step on the way to full parsing, but it could also be useful in itself when looking for units of meaning in a sentence larger than the individual words. To perform the chunking task, a POS tagged set of tokens is required [14].

3.4 Joint Segmentation and Classification Framework

A Joint Segmentation and Classification Framework (JSC) for sentiment analysis, which simultaneously conducts sentence segmentation and sentence-level sentiment classification. This is the work that automatically produces sentence segmentation for sentiment classification with in a joint framework. First a candidate generation model to generate the segmentation candidates of a sentence,

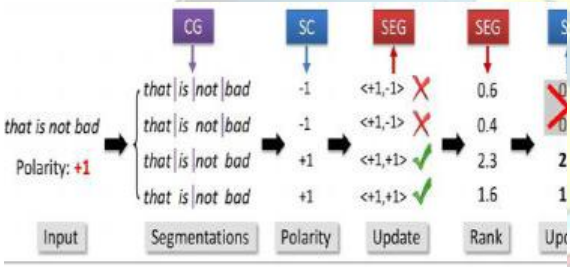

Fig 1:The training process of the Joint framework for Sentiment Classification

Secondly A segmentation ranking model to score each segmentation candidate of a given sentence, Third is classification model to predict the sentiment polarity of each segmentation. The phrasal information of top-ranked candidates from the segmentation models are utilized as features to build the sentiment classifier. Fourth one is to increase the accuracy result of sentiment analysis we use NLP Tool with POS Technique[6].The main advantages of this framework is improving the accuracy of sentiment prediction and reducing the space and time complexity.

Table 1: Dataset for Student's Reasoning collected from students

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S.No	Student's Reasoning	Emotion	S.No	Student's Reasoning	Emotion
1	Father always scolding me for studies.	Negative	15	More memory power	Positive
2	Not having interest to study this course	Negative	16	Facilities at home is very less	Negative
3	Diversion due to electronic gadgets	Negative	17	Encouragement given by parents and teachers	Positive
4	I like enjoying with friends	Negative	18	more concentration during class	Positive
5	I am in stress	Negative	19	I am attending class regularly	Positive
6	Partiality with siblings	Negative	20	I have more self interest in my studies	Positive
7	Compulsion to join Course	Negative	21	I am active always and sincere	Positive
8	I feel subjects tough	Negative	22	I feel drousy and laziness by seeing the book	Negative
9	Less memory power	Negative	23	I feel the subjects are very easy to study	Positive
10	Subjects not understood due to lack of concentration	Negative	24	I have only opted this course to study	Positive
11	I feel homesick when I am in hostel	Negative	25	My parents have made many facilities to study at home.	Positive
12	Father mother split due to divorce	Negative	26	Father and mother always busy with their work	Negative
13	Parents avoiding me to be with my friends	Negative	27	Father and mother always fighting	Negative
14	Discouragement by parents	Negative	28	I feel boring in the class hours	Negative

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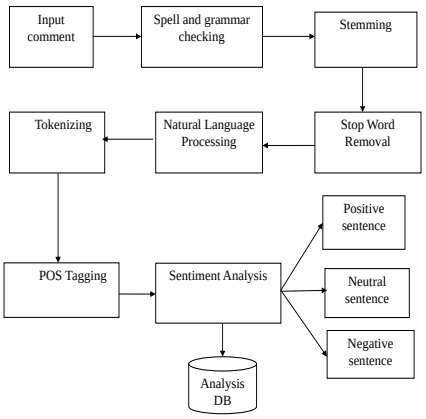

Fig 2: System Architecture for Students Counselling

3.5 Polarity Classification

Sentiment analysis is process of determining a text is positive or negative. The term weight is nothing but a value that is assigned for each word ranging from 0.0 to 1. 0 based on how positivity and negativity[7].Score is average value of the weights of all terms. Score is high for which value whether positive, negative or neutral and that emotion is assigned for sentence. The average of the scores is used to identify the word is positive or negative [13].

Type	Sample
Original sentence	*that is not bad*
Segmentation result	*that is not bad*
Basic computational units	*that, is, not bad*

Table 2: Example for Sentence Segmentation

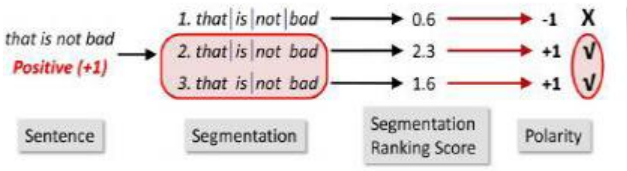

Fig 3: An example for training process of segmentation ranking model

IV. Conclusion

In this paper, we built online student counselling using sentiment analysis. The sentence level sentiment analysis is done using Joint segmentation framework. When compared to SVM the Joint Segmentation and Classification is better mainly in the case of negative polarity detection. This Joint Segmentation framework performs both the sentence segmentation and sentence level sentiment classification. For improvement of students community in college this student counselling identify positive and negative emotions. With this remedial solutions are taken for students to improve them in academics. Here dataset collected from students have 28 student reasonings are there.

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