

# An Empirical Study of Topical Relation in Opinion Mining

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**Abstract:** Opinion mining applications are used for different purposes in different domains, every application has some common attributes but each application uniquely describes itself. In this paper we have done literature of some applications, also presented the idea of our application. Our main concept is related to Topical Relations, which shows the relation between opinion words and opinion target. Topical Relation gives relation between opinion target and opinion words. We have performed our experiment on electronic product reviews and tried to get accurate relation between target and words.

**Keywords:** Topical Relation, Opinion Target, Opinion Word, Opinion Mining.

## I. INTRODUCTION

Opinion mining rapidly growing in education and other industries. Reason behind for its popularity is that the applications which are based upon Opinion Mining are giving results which are very useful in day-to-day activities. Some examples of these applications are: Opinion mining in Tourism, Opinion Mining or sentimental analysis based on Twitter Data, Facebook [1]. Some of the applications use user's twitter comments to predict the Election results.

In this paper, we studied different applications of Opinion mining in various Domains. These domains are varying from Education Industry to Social Media. We also present application of our work on which we are currently working. In our application, we are dealing with the "Topical Relation" in Opinion Mining. Topical Relation or Domain Relevance shows how the given topic is related to other terms. To implement Topical Relation application, we require Opinion Target and Opinion Words. Both the Opinion Target and Words are extracted from online product reviews.

## II. LITERATURE REVIEW

In this paper, Shanshan Gao, Jinxing Hao and Yu Fu [2] made a survey of 3 different sites which provide tourism facilities and packages to the customers. After providing facilities, users are requested to give their reviews or opinions. Such reviews are very useful to rate the packages of tours according to their popularity. If a particular package gets good reviews from the customers the websites sets the price of the package high as it is in demand. These review analysis is also useful for recommending packages to the users with similar taste. These reviews are categorised into 3 classes positive,

negative and neutral. The authors have concluded that all three sites are having good accuracy about the positive reviews but at the same time there is no improvement for neutral reviews. The authors have analysed reviews which included mostly positive comments on the tour packages, this reviews lacked in neutral and negative comments which was a drawback as no analysis was made for the improvement of positive and negative comments. The review analysis was mostly made on long text reviews written in the English language. Whereas short comments and reviews are neglected.

Asma Alkabani, Ahmed Ghamry, Farookh Hussain and Omkar Hussain [3] done their work to extract reviews from the customers whose are taking benefit of online services provided from cloud computing. These services are called as Software as a Service (SaaS). SaaS is a software distributing and licensed model, provided by third parties on a subscription basis. After using these services users provide their feedback or opinion. The given feedback can be either in subjective manner or objective manner. Subjective feedback represents emotions about the particular service; where as objective feedback represents some fact or idea about the service. These subjective and objective feedbacks are further divided into three categories positive, negative and neutral. These authors used SVM model to predict the sentiments of opinions.

Pedro Saleiro and Silvio Amir[4] used Opinion mining for tracking political opinion about the leader. The system implemented by authors named as POPmine. They collected data from different online sites such as twitter, news sites and media blogs. Collected data stored in NoSQL database (MongoDB). After information

extraction they performed two tasks Named Entity Recognition and Named Entity Disambiguation. They also build sentimental analysis module to detect and classify opinions into positive, negative and neutral opinions which contains at least one political entity. They faced some challenges during text classification, while dealing with small size messages and the informal structure of the text. To overcome the challenge they considered terms from SentiLex-PT. To show the output, they used two types of Opinion Indicator: Buzz and Sentiment. Buzz estimates daily frequency of political leaders those are mentioned in twitter, media blogs. Sentiment Indicator represents sentiments regarding political leaders across time.

Kavita Ganesan and ChengXiang Zhai [5] developed Entity Ranking system which uses Opinion Mining to rank the product and services, based on preferences given by user. For the experiment purpose they took car and hotel reviews from Tripadvisor.com and Edmuds.com respectively. Extracted reviews are then classified into positive and negative categories. To rank the products or services based on user preferences, they represent each product or entity with the reviews taken from website. This review contains different features of the entity on which users gave their opinion. Method takes keyword query from user. This keyword query contains different features of the entities. According to users given preferences about features, products and entities got rank. This entity ranking is very useful for the user to chose the best product or entity based on their own preferences.

### III. APPLICATION OF OUR WORK

Our Literature work explored different applications and we came to know that there are some common attributes for each. On the other hand, every application has a number of characteristics that uniquely describes it.

In our work, we are focusing on Topical Relations in Opinion Mining. In simple words, Topical Relations are relation between Opinion Words and Opinion Targets. Opinion Words are those words which are used to express the Opinion. Opinion Targets are objects on which opinions are expressed. Objects can be physical or logical object. Examples of physical objects are Electronics like Mobile, Laptop, furniture or book, whereas logical objects are online services.

#### A. Application Input:

The input required for our work is the document of User reviews. This document contains hundreds of reviews about one or more entity.

Consider an example where we took opinion about mobile and laptops. This document contains lots of reviews and reading each and every review makes the process tedious. So in our work, users are requested to give one topic as an Input. For example, Samsung Galaxy Core 2 is submitted

as an input. Our method assumes this given input as an Opinion Target and it will search for the opinion words which are related to given target.

#### Processing:

Review Document contains lots of reviews, some reviews related to the given target (Inside Domain), while some reviews are not (Outside Domain). Both types of reviews stored separately for the further processing. Related reviews sent for the pre-processing, in this stage common words in sentences ('the', 'is', 'and') are filtered out using data cleaning techniques to improve the performance of system.

After pre-processing, we segregate Opinion words and Opinion Targets. Our main goal is to relate given opinion target with the extracted opinion words. For this we use some semantic rules which are processed at sentence level. In our review document, there are hundreds of sentences, this process will repeat for every sentence.

#### B. Output

In Output, user is requested to give Opinion Target. Consider an example, where ABC user gives "Samsung galaxy mobile" as target. Our application will search for all the opinion words which are related to the given target such as "battery", "Screen size", "price" etc. After extracting opinion words, we will find out relation between opinion words and target. In this example, ABC user will get (Samsung galaxy mobile->battery=very good) (Samsung galaxy mobile->price=high).

For the experimental purpose we took electronics product reviews from amazon.com. We mostly focused on Mobiles, Laptops, TVs and Computer Desktops. This application can also be work with comments taken from social media such as Twitter or Facebook. In case of social media reviews use person name as an Opinion Target and take twitter or Facebook reviews to find out the relation between the target that is person and opinions which are expressed for that person.

### IV. CONCLUSION

In this paper, we did the survey of some applications which are based on Opinion Mining. All these applications are having their own methods to use opinion mining and use their application in day to day activities. We also represent the idea of application of our work and also show how it will be useful in opinion mining. For the experiment purpose we use product reviews from electronic site but we can expand the data set by adding more words, adjectives, adverbs. We can extract more relation with more accuracy by adding more data set.

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