

A Recommendation System for Online Products by Analyzing the Customer Feedback

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ABSTRACT

E-Commerce sites are gaining popularity across the world. People visit them not just to shop products but also to know the opinion of other buyers and users of products. Online customer reviews are helping consumers to decide which products to buy and also companies to understand the buying behaviour of consumers. In this paper we have created a web based system for recommending and comparing products and electronic services. We have used natural language processing to automatically read reviews, Naive Bayesian Classification to determine the polarity of reviews, Grammar Algorithm to filter and detect the SMS word, sentiment classification is used to find sentiment words from the customer feedback and Opinion Algorithm to display whether the product is recommended or not. We have also extracted the reviews of product features and the polarity of those features. We graphically present to the customer, the better products and services by comparing different ecommerce sites based on various criteria including the star ratings, date of review, the helpfulness score of the review and the polarity of reviews.

Keywords:- Ecommerce, opinion mining, feedback, Naive Bayesian Classification Algorithm, Opinion Mining, Feature Based Clustering and Reviews

I. INTRODUCTION

With the rapid expansion of e-commerce platform, online shopping on the products has enhanced drastically. Due to the vast variety of products and convenient shopping experience with attractive offers, these platforms have become popular for customers and even for manufacturers. But at the same time it becomes hard for the customers to get the help from the professional sales staff to buy the product. One approach that is being used to deal with these challenges is, merchant providing meta-data for the products sold online. The problem with the “meta-data” is that, the user finds difficult in deciding about the product by just knowing the features of the product, this lead to customer insecurity and which in turn have an adverse effect on online e-commerce revenue. Online merchants have enabled forums which helps customers to get reviews and to express opinions about the product. But with hundreds or thousands of reviews available for a popular product, it had made difficult for the customer to

read all the reviews and to make a well-versed decision on buying the product. And if the customer reads only some of the reviews, then biased view about the product may be generated. Our proposed system is used to solve the problem with this recommended system, as they are completely opaque, due to which it becomes hard for the customers to believe about their commended items. For example in the domain of mobile product reviews, collected together and separate each features of the product .such as camera, battery, processor etc.,

The proposed system is carried out as follows:

(1) initially, the set of customer’s reviews for the products are extracted from the web and then semantically analysed and then classify the specific domain. (2) Extracting the keyword from the customer feedback of all product synonyms words and phrase are grouped under the each specific domain such as features, service, product and also application. It existing techniques have failed to deal with them well, in order to

classifying the reviews. (3) After extracting, it can be polarized as positive, negative and neutral. (4) At last, summarization of the reviews is done by extracting the relevant excerpts with respect to each feature-opinions pair and placing it into their respective feature based cluster. These feature based excerpts can easily be digested by the user and similar works are carried to product, service and web application domains. Here the system implemented is dynamic i.e., after each period (daily or hourly basis) all the user reviews added during that span of the period are extracted from the web and an updated feature based summary is generated.

Our work is different from traditional text based summarization-We generate graphical summary by using free text document based on features and polarities of the products. In this research, we propose a system which automatically extracts feature, compare the product as same as another brand, recommend a service and also web applications, is based on the customer feedback which are stored on cloud storage. Finally we represent as each graph for features, service, products and web applications.

We proposed a number of techniques using the information present in natural language processing, artificial intelligence and opinion mining to generate feature based opinion summarization of customer reviews for the product. We will evaluate our proposed methodology using the customer reviews extracted from the different product website. Our results show that these methodologies are highly effective

II. PROPOSED SYSTEM

In this paper, we have greatly worked our process in order to make the system according to the domain of the product. Here the system is implemented as dynamic i.e., after each span of period (daily or hourly basis) all the user reviews updated during the period are extracted from the web and an updated feature based summary is generated. And also before the extraction of feature starts another algorithm is made to run on customers' reviews, to form groups of all the domain synonyms nouns or noun phrases, using semi-supervised learning.

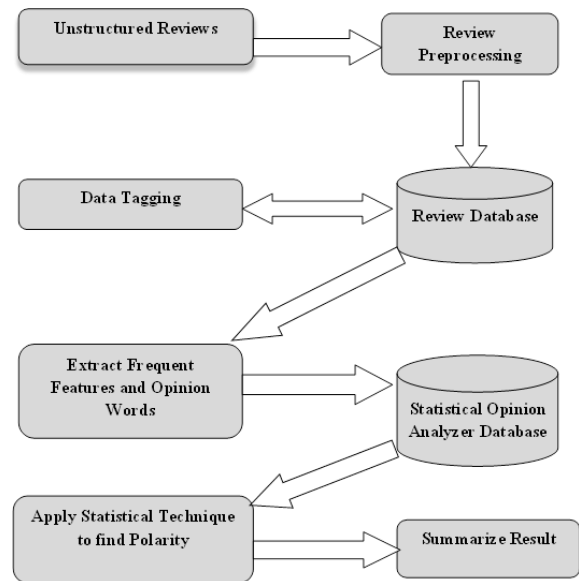


Fig-1: Architecture Diagram for Proposed System

A. Analysing the customer feedback

From the customer reviews, we are analysing all the reviews and are stored in the database (cloud). By analysing the customer feedback, we are classifying the keyword mentioned in the specific domain in the customer feedback such keyword as product, features, service and ecommerce sites. And then grouped together with keyword and separate specific domain is used to evaluate the product of the application.

B. Classification of customer feedback

In fig 1: To classifying the feedback, they are grouped under the specific domain and then applying grammar algorithm to identifying the SMS word, spell check etc., and then filtering reviews are put into the opinion mining operation. By implementing in this algorithm, first of all polarizes the reviews as positive, negative and neutral. From the positive comments are analysed and identifying the keywords such as good, best, awesome etc., Similarly negative comments are detecting the keyword such as bad, worst, poor etc., And then neutral state find out by using keyword such as not bad, better, less than, greater than etc. These polarized reviews are stored in database (cloud storage). From the database; we are taking out, count of the positive, negative and neutral reviews about the product, features, service and application. It also compared with other brand of same product, service, and web application.

Similar works are carried out all specific domains (1) Features of product are from the customer feedback by detecting the keyword. For example, we are

taking a product as Smartphone, there features of the product as camera, processor, battery etc. if the customer says “battery is good, but camera is bad”. In a single sentence we polarize the positive, negative as different features of the product in another application. So that detecting each features from individual feedback and inserts the count of the specific domain. See Table 1.1: Product: Mobile phone-Apple i phone

Feature name	No. of + reviews	No. of - reviews	Remark
Memory or RAM	3	0	Good
Battery	4	3	Poor
Processor	0	1	Poor
Camera	3	0	V. Good
sound	2	3	Poor
Video Quality	4	0	V. Good
Connectivity	2	0	Fair
Infrequent features	58	17	Excellent
Total/Recommendation	18	7	Recommended

Table 1.1: Product: Mobile phone-Apple i phone

Recommending a web application like ecommerce sites e.g.: Amazon, eBay etc. are compared with one another based on the review of each application and then applying similar work before mentioned

As same as for service which focus on cost, return date, damage etc., All are based on the customer reviews mentioned in their field of feedback area .for example “user buy product on 23/1/2016 and delivery date is 30/1/2016 but delivered date is so late” these types of questionnaires feedback are considered as “service” domain by using the keyword deliver, return cost, in front of the noun and phrase.

And finally all the outputs are represented in separate graph as per the number of customer count value and features (negative and positive and neutral).

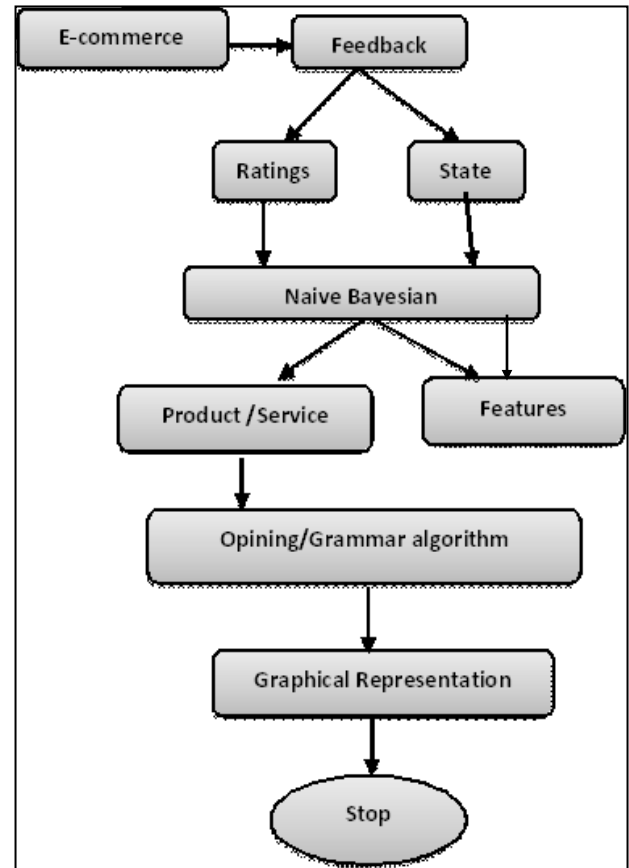


Fig-2: Flow diagram for proposed system

III. EXPECTED RESULT

We are expecting the result as in the efficient manner by using a graph. The graph represented in domain such as product, features, service and web application.

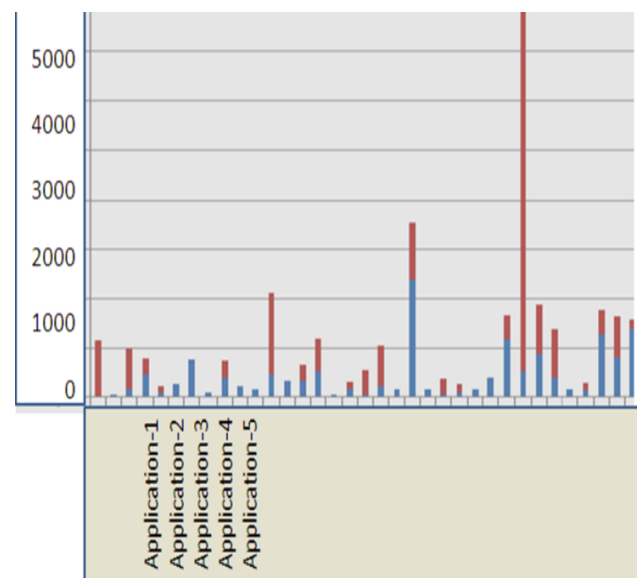


Fig-3: Graph for Comparison of Application

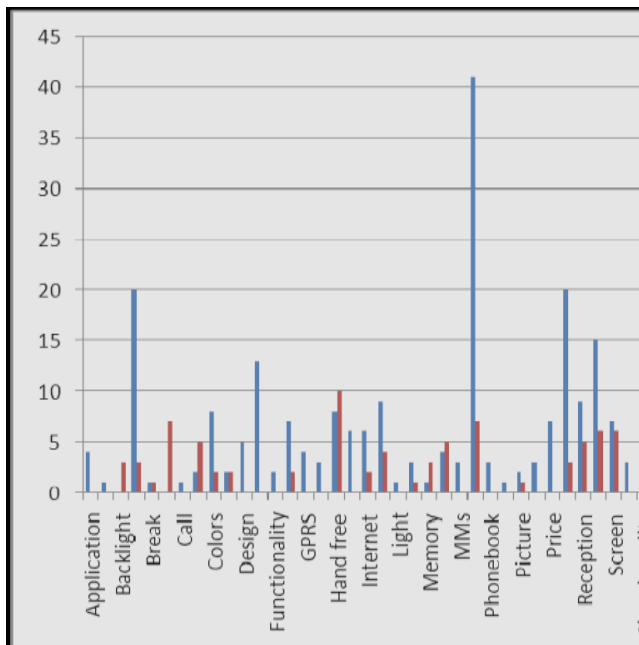


Fig-4: Graph for Features of the Product

These graph indicates individual features of the product and comparison of different application based on customer feedback

IV. RELATED WORK

In Anwer et al. [1] proposed a paper for Feature based opinion mining of online free format customer reviews using frequency distribution and Bayesian statistics. The system reads the reviews word-by-word and finally finds out the summarized result in terms of frequency and probability of opinions .It develop opinion software but, it only deliver the count of positive and negative reviews and not recommended. Only used for product, not for product features. Neutral sentence are not calculated and manually compare the product.

Bolanle Adefowoke Ojokoh, Olufunke Catherine Olayemi, Olumide Sunday Adewale et al. [2] proposed a paper for Generation Recommendation Status of Electronic Products from Online Reviews. This paper describes a research work that focuses on mining the opinions expressed on some electronic products, providing ranks or ratings for the features, with the aim of summarizing them and making re-commendations to potential customers for better online shopping. A technique is also proposed for scoring segments with infrequent features. The evaluation results using laptops demonstrate the effectiveness of these techniques.

Christopher Scaffidi, Kevin Bierhoff, Eric Chang, Michael Felker et al. [3] proposed a paper for Red Opal: Product-Feature Scoring from Reviews. Red Opal is a new search system enables user to identify products rapidly based on features. It is fully automatic system examines prior customer reviews, product features, and scores each product on each feature .yet unclear whether we should add trigram features to Red Opal.

Keshav ,Arvind Swami Nathan, Gouthm, Naren et al.[4]Content based Recommender System on Customer Reviews using Sentiment Classification Algorithms. The paper proposes RecoProd - a recommender system which uses sentiment analysis techniques to provide the best products for the customer. RecoProd consists of an Information Retrieval component which extracts the reviews from the ecommerce websites using the product names as queries. Aspect based summary of opinions for each product is carried out and visually compared. The products are then clustered and the optimal product along with the recommended products is displayed to the .RecoProd has been developed only for mobile phones.

Poojachavan and Rahul kulkarni [5] proposed a paper for Mining E-Commerce Feedback Comments Using Multi-Dimensional Trust Computation Based on the feedback comments to provide better service to customers. It does not focus in fake feedback.

SinghJandail and Ravendra Ratan [6] proposed a novel approach for sentiment analysis and opinion mining. This paper tries to demonstrate the plausibility of the idea through clustering and classifying opinion mining experiment on analysis of blog posts on recent product policy and services reviews. It gives a novel approach for analyzing the review for the customer opinion. It only focuses the statement reviews and provides polarity of the reviews and not focus in age of reviews. Count of the polarity algorithm not provides efficient result.

Su Su Htay and Khin Thidar Lynn [7] proposed a paper for Extracting Product Features and Opinion Words Using Pattern Knowledge in Customer Reviews. This paper is to get the patterns of opinion words/phrases about the feature of product from the review text through adjective, adverb, verb, and noun.

Tinku Varghese and Subha Sreekumar [8] proposed a paper for An E-commerce Feedback Comment Mining Using Sentiment Word Net Tool and K-Means Clustering Method .Each sentence in a feedback comment is considered as a document. This

calculation is lead to obtain a sellers trust profile. Here reputation scores universally high for sellers and this is difficult for a potential buyer to select the trustworthy sellers. The system is based on the observation that buyers often express their opinions openly and honestly in free text feedback comments. Not focus in short word and product its features.

Xiuzhen Zhang [9] proposed a paper for Computing Multi-Dimensional Trust by mining E-Commerce Feedback Comments demonstrates the novel application of combining natural language processing with opinion mining and summarization techniques in trust evaluation for e-commerce applications. It is based on the feedback comments to provide better service to customers. It does not provide accurate result.

V. CONCLUSION

In this paper only a brief description of techniques is presented. To extract the opinions of the people opinion mining and sentiment analysis is the best approach. The motivation of this mining review is to benefit to customers and encourage the customer to buy a product through online in efficient manner. In this contrast of products, features and services provide graphical representation in a user friendly manner.

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