



# International Journal of Innovative Research in Computer and Communication Engineering

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## A Survey: User Review Based Recommendation System

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**ABSTRACT:** E-commerce websites are being popular nowadays. Many people are using such websites to buy various products which they are using in day to day life. After purchasing the product the authentic buyer has an option to give review about particular product which he has purchased. Reviews may contain different polarities such as positive, negative or neutral. By reading various reviews of different polarities the buyer who is willing to buy that particular product may get confused. If customer came across negative reviews it might cause a negative impact of that product on potential customer. So to avoid such confusions regarding the quality of that product we perform sentimental analysis on reviews given by the similar users who have already purchased the product which potential customer is interested to buy. We have developed a recommendation system which performs the sentimental analysis by collecting various data reviews that is gathered from different website. We will be using REST API in our web application to perform the analysis.

**KEYWORDS:** Data Mining, Sentiment Analysis, Social User Behaviour.

### I. INTRODUCTION

The sentiment analysis is required in each and every step of human life, as different people have various opinion regarding a particular thing which may affect us in many ways. The opinions of various people can have a significant influence in our day-to-day decision-making process. These decisions may vary from buying a product from online such as a smart phone to making investments to choosing a college—all decisions that affect various aspects of our daily life. Before all these trending websites like amazon, eBay etc. people would get opinions on products and services from their sources such as friends, relatives, or consumer reports. However, in this Internet era, it is much easier to acquire diverse opinions from different people around the world. People look to review sites (e.g., CNET, Epinions.com), e-commerce sites (e.g., Amazon, eBay), online opinion sites (e.g., TripAdvisor, Rotten Tomatoes, Yelp) and social media (e.g., Facebook, Twitter) to get feedback on how a particular product or service may be perceived in the market. Similarly, organizations use surveys, opinion polls, and social media as a medium to obtain feedback on their products and services. Sentiment analysis or opinion mining is the computational study of opinions, sentiments, and emotions expressed in the form of text. The sentiment analysis is been used more widely because the information it yields can result in proper analyzation of products and services. For example, by considering the feedback given by different people regarding a thing, one can measure the quality of that particular product. Product feedback is helpful in making a better products, which can have a direct impact on revenue, as well as comparing competitor offerings. Hence in the process of building a system that can make our life easy which will predict the sentiments of different products or services, the goal is to extract information which may be in the either forms document, text or URL and determine whether the opinion is positive, negative, or neutral.



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## II. RELATED WORKS

In [2] author has carried out sentimental analysis of twitter data in various tasks are involved like web mining, Natural language processing, machine learning which is complex in nature. So the author has decomposed these tasks into these following three tasks: subjectivity classification, sentiment classification and complimentary task.

**Subjectivity classification:** Subjectivity classification is the task of classifying sentences as opinionated or not opinionated. Let  $S = \{s_1, s_n\}$  be a set of sentences in document  $D$ . The problem of subjectivity classification is to identify sentences used to represent opinions and other forms of subjectivity (subjective sentences set  $S_s$ ) from sentences used to objectively present factual information (objective sentences set  $S_o$ ), where  $S_s \cup S_o = S$ . B. **Sentiment Classification:** Once the task of finding whether a sentence is opinionated is done, we have to find the polarity of the sentence i.e., whether it expresses a positive or negative opinion. Sentiment classification can be a binary classification (positive or negative), multi-class classification (extremely negative, negative, neutral, positive or extremely positive), regression or ranking. Depending upon the application of sentiment analysis, subtasks of opinion holder extraction and object feature extraction can be treated as optional.

**Complimentary Tasks:** Opinion Holder Extraction It is the discovery of opinion holders or sources. Detection of opinion holder is to recognize direct or indirect sources of opinion. Object /Feature Extraction It is the discovery of the target entity.

## III. LITERATURE SURVEY

It has been a widely used area over the years and still it leaves a lot to be researched. In this chapter, various work carried out in literature on sentiment classification and opinion mining are reviewed. Online customer reviews are regarded as a important source of information that is helpful for both future consumers as well as the companies themselves. In webpages, reviews are presented in natural language in unstructured format. The job of manual scanning through huge quantities of reviews is computationally expensive and is not practicable with regard to businesses. Hence, it is more effective to automate processing of those reviews and present the required information in an appropriate format.

Somprasertsri and Lalitrojwong (2010) suggested a method for mining product attributes as well as opinions on the basis of considering syntactic as well as semantic information. Through application of dependency relationships as well as ontological knowledge with probabilistic based models, outcomes of experiment showed that the proposed method was more flexible as well as efficient. With more rapid Internet, people typically search for information on the Internet. Typically, a huge quantity of documents, webpages or learning objects are outputted by search engine in no specific order. Although they might be connected, users have to move back and forth the results attempting to understand which page to read first as the users have no expertise in the particular field. Though users might have certain intuition regarding the domain, they are not yet connected.

Ji et al., (2010) proposed a sentiment mining and retrieval system which mines useful knowledge from product reviews. Furthermore, the sentiment orientation and comparison between positive and negative evaluation were presented visually in the system. Outcomes of experiments on a real-world dataset have shown the system is both feasible and effective.

A sentiment phrase classification vector based web OM algorithm was presented by Han et al., (2010). Through sentiment phrase classification techniques the algorithm compared similarity between document vectors, mined the document's theme and judged document theme attributes. Experiments revealed the algorithm's better effectiveness and practicality.

An important Opinion Mining as well as its application domain was suggested Binali et al., (2009), which critically tested already present research, proposed an opinion mining model and revealed novel research areas. Individuals, businesses as well as governments are capable of knowing products' typical opinion or that of the company. The heart of it is the subjective terms, semantic orientation in reviews that attempt to set contextual connotations via opinion mining. This results in a framework motivation for opinion mining. It sorted already present literature for ensuring clear research opportunities. Conditional Random Fields (CRFs) model was adopted by Qi and Chen (2011) to perform OM



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tasks. Many elements in the model were integrated to optimize training and decoding. The new method was contrasted with lexicalized Hidden Markov Model (L-HMMs) based OM method in the experiment that showed that it was greatly accurate from many aspects.

## IV. PROPOSED SYSTEM

### 1. Software Pre-requisites:

- The basic and initial software requirements are as follows,
  - (a) Windows / Linux operating system
  - (b) Java Script and Java web services (Restful API's)
  - (c) HTML5 and CSS3
  - (d) Bootstrap framework
  - (e) Apache Tomcat Server
  - (f) Java

### 2. Input process:

- (a) Acquiring the data of the product review through the AYLIEN API library using the security key and a secret password after registering for the same.
- (b) Ingestion of the data takes place, the reviews are in json format and are totally unadulterated.

### 3. Processing:

- (a) After the ingestion process is completed we take this raw json format reviews and Using a java code remove the vulgarities of the reviews.
- (b) The reviews are converted into the format the machine understandable and easy to process.
- (c) Important step of the project starts with the data analysis phase in which we mine the aspects such as Positive statements, Negative statements, sentiments of the review under entity extraction step using Java.
- (d) The next step involves of applying algorithms to calculate the positive, negative and Neutral content using the probability classification.

### 4. Output process:

- (a) The analysis done on the opinion is presented in the form of its polarity and sentiment Which varies from -1 to +1.
- (b) The same analyzed data is used to build a system which is major recommender system. The system works on real time basis and depends upon the large quantity of data to work.

### 5. Testing:

- (a) The system and the chart is thoroughly tested using various software testing techniques.
- (b) At each module testing is done in order to create a reliable system and useful interactive characteristics builder.

## V. THE OPERATION OF THE SYSTEM.

- Project task set
  - I. Task 1: Data Ingestion
  - II. Task 2: Data Cleaning
  - III. Task 3: Data Analysis
  - IV. Task 6: Visualization

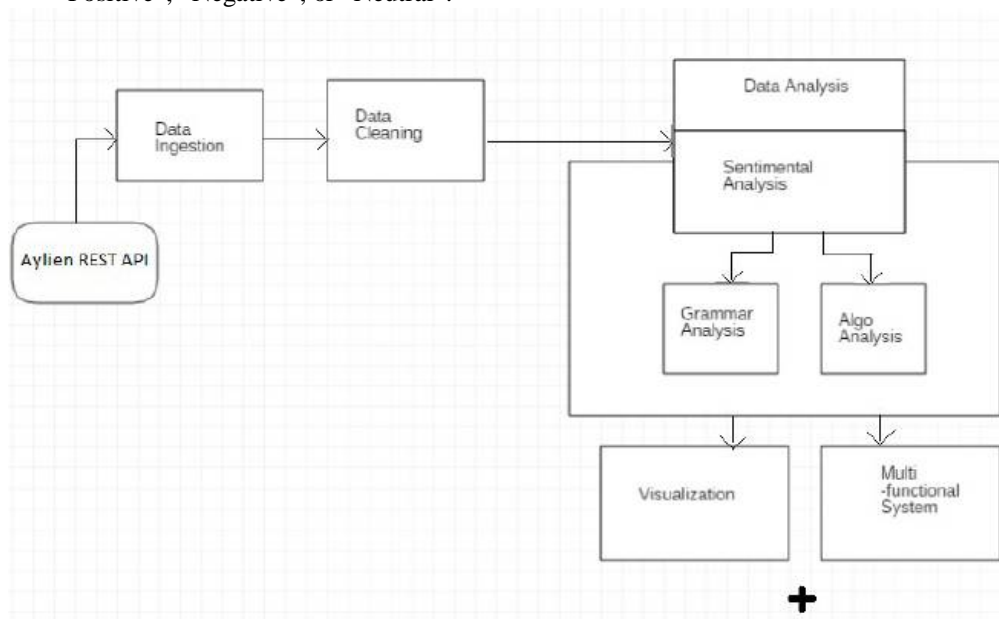
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- 1) **Data Ingestion:** Data Ingestion is the first process that is carried out by the system in which it extracts the necessary information that is to be analyzed which can be given in any form such as “URL”, ”Text”, or a “Document”.
- 2) **Data Cleaning:** Data Cleaning is the second process that takes place in which each and every words that is not required while the sentimental analysis is removed and only the necessary words that would be useful in predicting the sentiments of the particular information is stored in the database.
- 3) **Data Analysis:** Data Analysis is the third process that is carried out by the Aylien REST API in which the information obtained after the cleaning process is analyzed properly to conclude with its sentiment. In this process mainly the grammar of the each sentences in the information is taken into consideration.
- 4) **Visualization:** Visualization is the last step in which the result is displayed in either of these three form i.e. “Positive”, ”Negative”, or “Neutral”.



## VI. SUMMARY AND CONCLUSION

By Sentiment analysis, we are classifying the emotions of people towards specific features of the entity. The entities are regarding to different fields such as individual, business, organizations etc. Then the main focus is on categorizing that opinion in three parts like positive, negative and neutral. It is specially performed to create recommender system. Through this system rating will be done based on the tweets of the people. This project has unlimited scope in various areas such as in Politics for election candidates, in sports prediction, Analysis of manufacturing products also for their brands. In traditional days, sentiment analysis is performed by using data mining concept, in short it was easily possible to fetch data from the database. This process was very time consuming but as we are using REST API so it reduces time and able to handle large data at a time. Similarly because of the use of multi-node architecture, there are less chances of failure. In this architecture on Main server database will be stored and other nodes are able to retrieve that data without necessity of their own database.



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## VII.CONCLUSION

We can hence conclude that recommender system can be used for analysing different things which would make many of the tasks in our personal lives much easier. Not only in personal life but this system can be used by organizations to analyse how their products and services are perceived by consumers to improve their business.

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