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A Survey on Opinion Mining

Shefali Goel[1], Dr. R. K. Gupta[2]
[1]*M.Tech. Student, Department of Computer Science & Engineering, Madhav Institute of Technology & Science, Gwalior, India*
[2]*Professor, Department of Computer Science & Engineering, Madhav Institute of Technology & Science, Gwalior*
shefaligoel35@gmail.com[1]
rkg@mitsgwalior.in[2]

Abstract: ***The technique of extracting people's thought and conception from the text is known as opinion mining. Opinion Mining is the study of human's opinion regarding an object. Opinion mining is one of the part of natural language processing, information retrieval and text mining. The huge amount of web content available on the social media in the form of reviews, blogs, tweets, comments etc has become an effective, attractive and challenging problem. That's why it is much more difficult to analyze the opinions of human. Therefore there is necessity for developing an effectual system to evaluate the opinions and generate the accurate results.***
Keywords: Opinion Mining, Natural language processing, Text mining, Information retrieval.

I. INTRODUCTION

Opinion mining is a technique to take out the opinions of people's text. Opinion Mining deals with evoking and predicting the human's opinion concerning an aspect of an entity in the corpus[3]. Due to the development of web technologies, different areas are developed in this field. The manual analysis of people's opinion especially the reviews, blogs, tweets, of the social media takes lots of time and is very difficult to extract the aspect of entity[2]. To handle these limitations, the opinion mining has been presented as an fruitful way to extract the information through the human comments. So there is a need an effective system to evaluate the user's opinions and generate the accurate results. This result beneficial for the companies to improve the product features.

A. Opinion Mining: Definition, Procedure And Uses

Opinion Mining is one of the part of natural language processing, information retrieval and text mining[2]. The position of Opinion Mining is shown at fig1. Opinion Mining is a member of the web content mining which is also a member of the web mining. Therefore, the web content mining contain huge amount of content on the web, so in this area text mining is used. Web Mining itself is the member of the data mining research part. So the data mining are used to extract the information from the huge data available on the web[3].

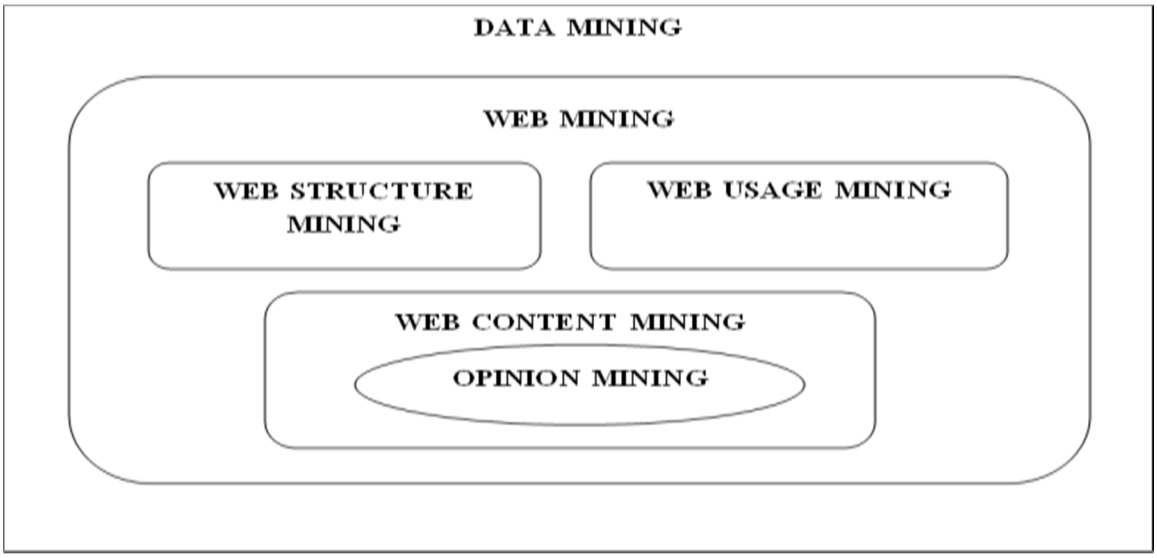


Figure 1. Positional diagram of opinion mining

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B. Definition

The opinion mining is to extract the sentiments of people's from the corpus[2]. The major definition of opinion mining is "Opinion Mining is extracting people's opinion from the web contents. It analyze user's opinions and sentiments for entities and organizations.

1) Procedure

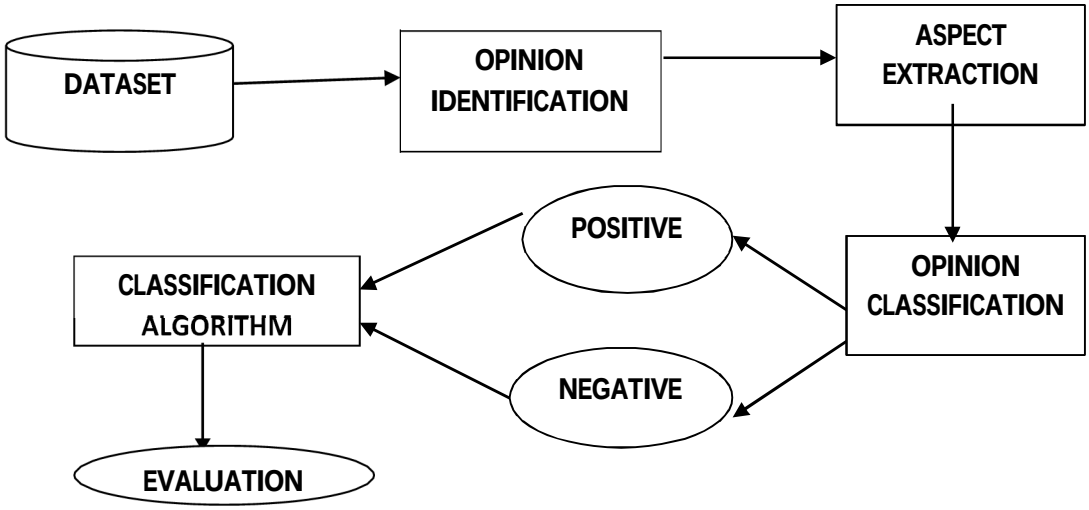


Figure 2. Functional diagram of Opinion mining

a) *Data Collection:* Having an inclusive and flexible dataset is the first task to perform opinion mining procedure from various web contents such as blogs (such as Twitter), reviews (such as flipkart, Amazon)[6].

b) *Opinion Identification:* In this phase all the collected opinions are first identify and then separated which are of different category.

c) *Aspect Extraction:* The aspect extraction phase take out the existing aspect as the given procedure.

d) *Opinion Classification:* This phase classified the opinions with the help of different technique.

e) *Classification Algorithm:* In this phase, different classification algorithms are used.

f) *Evaluation:* In this phase, different evaluation parameters are used such as accuracy, precision and recall to evaluate the performance[6].

C. Applications

Opinion Mining has various applications in different areas such as Opinion mining in the commercial product areas, Business Intelligence, Spam detection, Detection of "flame", Recommendation system, Decision making, social media monitoring and VOC to track customer reviews, survey responses, competitors etc[6].

D. Levels of Opinion Mining

1) *Document Level:* In this level of Opinion mining, the whole document is consider as input and verify it, whether it reveals the overall sentiments or not. The polarity of the corpus at the document level is either positive or negative. In this, the overall document is considered as a single object so the document level opinion mining is not much suitable for evaluation [2].

2) *Sentence Level:* There are two main task perform on sentence level of opinion mining. The first part is to identify that the sentence is objective or subjective and the second part is to determine the Polarity of the sentence whether the sentence is positive or negative[2].

3) *Aspect Level:* People also express their opinions in the aspect level of opinion mining other than of document or sentence level of opinion mining because these two are not enough for making a good decision and for precise evaluation of the corpus[2].

4) *Concept Level:* Cambria (2013) developed the another level of opinion mining i.e. Concept level of Opinion Mining. Concept level of opinion mining analyze the corpus emotions in depth[2]. The concept level of Opinion Mining is to infer the

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sentiments and the emotional information related with natural language thoughts.

II. RELATED WORK

Most of the works on opinion mining focus on extracting people's opinions human. Irum sindhu et al. [26], proposed the Aspect based opinion mining on student's feedback for faculty teaching performance evaluation. In this paper SemEval- 14 dataset are used and perform domain embedding using skip gram model and result shows that 91% accuracy in aspect extraction and 93% in sentiment detection using LSTM neural network. K.V. Akhil Kumar [1], proposed Aspect Based Sentiment Analysis using R programming. In this paper the review dataset of particular product is taken from Amazon and POS tagging is implemented using "NLP Package" in R and SVM and Naïve Bayes classifier have been implemented using "e1071 package" in R. In this, they compared the accuracy of SVM and Naïve Bayes and SVM has a higher accuracy i.e 83.47%. In [27] Omar Alqaryouti et al. study on Aspect based sentiment analysis using smart government review data. In this paper author compares previous different techniques for sentiment classification with the proposed techniques i.e Integrated lexicon and rule based approach. In this the author achieved the highest correlation value i.e. 0.81 and accuracy of 92.25%.This main reason of this result is using the feature based aspect sentiment analysis using SVM. In [4] Feilong Tang et al. proposed an Aspect based fine-grained sentiment analysis for online reviews .This paper presented the two generative models that can extract fine grained aspects and opinions for online reviews. In this paper the author proposed a joint aspect based sentiment topic (JABST) model and then propose a maximum entropy based JABST model (MaxEnt-JABST). In [7] Abinash Tripathy et al. proposed Classification of sentimental reviews using Machine learning techniques. In this, the paper shows the result obtained by applying two classifier i.e. Naïve Bayes (NB) and Support vector machine (SVM). Such algorithm are used for sentimental review, whether the review is positive or negative. The polarity movie dataset is used for training and testing the model and it is observed that SVM gives best result for predicting the review of sentiment. In [8] Abhilasha Singh Rathor proposed Comparative study of Machine learning Approaches for Amazon reviews. The paper focuses on analyzing the efficiency of three machine learning techniques (Support Vector Machines (SVM), Naive Bayes (NB) and Maximum Entropy (ME)) for classification of online reviews using a web model using supervised learning methods. The reviews are classified as positive, neutral and negative. They extracted Amazon Reviews using Amazon API. In this, unigrams and weighted unigrams are used to train machine learning model. The results have shown that machine learning algorithms work well on weighted unigrams and SVM has resulted maximum accuracy. In [24] Abdul Mohaimin Rahat et al. proposed Comparision of Naïve Bayes and Support vector machine algorithm based on Sentiment analysis using review dataset. In this paper, the SVM and Naïve Bayes classifier are compared and analyzed. The result shows that SVM gives better result than Naïve Bayes

Table 1.Comparision table of various Algorithms based on Accuracy

SNO.	AUTHOR & YEAR	DATASET	ALGORITHM USED	ACCURACY(%)
1	AbinashTripathi [2015]	Polarity movie reviews	SVM & Naïve Bayes	94.0
2	Muhammad Bilal [2015]	Roman-Urdu Opinions	Naïve Bayes, Decision Tree & KNN	97.5
3	K.V.Akhil Kumar [2016]	Reviews of Canon SD500	SVM & Naïve Bayes	83.47
5	Abhilasha Singh Rathor [2018]	Amazon reviews	SVM, Naïve Bayes & Maximum Entropy	81.20
6	IrumSindhu [2019]	SemEval-2014	LSTM	82

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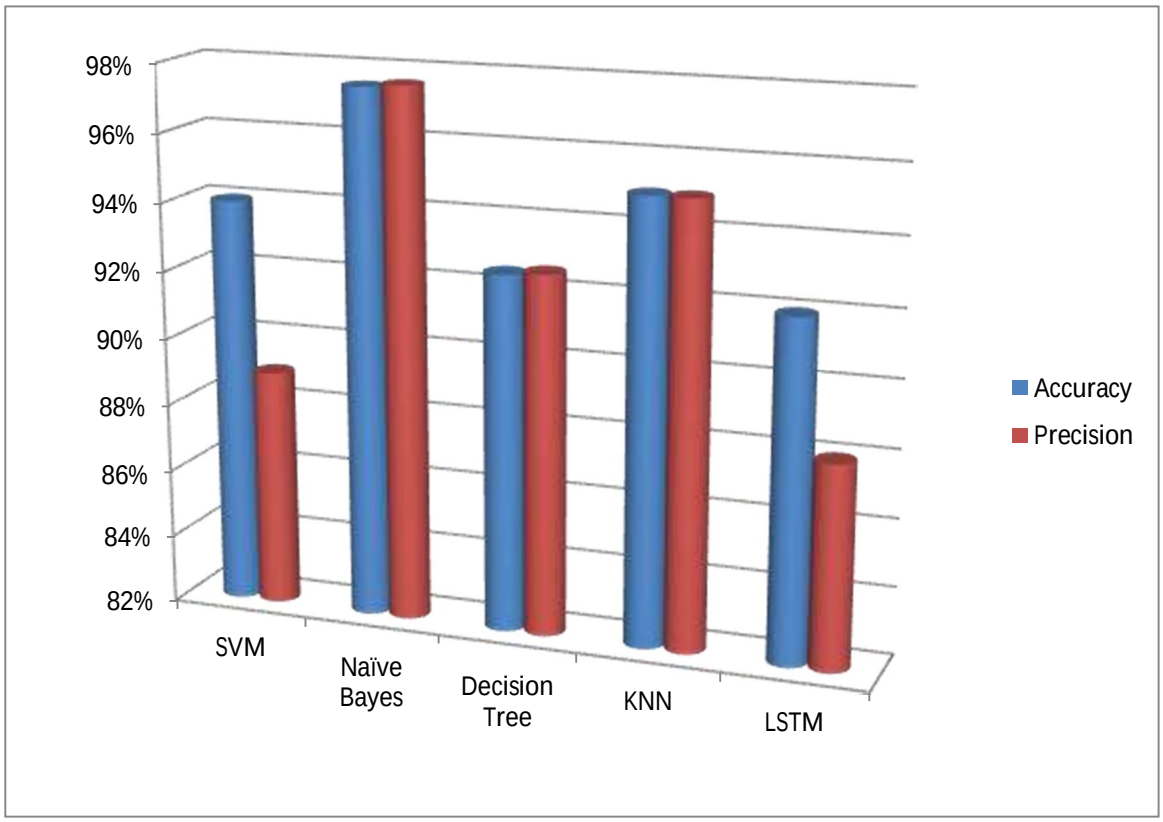


Figure 3.Comparision chart of Algorithms based on Accuracy

Table 2.Comparision table based on Precision and Accuracy

SNO.	AUTHOR & YEAR	DATASET USED	PRECISION(%)	ACCURACY(%)
1	Zhu, J., Zhu, M., Wang [2009]	Chinese restaurant reviews	69	56
2	Sharma, A., Dey, S. [2014]	Movie review corpus	81.12	78.78
3	Peleja,F.,Magalhae s [2015]	SemEval-2015 restaurant	71	-
4	Maharani, W., Widyantoro [2015]	Amazon reviews	52.4	60
5	Pateria, S., Choubey [2016]	SemEval-2016: restaurant	67.75	71.54
6	Jebbara, S., Cimiano [2016]	SenticNet and WordNet	65.9	68.4
7	Islam, J., Badhon, Z.A., Shill[2016]	OpinRank dataset	40.45	42.57

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8	Poria, S., Cambria[2016]	SemEval-2016: restaurant	88.27	88.27
9	Gunes, O.[2016]	SemEval-2014: restaurant	84.76	83.07
10	Araque, O., Zhu, G., Garca-Amado [2016]	Yelp and SemEval-2016	80	79
11	Khalil, T., El-Beltagy[2016]	SemEval-2016	72.69	72.88
12	Deewattananon, B., Sammapun[2017]	Reviews from Playstore	62.5	60.21
13	Zhi, S., Li, X., Zhang[2017]	Reviews of a video software	73.17	74.8
14	Marstawi, A., Sharef, N.M., Aris, T.N.M. [2017]	Reviews of Canon SD500	94	89
15	Panchendrarajan, R., Ahamed[2017]	Restaurant reviews	94.7	75.8

III. CONCLUSION

Opinion Mining is an emergence area of the Natural Language Processing. In this paper, we have briefly explained about the opinion mining its definition and procedure through figure 2 and the level of opinion mining through figure 3. Opinion mining deals with each word in the sentence known as aspect extraction and determined the polarity of the sentence whether it is positive, negative or neutral known as aspect orientation. It is the most challenging area because the massive volume of data available on the web in the form comments etc to processing such type of problem and for making good decision.

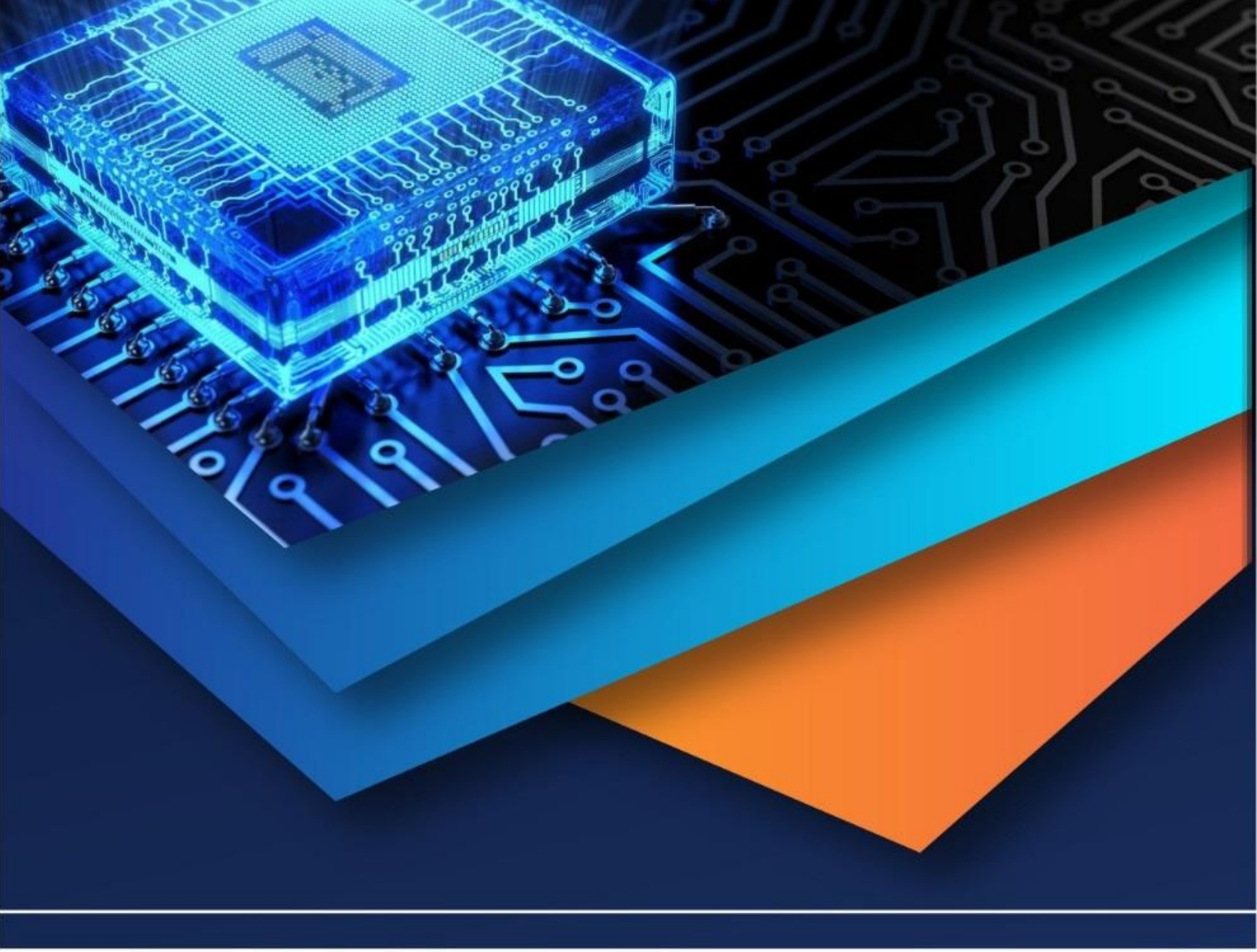
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