

A Survey on “Citizen Opinion Mining Initiatives In Government Decision Making”

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Abstract- Opinion mining is a type of natural language processing for finding the mood of the public a couple of targeted government policy. Opinion mining techniques can be used for measuring influence facts like citizen behavior, desire, needs that help to improve government services. It's includes building a system to gather and examine opinions about the policy, made in weblog posts, comments, stories or tweets. Opinion mining can be useful in several approaches in marketing, it helps to evaluate the success of a launch of latest product, certain aspects. Opinion mining is used to make accurate decision. This paper gives a brief survey on the opinion mining framework..

Keywords- opinion mining, decision making, twitter data

I. INTRODUCTION

Opinion Mining (O.M) is a promising discipline which is defined as combination of understanding, retrieval and computational linguistic techniques offers with the opinions expressed in a record. The field essential objectives are fixing the issues concerning opinions about products, politics, policies in newsgroup posts, assessment web sites, and so on. There are unique techniques for summarizing citizen stories like Data Mining, Information Retrieval, Text Classification and Text Summarization, before WWW users asked the opinions of his family and friends to purchase the product. In the very same way when any government organizations need to take the decision about their policies they had to conduct various surveys to the focused groups or they had to hire the external consultants to do so. Web 2.0, ease the government decision makers to take decision for any policies by reviewing the posted comments. Citizens can post reports on web communities, dialogue forums, twitters, blogs, product's site these feedback are referred to as person generated contents. Web2.0 is taking part in a relevant function in data extracting source in opinion mining. It facilitates government to know about the policies from other citizen's reviews who have strong point of view for specific policy. Organizations, rather of conducting surveys and hiring the outside consultants to understand in regards to the purchasers opinions, extract opinionated textual content from product site. An automated opinion summarization mannequin

is required to whole these tasks. Opinion Mining or Sentiment Analysis is the discipline to extract the opinionated text datasets and summarize in understandable form for end user. Opinion mining is used to extract the positive, negative or neutral opinion summary from unstructured data. It involves subjectivity in text and computational management of opinion. It is the sub discipline of web content mining, which involves Natural Language Processing and opinion extraction task to find out the polarity of any product consumers feedback. Determine 1 describes the object model of Opinion Mining [1].

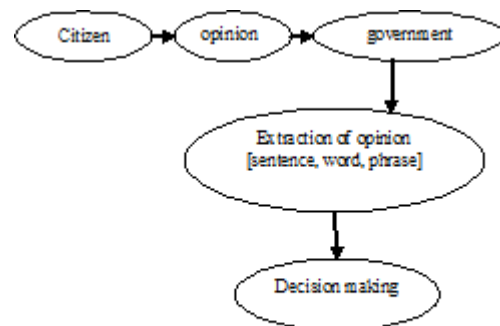


Fig. 1. Opinion Mining Model

Opinion Mining combines the systems of computational linguistics and information retrieval and is concerned with the opinions expressed alternatively than themes within the text. Opinions will also be expressed on whatever. Three most important add-ons of Opinion Mining are:

- Opinion Holder: Opinion holder is the person or organization that expresses the opinion. B
- Opinion Object: It is a feature about which the opinion holder is expressing his opinion.
- Opinion Orientation: Determine whether the citizen opinion about an object is positive, negative or neutral. For example “This government does a great work”. In this review, Opinion Holder is the citizen who has written this review. Opinion object here is the “the work done by government” and the opinion word is “great” which is positively orientated. Determination of semantic

orientation is an undertaking of finishing up whether a sentence or report has either positive or negative orientation [2].

II. APPLICATIONS

- a) it is used in E-commerce activities. When any user buys any product or service from e-commerce websites, then it allows them to submit their feedback about shopping and product qualities. They provide summary for the product and different features of the product by assigning ratings or scores.
- b) It is used in Ad Placement that displays ads as sidebars in online systems. It is important to realize Web pages that contain sensitive content which is unsuitable for ads placement.
- c) It helps the Government in knowing their potency and failure by analyzing feedback from public.
- d) It is used in Entertainment and helps the people to decide which movie or serial to watch.
- e) It is used in Stock market to determine whether the stock price will be increasing or decreasing and help the investor to take decision whether to purchase or sell the stock.
- f) It is used in Marketing. Nowadays each company provides the facility to its customers to write opinions about its product and services which they delivered. So it is helpful for companies to save a lot of money as well as time because there is no need to conduct surveys as the reviews related to all the products are available on their websites.
- g) It is used in Education also, to help students to decide which academic institution is good for study.
- h) It is used in Voice of Customer to know what individual customer is saying about products or services.
- i) It is used in Voice of Market to determining what customers are feeling about products or services of competitors. It also helps the corporate to get customer opinion in real-time [3].

III. FEATURE EXTRACTION AND SELECTION

Feature decision approaches provide a criterion to get rid of terms from document corpus to cut down vocabulary space. Feature selection is done in literature as follows:

1. Information gain (based on presence/absence of a term in a document, a threshold is set and terms with less information gain removed).
2. Odd Ratio (suitable for binary class domain which has one positive and one negative class to classify. The

algorithm is run in each class and top- n features from the sorted list are taken).

3. Document Frequency (Measures appearances of a term in available corpus documents and based on threshold, computed terms are removed).
4. Mutual Information (words with frequent association in a document are chosen. Features weighting mechanism is two types. They are:
 - 1) Term Presence and Term Frequency- word occurring occasionally has more information than frequently occurring words.
 - 2) term frequency and inverse report frequency (TFIDF) - records are rated with easiest ranking for phrases showing most likely in few files and lowest rating for phrases appearing typically in all documents. Discovering regularities is convenient and consumes much less time when data suits computer learning which is executed by means of removing of irrelevant and redundant data aspects and this system is termed characteristic decision. Function determination is automatic and computationally tractable, unlike constructing new input data. Feature selection benefits learning by reducing data required to achieve learning, improves predictive accuracy, compacts learned knowledge and is easily understood. It also has lower execution time. Current machine learning feature selection methods are in two divisions — wrappers: evaluation of features using learning algorithm, and filters: evaluation of feature through heuristics headquartered on data's general traits. As feature selection is optimized for a specific learning algorithm, wrappers ensure better results regarding final predictive learning algorithm accuracy than filters. But, as a learning algorithm evaluates all features sets, wrappers are highly-priced to run and intractable for gigantic databases with many points. Feature selection methods are,

- Correlation based feature selector (CFS),
- Information Gain,
- Support Vector Machine (SVM),
- Principal component analysis (PCA)

IV. CHALLENGES ON OPINION MINING

1. opinion reviews, comments and feedback could be in different languages (English, Urdu, Arabic, and French etc.), Thus to deal with each language in keeping with its orientation is a difficult challenge.
2. As noun words are considered as feature words but Verbs and adjectives can also be used as feature words which are difficult to identify.

3. If a citizen-One comments on government policy, “this policy is excellent for us” and citizen-Two comments, “this policy is very good”. Both are talking about same feature but with different wording. To group the synonym words is also a challenging task.
 4. Orientation of opinion words could be different according to situation. For example “Camera size of mobile phone is small”. Here adjective small used in positive sense but if customer parallel said that “the battery time is also small”.
 5. Here small symbolize negative orientation to battery of phone. To establish the polarity of identical adjective words in exceptional quandary can also be a difficult task
 6. Because the citizen comment in free structure, they are able to use abbreviation, short phrases, and roman language in studies. For instance u for you, gov for government, pic for picture, f9 for best, b4, before, gud for good etc. To deal for such type of language want quite a few work to mine opinion.
 7. One of a kind folks have one of a kind writing styles, equal sentence could include confident as well as terrible opinion, so it is complicated to parse sentence as positive or negative in case of sentence level opinion mining .
 8. In Bing Liu approach opinion invariably labeled most effective in two classes positive and terrible but impartial opinion also expressed often. Liu considers most effective adjective as opinion words but opinion might also expressed as adverb, adjectives and verb. For illustration “like” is a verb but additionally an opinion word. His approach finds the implicit features because it extracts the sentences contain at least one feature word. So the features commented by customer indirectly are ignored.
 9. Lexicon based methods use for opinion mining has not an effective method to deal with context dependent words. For example the word “small” can express the either positive or negative opinion on the product features. For a mobile phone if customer comments that “size of mobile phone is small” this sentence does not show either size is positively opinioned or negatively.
 10. To finding of spam and fake reviews, mainly through the identification of duplicates.
 11. The comparison of qualitative with summary reviews and the detection of outliers, and the reputation of the reviewer. 11. The combination of opinion with behavior to validate data and provide further analysis into the data ahead of opinion expressed.
 12. The continuous need for better usability and user friendliness of the mining systems [4].
- 1) Citizen Reviews for Individual Policy Feature Based Ranking.
 - 2) Overall positive and negative polarity at paragraph degree.
 - 3) Ranking of quality paragraph or sentence based on satisfactory feature and their polarity worried.
 - 4) Continuous Improvement of the algorithms for opinion detection.
 - 5) Decrease the human effort needed to analyze contents.
 - 6) Semantic analysis by way of lexicon/corpus of phrases with identified sentiment for sentiment classification.
 - 7) Identification of extremely rated authorities.

Future Research: long term and short term issues Short-term:

- Enhanced discoverability of content through Linked Data
 - Visual representation
 - Audiovisual opinion mining
 - Real -time opinion mining
 - Machine learning algorithms
 - SNA applied to opinion and advantage
 - Bipolar comparison of opinions
 - Comment and opinion recommendation algorithm
 - Cross-platform opinion mining
 - Collaborative sharing of annotating/labeling resources
- Long-term:
- Autonomous machine learning and artificial intelligence
 - Usable, peer-to-peer opinion mining tools for citizens
 - Non-bipolar assessment of opinion
 - Automatic irony detection [5].

VI. ISSUES OF OPINION MINING

- A positive or negative sentiment word could have their reverse that means in a special domain so it's rough to predict with the aid of its keyword meaning.
- Interrogative Sentence an interrogative sentence won't have neither positive nor negative sentiment however the key word used in the opinion is also positive or negative [6].
- Sarcastic Sentences Few sentences within the form of jocks could violate the which means of the entire sentences such sort of sentence desire a vigor full awareness towards the key phrases and sentences. These funny sentences no longer simplest violet the sentence of a unique sentence but additionally damage the worth of the entire record.
- Sentiment without sentiment words sometimes sentiments does not use any sentiment words like good , better , best , worst ,bad etc. but the sentences may have its positive or

V. RESEARCH AREAS IN OPINION MINING

Current research is focusing on

negative feedback about the product , services and policies.

- Conditional sentences conditional sentences are also an predicament in Sentiment mining conditional sentences can also be creating the identical quandary like interrogative sentences.
- Creator and Reader understanding point (person to person varying) dollar cost is growing with appreciate to Indian rupee. This document has both the positive and negative meaning and its value is varying from person to person. This sentence has the positive sentiment for the Exporter while this same sentence has the negative sentiment for the importers.
- Spam reviews Spam sentiments are these sentiments which can be posted through the opposite or competitor group for growing their product price or their organization price among the users. Some politician may use the same spam review to just for their publicity.

VII. CLASSIFICATION METHODS IN OPINION MINING

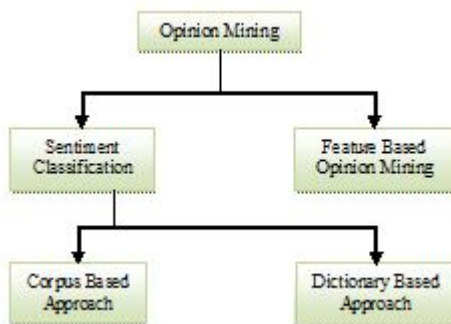


Fig.2. Classification of approaches of semantic orientation

Problems in extracting a text's Semantic Orientation (SO) (whether text is positive or negative to specific subject matter) starts from determining SO for individual words. The hypothesis is that, in a SO of relevant words in a text, SO for entire text is determined. SO approach to Sentiment analysis is unsupervised learning as it needs no prior training to mine data. Figure1.1 details classification of SO approaches.

Corpus founded method A preferred corpus-driven system is identifying words emotional affinity to study their probabilistic affective ratings from a giant corpus. The method is to assign a happiness factor to words based on their occurrence frequency in happy labeled blog posts compared to total frequency in a corpus of blog posts labeled with —happy| and —sad| mood annotations. They compare happiness factor of scores of words with scores in the list. Dictionary Based Approach Dictionary based approach uses lexical resources like Word Net to automatically obtain emotion-related words for emotion classification beginning

from primary emotion adjectives set, they retrieve similar words from Word Net using senses of all words in synsets with emotion adjectives. The process exploits synonym and hyponym relations in Word Net to manually locate words similar to nominal emotion words. Affective weights are acquired automatically from a very large text corpus in an unsupervised way. Feature based opinion mining Using OM, a review is evaluated at 3 levels- document, sentence and feature levels. Evaluating a review at document level, the entire review is classified positive or negative based on opinions expressed in that review. When evaluated at sentence level, then every sentence is classified as positive or negative while feature level or feature based OM gives summary where a product feature is liked or disliked by reviewers. The major feature based OM tasks include –

- (1) Identifying products features in review,
- (2) Determining opinion expressed by reviewer (positive, negative or neutral),
- (3) Summarizing discovered information [7].

VIII. TWITTER DATA

Micro blogging today has become a very popular communication tool among Internet users. Millions of messages are appearing daily in general web sites that furnish offerings for micro blogging such as Twitter1, Tumblr2, Facebook3. These are help to make strong decision for any government policy. Authors of those messages write about their life, share opinions on type of issues and discuss present issues. Considering of a free layout of messages and an effortless accessibility of micro blogging platforms, internet users are likely to shift from normal verbal exchange instruments (akin to natural blogs or mailing lists) to micro running a blog services. As increasingly citizen submit about merchandise and services they use, or express their political and devout views, micro blogging internet-websites become priceless sources of citizens opinions and sentiments. Such knowledge may also be effectively used for advertising and marketing or social stories we use a dataset formed of accrued messages from Twitter. Twitter contains a very large number of very short messages created by the users of this micro blogging platform. The contents of the messages vary from personal thoughts to public statements. Table 1 shows examples of typical posts from Twitter. Because the viewers of micro running a blog structures and services grows every day, data from these sources can be used in opinion mining and sentiment analysis tasks. For example, government may be interested in the following questions:

- What do people think about our policies (service)
- How positive (or negative) are people about our policies?

- What would people support our policies to be like? Political parties may be interested to know if people support their program or not. Social organizations may ask people's opinion on current debates. All this information can be obtained from micro blogging services, as their users post everyday what they like/dislike, and their opinions on many aspects of their life. In our paper, we study how micro blogging can be utilized for sentiment evaluation purposes. We exhibit find out how to use Twitter helps government as a corpus for sentiment analysis and opinion mining. We use micro blogging and extra specifically twitter for the next explanations:
- Micro blogging systems are utilized by one-of-a-kind people to precise their opinion about one of a kind topics, hence it is a useful source of people's opinions.
- Twitter involves an massive quantity of text posts and it grows every day. The amassed corpus will also be arbitrarily gigantic.
- Twitter's audience varies from common citizen to celebrities, enterprise representatives, politicians⁴, and even country presidents. Accordingly, it is feasible to acquire text posts of citizens from exclusive social and interests groups.
- Twitter's viewers is represented by means of citizens from many countries ⁵. Even though customers from U.S. Are prevailing, it is feasible to collect data in distinctive languages. We accumulated a corpus of 300000 text posts from Twitter evenly cut up automatically between three sets of texts:
 1. Texts containing positive emotions, akin to happiness, entertainment or pleasure
 2. Texts containing negative emotions, similar to unhappiness, anger or disappointment
 3. Objective texts that best state a reality or do not specific any emotions we participate in a linguistic evaluation of our corpus and we exhibit the way to build a sentiment classifier that makes use of the accumulated corpus as training data [8].
- Twitter's audience is represented with the aid of citizens from many nations ⁵. Even though citizen from U.S. Are prevailing, it is possible to accumulate knowledge in specific languages. We gathered a corpus of 300000 text posts from Twitter evenly split robotically between three units of texts:
 1. Texts containing constructive feelings, comparable to happiness, enjoyment or joy
 2. Texts containing negative feelings, equivalent to unhappiness, anger or disappointment
 3. Objective texts that best state a fact or don't categorical any emotions we perform a linguistic evaluation of our corpus and we exhibit the best way

to build a sentiment classifier that makes use of the accrued corpus as training knowledge [8].

Table 1. Examples of posts with expressed users opinions

Funkeybrewster: @redeychicago I think Obama's visit might've scaled the victory for chicago. Hopefully the games mean good thing for the city.
Vourve: I like how Google celebrates little things like this: Google.co.jp honors Confucius Birthday – japan Probe
Mattfellows: Hai world, I hate faulty hardware on remote systems where politics prevents you frome moving software to less faulty systems.
Brooklyn: I love the sound my ipod makes when I shake to shuffle it. Boo bee boo
MeganWilloughby: Such a Disney buff, Just found out about the new Alice in Wonderland movie. Official trailer: http://bit.ly/13ljs0 I love the Cheshire Cat.

IX. LITERATURE SURVEY

Lavanya T [2016] et al. It is proposed to plan an algorithm which removes conclusion targets and opinion words utilizing word arrangement display for online audits extricated from Twitter. An opinion target is defined as the topic about which users express their opinions. An opinion words are defined as the words that are used to express users' opinions The point of the venture is to decide the contemplations of blog or audit author regarding some theme or the general relevant extremity of online surveys utilizing word arrangement display. The key objective of this project is to design an algorithm that predict opinion words and opinion targets for analyzing the market status of a product by mining user reviews posted in social networking site namely the Twitter. For evaluation, Benchmark Customer Review Dataset and real tweets dataset pertaining to product reviews extracted using Twitter API. The results are measured as far as Precision and Recall for exactness of discovering assessment words and focuses keeping in mind the end goal to be a basic element for opinion mining and sentiment analysis. The experimental results show that the proposed method achieves better accuracy in an efficient way. In addition, the ultimate outcome of this project to make choice of designing potential consumer oriented products e.g. Mobile, laptop, and so on [9].

Jumadi [2016] et al. Tweet data on Twitter as microblogging prepared to be an useful and helpful data. We propose public opinion mining with Support Vector Machine (SVM) algorithm to group tweet opinion data which is an enormous data. This citizen opinion mining will be used to get insight of public opinion about State Islamic University of Sunan Gunung Djati Bandung which is one of large university in Indonesia. We have two classes for opinion classification that is negative and positive opinions. Pre-preparing stage before ordering comprises of cleaning data, emotion tokenizing, case collapsing, stop words evacuation, and stemming process. The aftereffect of this exploration is 0.838 accuracy esteem and 0.76 review for positive class. At that

point, 0.78 exactness esteem and 0.853 review for negative class. Opinion classification with SVM of this research has accuracy 78.75% [10].

Shokoufeh Salem Minab [2015] et al. The reason for this paper is to analyze the past works online analysis of sentiment on Twitter. Social media such as Twitter create space to explain the thoughts and opinions on various topics and different events, millions of users can share their ideas in this Microblog. Therefore Twitter is changed over as a source to investigation of data; settle on a choice and an examination of supposition. There is a sense in the greater part of the writings, yet it is more essential to give techniques to acquiring appropriate gauging and improved utilization of data for anticipating supposition. Likewise twitter data takes after the stream demonstrate. In this model, data were arrived base at rapid to destination As a result, data mining algorithm should be able to predict user feeling in immediate time under limited space and time [11].

Vemuri Sindhura [2015] et al. Opinion mining exemplifies the systems and procedures that promise to exactly facilitate the opinion oriented information searching for systems that worried computational regimen of opinion or subjectivity within the text. The approach is to collect data from Twitter, a micro blogging social networking site and analyze various Opinion mining techniques. A little effort is made to review in detail about various approaches to perform a computational analysis of opinions. Various data-driven tactics for opinion mining as characteristic situated Opinion Mining system, machine studying founded Opinion Mining method and Ranking model with an opinionatedness feature are reviewed and their strengths and weakness are touched upon [12].

O'nder C [2015] et al. In this study, our real objective is to explore the positive/negative extremity of Turkish Twitter bolsters by utilizing content characterization techniques for sentiment analysis. Bag of Words and N-Gram models are utilized to separate the substance of content in highlight extraction phase. Distinctive closeness measurements are broke down to enhance the execution of the KNN classifier on both Reuters-8 and Turkish Twitter Feeds data. The Reuters-8 data used to analyze impact of content dialect and length on classification comes about. The examinations are directed on six distinct blends of highlight extraction models and weighting techniques. Experimental results about demonstrate that IT-Sim gives better execution contrasted with other grouping measurements and Tf-Idf is the best weighting technique. The accuracy of the kNN classifier is relied on upon mix include extraction display with various weighting techniques and the estimations of k parameter [13].

Suvarna D. Tembhurnikar [2015] et al. In this paper our utilize BN gram which is one of the novel point identification techniques on three vast Twitter datasets related to late occasions. It has been watched that the pre-preparing of the data and examining methodology are extraordinarily influencing the quality of detected topics. On much focused topics, standard NLP techniques can do well for social streams. But for handling more heterogeneous streams novel techniques are used. BNgram technique gives the best execution, in this way being more dependable. In this paper we likewise discover the opinions of individuals identified with occasions "Sentiwordnet dictionary" is used for finding scores of each word. And then sentiments are classified as "negative, positive and neutral" [14].

Malhar Anjaria [2014] et al. We likewise propose a hybrid approach of separating opinion utilizing direct and indirect components of Twitter data in view of Support Vector Machines (SVM), Naive Bayes, Maximum Entropy and Artificial Neural Networks based directed classifiers. We combined Principal Component Analysis (PCA) with SVM trying to perform dimensionality decrease. This paper demonstrates two distinctive contextual analyses of completely unique social situations, US Presidential Elections 2012 and Karnataka Assembly Elections 2013. We close the conditions under which Twitter may fall flat or prevail with regards to anticipating the result of decisions. Exploratory outcomes exhibit that Support Vector Machines beat every single other classifier with greatest effective expectation accuracy of 88% if there should be an occurrence of US Presidential Elections held in November 2012 and maximum prediction accuracy of 58% in case of Karnataka State Assembly Elections held in May 2013 [15].

LI Bing Keith C.C. Chan [2014] et al. Motivated by these exploration issues, this paper proposes a novel matrix-based fuzzy algorithm, called the FMM framework, to mine the characterized multilayered Twitter data. Through arrangements of tantamount analyses connected on Twitter data, the proposed FMM framework accomplished a magnificent execution, with both quick handling velocities and high prescient precision. As of late, a few endeavors have been made to mine social media for the analysis of public sentiment By means of a literature review on early works related to social media analytics especially on opinion mining, it was recognized that in the real life social media environment, the structure of the data is ordinarily uncertain and it doesn't specifically create enough data to completely speak to any chose target [16].

BalakrishnanGokulakrishnan [2012] et al. Opinion mining and sentiment analysis is a quickly developing theme with different world applications, from surveys to ad situation. Customarily people accumulate criticism from their companions or relatives before obtaining a thing, yet today the pattern is to recognize the sentiments of an assortment of people the world over utilizing miniaturized micro blogging data. This paper talks about an approach where a plugged stream of tweets from the Twitter microblogging website are preprocessed and ordered in light of their enthusiastic substance as positive, negative and immaterial; and examinations the execution of different classifying algorithms in view of their accuracy and review in such cases. Assist, the paper exemplifies the utilizations of this examination and its limitations [17].

X. CONCLUSION

In this paper data analysis approach is presented that extract group of strong opinions from twitter data that is used to take decision for any object. The selected given dataset is converted into more priceless structured data. The rationale of opinion mining with the aid of linguistic analysis and opinion classifiers for you to collectively assess positive, negative and neutral sentiments for any given political decision.

REFERENCES

- [1] Nidhi R. Sharma , Prof. Vidya D. Chitre “Opinion Mining, Analysis and its Challenges” International Journal of Innovations & Advancement in Computer Science IJIACS, Volume 3, Issue 1 April 2014.
- [2] Richa Sharma, Shweta Nigam and Rekha Jain “Supervised Opinion Mining Techniques: A Survey” International Journal of Information and Computation Technology. ISSN 0974-2239 Volume 3, Number 8 (2013).
- [3] Anu Maheshwari, Anjali Dadhich, Dr. Pratistha Mathur “Opinion Mining: A Survey” International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 1, January 2015.
- [4] Nidhi R. Sharma , Prof. Vidya D. Chitre “Opinion Mining, Analysis and its Challenges” International Journal of Innovations & Advancement in Computer Science IJIACS, Volume 3, Issue 1 April 2014.
- [5] S. Veeramani , S. Karuppusamy “A Survey on Sentiment Analysis Technique in Web Opinion Mining” International Journal of Science and Research (IJSR) ,Volume 3 Issue 8, August 2014.
- [6] Vidisha M. Pradhan, Jay Vala and Prem Balani “A Survey on Sentiment Analysis Algorithms for Opinion Mining” International Journal of Computer Applications (0975 – 8887) Volume 133 – No.9, January 2016.
- [7] Jeevanandam Jotheeswaran, Dr. S. Koteeswaran “Sentiment Analysis: A Survey of Current Research and Techniques” International Journal of Innovative Research in Computer and Communication Engineering Vol. 3, Issue 5, May 2015.
- [8] Alexander Pak, Patrick Paroubek “Twitter as a Corpus for Sentiment Analysis and Opinion Mining”2009.
- [9] Lavanya. T, Miraclin Joyce Pamila. J. C, Veningston. K “Online Review Analytics using Word Alignment Model on Twitter Data”2016 IEEE.
- [10] Jumadi, Dian Sa’adillah Maylawati, Beki Subaeki and Taufik Ridwan “Opinion Mining on Twitter Micro blogging Using Support Vector Machine: Public Opinion about State Islamic University of Bandung”2016 IEEE.
- [11] Shokoufeh Salem Minab, Mehrdad Jalali and Mohammad Hossein Moattar “Online Analysis of Sentiment on Twitter” 2015 IEEE.
- [12] Vemuri Sindhura, Y. Sandeep “Medical Data Opinion Retrieval on Twitter Streaming Data” 20 15 IEEE.
- [13] O’ nder C, oban, Barıs, O’ zyer and Gu’ls, ah Tu’mu’klu’ O’ zyer “A Comparison of Similarity Metrics for Sentiment Analysis on Turkish Twitter Feeds” 2015 IEEE.
- [14] Suvarna D. Tembhurnikar, Nitin N. Patil “Topic Detection using BNgram Method and Sentiment Analysis on Twitter Dataset” 2015 IEEE.
- [15] Malhar Anjaria, Ram Mahana Reddy Guddeti “Influence Factor Based Opinion Mining of Twitter Data Using Supervised Learning” 2014 IEEE.
- [16] LI Bing Keith C.C. Chan “A Fuzzy Logic Approach for Opinion Mining on Large Scale Twitter Data” 2014 IEEE.
- [17] BalakrishnanGokulakrishnan, Pavalanathan Priyanthan, ThiruchittampalamRagavan, Nadarajah Prasath, AShehan Perera Opinion Mining and Sentiment Analysis on Twitter Data Stream “”20 12 IEEE.