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Opinion Mining of Amazon Data for Alexa Review Analysis

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Abstract: ***The fast expansion in piles of unstructured literary information joined by multiplication of devices to investigate them has opened up extraordinary freedoms and difficulties for text mining research. The programmed naming of information is hard in light of the fact that individuals regularly express feelings in complex manners that are here and there hard to fathom. The marking interaction includes tremendous measure of endeavours and mislabelled datasets typically lead to erroneous choices. In this paper, we plan a frame work for sentiment analysis with opinion mining for the instance of Amazon Alexa. Most accessible datasets are not named which presents a great deal of works for scientists as tolls text information pre-preparing task is concerned. Also, supposition datasets are frequently profoundly area touchy and difficult to make since assumptions are sentiments like feelings, mentalities and conclusions that are ordinarily overflowing with phrases, sound to word imitations, homophones, phonemes, similar sounding word usages and abbreviations. The proposed system is named feeling extremity that naturally readies a supposition dataset for preparing and testing to extricate impartial assessments of inn administrations from surveys to find a reasonable AI calculation for the grouping segment of the structure.***
Keywords: sentiment analysis, bag of words, opinion mining, natural language processing.

I. INTRODUCTION

An enormous amount of data burst has been experienced in the amount of data mainly for the unregulated data collected from people who express opinions through the voice with the amazon Alexa and also on various social media platform for varied reason. Notwithstanding, with the progression away limit joined by the expanding complexity in data mining tools, openings and difficulties have been made for examining and getting valuable experiences from these heaps of information.

In this paper, we have chosen the data from amazon Alexa from users received through the Alexa for sentiment analysis with opinion mining from customer prospect. In sentiment analysis we use the know-how of natural language processing and computational linguistics to automate the classification of sentiments generated from reviews. Alexa gives us the comfort of playing music, provide information, deliver news along with various information, even allow us to control our smart home.

Mining amazon Alexa reviews is requisite to gain deeper knowledge of customer expectations and support effective progressions of customer needs. It would help in gaining a better understanding of Alexa users' needs and to discover areas for further improvement and improve the performance of the service to cater the need of the users. The reviews collected are provided exclusively by the customers who have used and found Alexa having either a positive or negative participation. Purchaser give feedback about the accuracy and factual correctness of the news provided by the Alexa, accuracy in placing correct order made through voice commands, efficiency in able to play the right music track demanded by the user. Furthermore, sentiment analysis of Alexa reviews is crucial to understand hidden patterns generated by data that would help to effectively improve performance.

II. RELATED WORK

In recent times opinion mining has become a prominent area of research. The disorganized data from websites create a challenge in progress of opinion mining or sentiment analysis. Dissimilar methods of dictionary for sentiment analysis of text as language distinct dictionary, corpus and lexicon are put forward by Natural Language Processing (NLP) which is used in a part of opinion mining. Automatic removal of stop word or needless word is what they are trying to do. Moreover, different word references are settled by AI techniques, which attempt to rank scoring of different word references. For instance, the paper in utilized fluffy rationale calculation to gather the positioning of various word reference into rule for arrange the assessment. After word division measure is evacuation stop words by word reference checking. The focus here is on determining polarity of words either in positive or negative in a cluster of customer significance that are obtained from the sample texts and made to relate to occurrence of whole sentence. If the dictionary of emotional words serves as a weight for the obtained words, positive or negative response is answered. Notwithstanding, customer feedback has contrasting response with the product. Naive Bayes model on contrast to other model to which there are numerous sources ranging from social sites to web site.

Our approach is distinctive from the above mentioned, proposed paper uses the convenience of classifier model to generate from classifier to distinct not only on basis of positive or negative review but also factor analysis to brunt the users who gave the review.

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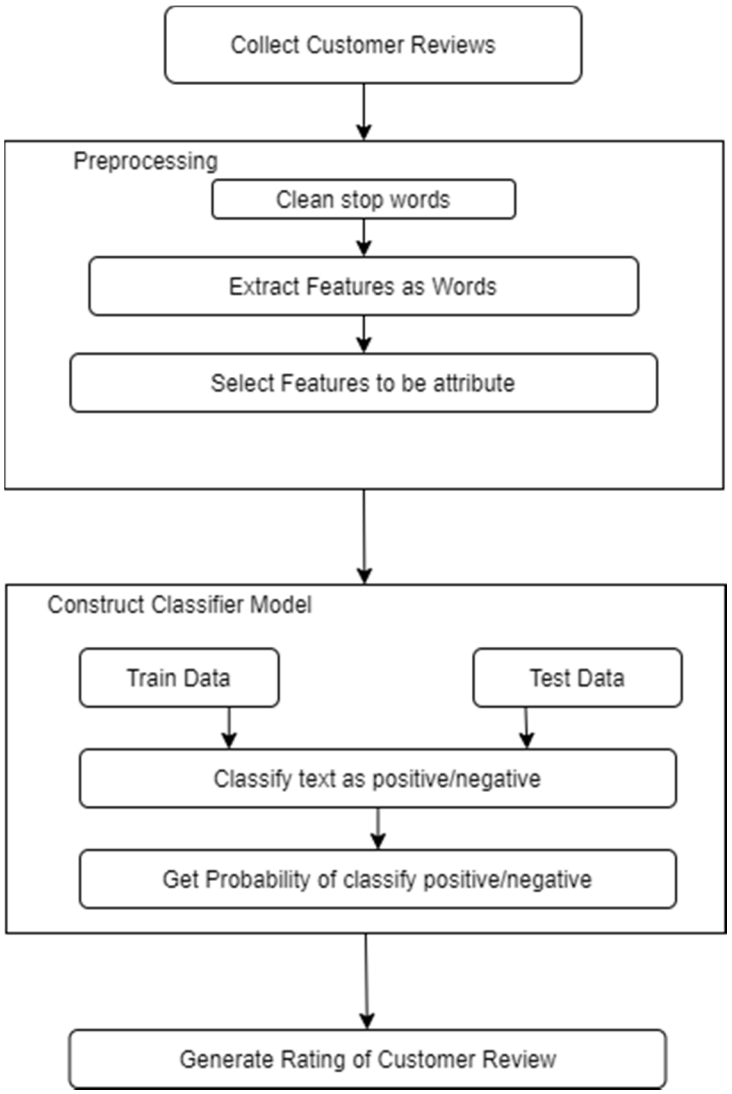
III. PROPOSED METHODOLOGY

The proposed methodology used amazon Alexa's customer reviews from amazon verified reviews. The objective is to classify user reviews from the collected data who have used and found Alexa either helpful or any found any issue. The number of reviews collected are 3000 customer revies, used to check the service of amazon Alexa. Collection of data marks the initial process and then removal of stop words and use of frequently used words is done in pre-processing cleaning, which will be taken into consideration for attribute of classifier model. Classifier model is used to segregate customer review into positive or negative from data set.

A. Pre-processing

The feature selection is to the attributes which are selected from the extracted words from the selected data of 3000 customer review.



There are 3 figures and 1 table, the first figure gives the frequency count of the positive opinion words throughout the review set, the second figure gives the frequency count of the negative opinion words throughout the review set, the third figure gives the frequency of the most used words throughout the dataset. While the table gives the frequency of the words that occurred the greatest number of times throughout the dataset.

The frequency of both positive as well as negative are considered for the preparation of attribute as considering individual customer review. The data set is separated into two, that are training data set and test data set.

Table 1. Frequently used Word's Count

Words	Frequency	Words	Frequency
love	1064	sound	427
echo	868	one	371
Great	729	set	364
Use	718	get	354
Work	650	devic	348
Alexa	633	dot	347
Music	540	easi	342
Like	535	play	333
Play	333	Sound	427
Speaker	307	one	371
Product	284	set,	364
Good	278	get	354
Thing	276	devic	348
Amazon	260	dot	347
time	257	easi	342
home,	221	smart	184
would,	218	Purchas	180
still	206	Connect	179
Show	203	Day	178
Realli	193	New	177
Light	192	better	177
bought	189	ask	176

Fig 1. Frequent word of negative opinions

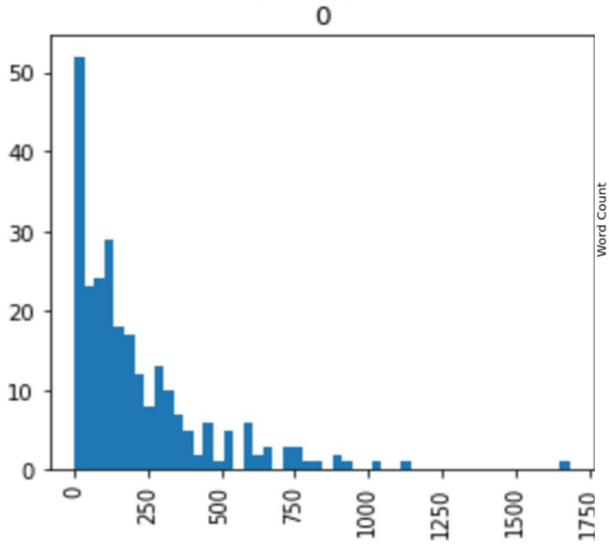


Fig 2. Frequent word of positive opinions

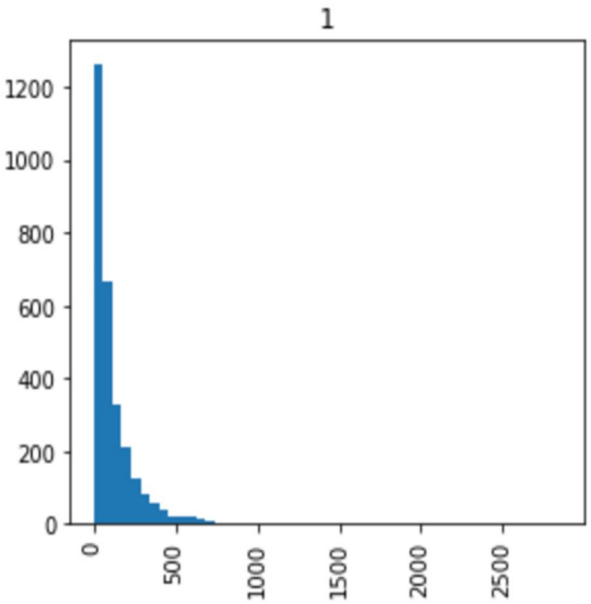
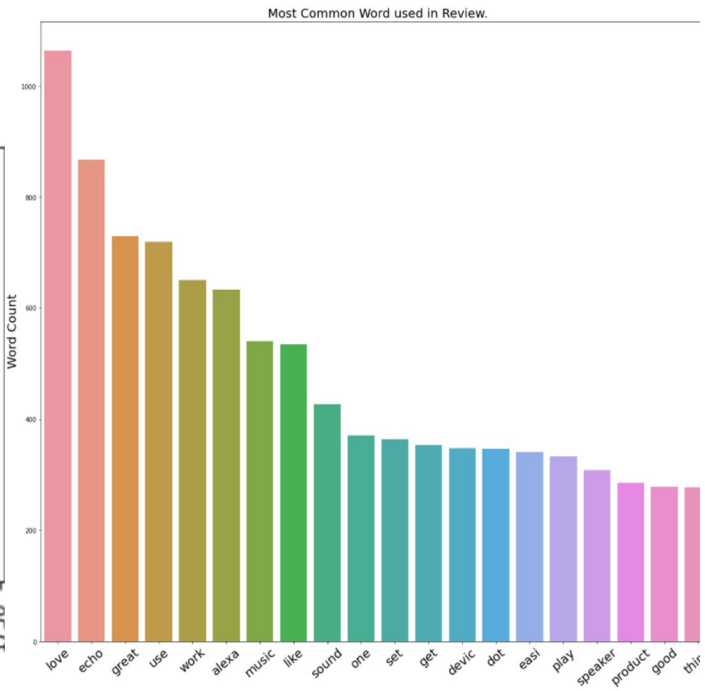


Fig 3. Frequent word used



B. Model Construction

The above mentioned data set led to the following model construction. The classifier models are using 2 models which are as follows : Decision Tree and Naive Bayes. These models are used in order to predict class labels with positive or negative for both training data set as well as test data set individually. The classifier models are a described :

1) *Decision Tree:* The choice tree learning was proposed as a model of information order for a class name, which called ID3 and created to C4.5. Furthermore, choice tree is unmistakably addressed through a tree graph. It begins from the principal hub is a root hub. The root hub chooses a quality as words in assessment from the best estimation of estimation. Each characteristic has its own qualities for example true or false, which are isolated by branch joins made out of unique credits. Toward the end, the information uncovers a class which addresses a leaf node. The benefit of the choice tree is for requesting ascribes that are the best estimation as After the recognized data of property is determined, the entropy esteem is additionally determined to characterize the synopsis of each branch required be obviously isolated from property. The most noteworthy acquired estimation of the quality An outcomes in the best property to arrange informational collection which is determined and range somewhere in the range of 0 and 1.
2) *Naive Bayes:* Naive Bayes is a calculation of likelihood dependent on Bayes hypothesis of learning. It intends to make a model as likelihood. The benefit of naive Bayes is a successful technique which is simple preparing. The likelihood of the order information with earlier information is signified by P (ail Vj), where ai alludes to the property I and Vj alludes to class name subsequently, the characterization has been determined for this likelihood. The most elevated likelihood of ai is relied upon Vj for each class is pattern to reply of arrangement. The scope of likelihood is somewhere in the range of 0 and 1. Certain advantages of the Naive Bayes classifier are that it is basic and simple to execute and doesn't need as much preparing information. It handles both nonstop and discrete information and is exceptionally adaptable with the quantity of indicators and information focuses alongside being quick and can be utilized to make ongoing forecasts it isn't delicate to unimportant highlights.
3) *Bag of Words:* Bag of Words: A sack of-words model, or BoW for short, is a method of removing highlights from text for use in displaying, for example, with AI calculations. The methodology is exceptionally straightforward and adaptable and can be utilized in a heap of ways for separating highlights from archives. A sack of-words are a portrayal of text that depicts the event of words inside a record. It includes two things:

a) A jargon of known words.
b) A proportion of the presence of known words.

The bag-of-words model is exceptionally easy to comprehend and carry out and offers a great deal of adaptability for customization on your particular content information. It has been utilized with extraordinary accomplishment on forecast issues like language demonstrating and documentation characterization.

IV. EXPERIMENTAL RESULTS

The initially obtained empirical results are retested with opinion analysis on reviews of 3000 customers from the amazon verified reviews through amazon Alexa on amazon Alexa. The results are made to corelate on basis of percentage of accuracy, precision, recall as well as F1 score of the three models, namely Decision Tree model, Naive Bayes model and Bag of word model. The accuracy percentage for the Bag of Word model as well as the Decision Tree model result to be similar of 94.29%, while that of the Naive Bayes model is 53.49% which happens to be the lowest.

The F1 score for all the three models has a variation and unlike accuracy percentage the value for no two models is same. F1 for Decision tree model is 0.6087, while that of Bag of Word is 0.5000 and that of Naive Bayes is 0.1793.

The precision score for the three models is 0.5183 for Decision tree, of Naive Bayes is 0.5926 and that of Bag of Words model is 0.3333.

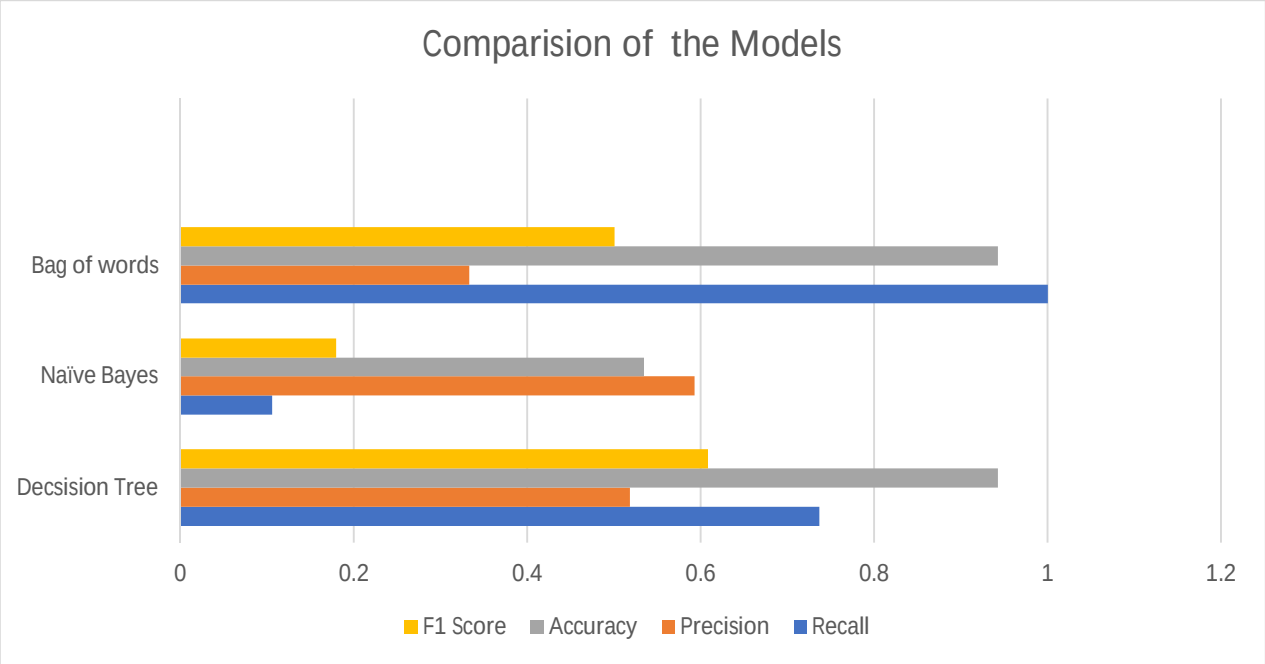
The recall values for Decision tree is 0.7368, Naive Bayes is 0.1056 and that of Bag of Word is comparatively high to the other two at 1.0000.

Tab 2. Individual Rating Feedback

	feedback							
	count	mean	std	min	25%	50%	75%	max
rating								
1	161.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	96.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	152.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
4	455.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
5	2286.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0

Tab 3. Comparison of model

Performance Measure Techniques	Decision tree	Naïve Bayes	Bag of Words
Recall	0.7368	0.1056	1.0000
Precision	0.5185	0.5926	0.3333
Accuracy	0.9429	0.5349	0.9429
F1 Score	0.6087	0.1793	0.5000



V. RESEARCH GAPS AND CHALLENGES

The usage of sarcasm, jakes, exaggeration etc still create a major issue for sentiment analysis models. People communicate their negative feelings using optimistic words so wrong results are generated in many cases. If the nature of domains is changed the chances of wrong analysis increases due to the domain specific nature of the sentiment models. The variation in the languages for the opinions and reviews makes it difficult to tackle each language and find out sentiments. Data spam detection and fake data detection is still not explored and at present very limited research work has been done for this problem making it difficult.

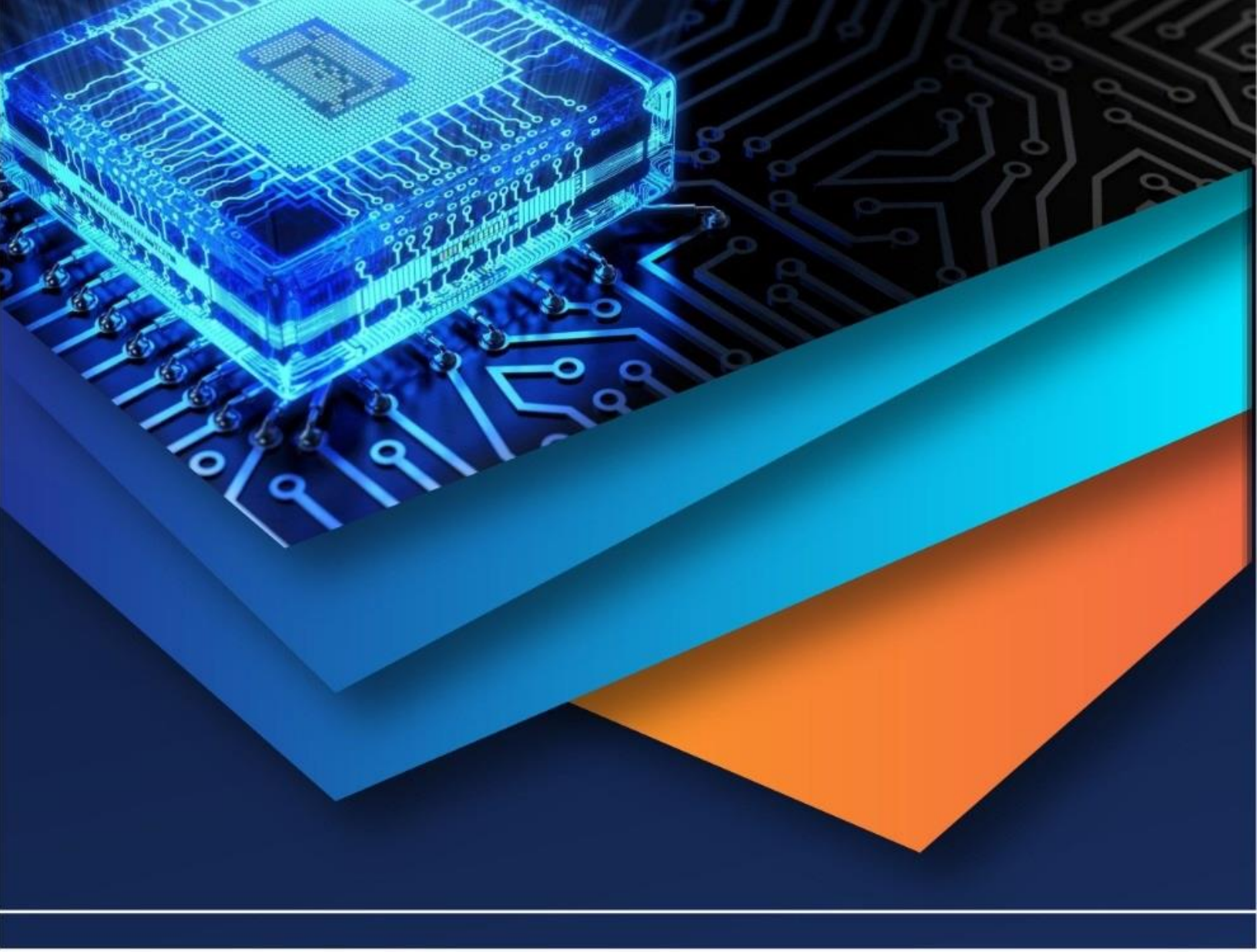
The concept of multipolarity also makes it misleading to have only the total result of the analysis. Simpler bag-of-words sentiment classifiers have the weakness that they do not handle negation well; the difference between the phrases “not good” and “good” is somewhat ignored in a unigram model, though they carry completely different meanings. The determining of the range of words that are affected by negation is often not done while using different linguistic rules.

VI. CONCLUSION AND FUTURE SCOPE

The sentiment analysis done using opinion mining framework in this presented paper can be used to help improve customer experience with reviewed developments. The sentiment polarity executed above we found that certain comments were wrongly assumed to be as neutral while being either negative or positive. Words absent in the English terminology were being classified as to be being neutral. Although, most of the words were being classified with a much better accuracy. Still alot of research is possible in the field area to minimize any possible error. In the above presented paper tries to get the label to sentences correctly, it also helps in labelling sentiment datasets automatically. An initially drawback is of being space specific. However, with just a little development this proposed model could be used in various fields.

REFERENCES

[1] S. 1. Wu, R.D. Chiang and Z.H. Ji, Development of a Chinese opinion mining system for application to Internet online forum, The Journal of Supercomputing, Springer US[Online], 2016.
[2] Z. Li, L.Liu and C.Li, Analysis of customer satisfaction from Chinese reviews using opinion mining, Proceeding of the 6th IEEE International Conference on Software Engineering and Service Science(ICSESS). 2015, pp.95-99.
[3] Q.Su, X.Xu, H.Guo, Z.Guo, X. Wu, X. Zhang and B.Swen. Hidden Sentiment association in Chinese web opinion mining. Proceeding of the 17th International Conference on World Wide Web, 2008, pp.959-968.
[4] S.Atia and K. Shaalan, Increasing the accuracy of opinion mining in Arabic. Proceeding of the 1st INTERNATIONAL RESEARCH JOURNAL OF ENGINEERING AND TECHNOLOGY (IRJET) E-ISSN: 2395-0056 VOLUME: 06 ISSUE: 05 | MAY 2019 WWW.IRJET.NET P-ISSN: 2395-0072 © 2019, IRJET | Impact Factor value: 7.211 | ISO 9001:2008 Certified Journal | Page 4489 International conference on Arabic computing linguistics, 2015, pp.l 06-113.
[5] R.M. Duwairi and I. Qarqaz, Arabic Sentiment Analysis using Supervised Classification. Proceeding of 2014 International Conference on Future Internet of Things and Cloud. 2014, pp. 579-583.
[6] H.S. Le, T.V. Le and T.V. Pham, Aspect Analysis for Opinion Mining of Vietnamese Text. Proceeding of International Conference on Advance Computing and Application, 2015, pp.118-123.
[7] T. Chumwatana, Using sentiment analysis technique for analyzing Thai customer satisfaction from social media. Proceeding of the 5th International Conference on Computing and Informatics, 2015, pp.659-664.
[8] S.Ahmed and A.Danti, A novel Approach for sentimental analysis and opinion mining based on sentiwordnet using web data. Proceeding of International Conference on Trends in Automation, Communications and Computing Technology, 2015, pp.1-5.
[9] R.K. Bakshi, N. Kaur, R. Kaur and G.Kaur, Opinion mining and sentiment analaysis, Proceeding of the 3rd International Conference on Computing for Sustainable Global Development, 2016, pp. 452-455.
[10] P.Barnaghim, 1.G. Breslin and P. Ghaffari, Opinion mining and sentiment polarity on Twiiter and correlation between events and sentiment, Proceeding of the 2nd International Conference on Big Data Computing Service and Application, 2016, pp. 52-57.
[11] N. Kumari and S. N. Singh, Sentiment analysis on Ecommerce application by using opinion mining, Proceeding of the 6th International Conference-Cloud System and Big Data Engineering (Confluence), 2016, pp. 320-325.
[12] V.B. Raut and D.D. Londhe, "Survey on opinion mining and summarization of user review on web", International Journal of Computer Science and Information Technology, Vol. 5(2), 2014, pp.1026-1030.
[13] 1. Fiaidhi, O. Mohammed, S. Mohammed, S. Fong, and T.H, Kim, Opinion Mining over twiiterspace: Classifying tweets programmatically using the R approach. Proceeding of the 7th International Conference on Digital Information Management, 2012, pp. 313-319.
[14] M. R. Islam and Minhaz F. Zibran, "Exploration and Exploitation of Developers' Sentimental Variations in Software Engineering", Internation Journal of Software Innovation, Vo1.4(4), 2016, pp.35-55.
[15] Y.Yokoyama, T. Hochin and H. Nomiya, "Estimation of Factor Scores of Impressions of Question and Answer Statements", International Journal of Software Innovation, Vol. 1(4), 2013, pp.53-66.
[16] L. Lin, 1. Li, R. Zhang, W. Yu and C. Sun, Opinion mining and sentiment analysis in social networks: A retweeting structure-aware approach. Proceeding of the 7th International Conference on Utility and Cloud Computing, 2014, pp.890-895.
[17] A.H. Al-hamaami and S. H. Shahrour, Development of an opinion blog mining system, Proceeding of the 4th International Conference.



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