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MONITORING AND REMOVAL OF FAKE PRODUCT REVIEW USING ML

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ABSTRACT

Detection and Removal of fake product from dataset using Natural Language Processing(NLP) is important techniques in an aspect. In this project we are using Machine Learning (ML) Algorithm to detect the fake product reviews in a dataset, which predict the accuracy of how genuine. When the product review is the major aspect to buy products in E-commerce, the rate to fake reviews in increasing day by day on website and applications. So this fake product reviews problem must be addressed by the large E-commerce company, before purchasing the product from the trusted company.

By using this technique we can rectify the issue of fake product reviews and spammers are eliminated, which prevents the users to losing the trust on E-commerce. By using this project the Authority of the company can detect the fake reviews and take necessary actions towards them. This model is developed using the Naïve Bayer Algorithms. By applying this algorithm can know the spam reviews and website or application. To count such spammers a dataset is required, we are using "amazon academic dataset" to train the model and can be scaled to get high accuracy and flexibility rate.

I. INTRODUCTION

The online shopping has become very popular now a days, people are buying almost everything in online. After the covid and lockdowns almost people are depending on the online markets only. Due to increase in the online shopping many startup companies are established. As the new startup companies established, as soon the spammers are also established in market to cheat common people.

Normal people while buying a product , they don't have any physical contact with the product to check the quality of the product, almost every people depends on the online reviews and the stars given by the other people on that product. As the common people views the product in online website just views the ratings and how many people rate that products are checked at the movement. Or some times just checks how many people given the reviews to that product.

So the spammers do some spamming businesss to improve there company products. Or may the spammers do some bad comments on the other company products , this has become the biggestissue for the companies who are depend only on the online marketing.

While the spammers gives fake reviews like"awesome","fantastic" or the "very good". These are the major words used by the spammers to get more comments on the products. This has become the very big issue. To detect these types of spammers . The companies like Amazon or flipcart they having large amount of products , data and large amount of reviews .

It is impossible manually to detect and remove the spammers in large set of data. So by using the Machine Learning algorithms we can improve the technology and train the model and using the NLTK (Natural Language Tool Kit) we can filter the data and using the Naïve Bayes algorithm. We can detect the spamming comments and can be removed from the dataset.

The natural language tool kit is the set of words will be given to train the model , these NLTK packages are imported while implementing the algorithm and then do the sentiment analysis to the model and get the reviews positive review or the negative review.

The sentiment analysis is done for the every single words before applying the algorithm, before the sentiment analysis we are using the pre-processed data which do not contains the stopwords which are extracted before by using the NLTK packages.in the sentiment analysis we using just the value added words and do the analysis on it. Then after getting the results , we are going to get the accuracy ,the accuracy is used to know the model result. then we wants to know about the spammers in the dataset, so we are doing the spamming test afterwards , in the classification of the model we get the spammers reviews in the dataset.

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We then remove all the fake reviews from the dataset. For train the model we are using the "Amazon academic dataset" this is the set of data which containing the both fake reviews and genuine reviews . this type of dataset is most important for the model to train with the algortithm.

II. LITERATURE SURVEY

2.1. Fake review detection through supervised classification.

1.Pankaj Chaudhary, 2.Abhimanyu Tyagi 3.Santosh

In the few years of the research on the tackel of the information on the reviews through the social media. The truthness, accuracy has not been seen and the context of the reviews and numerous other combination of the multiple dimentions. The collection of the reviews is from the multiple dimentions that means , they collection from the different source to check the ability, accuracy and the truthness of the reviews. Mainly they collect the data from the social media. As we know social media's like the websites are the most used once and the people are giving reviews there. And the spammers also using there techniques to spam the reviews potentially harmfull the online health environment. In the majorly the data are from the data approach technique which classifly the credibility by the employee, they used the supervised classification method to classify the reviews based on the training the model with the algorithms, which classify and detect the spam in the reviews .

2.2. Opinion spam and analysis.

Nitin Jindal and Bing Liu ,Department of Computer Science ,University of Illinois at Chicago

The analysis is based on the opinion given by the users for the products, currently the analysis done for the reviews is checking the sentiment of the words and find the positivity or the negativity of the reviews , the opinion spam can be detected by using the opinion analysis technique. People are use the websites, there web spam is done.

The objective of the web spammers is to target the websites and make a spam opinion which looks like a positive sentences or promoting the negative sentences, to prevent these types of spamming the sentimental analysis is done for the reviews and detect the spammers on time and remove there account or permanently block there accounts from the social media.

III. METHODOLOGY

This model is build to detect the fake reviews and remove the fake reviews from the reviewlist. It require the reviws to analyse the data. At first the website is created to take the data from the website. Here admin work is to Add the category, The Admin can add any number of category and the details regarding the category.

In the next step we add the products to the category, the product containing the name, description, rate of the product, quantity and image of the product. Then in the next page admin can view the look of the products. Then he can check the number of users using the website who were registered customers for this website.

Then we can get the reviews from the customers, which is displayed, so admin can view the details of the customers along with the reviews they given for the product. Then admin can logout from the page, which is going back to the home page.

After that customer role is going to be follow. Here customer should register for the website. In the register page, customer should give his name, mail id, phone number and he can create his own password to login the page.

These details can be view by Admin. Then after registered in the website, customer could login the page which displays the products given by the admin. Here customer can choose the product he wants and also he can add any number of products to the cart then, the can submit the page.

The rate is calculated and display in the page to the customer to buy the product. After buying the products customer can add reviews to the product. The reviews he given is analyse after words whether it is fake review or not.

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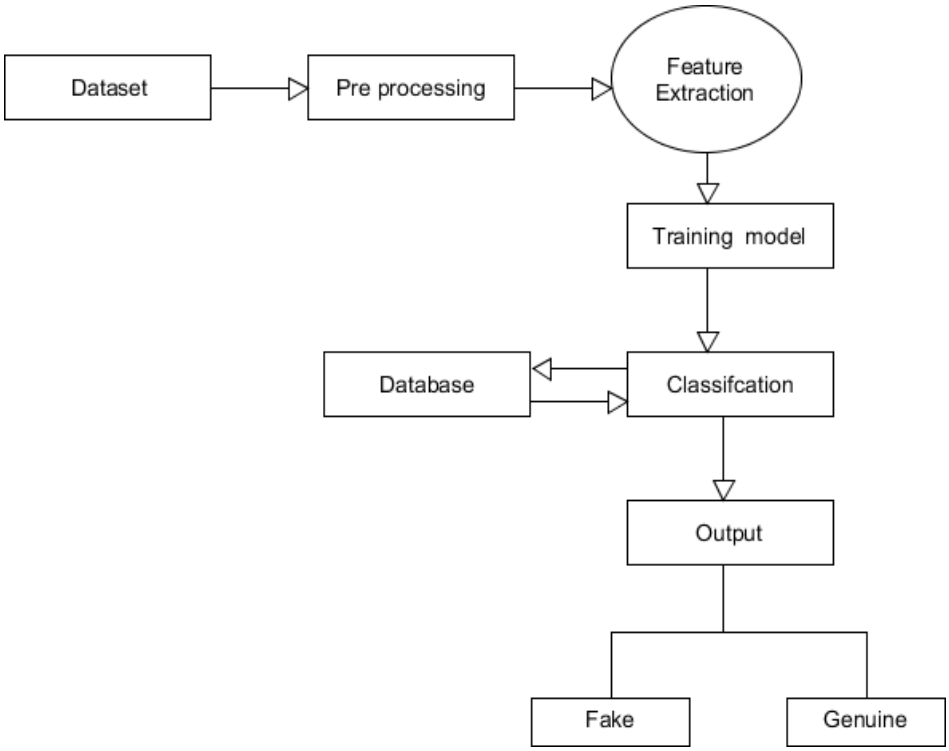

Fig 1: Flow chart diagram of Monitoring and removal of fake product

In this part of the flow, many customers do spam reviews to degrade the products. Or can give the good comments for the bad products . or the spammers are always giving fake reviews to make bad reviews on the website. Soo all the reviews given by the customers is analyse by the admin by using sentimental analysis process and classify the model with the Naive bayes algorithm to give the accuracy of the reviews by training the model.

In the further process, the reviews are going to analyse for using the "stopwords" are imported.The stopwords are the NLTK(Natural Language Tool Kit) which is around 50MB of the data is installed to the process. These are the set of English words like "The","is","was",etc. these are some words which do not give weightage. Soo we installing and compare with our data , it removes these stopwords in the dataset, this process is called the feature extracting process. The removal of fullstop and comas is called the pre-processing method. These are the two steps involved in the data cleaning.

Then after we can get the data which is ready to train the model. Here training of the data is divided in to two parts, one is used for the training of the data and another is used for the testing of the data. The ratio used to train and test the model is 80:20 percent. Then further for the sentiment analysis process, we are importing the tool which is available in the python. Using the sentiment analysis the featured data is going to analyse . the single words are analyse here and gives the random number for each words.

To train the model we are using the Naïve Bayes algorithm. The Naïve Bayes algorithm is the best Algorithm to classify the text data compared with others. The algorithm is based on the probability of the positive and negative data.

$$P (a / b) = (P (b / a) * P (a)) / P (b)$$

This is the formula is used to classify the result if it is positive review or the negative review. If we take any sentence, the sentence is filtered in the pre-processing and the words remaining are used for the implementation in the algorithm.

$$Sentence[x1, x2, x3,.....xn] .....(1)$$

The x prepresents the words present in the sentence, the sentence is divided by its words for further processing. then we use probability, divided by the number of words in the sentence.

$$P (y = yes / sentence) .....(2)$$

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Implementing (1) in (2) we get,

$$= P (y = yes / x1, x2, x3 \ldots\ldots xn) \alpha P (y) * \prod n$$

$$= P (x1 / y = yes) * P (x2 / y = yes) * \ldots\ldots\ldots\ldots \quad P(xn / y = yes)$$

$$= P (y = yes) * P (x1 / y = yes)$$

The probability by taking the positive set divide by all the set of data once, then take the negative divide by all the set of data another time. By doing this probability we can find the accurate answers.

The random number given as follows:

- For the positive word, gives random number between 4 to 5.
- For the neutral words, gives random number between 2 to 3.
- For the negative words, gives random number between 0 to 1.

Using the randint() method, the random number is assigned to the single words in sentimental analysis.

The dataset is the collection of various data. There are mainly three types of collection of dataset is present they are, 1) taking the data from the websites, 2) taking data from manually, 3) inbuilt taking of data. Here we are taking the data from the website. Which is a collection of fake and non fake mixture of data.

The dataset contains the reviews given by the customers for the product. Then timestamp, voting, id are present in the dataset, the dataset we are using here containing nearly 88,000+ reviews of data which is collected from the Amazon website and some manually.these dataset are using to analyse and detect the fake reviews and remove it from the dataset.

In the removal system we take the dataset and mining the dataset , then we use the timestamp of 1800 mili seconds time, if in that time the review is repeated more than 6 times that review is considered as the spam or fake review and removed from the dataset. This is the process to detect and removal of the reviews from the dataset.

IV. RESULTS AND DISCUSSION

As we discussed above the method is implemented to remove the fake product review from the dataset. By using the Naïve Bayes algorithm we can get the most accuracy , F-measure, Precision and recall values . The accuracy of the system is around 80% percent. As we discussed if we give an example to find positive or negative. “Shirt is of very good quality” for this sentence we have to do pre-processing first. There the punctuations are removed from the sentence. Then the feature extraction process. There the sentence is compared with the stopwords then “is”, “of”, words were removed from the sentence.

Then the sentiment analysis is going to apply, there “shirt” is given as neutral value. “Very” is also neutral value, “Good” is positive value. And “quality” is neutral value. Then apply the Naïve Bayes algorithm for it. It gives the random values for the words and calculate the probalility function. That will give the final result for that.

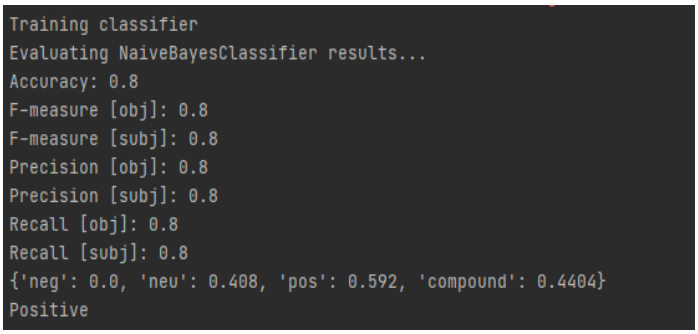

Fig 2: Result showing accuracy using Naïve bayes algorithm

In the Above picture shows the Accuracy values along with F-measure values, precision and recall values then values given for the neutral and positive words and calculate the compound value .the accuracy is noted around 0.8 around.

To remove the fake reviews from the dataset we are going to take the reviews given by thee users in the website, that reviews is pre-processed followed by feature extraction process and imports the NLTK packages and do the process of removing the fake reviews from the dataset.

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```
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          'RHD4B4FI8ZOX0',
          'R2O0LZSPMME6US',
          'R5F0MONILUKRP',
          'R3T4FXBLX36ZVL',
          'R286FBMJM6KBVL',
          'R3222TQXKRY5SC',
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          'RNN38RFJVIE5G',
```

Fig 3: Result showing the removed reviews from the dataset

The above image shows the reviews which are removed from the dataset, as they are spam reviews repeated more than or equal to 6 times in a minute. the results are displayed in a single coloumn.

V. CONCLUSION

In the current scenario day by day, the data on the websites is growing exponentially. Social media is generating a large amount of data such as reviews, comments, and customer's opinions on a daily basis, stars on review. This huge amount of user generated data is worthless unless some data mining operations are applied to it. As there are many number of fake reviews this application helps to id detecting and removing of fake reviews efficiently. The fake product review detection problem is addressed fairly and gives a fair insight into its legality and need for Admin and to e- commers company, the purpose is to select an Naïve Bayes algorithm to fulfill the task of fake product review detection and its elimination.

VI. REFERENCES

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