Eliminating products’ fake reviews using network parameters and geo location

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Abstract. People purchase things based on the online reviews. But the reviews may not be trusted always. Sometimes there may be false information about the product and this may lead to loss for the sales. Customers also take wrong decision for purchasing the things. So, a system is proposed in this paper to eliminate false reviews. The product reviews are compared here. Using network parameters and geo location, the system identifies the IP address for PC and browser ID for mobile OS of the false review. Also it directs the admin to remove the review if it is attempted many times. By comparing the reviews, the level of the product can be increased. With the key boards the model divides the positive and negative reviews.

1. Introduction

Through internet people chat or share their ideas and do their online shopping. People choose the things from the list in website or E-Commerce site. In this way the internet is used for purchasing, selling, online payments and online delivery. This will make the product to reach the customers widely.

Before getting anything normally people will have a survey on the quality and price of that particular item. During survey the customer may sometimes get false online reviews. The false review may prevent the customer to buy that product. To satisfy the customers a model is required to ensure that the reviews are true. In this competitive world the enterprises should be aware of the undesirable reviews.

Online reviews may be helpful for the people who like to get the product at the same time false review has more impact on the customer decision and seller. Dishonest businessmen may give incentives to the persons who give favorable review and the persons who give negative review for the products of the competitor. Anyway reviews have great reflections on online market. So reviews must be honestly given. Undesirable reviews are spams.

Therefore it is necessary to remove the undesirable comments immediately if any found. The product seller normally gets the feedback from the customer. Sometimes there is a chance to put false review to mislead the customers.
Detecting and removing the false reviews are difficult process because the false reviewers act as the user and reviews are given repeatedly. The seller is able to compare the reviews but may not identify that the multiple reviews from the same user.

This system proceeds with review by review, reviewer and product level comparisons and training a classifier. Thus the system differentiates original from spam reviewers. The system detects the false reviewers and removes their comments.

Elshrif et al. 2018 [1] separated fake positive reviews and fake negative reviews. Li et al. 2018 [2] proposed sequence analysis model. Lakshmi et al. 2018 [3] said that recommendation of the product will improve sales. Hegde et al. 2018 [4] made to put the reviews in e-commerce site. Wang et al. 2018 [5] used supervised machine learning algorithm. Manleen et al. 2018 [6] have gone through all customer reviews for a particular product and the compared it with other competitor products. Deng et al. 2017 [7] suggested semi-supervised learning method. Sruthi et al. 2017 [8] took feedback ratings from e-commerce site to find seller reputation. Lu et al. 2017 [9] used Naive Bayesian model for his classifier. Gunjan et al. 2016 [10] used review ranking method. In [11] to [16] the authors explained about the networks and network parameters.

2. Proposed model

Customers make decision for online shopping based on the reviews. The customers may be misled from the fake reviews. The work in this paper deletes the fake reviews.

2.1. Problem statement

In online shopping a user can buy, sell and make reviews on the product. The review induces the customer to buy a product. So, the spammers will make the fake reviews and confuse the customers to take wrong decisions about the product. If the fake reviews made by spammers are handled properly, the efficiency of online shopping can be increased. The fake reviews can be identified and eliminated by the following steps:

- Getting IP address of the reviewer.
- Getting Browser ID of the reviewer.
- Getting geo location of the reviewer.
- Getting the account used by reviewer to post reviews.

The module contains Admin, Seller and User.

Figure 1 shows the seller login to the website and adds the product to the database.
The seller can also see the reviews of the other products. The user who enters the system will give reviews about the product and purchase the products. The admin will login to the system, view the reviews made by the customer. Then admin deletes the fake reviews made by the customer. The admin deletes reviews based on three conditions.

Using IP address
Fake reviews are determined. If more reviews come from same IP address then admin will monitor and identify the fake reviews. They are immediately deleted by admin. Both the positive, negative and neutral fake reviews will be deleted by admin.

Using Browser ID
Fake reviews are determined. If more reviews come from same browser ID then admin will monitor and identify the fake reviews. They are immediately deleted by admin. Both the positive, negative and neutral fake reviews will be deleted by admin.

Using geo location
User geo location will be determined by using latitude and longitude. It also finds the user location name. If the user sends more than two or three reviews from the same geo location that is same place then the system will automatically identify the fake reviews and admin will immediately delete the fake reviews.

The IP address, browser ID and geo location of the reviewer is got by using xampp software.

Requirements
Requirements are inputs and output data.

Inputs
Inputs in eliminating fake review have two types one is login data that is user name, email ID and password then the other one is user posting review for a product items.

Output Data
The actual output data is shown in website page that is deleting fake review, showing genuine review and values of network parameters and geo-location.

2.2. Resource requirements
Hardware
The module requires system-pentinum four with operating frequency 2.4 GHz and hard disk memory capacity of 40 GB to store and retrieve the information and floppy drive which is used for transporting data between the computers. Monitor-15 VGA color is used to provide visual output of the computer. RAM/ROM increases the processor speed.

Software
The software requirements of the system needs basic operating system like window to run the application, PHP script language for designing, MYSQL for accessing database in backend and Xamppis for integrated development environment.

2.3. The system architecture
The overall system architecture is shown in Figure 2.
The modules are Admin, Seller and User.

**Admin**
- Login → the admin should be login our application
- Accept the seller Request → the admin accepts the entire seller request
- View the today Order → the admin views all the order of the product
- View Pending Order → the admin view how many product pending he/she is every day see the pending order
- Add category → the admin can add the entire product and some category of product
- Add subcategory → the admin can add one main product the add some subcategory of that main product
- View Complaints → the admin can be view all the user complaints
- View Review Based on IPs address → the IP address of the customer is used to detect if the reviews are coming from one user.
- View Review based on Geo Location → the admin uses the Geo Location of the customer to identify whether the customer is same that is posting the review
- Find the Highest negative Review → the admin view all the positive and negative review. Then the admin filter the highest negative reviews only.
- Give feedback to Seller → all the negative review to inform the seller
- Logout.

**Figure 2.** The overall system architecture
Seller
Register ➔ the seller should be register the page Login➔ the seller must be login our page
Add product ➔ the seller can add the entire product Manage Product ➔ the seller can manage the entire product
Get admin Suggestion➔ the seller can get all the review and suggestion for admin
Compare the review with other same products ➔ the seller can compare the review with other same products
Logout.
User
View the products ➔ the user can be view all the products Write Review ➔ the user can give review for each product.
Full cost of the project is identified. The admin gives product items and request for accessing them to seller. The user writes the review and spammer also writes the fake review by using user account. This will be identified and deleted by admin.
Seller provides product request to admin and admin will add and manage the products. This enables the user to take decision for a product items on online shopping.

3. Implementation
The system is implemented through xampp software. In order to eliminate the fake reviews we are considering IP address, browser ID and geo location.
The PHP script is used to implement this system. Xampp command is an open source cross platform web server package. It interprets the script written in PHP and Perl Programming Languages.

Delete function

```php
$delete_query="DELETE FROM `productreviews` WHERE `id`='$delete_id'";
$delete_res=mysqli_query($con,$delete_query);
```

This function is used to delete the fake reviews from same IP address, browser ID and geo location. It is monitored and deleted by admin.

Negative and positive words count

```php
$postive_words=['good','excellent','nice','accept','nice','best','assume','wonderful','ok','fit','happy','fine'];
$negative_words=['waste','not','bad','broken','damage','foul','hate','lose','reject','unhappy','upset','high','worst'];
```

Increment function is used to count the positive and negative words.
Both are compared if the counts are equal it is neutral review, if positive count is high it is positive review and vice versa.

3.1. Procedure
Step1:

Open “Xampp control panel” and start “Apache” and “MySQL” module.

Step2:
Open browser and type \texttt{http://localhost/fake review} the homepage will open.
Step 3:
Type http://localhost/fake review/ admin/

Step 4:
Admin and seller uses same admin page to better efficiency so, both have login details.

Step 5:
Home page is used by user to shop and admin page is used by admin and seller for better user page.

RESULTS

Figure 3 provides network parameters and geo location values of the reviewer.

![Network parameters and geo location values](image)

**Figure 3.** Network parameters and geo location values

Figure 4 deletes the fake reviews.

```
2405:204:70c0:3959:406b:5b8c:6d14:ecf5
```

- **Delete**
  - Name: kirthigavaishu@gmail.com
  - Email: kirthigavaishu@gmail.com
  - Review: bad

- **Delete**
  - Name: jully
  - Email: hjgh@gmail.com
  - Review: waste

- **Delete**
  - Name: bala
  - Email: bala@gmail.com
  - Review: dont buy

- **Delete**
  - Name: kir
  - Email: kir@gmail.com
  - Review: time waste

- **Delete**
  - Name: vaish
  - Email: vaish@gmail.com
  - Review: bad product

- **Delete**
  - Name: lax
  - Email: lax@gmail.com
  - Review: very bad

**Figure 4.** Fake review deletion
Figure 5 provides negative review count.

| Top Negative Review |
|---------------------|
| NEGATIVE REVIEW     |
| Product Name        | test |
| Product Company Name| dlk  |
| Product Price       | 200  |
| Negative Review Count| 9    |

![Figure 5. Negative reviews count](image)

4. Conclusion
A system is proposed in this paper to eliminate false reviews. The product reviews are compared here. Using network parameters and geo location, the system identifies the IP address for PC and browser ID for mobile OS of the false review. The system also detects the geo location of the reviewer. Also it directs the admin to remove the review if it is attempted many times. By comparing the reviews, the level of the product can be increased. With the key boards the model divides the positive and negative reviews. This method also finds the product which needs improvement in the quality and sale based on the negative comment counts given by the users.

5. Future enhancements
In this paper elimination of false reviews is done manually with the help of PHP program. In future it is planned that the removal of the undesirable comments should be made automatic by integrating the PHP program with machine learning algorithms. The module should identify the spammers in different geo location.

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