ONLINE PRODUCT OFFER ANALYSIS FOR CUSTOMER PROFITABILITY WITH COLLABORATIVE FILTERING

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Abstract— On-line shopping is a current trend on the meadow of E-Business and is certainly going to be the outlook of shopping in the world. Most of the companies are organizing their on-line portals to advertise their products on-line. This method can be used to store up the details of the catalog, upgrade the inventory based on the sale details, produce revenue for sales, reports periodically etc. This is one included system that contains the user component, employee and the admin component (used by the administrators for performing admin level functions such as adding new items to the catalog, changing the price of an item etc.). This system runs on several terminals, offers a GUI interface and connects to a common database(s). This system is gathering the Sentiment analysis from the social media for all the book and conduct Collaborative Filtering technique to know the user book personal interest and use hybrid technique to anticipate the customer choice from the ecommerce data and recommend a book to the customers.

Keywords-Online shopping, E-business, Filtering, Sentiment Analysis.

I. INTRODUCTION

A significant amount of demographic is choosing online shopping – which is comfortable – over legacy schemes like window shopping. This has made people responsive of the uses that e-commerce holds over regular commerce. This generation, who has made online shopping as their default method of purchasing lifestyle commodities is yet to harness a similar way of shopping for day-to-day commodities. E-commerce vendors such as Amazon, Flipkart, Myntra have cemented a market of their own as they provide smallest of the household item to huge luxurious items at the fingertips of the users. Variety of items is available online on these e-commerce sites. This has created instability in the market as local shops are covering at the back in the online scenario. Due to smart incentives and huge varieties provided by e-stores, there is an adverse effect of online shopping on the permanent shop retailers. This has provoked the fear of ambiguity and vulnerability into the mind of shopkeepers. In online shopping systems, users come across millions of products to choose from. So it becomes hard for them to shop from the vast array of products. This requires vast amount of time and efforts of consumers in searching for the desired product at an optimal cost. This lead to the scheme of the recommender system. A recommender system act as a personal assistant that helps you in choosing from a comprehensible list of items, thus saving time and energy. Recommender system simplifies the job of users to fetch the desired item by recommending the related item which the user may like. This recommendation depends on user's previous search history and previously purchased items. So this system uses recommender to prioritize the item based on user preferences.

II. LITERATURE REVIEW

In the recent times the number of online users is increasing rapidly via Internet. Different vendors emphasis on shopping behaviour of customers on online environment. Customers spend more time in online which appears to contend with various types of online activity and other social networking sites [1].Determinants of online shopping behaviour should identify the attitude of customers, illegal secondary customers, and behavioural control [2].Online customers should purchase product and the optimistic behavioural intension leveraged by favourable apparent behaviour [3]. Shopping behaviour should center of interest on the buyers positive perceived customers rather than influencing the subjective norm[4]. Different vendors shouldunderstand customer's approach towards online buying and their satisfaction levels [5]. Various sites leads the customers to purchase their product in cheap price. Highlights the importance of e-WOM towards the formationof intentionsfor onlinepurchase[6]. Creating a smart cards will concentrate on the billing of purchased products towards the automated shopping experience [7]. The Smart Local shopping system is an e-commerce based recommender system that offers a platform independent application which is suitable for both AndroidandIOS[8]. Online shopping proposes a research model to discover the relationships among faith, apparent website complexity, and online shopping behaviour [9].

III. METHODOLOGY

Collaborative filtering algorithm has been used for sentiment analysis which takes user feedback and checks whether the feedback is positive or negative.

COLLABORATIVE FILTERING ALGORITHM The algorithm can be written in the following steps:

Step1: Choose n customers those who have the highest similarity.

Step2:.Compute a prediction, $P_{a,u}$ from a weighted combination. Similarity between two users is computed using the Pearson correlation coefficient, Where $r_{a,i}$ is the measurement given to item i by user a and r_a is the mean rating given by user a.

Step 3: Predictions are calculated as the weighted average of deviations from the neighbour's mean, Where $P_{a,i}$ is the prediction for the user a for item i. $P_{a,u}$is the relationship between user a and u. n is the number of user in the neighbourhood.
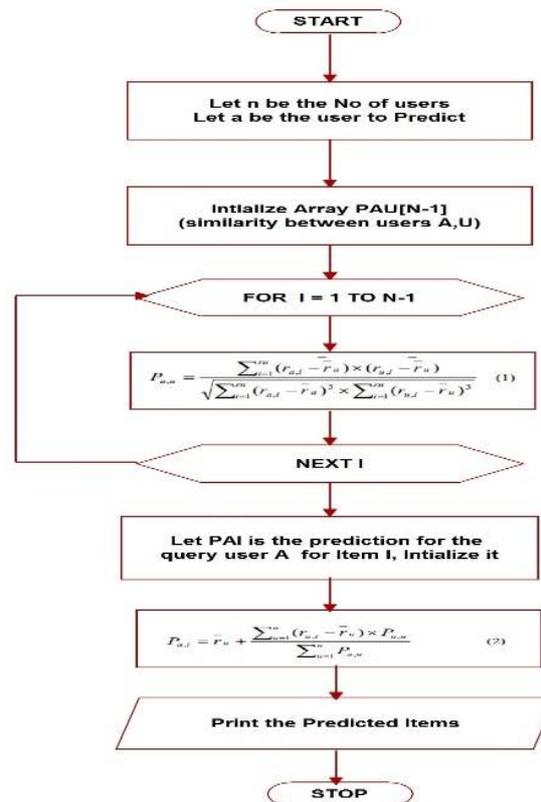
Where $r_{a,i}$ is the measurement given to item i by user a; and r_a is the mean rating given by user a. In step 3, predictions are computed as the weighted average of deviations from the neighbour's mean:

$$P_{a,i} = \bar{r}_a + \frac{\sum_{u=1}^{n}(r_{u,i} - \bar{r}_u) \times P_{a,u}}{\sum_{u=1}^{n} P_{a,u}} \qquad (2)$$

Where $P_{a,i}$ is the prediction for the user a for item i. $P_{a,u}$ is the similarity between user a and u. n is the number of user in the neighbourhood.

$$P_{a,u} = \frac{\sum_{i=1}^{m}(r_{a,i} - \bar{r}_a) \times (r_{u,i} - \bar{r}_u)}{\sqrt{\sum_{i=1}^{m}(r_{a,i} - \bar{r}_a)^3 \times \sum_{i=1}^{m}(r_{u,i} - \bar{r}_u)^3}} \qquad (1)$$

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Flowchart Collaborative filtering

IV. IMPLEMENTATION

The execution phase includes more than writing code. Code also needs to be tested and compiled as well as compiled and built into a complete executable product. We usually need to utilize configuration management in order to keep track of different version of code. This is the stage of the project where the abstract propose is turned into a operational system. If the implementation is not cautiously designed and controlled, it can cause chaos and confusions. It is constantly a better design to keep in mind that some characteristics that should be found in a good implementation like Readability- our code is written in MVC Architecture ,JAVA to accomplish the purpose of the project that is to introduce a novel scheme of mechanism design for balancing the resource consumptions . Our implementation stage requires the following tasks:

- Careful planning
- Investigation of system and constraints
- Design of methods to achieve the changeover
- Evaluation of the changeover method
- Correct decisions regarding collection of the platform
- Appropriate variety of the language for application development Java Technology Java technology is both a programming language and a platform.

E-Commerce

- **Category Management:** In this process user can able to view all the categories.
- **Book Details:** In this process, user can view all the books and descriptions of the book present in the categories.
- **Recommendation System with Text Mining Process:** In this process, based on the postings and comments of the book, by doing the text mining, comments will be categories in to the positive, negative and neutral.

Web Service Connections:

In this process communication is establish between the Social Network and the E-Commerce, depends upon postings and comments given in the Social networking, books will be recommended at the E_commerce application. .

Sentiment Analysis

From user feedback it will check whether the feedback is +ve or –ve. First this process will remove unnecessary words and extract keywords from the feedback and current voting system to confirm whether the review is +ve or –ve.

Hybrid Recommendation System

This system is gathering the Sentiment analysis from the social media for all the book and conduct Collaborative Filtering technique to know the user book personal interest and use hybrid technique to forecast the user choice from the e-commerce data and recommend a book to the user.

Social Networking Module:

- **Registration Process**: In this process user has to sign up to the application by giving his Name, User ID, Password, Birth date etc…and sign up to the application.
- **Postings & Comments**: In this process user can post the new postings by uploadingthe images and the descriptions of the products.
- **Create Group:**In this process user can create his group by sending the request to the other members of the group. If he accepts the request, he can view the postings of both.

V. RESULT ANALYSIS

Figure 1: E-commerce page

E-commerce page: In Figure 1, the user has to select a product from the category and can view the product details, user can also view the latest products.
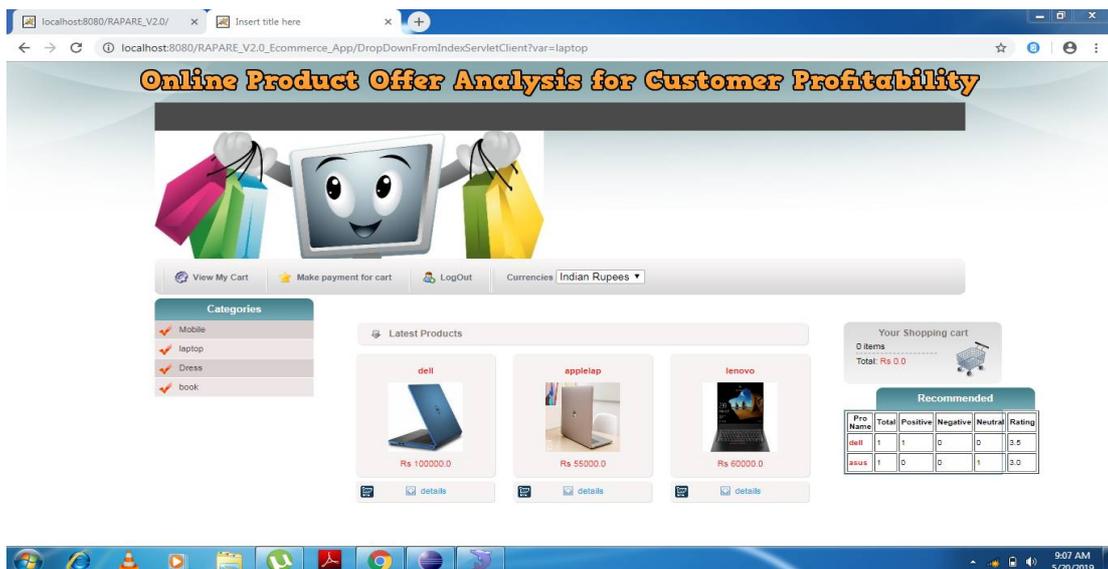

Figure 2: Recommendation process

Recommendation process: In Figure 2, the user will view the card details and recommended product reviews based on the user can buy a product.
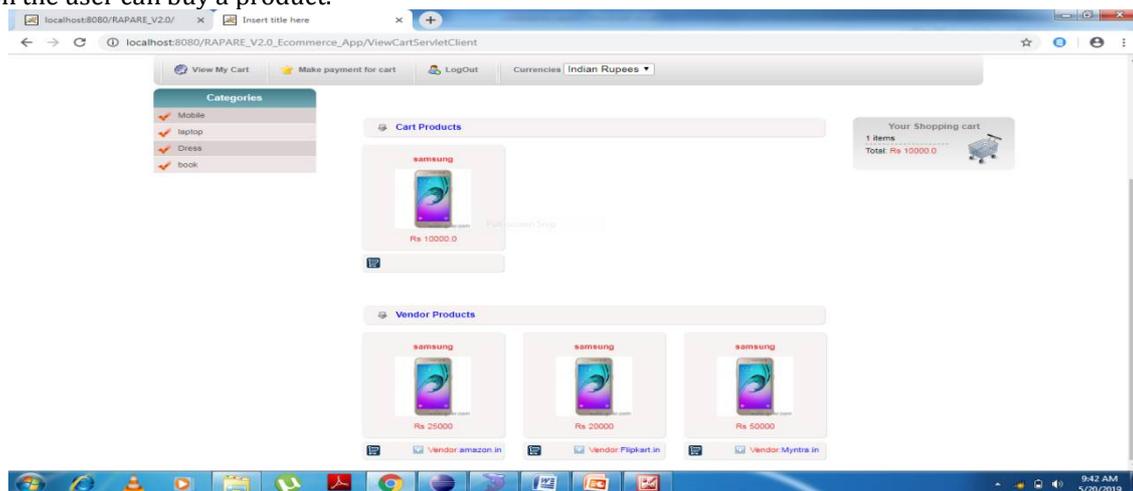

Figure 3: Vendors process

Vendors process: In Figure 3, when user selects a product and add the product to the cart, user will view the products upload by the vendors.

Figure 4: Payment process

Payment process: In Figure 4, when the user requests to buy a product through online, the customer will make payment by adding the card details and after the transaction is done the customer will get a mail stating that transaction is done successfully.

VI. CONCLUSION

This scheme can be used to store the details of the inventory, update the inventory based on the sale details, produce receipts for sales, generate sales and inventory reports periodically etc. This is one included system that contains both the user component, social networking component and the admin component (used by the administrators for performing admin level functions such as adding new items to the inventory, changing the price of an item etc.). This system provides accounting, inventory, invoicing information in included fashion, rather with Graphic User Interface (GUI). The growth aims to develop software which will store data about their different products, their manufactures, product's Inventory status, customer records and even the record of their users.

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