Web Application for student trading using Data Mining Techniques

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***ABSTRACT*: This is an online trading application for students within the university. This platform is used to make how junior students are related to senior students. This application is helpful for junior students by the senior students from the materials posted on the online trading. This platform is used for direct consumer-to-consumer (C2C) trading for the students in the authorized university. The main objective is for second hand products trading in this, materials like book, mobile phones, tutorials, sports equipments. Whatever the products uploaded by the seller is predicted by the machine for cost pridiction using naïve bayer method. The uploaded products are recommended to the students using Collaborative filtering method on history, this decision making is explored by the machine using the data mining technique. The data mining technique are used to get vast information of the previously stored data. This helps the user of this application to trade online without predicting the cost for C2C student trading.**

***Keywords*- products, recommendation, Collaborative filtering, naïve based, data mining, online trading, C2C trading.**

INTRODUCTION

The process of buying and selling of the products using commercial applications over the internet is e-commerce or electronic commerce. The transmission of funds or exchange of products over the network is carried out using any one of the trading type in the commercial applications. There are different categories of trading used in the commercial applications are:

- Business-to-Business trading (B2B).
- Business-to-Consumer trading (B2C).
- Consumer-to-Consumer trading (C2C).
- Business-to-Administration (B2A).
- Consumer-to-Administration (C2A).

C2C trading, known as consumer to consumer transaction, is the transaction or exchange of the products from consumer to consumer, often through a third parties using internet. One common example is OLX and Ebay, where the individual or seller uploads the product for sale by specifying the product name, description, featues, photos and cost. They provide the buyers to get the products uploaded by the seller, they provide control over the quality of the product. They don't have control over the illegal goods to be prevented.

There are some online classified advertising sites, such as craigslist and gumtree. The C2C trading minimises the cost of using third parties in future, where the consumer sells the product directly. This provides broader market, where the consumer can use this application whenever they are in need for this reason paypal is included. The large online marketplace sites have many drawbacks.

Disadvantage of C2C trading for large online applications

- Lack of quality control.
- Cost is decided by the seller.
- Notorious for scams.
- Lack of user satisfaction.
- No standardisation.
- Insecurity in the transaction.
- Hard to pay for the products using cheques, ATM cards, etc.
- No proper recommendation for the user.

There are many second hand shops available at market for selling used products. In colleges, there is a manual approach of selling or buying study materials from senior students. Where the senior students want to help juniors should find them and sell the materials, or juniors should search for the seniors to buy the tutorials.

If the targeted users are students or people within a local community, a new web application can be developed to make a typical transaction simpler, as it maybe suitable for the lifestyle of students. Development of less intrusive and more flexible recommendation methods that also relay on the measures that more effectively determine performance of recommender systems.

This is an online trading application for students within the university. This platform is used to make how junior students are related to senior students. This application is helpful for junior students by the senior students from the materials posted on the online trading. This platform is used for direct consumer-to-consumer (C2C) trading for the students in the authorized university. The main objective is for second hand products trading in this, materials like book, mobile phones, tutorials, sports equipments. Whatever the products uploaded by the seller is predicted by the machine for cost pridiction using naïve bayer method. The uploaded products are recommended to the students using Collaborative filtering method on history of the student, this decision making is explored by the machine using the data mining technique. The data mining technique are used to get vast information of the previously stored data. This helps the user of this application to trade online without predicting the cost for C2C trading.

To estimate ratings for the products that can recommend potentially to the user. The recommendation of the products to the user is made on the high estimated ratings for the products. Students are represented by the profile that includes their characteristics such as age, gender, semister, etc. whereas each product is defined by a set of characteristics. On the estimation of item ratings, heuristics and methods from machine learning and approximation theory have been used.

There are many online trading platforms available for the netizans as mentioned above. There is no better platform for direct consumer-to-consumer (C2C) trading for university students, to buy and to sell the materials directly to the needed students within the prescribed group or university. There is a requirement in a social network where the materials can be easily exchanged directly by the users.

G. Adomavicius et al. [3] is mainly concentrated on the field of recommendation methods, which consists of three types namely content-based, collaborative and hybrid recommendation approaches. Vincent chan et al. [6] the direct consumer to consumer trading states that the direct student trading is the state-of-art platform. The aim is to provide the user to experience the direct trading customer-to-customer trading using the data mining techniques. A hybrid neighborhood search algorithm is used to serach and match for the price recommendation to the user about the products. Neural Network approach is also used to recommend the price of the product to the user.

Delgado et al. [2] in this, the recommender system make use of the data which is prefered by the multi-user over products. The main objective is to filter the items which are more attractive by predicting the preference of the user and recommending the user. Based on the preferences, transaction over the products, votes over the same products by other users, combining memory-based individual patterns and on-line weighted-majority voting, similarity patterns prediction is made. They have used the memory based weighted majority algorithm for recommender system.

D.Billsus and M.J.Pazzani [4] in this, the items are recommended to the user by using the collaborative filtering from the machine learning. The proposed algorithm is carried out for a large database when the user ratings are high for perticular products. This algorithm is analysed in the rectangular matrix form in which the values are represented by the boolean values. The values are taken from the ratings of the user for the perticular products and that values are extracted from the previously stored data in the database. This predictive method is useful to predict the cost of the perticular products without the overlap of any other rated products. This allows the internet to collect the enormous amount of possible information about the user's choice.

G. Pang et al [5] the adaptive route selection for dynamic route based on Fuzzy-Neural approach, focused on the optimum route serach for the driver's preference for the car navigation. This algorithm gives the guideliness for the user by providing the recommendation of the routes in the real time traffic conditions. The user/driver gets the recommendation of the route using the fuzzy-neural algorithm, so that the users are made adaptive to decision-making and navigate through the recommended route.

This paper helps to show the development of an intelligent, simple-to-use and user-friendly trading platform targeted for direct consumer-to-consumer trading among university students. It must mention that a registered user can be easily verified as a university student by his/her university email address, which helps to provide a high degree of security for all registered users. This would facilitate easy trading of used goods/items among students within a local community or on campus. The main aim of application is decision making is made by the machine to predict the cost of the selling products to the consumer using the data mining techniques

METHODOLOGY

In this module, we have used two methods to predict the cost of the items uploaded by the seller and viewed by the receiver.

Algorithm for Cost Prediction using Naïve based

Step 1: Scan the dataset (storage servers)

Retrieval of required data for mining from the servers such as database, cloud, excel sheet etc.

Step 2: Calculate the probability of each attribute value. [n, n_c, m, p]

Here for each attribute we calculate the probability of occurrence using the following formula. (mentioned in the next step). For each class (price) we should apply the formulae.

Step 3: Apply the formulae

P (attributevalue (ai)/subjectvalue (vj)) = (n_c + mp)/(n+m)

Where:

n = the number of training examples for which v = vj

nc = number of examples for which v = vj and a = ai

p = a priori estimate for P(aij,vj)

m = the equivalent sample size

Step 4: Multiply the probabilities by p for each class, here we multiple the results of each attribute with p and final results are used for classification.

Step 5: Compare the values and classify the attribute values to one of the predefined set of class.

Collaborative filtering for recommendation of products

The system recommends products for the buyers by using "Association Rules" based on the buyer's previous transaction records.

On the basis of **collaborative filtering** principle, the recommendation process of student's attractions can be divided into three steps:

Step 1: Recommendation Process

- The representation of user (student) information. The purchasing history of attractions by student need to be analyzed and modeled.
- The generation of neighbor users (students). The similarity of students can be computed according to the buying history data and the collaborative filtering algorithm. A neighbor student list can be calculated on the basis of known similarities.
- The generation of attraction recommendations. Top-N attractions will be recommended to the student according to the buying history of user's neighbors.

Step 2: Generation of Neighbors

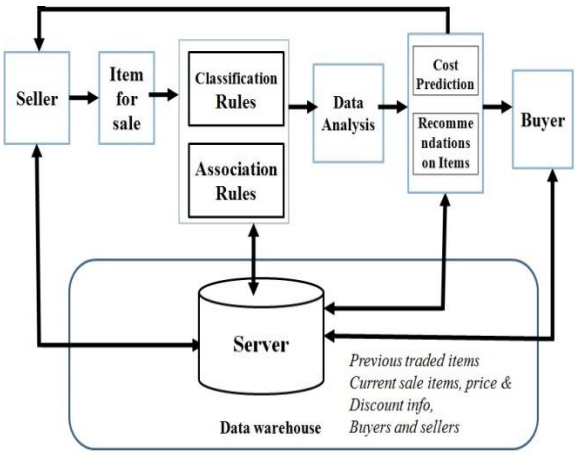
- Neighbor users generated mainly based on the similarity between each user.
- Suppose that the set of all students S = {S1, S2... Sn}, for each student Si (i=1, 2... n), the system can calculate the neighbors list including the top N students which similarity is higher than the given threshold.
- There are mainly three ways to measure the similarity between customers, including Cosine method, Correlation similarity method and Adjusted Cosine method.

Step 3: Generation of Recommendations

Recommendations of attractions are computed by the purchasing times of neighbors. According to the calculation, we can know that the neighbors of customer/students are identified, so we can list all the purchasing history of all the attractions so as to summary the most popular ones. We can find that the maximal purchasing times of that student's neighbors.

When new customers enter the system, there is usually insufficient information to produce recommendation for them, because there is no purchasing history of the new students. **The usual solution of the cold start problem is similarity calculation between each user by profile information, such as user area of interest, department, semester, etc**.

ARCHITECTURE

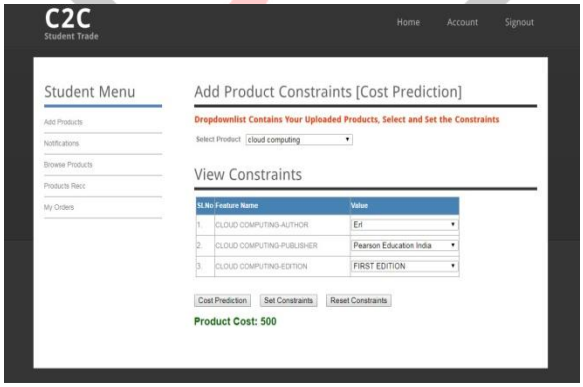


This is an online based application where students play as seller or buyer roles. Seller uploads the products for sale with its details such as the product name, description, features, and photos into the server. Here the products are used education related products such as books, electronic materials, sports equipments and tutoring services etc. This application predicts the selling price for the uploaded product and the buyer will buy the product if necessary, based on the transaction history the system will recommends the products for that student.

In a particular university the admin registers all the students of their university, the data are stored in the server. The system uses Classification rules and Association rules. Classification rule is used to predict the cost of the uploaded product, to predict the cost of the product the naïve bayer alogirthm is implemented. Association rule is used to recommondation of the product we have include collaborative filtering algorithm. This alogithm finds the common used products by the students and recommend the products to the students to buy that product if requred. The buyer may be senior or junior and the seller maybe jonior or senior students Data is analysed by the system to predict the cost of the product.

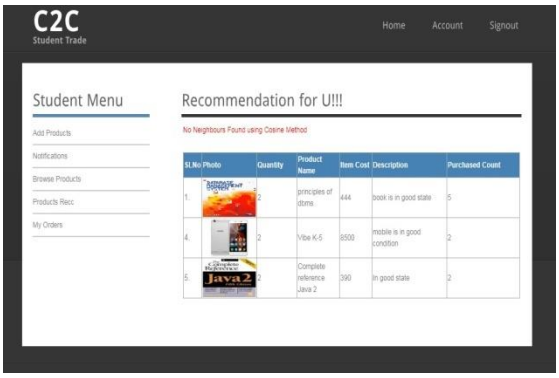
This application is used in a particular university or within a campus by the registerd students. The collaborative filtering is used to solve the cold start problem, when there is no history of the transaction by the student. This algorithm uses the information like department, semister and area of interest.

EXPERIMENT RESULTS



Cost Prediction for the perticular product

Registered student will login and adds the products with all the features, then selects the perticular product (Cloud computing) from the dropdown list as shown in the above diagram. The related constraints are diplayed as view constraints, and then the student has to click the cost prediction button, and the cost is not set by the student. In this C2Cstudent trade application, the system will predict the cost of the selected product using the naive bayer algorithm.



Recommendation of the product

In the C2C student trade, the registered student will get the recommendation of the products using the collaborative filtering algorithm by analysing the student interest in buying the products the system

CONCLUSION

Now a day, there are many online trading applictions available in the internet as commercial applications. It has various drawbacks and is not user-friendly for the students to exchange the products within the university. Some of the buyers may get confusion to make the payments to the seller for the required products because the cost is decided by the seller on demand for the uploaded products. This will make the seller to gain profit or sometimes the buyer may gain profit.

This paper is focused on the development of the web application using the data mining techniques to overcome the drawbacks of the cost prediction using **naïve bayer** algorithm, to predict the cost of the products by the machine using the previously saved data. And **collaborative filtering** is used to get the recommendation of the products in the user's history. The direct consumer-to-consumer (C2C) trading and helps the buyer to use the materials without any trouble or confusion about that product. This is a user friendly, easy to use by the students of the same university or within a campus.

FUTURE ENHANCEMENTS

Currently, in this paper we have focused on direct Consumer-to-Consumer (C2C) trading for exchange of products. Payments for the products are made at the time of buying the product to the seller. Online payments can be extended for the product payment type like credit, debit, cash, etc.

The consumer-to-consumer (C2C) trading is used by the registered students of the same university, where the admin of the university registers the students of their university. Once the registered student gets login to the application the buying and selling of the products are cannot be controlled by the admin of the application. However, the admin should get the notification or information about the product trading.

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