Implementation on Social Media to E Commerce: Product Recommendation with Rehotting Prediction

[1]Gaurav Mishra, [2]Paurnima Rokade, [3]Vijaya Biradar, [4]Pooja Khetmalis, [5]Prof. Gauri Virkar

gm77621@gmail.com, poru.rokade127@gmail.com, biradarvijaya46@gmail.com, poojakhetmalis@gmail.com, virkar_gauri@rediffmail.com

[#1234]Students, Department of Computer Engineering, Jspm's Bhiwrabai Sawant Institute of Technology and Research, Wagholi, Pune, Maharashtra

[#5]Prof., Department of Computer Engineering, Jspm's Bhiwrabai Sawant Institute of Technology and Research, Wagholi, Pune, Maharashtra

Abstract : Now days , Online Media and E-Commerce is widely used in world. Each and every person daily uses both social media like Facebook, Twitter, many more. In this system we combine the social media and e-commerce product for reducing the time of the each user based on recommendation and prediction system. For example we consider as an E-commerce websites using our social accounts like FB or G+, can also share our recent purchase details on the social media using the links to the product pages of e-commerce sites. Proposed System focusing on the product recommendation to the every user to share the details on e-commerce sites by leveraging the information or knowledge gained from the users' social accounts. This will enable to assess the needs of the user in cold start situations. Cold Start technique used for avoiding the data loss in this website. Cold Start is a state when user login in to the e-commerce website for the first time and user don't have any information about the history of purchases, shopping trends, etc. as it is not yet created or available. When user have social account information (no confidential information will be accessed) like posts, friends, shares, etc. then it can harness this to our benefit. For example, will be applying data mining algorithms to access the micro-blogs the user has created and extract the useful keywords and hence this data from the micro-blogs becomes the basis for product recommendation in cold start situations.

Keywords: Cold start, Product Recommendation, E-commerce, Micro-blogs, Product Demography, Data mining, Information Search.

I. INTRODUCTION

In recent years, the boundaries between e-commerce and social networking have become increasingly blurred. E-commerce websites such as eBay features many of the characteristics of social networks, including real-time status updates and interactions between its buyers and sellers. Some e- commerce websites also support the mechanism of social login, which allows new users to sign in with their existing login information from social networking services such as Facebook, Twitter or Google+. Now-a-days, product recommendation is a key area to focus for increased sales for any e-commerce website. For example, Netflix has re-leased an interesting fact that about 75% of its subscribers watch are from recommendations.

There are many algorithms which focus on connecting the social media to e-commerce but none are focused on product recommendation by leveraging the social media information like demographic, micro-blogs, location etc. We propose to utilize the linked users across convivial networking sites and e-commerce websites (users who have gregarious networking accounts and have made purchases on e-commerce websites) as a bridge to map user's gregarious networking features to latent features for product recommendation.

In concrete, we propose learning both users and products feature representations (called utilizer embedding and product embedding, respectively) from data amassed about users from social media website and product details collected from e commerce website.

Our major contributions are summarized below:

- We formulate a novel quandary of recommending products from an e- commerce website to friendly networking users in cold-start situations.
- We propose to study various attributes of social media user from various means possible (To the best of our erudition, it has been infrequently studied before.) for learning correlated feature representations for both users and products from data amassed from an ecommerce website and social media website.
- We propose a modified natural language processing (using Wordnet and Wu Palmer algorithm) to transform users' micro blogging attributes to latent feature representation which can be facilely incorporated for product recommendation.
- We are making use of K means algorithm to provide relevant material to users as per their actual requirement.
- We propose and instantiate a user feature and product demand value cross connection study approach by incorporating utilizer and product features for cold-start product recommendation.

POPULAR SOCIAL MEDIA OPTIONS

- Facebook has been cited as the ideal social media platform for creating brand awareness and engaging with consumers.
- Twitter is suitable for encouraging interaction with customers and the hash tag feature makes it easier to share valuable content.
- YouTube is an excellent choice for businesses that want to use videos to promote their brands and increase their visibility;
- Pinterest is a worthwhile option for you if you need to offer merchandise exclusively and showcase products in advance.

II. OBJECTIVE

- To study the consumers profile that purchase products from online;
- To identify the factors influence the customers to purchase products through social media;
- To find the products purchased through online; and
- To analyse the post purchase behaviour of consumers.

III. PROPOSED SYSTEM

The boundary between e-commerce and social networking has become blurred. Some e-commerce websites also support the mechanism of social login, which allows new users to sign in with their existing login information from social networking. None of the e-commerce systems have adopted the use of micro-blogging and other demographic information for cold start situation where a customer to e-commerce site is offered suggestion of the products. System developed hereby is focused on the details of the microblogs, demographic information, location information, etc. to address the product recommendation. It is combination of the social and e-commerce site which gives more accuracy for analyzing the both technology. In this system user can use both websites at same location. In this project, we have created two websites namely social site and e-commerce site. No. of users are connected to both sites. Social site have functions like Create profile, Update profile, Sending friend request, giving feedback, and sharing the product information. E-commerce site also has features like Check product, Buy product, Feedback, Ranking the product. Mining the results from both sites user can get to know appropriate product recommendation and sell of e-commerce also get increased by receiving feedback from users. User preference is studied and appropriate products are recommended to them on basis of following components :

a. Demographic Attributes

A demographic profile feature of a user such as gender, age and education can be used by e- commerce companies to provide better customized services. Demographic attributes have been shown to be very important in marketing, especially in product adoption for consumers. Six major demographic attributes can be stated as gender, age, marital status, education, career and interests.

b. Text Attributes

Microblogs contain rich commercial information of users.Also, users' microblogs often display their opinions and interests towards certain areas.As such, we can expect a potential relationship between text attributes and users' purchase preferences.

c. Temporal Attributes

Temporal activity patterns are also considered since they reflect the living habits and lifestyles of the microblogging users to some extent.

d. Pos tagging

Part-of-speech tagging (POS tagging or POST), also called grammatical tagging or word-category disambiguation, is the process of marking up a word in a text (corpus) as corresponding to a particular part of speech, based on both its definition and its context. User's textual data present in microblogs are studied well and important keywords are extracted that can be compared with description or hashtags of products on e commerce website that can be further used for recommendations to that particular user.

e. Product Rehotting with recommendation

The continuous modeling strategy argues that topics are continuously changing in the time domain. Even there could be some products available at e-commerce stores that are not popular enough for sale because of detoriation in their demand value. At such point of time we can rehot such products by recommending them with additional offers and discounts to such users who are liable to purchase these products in near future.

f. Product re ranking

By utilising this feature firstly the user choice and preferences are studied well , according to this data collected products are mined and most probable matches of products related to user choice are taken into consideration and later on after careful analysis of these options chosen according to popularity basis the "best of all" is selected for final recommendation.

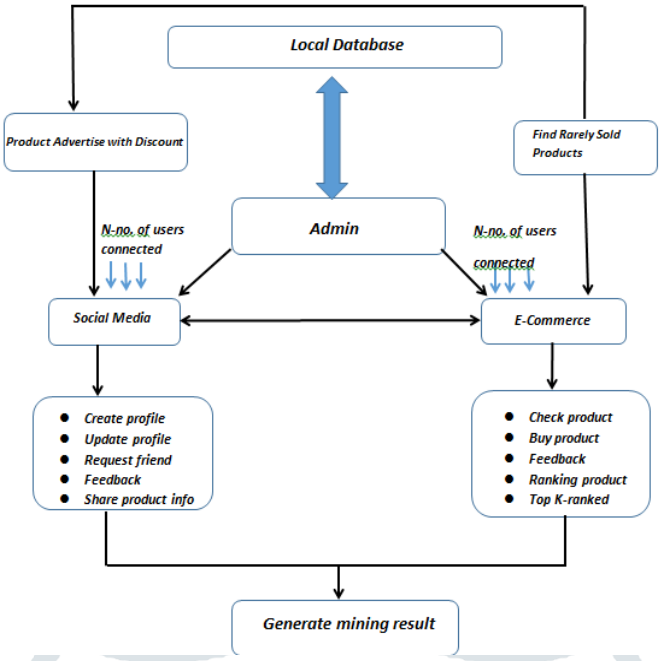

Fig 1. System architecture

IV. WORKING OF OVERALL SYSTEM

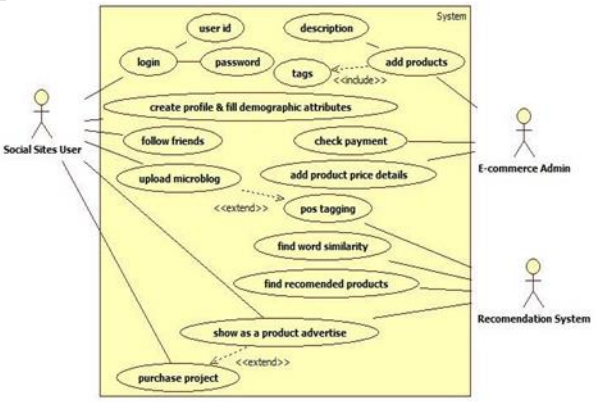

Figure 2:Working of overall system

We have developed two websites namely Social Networking site for users to socialize via virtual socializing platform and next is an E Commerce site used to sell products category wise in an given geographical area. So the main concept here is that we are going to recommend products to users based on their micro blog analysis. Social site allows users to make new friends, update their posts, like or dislike posts shared by our friends, etc. While Admin appointed for E-Commerce site is responsible to add and update new products according to latest trends along with discarding products which are not being in fashion at given instance. Products are added along with its name, description, price, discounted price and related hash tags to it. Cold start situation is wherein the user is new to our platform and we do not have sufficient knowledge to provide them relevant recommendation of products actually required. This problem can be solved by analyzing initial recently added posts by user.When user updates his post then our system uses K means clustering and Wu Palmer algorithm with Wordnet connectivity which implements POS tagging in order to find out base words from user's updates and compare them with hashtags associated to products on E Commerce site to recommend such required products actual user intended and provide them relevant recommendations hereby.
There might be such instances too where there might be certain products which are not in high demand as expected. A seperate panel is provided at E-Commerce website to analyze the details of products sold. At the same time there might be certain users who are liable to purchase these products according to their area of interest. In this way Rehotting of products is done(i.e. Rising demand value of products previously deteriorated. Lastly we can say that there would be two panels provided to users on social site (one for normal recommendation according to user's choice and another one according to rehotting of products done) solving both Cold start and Rehotting problems generally arising.

V. ALGORITHMS BEING USED

K-means Clustering Algorithm

Let X = { x1, x2, x3, ..., xn } be the set of data points (Products to be sold on E Commerce site) and V = {v1, v2, ..., vc } be the set of centers (Users socializing on Social Website).

1. Randomly select c cluster centers.
2. Calculate the distance between each data point and cluster centers.
3. Assign the data point to the cluster center whose distance from the cluster center is minimum of all the cluster centers.
4. Recalculate the new cluster center using : Vi = (1/Ci) Σ (Xi) here, 'ci' represents the number of data points in i^th cluster.
5. Recalculate the distance between each data point and new obtained cluster centers.
6. If no data point was reassigned then stop, otherwise repeat from step 3).

POS Tagging

- The input text is first tokenized, or broken into words.
- Wordnet dictionary then provides an initial tag for each word token.
- For example, a simple lookup would reveal that "dog" may be a noun or a verb (the most frequent tag is simply chosen), while an unknown word will be assigned some tag(s) based on capitalization, various prefix or suffix strings, etc.
- After all word tokens have (provisional) tags, contextual rules apply iteratively, to correct the tags by examining small amounts of context.
- Rules are reapplied repeatedly, until a threshold is reached, or no more rules can apply.
- Rules are of the general form:(Tag1->Tag2 if Condition), where the Condition tests the preceding and/or following word tokens, or their tags and their co realtions existing amongst them.
- And after that these tokens are being passed on to Wu Palmer Algorithm as input to find comparison results between user's micro blogging data on social networking site and hashtags provided to products on ecommerce site and finally provide best recommendation to users actually needed.

Wu-Palmer Algorithm

- The Wu & Palmer calculates relatedness by considering the depths of the two synsets in the WordNet taxonomies, along with the depth of the LCS (Least Common Subsumer)
- Formula is score = 2 * depth (lcs) / (depth (s1) + depth (s2)).
- This means that 0 < score <= 1. The score can never be zero because the depth of the LCS is never zero (the depth of the root of a taxonomy is one).
- The score is one if the two input concepts are the same.
- Input parameters: two words with their part of speech.
- Returns: The return value is the relatedness score. If no path exists between the two word senses, then a negative number is returned. If an error occurs, then the error level is set to non- zero and an error string is created.

VI. RESULT

The below result shown is the combination of the social and e-commerce site. This system gives the more accuracy for analyzing the both technology. In this system user can use both websites at same location. If any user can purchase the any product from e-commerce website, he can send review of the product on his/her social site. Once user send that review then that post is updated on social site for product recommendation to his/her friends. In this project, we are going to create two websites namely social site and e-commerce site. No. of users are connected to both sites. Social site have functions like Create profile, Update profile, Sending friend request, giving feedback, and sharing the product information. E-commerce site also has features like Check product, Buy product, Feedback, Ranking the product. Mining the results from both sites user can get to know appropriate product recommendation and sell of e-commerce also get increased by receiving feedback from users.

Figure 3: Home Page of E Commerce Website

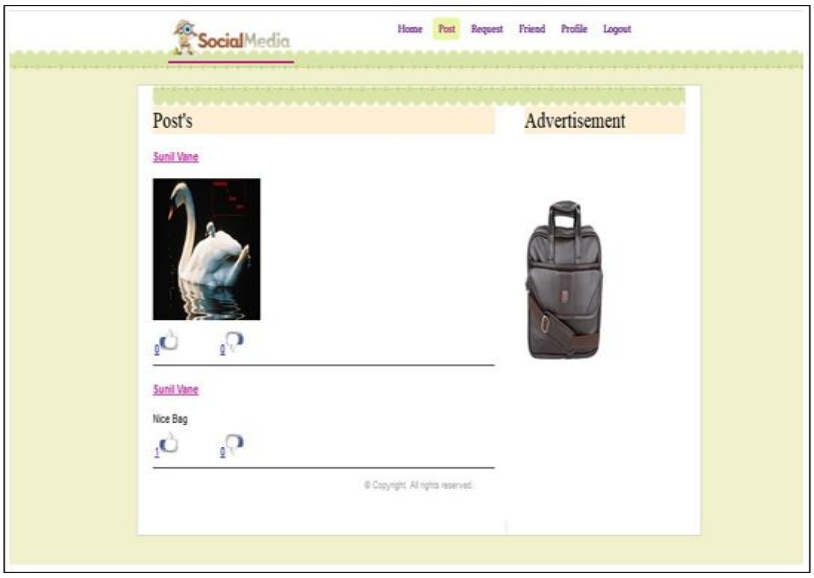

Figure 4: Posts being updated by user on Social Website

Figure 5:Accepting or Rejecting friend requests being made.

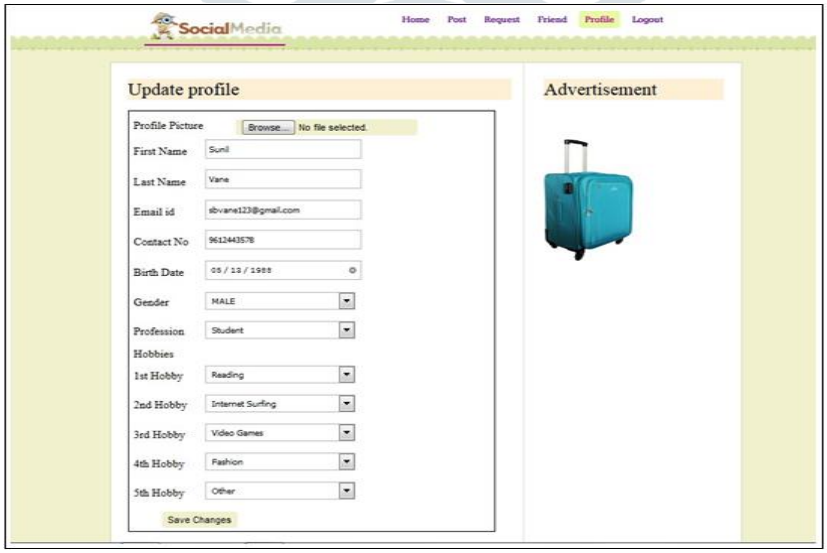

Figure 6: Updating Profile of user on Social Website

VII. CONCLUSION AND FUTURE WORK

In this Paper, we have studied a novel problem, cross-site cold-start product recommendation, i.e., recommending products from e-commerce websites to micro blogging users without historical purchase records. Our main idea is that on the e-commerce websites, users and products can be represented in the same latent feature space through feature learning and natural language processing. Using a set of linked users across both e-commerce websites and social networking sites as a bridge, we can learn feature mapping functions using a modified gradient boosting trees method, which maps user's attributes extracted from social networking sites onto feature representations learned from e-commerce websites. The mapped user features can be effectively incorporated into for cold start product recommendation.

The results show that our proposed framework is indeed effective in addressing the cross-site cold-start product recommendation problem. We believe that our study will have profound impact on both research and industry communities. Currently, only simple network architecture has been employed for user and product feature learning. In future, more advanced deep learning models such as Convolution Neural Networks can be explored for feature learning.We could also add an extra feature in our system that can understand the different languages used by user and it can provide the results accordingly as per their requirements in near future.

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