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A Survey on Product Recommendation Systems Using Social Data and Microblogging Information

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ABSTRACT: Across the world almost every single person in a metropolitan daily uses both social media like Facebook, Twitter, etc. for networking and uses internet to make huge purchases using e-commerce sites like Flipkart, Amazon, etc. Anyone can login to e-commerce websites using their social accounts like Facebook or Google+. Also they share their recent purchase details on the social media using the sites to the product pages of e-commerce sites. Focus on the product recommendation to the users on e-commerce sites by leveraging the information or knowledge gained from the user's social accounts. This will enable to assess the needs of the user in cold start situations. Cold Start is a state when user logs in to the ecommerce website for the first time and donot have any information about the history of purchases, shopping trends, etc. as it is not yet created or available. When we have users social account information (no confidential information will be accessed) like posts, friends, shares, etc. then we can harness this to our benefit. For example, we will be applying data mining algorithms to access the microblogs the user has created and extract the useful information and hence this data from the microblogs becomes the basis for product recommendation in cold-start situations.

KEYWORDS: E-commerce, Social media, Product recommender, Product demographic, Micro blogs, Cold-Start User, Information Search.

I. INTRODUCTION

Interesting problem about recommending products from e-commerce websites to users at social networking sites who do not have historical purchase records, such that in "cold-start" situations, called it as cross-site cold-start product and other recommendation. Although online product recommendation has been extensively studied before the most studies of only focus on constructing solutions within certain ecommerce websites and mainly utilize users' historical transaction records. To best of our knowledge, cross-site cold-start product recommendation has been rarely studied before this. Individuals can likewise express their sentiments on different subjects of hobbies. A wide mixture of subjects, extending from current occasions and political civil argument, to games and diversion, are in effect effectively talked about on these social discussions, for the instance, Facebook clients could remark on or "like" campaign posted by an organization. Twitter clients could send tweets with a most extreme length of 140 characters to immediately impart and convey their insights on the games, motion pictures, and so forth.

With the increasing popularity of the online e-commerce services, more and more people buy products online sites. As such, a large volume of online reviews have been constantly generated by the users. Since review data contain rich information about the user's feedback and opinions towards products they purchased, mining online reviews has attracted much interest. In existing system the problem is only the user's social networking information is available and it is a challenging task to transform the social networking information into latent user features which can be effectively used for the product recommendation. To address this informing, Linked users across social networking sites and the e-commerce sites as a bridge to map users' social networking features to the latent features for the product recommendation. In specific, learning both users and product's feature representations from the data collected from e-commerce websites.

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Next, how to extracting the microblogging information features and transform them into a distributive feature representation before the presenting a feature-based matrix factorization approach, which manufacture the learned distributive feature representations for the product recommendation. Prepare a list of the potentially useful microblogging attributes and construct the microblogging feature.

II. RELATED WORK

M.Giering [1] we have studied product recommendation system that was implemented for a chain of retail stores. Data consisted of daily sales information for 600 products at the store level, broken out over a set of non-overlapping customer types. A Singular Value Decomposition recommender system was built based on a fast online thin. In retail data mining the ability to accurately suggest expected sales transfer into several high impact and implementable actions. Common applications resting on accurate product sales modelling include product assortment optimization, sales anomaly detection, customer segment targeting, new product distribution and new store stocking we also have firmographic information available that provides contextual business information about each store. The product selection in each store varied significantly and hence there were missing values in our data set that corresponded to the product that were not available in the all stores. This worked to our advantage in forecasting sales of items not currently carried in a particular store.A product recommender is an implementation of a recommender system similar to those used by movie rating sites like Netflix, but for retail items.The store level product recommender serves several functions. The data were daily store level sales data broken out by item and retailer-defined customer types.

G.Linden, B.Smitch, and J.York [2] to generate a list of recommended items they use input about a customer's interests. Numbers of applications use only the product that customers purchase and explicitly rate to represent their interests, but also use other attributes, including items viewed, demographic data, favorite artists and subject interests. Most recommendation algorithms started by finding a set of the customers whose purchased and rated items overlap the users purchased and rated items. Cluster models divide the customer base into many subdivisions and handle the task as a classification problem. The algorithms goal is to assign the user to the subdivision containing the most similar customers. It then uses the purchases and ratings of the customers in the subdivision to generate recommendations. Item to-Item collaborative filtering advantage is increase Scalability and performance ; disadvantage is item space partitioning ,examine only a small customer sample and discard the most popular or unpopular item.

W.X.Zhao, Y,Guo , Y.He,H.Jiang, Y .Wu ,and X. Li [3] Productrecommender systems are often deployed by e-commerce websites to improve user experience and improve sales. Recommendation is limited by the product information hosted in those e-commerce sites and is only triggered when the users are performing e-commerce activities. A great success of commerce websites such as Amazon and eBay as they transcend geophysical barriers and allow individuals or business to form transactions anytime and anywhere. Online social media has already become the new area of our lives and involved different aspects of our social presence from day to day. Through online activities such as chatting with friends and posting short status updates, online social networks (OSNs) have become important platforms where users discuss their needs and desires and even disclose their personal information, to capture users purchase intents from OSNs and develop a generic product recommender system not limited to any specific e-commerce website. In particular, they developed their recommender system based on a microblogging service. The development of a novel product recommender system called METIS, a Merchant Intelligence recommender System.

J.Wang, W.X.Zhao, Y.He, and Xiaoming Li [4] the availability of the sheer volume of online product reviews makes it possible to derive implicit demographic information of product adopters from review documents a novel approach to the extraction of product adopter mentions from online reviews. The extracted product adopters are then categories into a number of different demographic user groups. The demographic information of many product can be used to characterize both products and users, which can be incorporated into a recommendation method using weighted regularized matrix factorization. With the increasing popularity of online e-commerce services, more and more people buy products online. As such, a large volume of online reviews have been constantly generated by users. Product recommendation important role to improve the sales of e-commerce companies. Early work on product recommendation typically uses collaborative filtering to make recommendations based on matching users with similar "tastes" or interests which can be revealed through users past purchase behaviors or rating patterns.

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Y.Seroussi, F Bohnert, I. Zukerman [5] Personalized recommendations have gained importance in helping users deal with the abundance of information available online. Personalized recommendations are often based on rating predictions, and thus accurate rating prediction plays an integral role in the generation of useful recommendations consider both demographic attributes. Explicitly supplied by users, and attributes inferred from user-generated texts. A growing interest in the collaborative rating prediction task. The MFUA model is defined for binary user attributes. Some user characteristics, such as gender, are naturally binary, but others, such as age, are defined on discrete or continuous scales. The common case where there are no explicit user demographics, but some texts by the users are available.

Jovian Lin, Kazunari Sugiyama,Min-Yen Kan,Tat-Seng Chua [6] As a tremendous number of mobile application are readily available, users have difficulty in identifying apps that are relevant to their interests. Recommender systems that depend on previous user ratings can address this problem for apps that have sufficient ratings from past users. Newly
Released app, which leads to the cold-start problem CF does not have any user ratings to base recommendations on. A method that accounts for emergent information culled from Twitter to provide relevant recommendation in such cold-start situations. App developers creating economic opportunities, companies , and marketers at present, users are access a substantial number of App Stores; furthermore, the selection available in app stores is growing rapidly as new apps are approved and released daily Apple recently reported that more than 40 billion apps have been the downloaded for its devices. Recommender systems have been introduced to alleviate this type of information overload by helping users find related product.

H.Ma, T.C.Zhou, M.R.Lyu and I.King [7] Recommender systems are ubiquitous in applications ranging from e-commerce to social media, helping users to navigate a big selection of product and to meet a variety of special needs and user tastes. Incorporating contextual knowledge into such systems such as relational information has proven to be an effective way to improve recommendation accuracy. Line of research aims to model relationships between users, through their connections in a social network. To model complex relationships between products, using data based on co-purchase and co-browsing behaviour. Modelling such networks presents a variety of challenges, in particular because the features that make two items complementary are far more complex than mere similarity.
Recommender systems are indispensable as a means of tailoring experiences to users, in order to generate personalized suggestions of content ranging from music and movies to beers. Critically, recommender systems rely on user feedback in order to build rich and high-fidelity models of user's preferences. Such systems are then evaluated in terms of their ability to predict ratings or rank products in accordance with user's real behaviour.

Mi Zhang, Jie Tang, Xuchen Zhang, Xiangyang Xue [8] Cold start is one of the most challenging problems in recommender systems. A context-aware semi-supervised co-training method named C- SEL. Specifically, the author have used a factorization model to capture fine- grained user-item context. Improved compared to the standard algorithms and the cold-startproblem is largely alleviated. Recommendation important role in attracted a user. More challenging task is how to grow the recommendation accuracy for the new product and the new users. Compared to the best-selling product, for the newly released ones and the old items that are rated by users then difficult for the standard recommendation and to providehigh-quality recommendations.

Sinno Jialin Pan and Qiang Yang [9] many machine learning and data mining algorithms is that the training and future data must be in the same feature space and have the same distribution. Focuses on the categorization and reviewing the current progress on transfer learning for the classification, regression, and clustering problems. Relationship between transfer learning and other related machine learning techniques. A comprehensive overview of the transfer learning for classification, regression and clustering developed in the machine learning and data mining areas. Traditional data mining and the machine learning algorithms make analysis on the future data using statistical models that are the trained on previously collected labeled or unlabeled training data. A categorization of transfer learning techniques: - 1) what to transfer, 2) how to transfer, and 3) when to transfer. Transferring knowledge to minimize domain divergence and classification or regression model error.

III. PROPOSED SYSTEM

The boundary between e-commerce and social networking has become blurred. E-commerce websites such as e-Bay has many of the traits of social networks, including real-time updates and interaction between buyers and sellers. Some e-commerce websites also support the mechanism of social login, which allows new users to sign in with their existing

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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. We are focused on the details of the micro-blogs, demo graphic information, location information, user posts, hobbies etc. to address the product recommendation. In this paper, we address the problem of recommending products to users who do not have any purchase records, i.e., in "cold-start" situations. We called it cold-start product recommender.

Fig1. Overview of System

Let's see the concept of this project with the help of this diagram. Here the first step is when the customer comes to the E-commerce site.

1) NEED ANALYSIS:- By using customers social information like his/her age, location, education, gender etc we can analyse what user want.
2) BEFORE PURCHASE:- Admin shows product to the customers as per their social information (like if he/she is a sport person then admin will show product related to sports only).
3) DURING PURCHASE:- Admin will shows that product during purchase with detail description that customer can buy.
4) AFTER PURCHASE:- After purchasing the product user can give feedback related to that product, according to users feedback Rating and Ranking is decided by Admin and posted it on social site of user.

The above is the combination of the social and e-commerce site. This system gives the more accuracy for analysing both technologies. In this system user can use both websites at same location. If any user purchases any product from e-commerce website, he can send review of the product on his/her social site. Once user sends 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.

All the users are connected to both sites.

Social site have functions like Create profile, Update profile, Sending friend request, Give feedback, and Share the product information. E-commerce site also has features like Check product, Buy product, Feedback, Ranking the product.

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Mining the results from both sites user can get to know appropriate product recommendation and sale of e-commerce also get increased by receiving feedback from users.

We used two algorithms to implement project. These are as follows:

1. K-means algorithm
2. Wu-Palmer algorithm

IV. CONCLUSION

We have studiedconnecting social media website and e-commerce website showed that it works on a data collected by a user from social media website and e-commerce website show that it can predicate a user's follow-up purchased behavior at a particular time descent accuracy,using a set of linked user across both e-commerce website and social media website as a bridge,we can learn feature predication of multiple user and recommend the product using microblogging. product recommender systems which are often designed for some specific e-commerce websites and can only make recommendations when users are performing e-commerce activities in those websites, it is not constrained by any particular e-commerce website and can make instantaneous product recommendations to users who have expressed their purchase intents in microblogs.

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