Analysis and Comparative of E-Commerce Personalized Recommendation

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ABSTRACT

With the rapid development of electronic commerce, the problem of "information overload" leads to the difficulty that user can't search the required goods effectively; personalized recommendation technology has been applied in e-commerce and popularization. By using the method of qualitative analysis of the current e-commerce site,the paper compares the information retrieval, association rule, content-based filtering and collaborative filtering, four main recommendation technologies, and analyses the advantages and disadvantages in the application layer. The recommendation technologies are introduced to review e-commerce research hot topic in the field of personalized recommendation, and analyses the current domestic e-commerce personalized recommendation theory research and application status, finally proposes the challenges faced by e-commerce personalized recommendation domain.

Keywords:E-commerce;Recommendation technology; information retrieval;association rules

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INTRODUCTION

The rapid development of e-commerce not only makes the enterprise to save the traditional management mode of the necessary physical investment costs, but also eliminates the traditional store display space constraints, gives shoppers a huge counter (also is infinite) goods [1].But because the customerscan't skim all of the goods through the small computer screen in a short time, and lack sales promotion personnel guide carefully, so that users face "information overload".Information overload refers to the commodity information web site to provide users with too much, because it is difficult to quickly find needed goods, so a user could get tired until losing interest in shopping and leave. Therefore, e-commerce sites is facing a serious problem: How the user browsing the web site will be suitable for the users of the goods to him or her, to overcome the adverse effects of information overload, thereby contributing to more deals in order to increase enterprise sales. At present, information retrieval, association rules, based on the content filtering, and collaborative filtering has been widely used in the electronic commerce recommendation system. The four kinds of technologies have achieved a certain degree of user oriented personalized recommendation, but it also has some deficiencies. In this context, recommendation system came into being which is according to the user's interests, recommend in line with the object of user interests, also known as the personalized recommendation system. According to the characteristics of the recommended object, at present there are two main types of recommendation system, an object is recommended Web search system, mainly USES the method and technology of Web data mining, for users to recommend conforms to the interests of Web page, such as Google, etc. Another is online shopping environment for recommended products personalized recommendation system, referring users to conform to the interests of commodities, such as books, audio and video, etc. Says the recommend system for e-commerce personalized recommender systems, hereinafter referred to as e-commerce recommendation system [2].

At present, information retrieval, Associationrule, based on content filter and collaborative filtering has been In the electronic commerce recommendation system are widely used. The four technologies realized the user-oriented personalized recommendation to a degree, but there are also some insufficiency. This article through the analysis of

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the personalized recommendation technology and electronic commerce provide decision-making recommend system for e-commerce sites to build Reference.

INTRODUCTION TO E-COMMERCE RECOMMENDATION SYSTEM

The definition of e-commerce recommendation system: using e-commerce sites provide commodity information and advice to the customer, should help users decide to buy what product, analog sales personnel to help customers complete the purchase process. This definition has been widely quoted. In July 1998, AAA organization by the United States all the scholars in Wisconsin specially convened to recommend system as the theme of the conference, focus on the development of the recommendation system [3].Currently, recommender system has been widely used in various industries, recommended objects including books, audio and video, web pages, articles and news, etc. (as shown in figure 1.
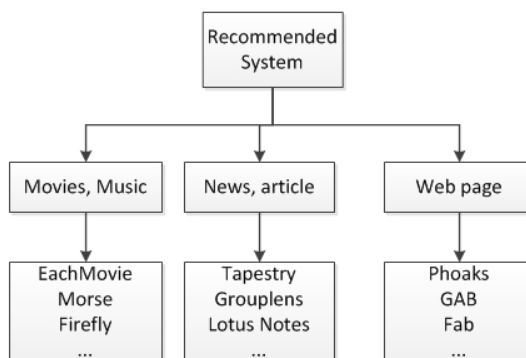

Fig .1: recommendation system

RECOMMENDATION TECHNOLOGY

(1)Content- based recommendation. It is the continuation and development of the information filtering technology, features related to the project or object by attribute to define. System based on the characteristics of the evaluation objects to learn the user's interest, and to predict the degree of match project according to the user data to recommend, such as newsgroups filtration system [4].

(2)Demographic based recommendation. Recommendation system based on users' personal attributes to the user classification, based on class again to recommend classes of users, users are not required to have a history data, and the collaborative filtering and content-based recommendation technology needs to be.

(3) Utility- based recommendation. It is calculated according to the utility of users to use the project, the core problem is how to create the utility function for each user, and consider the product attributes, such as providers of reliability and availability of the product and so on.

(4)Know ledge- based recommendation. To some extent may be regarded as a kind of reasoning technology, the method has the obvious difference due to different knowledge used in.

(5)Association rule based recommendation. Based on association rules, already bought goods as the rules header, recommend object as rules.The association rules are the bottleneck of the algorithm,which are found the key and most time consuming.But can be done offline, name of commodity synonymy problem is also a difficulty of association rules.

(6)Content-based filtering.Content-based filtering has many similarities in terms of technology and information retrieval; the difference is that it meets the user's information needs for a long time. Based on content filter for each user to establish a user description, record the contents of the user's likes and dislikes. Then compare with the content of the project (such as goods, W e b page, movies, music, etc.)The similarity of higher project recommended to the user, thus improve the scalability of recommend, and can better explain the recommendation results. Users can describe through the system to the user likes to machine learning to get the content of the project, or by the user's query, questionnaire feedback, and etc. based on the content filtering system such as LIBRA.

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(7)Collaborative filtering recommendation.Collaborative filtering recommendation is one of the most studied the personalized recommendation technology, it based on the recommendations from the neighbor user data to get the target users, recommended by the high degree of personalized collaborative filtering is based on the content to overcome the disadvantages of filters, such as Gold - berg is called collaborative filtering is proposed. The working mechanisms of content-based filtering and collaborative filtering is shown in figure 1.Collaborative filtering according to the target users with similar interests and preferences of other users of certain information to determine whether the information on the target user value, and then decide whether to recommend this information to target users, so as to relieve the information overload. The advantage of the collaborative filtering is to do not need to consider the recommended content of the project, so will not only filter object expanded to all types of resources, and realize the novelty is recommended. To be widely used in the electronic commerce recommendation systems, one of the most successful recommendation algorithm[5].
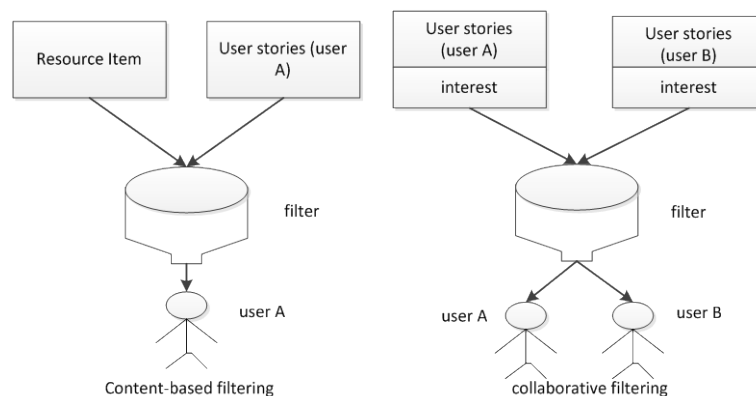

Fig.2:The working mechanisms of CBF and CF

RECOMMENDATION COMMENTS
Recommendation is also recommended, an important problem in the field of overall recommendation can have two kinds of methods: One is the on-line evaluation, another is the line evaluation. Online evaluation is online survey the user evaluation of recommendation system K. Swearing the recommendation system of evaluation and to recommend your friends compared the experimental results show that the friend's recommendation is often better than recommended recommendation system, recommendation system gives recommendations than friends recommended updates, and identify the key factors for several of the recommended design. Offline evaluation with a set of known data to evaluate the performance of the recommendation system, now generally adopt the digital equipment corporation system research center to provide a special experiment database, the library is a collection of 1996 ~ 2013, a total of 72916 users to 1628 films of 245667618 projects value assessment information, and evaluation analysis using discrete (0, 2, 4, 6, 8, 10),which can be downloaded from the company. Measure generally USES predictive value and the actual and estimated values of the average absolute error, Top - N recommend quality measure generally USES the standard, the evaluation system of information retrieval with accuracy, precision and recall rate (recall), measured accuracy and recall rate to a certain extent, is a pair of contradictory indicators, relatively high accuracy low recall rate. In order to balance the two, usually adopts the comprehensive evaluation index F- measure, in order to control the accuracy and recall rate of preference, E - measurer index is introduced. A typical experiment database offline Each Movie evaluate all recommendation algorithm is not necessarily correct, especially when considering the date and time, use offline evaluation is not very good for starting from customer satisfaction to evaluate the efficacy of the recommendation[6].

THE CHARACTERISTICS OF ELECTRONIC COMMERCE
(1)Trading virtualization.Through represented by the internet computer internet network in the trade, trade both sides from trade negotiations to pay was done through the Internet, such as the transaction virtualization.

(2)Low transaction cost. No intermediary participation, reduce the intermediate links to deal, paperless trade reduces file handling charges, the seller can undertake product propaganda through the Internet, reduce the advertising expenses. No store, save the rent.

(3)High efficiency. Companies use the internet to transfer information, improve the information transmission rate. Computers can store large amounts of information, query generation consumers, can transmit information quantity and accuracy, far more than other media, and can meet the market demand, update the product or adjust the price, so

can effectively understand and meet the needs of customers in a timely manner.

(4)Hyalinize. Buyers and sellers trade negotiation, signing and pay to the delivery notice of payment, the entire transaction process in a network to ensure the all kinds of information query and check it.

(5)Worldwide.The characteristics of the Internet is under the condition of the network popularization, the information can be radiation to the world, and Shared by people, under the condition of the electronic commerce globalization, globalization shopping.

(6)Harmony. In the e-commerce environment, it requires more various merchants, payment, logistics and distribution center, communications department, technical services, and other departments ability of cooperation.

TAOBAO CASES
Taobao, founded in 2003 on May 10th, founded by alibaba group investment at present, taobao is Asia's largest network retail business circle; the goal is committed to create a global network retail business circle. By combining community, river's lake, gang to increase the viscosity online population, and using the latest online mode, make online shopping the crowd very happy. The emergence of taobao for the entire network shopping market to create a transparent, the good faith, fair and open trading platform, and hitch will affect people's shopping habits. Promote offline market transparent, integrity, as well as the production and circulation. Thus derived a "open and transparent, sharing, and responsibility" of the new commercial civilization [5].

PROFIT MODEL
(1)Direct sales.Make purchase price and sale price difference between the online sales, more than 30000 kinds of product varieties, product 10% cheaper than offline stores - 20%.Inventory turnover rate for 12 days, the spot with suppliers now, had a 7% lower rate than Gome, Suning,Gross margins around 5%, the industry chain of suppliers and end customers to provide more value. Implementation of Taobao "low stress scale" of the business model.

(2)Virtual store rents. Store rent, products of landing fees, transaction fees.

(3)Precipitation money income.Using the received customer payment for goods and pay the supplier time lag of money precipitation reinvested in order to gain profit.Taobao mall on the third-party payment platform have Tenpay, Bill and Alipay.

(4)Advertising expense.At present, the network advertisement gradually accepted by people, for some large media websites, online advertising has become one of the important sources of business income. As shown in fig.1

CONCLUSION

Under e-commerce environment, One of the main problems in the enterprise is how to provide users with more personalized, more goods and services on line with user requirements .Due to the above recommended techniques which have their advantages and disadvantages, so the e-commerce sites need to build its recommendation system for a variety of recommended technique to cooperate in order to achieve the best personalized recommendation service.

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