

# Research on E - commerce Personalization Recommendation Strategy

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**Abstract:** With the development of e-commerce, personalized product recommendation has become an indispensable part. According to the characteristics of products and clients, the corresponding recommendation strategies are proposed. The construction and working methods of all kinds of recommendation systems are preliminarily designed and analyzed. At last, the author points out that the current recommendation system Recommended system problems and future development..

## 1. Introduction

With the advent of the digital age, the advantages of distance education have become increasingly prominent, promoting the construction of lifelong education system and learning society. Since June 2006, the Department of Higher Education of the Ministry of Education has initiated the project of "reforming the digital learning port and the construction and demonstration of lifelong learning society", the construction of digital learning and lifelong learning system has drawn more and more attention. Zhang Yao-chao, director of the Higher Education Department of the Ministry of Education, believes that the connotation of building a digital learning port is to provide the best possible service to the majority of learners. It should be emphasized that this service is to meet learners' individualized learning needs in real time, and to present them in a friendly and learner-acceptable form. In view of this, the digital learning platform that provides personalized service is crucial to the construction of a lifelong learning system and digital learning is undoubtedly the most important learning method in the lifelong learning system. In recent years, some researches have been done on the digital learning system providing personalized service at home and abroad, among which the research on personalized recommendation system is the most concerned.

## 2. Personalized Recommended Theory

In the personalized recommendation, personalization includes two meanings: First, understand the individual needs of users, and a clear description of these needs; Second, the recommended content to be available, but also reflects the personal tendencies. Clearly identify the user's individual needs is the premise to produce accurate recommendations. All of these functions, including identifying the user's personality, describing the requirements, generating recommendations, etc., are all based on a personalized recommendation system, which means there is a set of algorithms for the program. A complete recommendation system consists of three parts: input module, recommended module, output module. The input module is responsible for recording behaviors that can reflect the user's preferences, such as purchasing, browsing, downloading, grading, etc. The recommendation module uses appropriate recommendation techniques to establish an information model describing the user's preference for the recorded user behaviors. The module is the entire recommendation The core of the system, the specific recommended technology will be described in detail in the next section; Finally, various forms of recommended information will be fed back to the user in real time through the output module, such as suggestions, forecasts, comments and the like. It can be seen that the essence of personalized recommendation is that the system proactively analyzes the personalized needs of users according to their individual attributes, behavior habits and preferences, and recommends the interested information to the users, which can

be simply summarized as: Record Behavior → Analysis Preferences → real-time recommendation. Personalized recommendation system is a user-centered service system, its core is to generate recommendations to meet user needs. A good recommendation system should ensure the accuracy of recommendations, and as little as possible the user's labor, real-time generate recommendations and timely feedback. First of all, to ensure the accuracy of the recommendation. Recommended accuracy is reflected in whether the user's needs can be met. It can be said that the ultimate goal of personalized recommendation is to generate recommendations to meet user needs, so the accuracy of the recommendation results directly determine the vitality of the recommended system. If a recommender system can not generate recommendations that meet user needs, then this recommender system fails.

Second, collect the user's hobbies must be as little as the user's labor. The user's labor can be understood in two ways. On the one hand refers to registered user information, on the other hand requires the user to make the evaluation and other behaviors. Some recommendation systems often require users to register information that reflects their preferences in order to ensure the accuracy of recommendations, or they need to give users no less than a certain number of ratings before generating recommendations. This method can indeed improve the accuracy of recommendations, but also take into account the user's psychology, users should not be afraid of emotions. When people need to fill out detailed registration information like resumes, or must evaluate dozens of movies, books, I am afraid most users will give up before browsing. So as little as possible the user's labor is to recommend the system of human needs. Again, the recommended results must be calculated in real time, to ensure that users get before leaving the page. Only allow users to get the recommendation, the meaning of the recommended system is truly reflected. A successful recommendation can extend the user's access time, enhance the user's loyalty to the system, and profit-oriented e-commerce recommendation system even relying on recommendations generated by the recommendation system to increase turnover and create considerable economic benefits. Finally, timely feedback on the recommended results. The recommendation system to learn the user's preferences requires a continuous improvement process, each generated recommendations should lay the foundation for the next recommendation. Recommended deviations on the timely correction, the recommendation should be promptly enhanced, so feedback allows the system to more accurately grasp the user's preferences and improve the accuracy of the recommendation.

### **3. Personalized Recommended Key Technologies**

Collaborative filtering recommendation (collaborative filtering / CF recommendation) is currently the most widely used as a recommended technology. It predicts the preferences of individual users based on similar degrees of association between users or projects. The basic idea of collaborative filtering is to first synergize and then filter. According to the user's evaluation of the project to find similar users and group them (synergy), and then based on the neighbors within the group user information from the project set to extract the target user's project (filtering). Because collaborative filtering technology does not pay attention to the content of the project itself, it only focuses on the user's evaluation of the project, so it can handle complex structured projects like music and movies. Collaborative filtering recommendations can be divided into two types: user-based and project-based recommendations.

User-based CF is the first generation of collaborative filtering. It is based on the fact that each user has a user group similar to their hobby, and the users in this group are called "neighbors" of the current user, and the items of interest to these neighbor users can be recommended as the user item basis. This algorithm is called the nearest neighbor algorithm. Nearest neighbor algorithm to user behavior similarities to determine the preferences of the user's interest preferences are similar. Here the user's behavior refers to the choice of browsing, downloading, purchasing, evaluation, etc. can reflect the behavior of the user's preferences. In a typical User-based CF system, the input data is an  $m \times n$  user-item matrix  $R$ , where  $m$  is the number of users and  $n$  is the number of items. The value of matrix  $R$  is related to the project type and is usually determined by the behavior record module. If the project is a movie and the recorded behavior is download, the matrix value can be expressed

as 1 (download), 0 (no download).

Item-based CF is the similarity between the project and the project. Compared with the user-based collaborative filtering, the computational cost of finding the nearest neighbor is eliminated, and the computational efficiency is greatly improved. Its basic idea is that a user will like items that are similar to his favorite ones. Item-based CF is also divided into two steps: (1) Get the project's historical score record, that is, the user behavior selection vector on each project; (2) Compare the behavior selection vectors on each project to calculate the Similarity, get similar items recommended.

Compared with user-based collaborative filtering, the biggest improvement of project-based collaborative filtering is scalability. Because it replaces the similarities between users by calculating the similarity between items. Often, the number of projects in Internet applications is more stable than the number of users. Therefore, compared with users, the similarity between projects is much less computation, which can greatly reduce the amount of online computation and improve system performance. However, the limitations of both User-based CF and Item-based CF are obvious. The first is the "cold start" question. Because CF technology relies on sufficient user behavior data, a cold start problem arises when new users or projects appear on the system. New users must first evaluate a certain number of items in order to obtain accurate recommendations, and new items must also have a chance of being recommended by the system after sufficient user ratings have been made. Second, the "sparseness" problem is likely to be encountered by any one of the CF recommendation systems. On any web site, the user's record of the behavior of the project is a small part of the overall set of alternatives available. For example, in some large online bookstores, the number of user-rated books is no more than 1% of millions of books, resulting in relatively sparse data evaluation. When there is no intersection between the content evaluated by the users, it is difficult to judge whether the tastes of the users are similar or not, and it is difficult to find similar user sets, resulting in greatly reduced recommendation effects. Thirdly, because the collaborative filtering process evaluates projects based on community groups, the system largely reflects the tastes of the general public, and the recommendation accuracy of the user system for some special tastes is not high.

#### **4. E-Commerce Inspired by the Personalized System Recommendation Strategy**

The recommendation of learning resources means that the system proactively provides learners with learning resources that meet the learning needs and characteristics of learners. The earliest study of personalized recommendation system Altered Vista System (Recker et al., 2003) is a learning resource recommendation system. The system uses collaborative filtering technology, based on the user's assessment of learning resources to generate learning resources recommendation. In addition, Tiffany Ya TANG of the University of Saskatoon in Canada presented an intelligent self-evolving recommendation system that is not only adaptive to learners but also adaptable to an open Web environment, meaning that the system Can analyze learner and system interactive behavior initiatively, obtain learning resources dynamically from Internet and recommend to learner.

Learning activities refer to the system based on individual needs of learners to actively push learning activities. The Open University of Olando (EUNL) Educational Technology Experiment Center (ETEC) conducted an in-depth study of the learning system recommendation system. This study is based on the sub-project of the European Lifelong Learning Project in the context of the EU's TENCompetence project. TENCompetence eventually builds a lifelong learning system that supports the development of individual competencies. Because the system is open, learners can choose to learn so much that they can not choose the one that suits their needs. So Open University's Educational Technology Experiment Center began to study the use of personalized recommendation techniques in this project to find potential learning activities and generate the most suitable recommendations. They considered that in determining the learning topics, forward knowledge, learner characteristics, learning After the group, but also learning activities in a certain order recommended to the learner.

For a high-quality recommendation system should be the three aspects of the proposed integration, not only in isolation recommended, because local recommendations often can not produce good learning results, cut the overall learning program for learners, so that learners confused . For example, only recommended learning resources, learners can not well learn resources and learning activities to establish contact, is likely to be out of the established learning path, resulting in learning progress blocked. Especially under the environment of lifelong learning, learners rely on self-guided learning more and more, so it is very important to grasp the overall learning plan under the given learning objectives. So the recommendation system should strengthen learning resources, learning activities and learning Strategy integration, positioning to recommend a complete learning program to learners.

## **5. Conclusion**

In the background of building a digital lifelong learning system, personalized recommendation system as a lifelong learning system, the most important way to learn, has received widespread attention. Personalized recommendation system (referred to as PRS) earliest used in e-commerce and information services, is now relatively mature. The PRS in the application is still in the exploratory stage. In view of this, the author starts from the personalized recommendation system in the field of e-commerce, chooses the successful recommendation system case to do research, obtains the successful experience of the application of personalized recommendation system and extracts the enlightenment to the system personalized construction, finally Explore the personalized strategy of the system.

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