MJRET

Open Access

Multidisciplinary Journal of Research in Engineering and Technology

Journal homepage: www.mjret.in

ISSN:2348 - 6953

BOOK RECOMMENDATION SYSTEM

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Abstract: *Recommendation systems are widely used to recommend products to the end users that are most appropriate. Online book selling websites now-a-days are competing with each other by many means. Recommendation system is one of the stronger tools to increase profit and retaining buyer. The book recommendation system must recommend books that are of buyer's interest. This paper presents book recommendation system based on combined features of content filtering, collaborative filtering and association rule mining.*

Keywords: *Association rule mining, Collaborative filtering (CF), content based filtering (CBF), and Recommendation system*.

1. INTRODUCTION

Recommendation Systems (RSs) are software tools and techniques providing suggestions for items to be of use by a user. The suggestions relates to various decision-making processes such as, what items to buy? What music to listen? , or what online news to read? "Item" is the general term used to denote what the system recommends to the user. A RS normally focuses on a specific type of item (e.g., CDs, Books or news) and accordingly its design, its graphical user interface(GUI), and the recommendation technique used to generate the recommendations are all customized to provide useful and effective suggestions for that specific type of item. RSs are primarily directed towards individuals who lack sufficient personal experience or gets difficulty in selecting the items. For example, recommendation system may assists users to select a book, music, news etc. to read. There are many techniques used for recommendation. These are classified on the basis of different knowledge sources. Knowledge sources include users' features like age and gender, item/service features like keywords, genre and user-item preferences data like rating, purchase history, etc. This user-item preference data creates a user profile which plays an important role in recommendations. Existing recommendation techniques use these user and item features for recommendation but they are not sufficient to provide effective recommendations. User profiling and improving existing techniques is the main challenge

today.

2. TECHNOLOGIES USED IN BRS

These are the technologies that we are using in this Recommendation System to improve the quality of recommending filtered books that might be as per the User's interest.

a) Content Based Filtering

Content-based filtering (CBF) is one of the most widely used and researched recommendation approaches. One central component of CBF is the user modeling process, in which the interests of users are inferred from the items that users interacted with (past searches). “Items” are usually textual, for instance emails or WebPages. "Interaction" is typically established through actions, such as downloading, buying, authoring, or tagging an item. Items are represented by a content model containing the items’ features. Features are typically word-based, i.e. single words, phrases, or n-grams. Some recommender systems also use non-textual features, such as writing style layout information and XML tags. Typically, only the most descriptive features are used to model an item and users and these features are commonly weighted. Once the most discriminative features are identified, they are stored, often as a vector that contains the features and their weights.

The user model typically consists of the features of a user's items. To generate recommendations, the user model and recommendation candidates are compared, for example using the vector space model and the cosine similarity coefficient. Content-based recommendation systems try to recommend items similar to those a given user has liked in the past, whereas systems designed according to the collaborative recommendation paradigm identify users whose preferences are similar to those of the given user and recommend items they have liked.

b) Collaborative filtering

The term “collaborative filtering” (CF) was coined in 1992 by Goldberg. Who proposed that “information filtering can be more effective when humans are involved in the filtering process” .Compared to CBF, CF offers three advantages.

- First, CF is content independent, i.e. no error-prone item processing is required.
- Second, because humans do the ratings, CF takes into account real quality assessments.
- Finally, CF is supposed to provide serendipitous recommendations because recommendations are not based on item similarity but on user similarity.

Content based filtering cannot find out the quality of the item. To overcome this problem collaborative filtering system are used because they are based on opinion of the other users. Collaborative filtering (CF) (sometimes called “social filtering” or recommender system) is one of the way to do recommendation on the web. One of the earliest used collaborative algorithms and results were Group Lens and Ring. Item based collaborative recommendation algorithm looks in to the set of items the

target user has rated and computes how much similar they are to the target item i and then selects k- most similar items *{i1, i2….., ik}* to the set of items the target user has rated, the recommendation is then computed by taking the weighted average of the target user's rating on these similar items.

c) Association rule mining

Association rule mining, one of the most important and well researched techniques of data mining. It aims to extract interesting correlations, frequent patterns, associations or casual structures among sets of items in the transaction databases or other data representation. Association rule mining finds interesting association and correlation relationship among large data set of items .Market basket analysis in considered as a typical example of association rule mining. In market basket analysis customer buying habit is analyzed for finding association between different items customer put together in their shopping cart. Let *I = {i1, i2…, in}* be a set of items. An association rule can be represented by this form A B, where $A \subseteq I$, $B \subseteq I$ *and* $A \cap B = \emptyset$. Association rule extract the pattern from the database based on the two measures minimum support and the minimum confidence. The support and confidence measures are described as stated in.

- Support: The rule (A B) holds in transaction set D with support s, where s is the percentage of the transactions in D containing A ∪ B. *Support* $(A \cup B) = P(A \cup B)$
- Confidence: The rule (A B) has confidence c in the transaction set D, where c is the percentage of transactions in D containing A that also contain B. than or equal to the user defined minimum confidence.

3. RELATED WORKS

Recommender system is defined as a decision making strategy for users under complex information environments. Also, recommender system was defined from the perspective of E-commerce as a tool that helps users search through records of knowledge which is related to users' interest and preference. Recommender system was defined as a means of assisting and augmenting the social process of using recommendations of others to make choices when there is no sufficient personal knowledge or experience of the alternatives. Recommender systems handle the problem of information overload that users normally encounter by providing them with personalized, exclusive content and service recommendations. Recently, various approaches for building recommendation systems have been developed, which can utilize either collaborative filtering, content-based filtering or hybrid filtering .Collaborative filtering technique is the most mature and the most commonly implemented. Collaborative filtering recommends items by identifying other users with similar taste; it uses their opinion to recommend items to the active user. Collaborative recommender systems have been implemented in different application areas. The system then recommends other products which are similar online according to the users' purchase history. On the other hand, content-

based techniques match content resources to user characteristics. Content-based filtering techniques normally base their predictions on user's information, and they ignore contributions from other users as with the case of collaborative techniques and. Fab relies heavily on the ratings of different users in order to create a training set and it is an example of content-based recommender system. The system makes use of a user interface that assists users in browsing the Internet; it is able to track the browsing pattern of a user to predict the pages that they may be interested in. designed an intelligent agent that attempts to predict which web pages will interest a user by using naive Bayesian classifier. The agent allows a user to provide training instances by rating different pages as either hot or cold.

4. ARCHITECTURE OF THE BRS

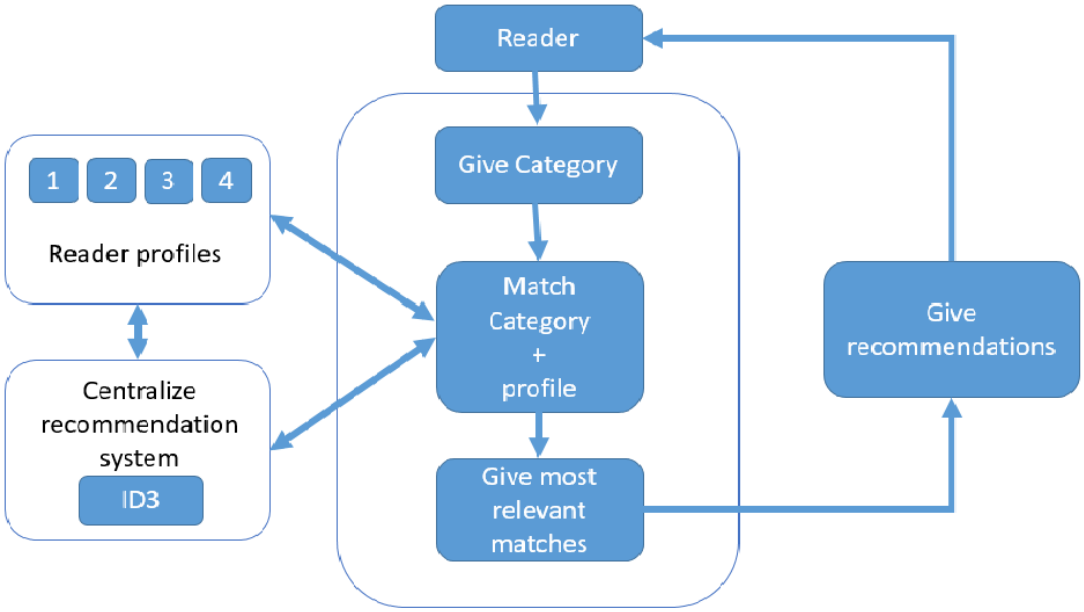

Fig.1. Architecture Design

5. TABLES USED IN THE BRS

Field Name	Description
Login ID	Customer login ID
Customer Name	Customer Name
Password	Login Password
Email	To confirm User ID
Mobile Number	To receive confirmation message

Address	To make purchase

Table 1: Registration Table

Field Name	**Description**
Book Name	Book's Name
Category ID	Book's Category ID
Author	Book's Author's Name
Publisher	Book's Publisher's Name
Edition	Book's Edition
Book Rating	Book's average rating given by the registered customers who have bought the book.

Table 2: Book information Table

6. CONCLUSION

We presented a systematic comparison of various technologies on a real-life purchase dataset. We showed that recommender systems can be developed on purchase rather than rating data, and that, in such cases, algorithms comparison is different from the standard rating case. In particular, on our data, the simplest algorithm based on bigram association rules obtained the best performances. We believe that such case-studies are necessary to better understand the specificities of purchase datasets and the factors that impact recommender systems for retailers.

ACKNOWLEDGEMENTS

We thank Prof.P.S.Desai for guiding us throughout and giving us this opportunity to publish the paper.

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