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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, Collaborative filtering, Content based filtering, Recommendation system

I. INTRODUCTION

Recommendation systems were evolved as intelligent algorithms, which can generate results in the form of recommendations to users. They reduce the overhead associated with making best choices among the plenty. Now, Recommender systems can be implemented in any domain from E-commerce to network security in the form of personalized services. They provide benefit to both the consumer and the manufacturer, by suggesting items to consumers, which can't be demanded until the recommendations[1]. Every recommender system comprises of two entities, one is user and other is item. A user can be any customer or consumer of any product or items, who get the suggestions. Input to recommendation algorithm can be a database of user and items and output obviously will be the recommendations. As in our case, inputs consist of database of customers and database of books and output denotes the book recommendations. This paper presents a new approach for recommending books to the buyers. This system combines the features of content filtering, collaborative filtering and association rule mining to produce efficient and effective recommendations.

II. CONTENT RECOMMENDATION SYSTEM

Conventional techniques dealing with information overload use content-based filtering techniques. They analyse the similarity between items based on their 2.2 Recommender Systems 23 contents and recommend similar items based on users' previous preferences. (Jian et al. 2005; Pazzani and Billsus 2007; Malone et al. 1987). Typically, content-based filtering techniques match items to users through classifier-based approaches or nearest-neighbor methods. In classifier-based approaches each user is associated with a classifier as a profile. The classifier takes an item as its input and then concludes whether the item is preferred by associated users based on the item contents

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Like other system Content based filtering is also having some limitations like finding the quality of the content. For example Content based filtering cannot differentiate between good article and bad article if both of them are using same terminology[2].

III. COLLABORATIVE FILTERING BASED RECOMMENDATION SYSTEM

Collaborative filtering, one of the most popular technique for recommender systems, collects opinions from customers in the form of ratings on items, services or service providers[5]. It is most known for its use on popular e-commerce sites such as Amazon.com. Content based filtering cannot find out the quality of the item. To overcome this problem collaborative filtering system are used.

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 $\{i_1, i_2, \dots, i_k\}$ 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[6].

IV. ASSOCIATION RULE MINING

Association rule mining finds interesting association and correlation relationship among large data set of items[7]. Market basket analysis is 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 $I = \{i_1, i_2, \dots, i_m\}$ be a set of items. An association rule can be represented by this form $A \rightarrow B$, where $A \subseteq I$, $B \subseteq I$ and $A \cap B = \emptyset$ [8]. 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[7].

1) *Support*:

The rule $(A \rightarrow B)$ holds in transaction set D with *support* s , where s is the percentage of the transactions in D containing $A \cup B$.

$$\text{Support}(A \cup B) = P(A \cup B) \quad (1)$$

2) *Confidence*:

The rule $(A \rightarrow B)$ 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.

V. BOOK RECOMMENDATION SYSTEM

Purpose of this book recommendation system is to recommend books to the buyer that suits their interest. This recommendation system works offline and stores recommendations in the buyer's web profile. This system has following seven steps:

- 1) In this step we record the books which users has bought earlier.
- 2) In next step we find out category of book from users buying history.

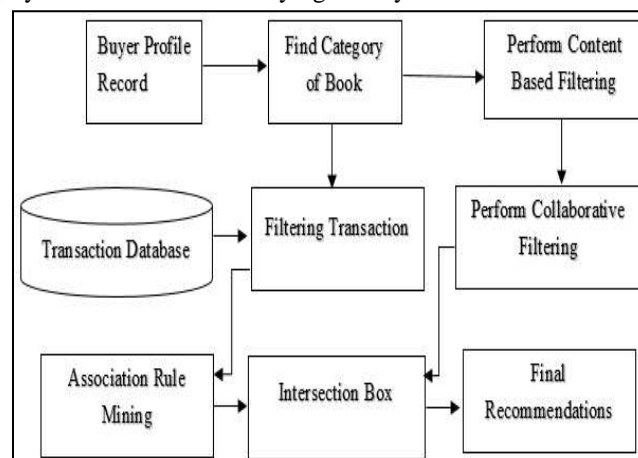


Fig.1: Block Diagram of Recommendation System

- 3) In this step we perform content based filtering i.e. we find all the books according to the category found in step 2.
- 4) On the result of step 3 we perform item based collaborative filtering and find out the list of books in the descending order of ratings. In this step system actually evaluate the quality of the recommending books based on the rating given to those books by the other buyers.
- 5) From the book transaction database we find all those transactions whose category is same as found in step2. Apply association rule on those transactions and find out the books which are frequently bought.
- 6) Find out the intersection of the result of step 4 and 5. Arrange the intersection result in the descending order of ratings as given by the step 4.
- 7) Outcome of the step 6 is the final recommendations for the buyer. All these steps are performed when the buyer is offline and the results are stored in the buyers web profile. When the buyer comes online next time the recommendations will be generated automatically This book recommendation system is represented by block diagram in the fig.1

VI. FINAL RECOMMENDATION

The final result of our system is shown in below figure 2.

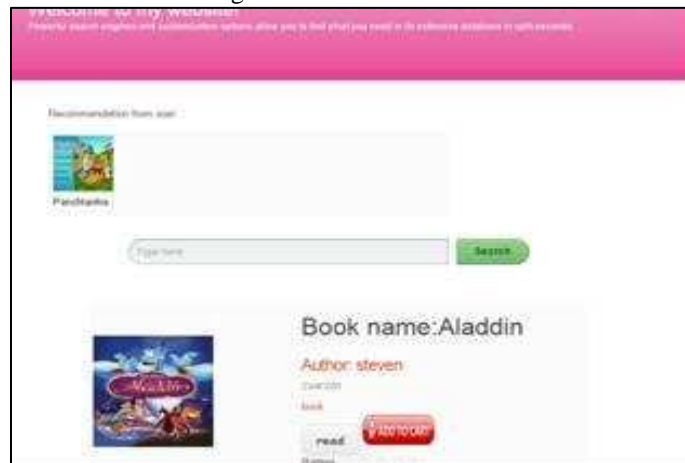


Fig. 2: Final result of book recommendation

VII. CONCLUSION

The goal of the most recommendation system is to predict the buyer's interest and recommends the books accordingly. This book recommendation has considered many parameters like content of the book and quality of the book by doing collaborative filtering of ratings by the other buyers. This recommender system also uses associative model to give stronger recommendations. This system does not have performance problem since it built the recommendations offline.

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