Product Recommendation System for E-commerce business

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ABSTRACT

The sale and purchase of goods are now starting to move from being offline to online using the internet, or what is known as e-commerce. With the development of the internet and intelligent computing technology, e-commerce is increasingly being used. The product offered by e-commerce platforms is a matter that needs to be considered because it can influence the user's decision in buying a product .This study aims to build itemized collaborative recommendation system for products on an e-commerce website according to the user's needs .There are several methods that can be used to recommend a particular product, one is based on popularity and the other is purchase history based .Thus, the product recommendations are expected to be in accordance with the user's interest which suits the usre's need .Based on the case studies conducted, the results of recommendations provided with this approach not only provide recommendation for specific products but also consume less time and energy of the users. Thus, the recommendation will be more varied and are expected to be more in line with the user interests.

Keywords: Recommendation system, itemize collaborative, popularity based, purchase history

ARTICLE INFO

I. INTRODUCTION

Recommendation systems become an important research area since the appearance of the first papers on collaborative filtering in 1990s.There has been much work done both in the industry and academic area for developing new approaches in recommender systems over the last decade. The interest in recommendation system still remains high because it constitutes a problem-rich research area and because of practical applications that help users to deal with information overload and provide personalized recommendations, content, and services to them. Examples of such applications include recommendations of various books, CDs, products at Flipkart.com, movies by Movie Lens. Online E-commerce websites like Amazon, Flipkart uses different recommendation models to provide different suggestions to different users. Amazon currently uses item to item collaborative filtering, which scales to massive data sets and produces high quality recommendation in real time. This type of filtering matches each of the users purchased and rated item to similar items, then combines those similar items into recommendation list for the users. In this project we are going to build recommendation model for the products of such website. Recommendation system is one application which is being used by many vectors and online

service providers to believe the necessity of online users. Thus, the recommender system is presented as an intelligent system, which identifies the user category having a basis on the user information(purchase history) and then user interest analysis. Once such information is obtained, in second stage, the analysis is performed to obtain the similarity group respective to necessity products and services. To perform such kind of analysis there are some existing techniques such as popularity based and purchase history based.
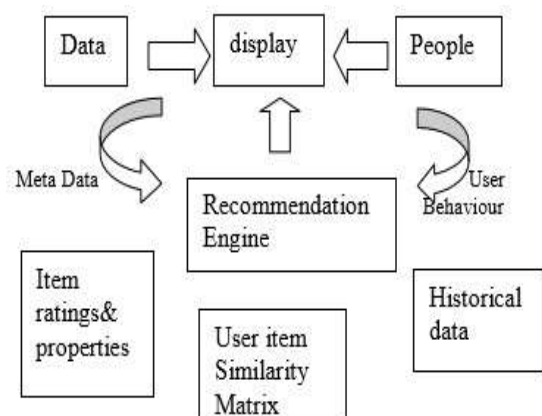

Fig: Architecture of Recommendation system

II. LITERATURE SURVEY

1)Deng Ailin, Zhu Yangyong, Shi Bole [1] proposed a collaborative filtering algorithm that is one of the methods used in recommendation system. The traditional algorithms focus only on user ratings and do not consider the changes of user interest and the credibility of ratings data, which affect the quality of the system's recommendation. Hence this paper presents an improved algorithm to solve this problem. The idea is based on the assumption that similar users have same preferences. Find users similarity to find the neighbors having the similar interest with that of the user.

Combine the neighbor's scores for giving the user's preference. Then the top-N items for that user are provided. But the similarity measurements in collaborative filtering algorithm pay attention to the similarity score rather than the user interest.

2)Wang Guoxia, Liu Heping [4] proposed survey in personalized recommendation systems. Service recommendation systems are very efficient. These are applied in a many applications. The number of customers has grown fast, resulting in big data analysis problem for the service recommendation systems. Collaborative filtering builds model from customer's past behavior as well as from similar decisions made by others having similar interests. Content-based filtering uses many attributes of an item to recommend more items having similarities in properties. These are combined to form hybrid recommendation systems. Each type of system has its advantages and disadvantages. This paper helps to choose better algorithm strategies for recommendation based on the requirements and input set of the system.

III. PROBLEM STATEMENTS

Building itemized collaborative recommendation system for products on an e-commerce website.

IV. PROPOSED SYSTEM

Proposed system is a better E-Commerce recommendation system that can give out effective recommendations for users which are satisfying to them to a great extent. Customers can get many benefits and also the trading volume can be increased.

Proposed system aims at implementing the recommendation system for customers to get the items they want. Proposed recommendation system mainly consists of models namely – ERD, Recommendation system, ect.as shown in fig-2. Proposed system satisfies the consumers to a better extent.
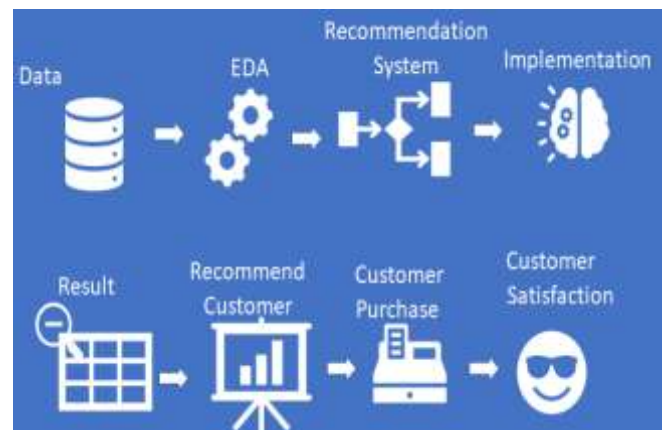
Fig 1.System architecture

Recommendation System - Part I
Product popularity based recommendation system targeted at new customers:
• Popularity based are a great strategy to target the new customers with the most popular products sold on a business's website and is very useful to cold start a recommendation engine.

Recommendation System - Part II
Purchased history based recommendation system targeted at new customers:
• Recommend items to users based on purchase history and similarity of ratings provided by other users who bought items to that of a particular customer.
• This technique is chosen here as it helps in predicting products for a particular user by identifying patterns based on preferences from multiple user data

V. CASE STUDY

In this section, a case study will be explained to implement the proposed method..
• In this system recommendation is done based on product popularity.

popular_product=pd.DataFrame(amazon_ratings.grou pby('ProductId')['Rating'].count ())most_popular = popular_products.sort_values('Rating',ascending=False)mos t_popular.head(5)
Out[4]:

ProductId	Rating
B001MA0QY2	7533
B0009V1YR8	2869
B0043OYFKU	2477
B0000YUXI0	2143
B003V265QW	2088

Analysis:

• The above graph gives us the most popular products (arranged in descending order) sold by the business.
• For eaxmple, product, ID #B001MA0QY2 has sales of over 7000, the next most popular product, ID # B0009V1YR8 has sales of 3000, etc.
• In this system recommendation is done based on purchase history based.

```
ratings_utility_matrix        =
amazon_ratings1.pivot_table(valu
es='Rating',      index='UserId',
columns='ProductId',
fill_value=0)ratings_utility_mat
rix.head()
Out[7]:
```

```
            0 0 0 0 0 1 1 1 1 1 B B B B B B B B B B
            2 5 7 7 7 3 3 3 3 3 0 0 0 0 0 0 0 0 0 0
            0 5 3 3 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
            5 8 3 7 2 4 4 4 4 4 0 0 0 0 0 0 0 0 0 0
  Pro       6 9 0 1 4 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0
  duc       1 2 0 0 5 3 3 4 4 4 5 5 5 5 5 5 5 5 5 5
  tId       6 5 1 4 1 9 9 0 6 6 2 2 2 2 2 2 2 2 2 2
            4 2 9 4 4 2 2 8 4 5 Y Y Y Y Y Y Y Y Y Y
            6 7 9 7 5 1 2 9 3 3 P P P P P P P P Q Q
            1 8 8 3 9 2 0 X X 7 E F G H M U V Y 0 2
  UserId
  A0
  020
  592
  1J
  HJ        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  K5
  X9
  LN
  P42

  A0
  245
  811
  34
  CV        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  80
  ZB
  LIZ
  TZ

  A0
  305
  658
  1JJ
  IO        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  L5
  FS
  KJ
  Y7

  A0
  309
  910
  1Z        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  RK
  4K
  607
```

VI. CONCLUSION

Recommendation system are an efficient technology that help people to find their interests with less effort ,less work and less spending time with more accuracy .This paper explained about the two recommendation systems. Thus these recommendation systems have offered many methods for searching and filtering information. Recommender system are rapidly becoming a important tool in E-commerce on the Websites. Based on popularity based and purchased based history recommendation is done easily.

The improved modelling of users and items, incorporation of the contextual information into the recommendation process, support for multicriteria ratings, and facility of a more flexible and less interfering recommendation process. As future work, we will implement this method on e commerce systems. Thus, the success of this method can be evaluated by using more relevant data. In addition, evaluations of user acceptance can also be made on the results of recommendations with the proposed method.

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