



RECOMMENDATION SYSTEM: AN OVERVIEW

Huddar R. M and Kulkarni R.V

Department of Computer Studies, CSIBER, Kolhapur

ARTICLE INFO

Article History:

Received 12th January, 2018
Received in revised form 24th February, 2018
Accepted 10th March, 2018
Published online 28th April, 2018

Key words:

Information Technology, Artificial Intelligence, Machine Learning, Recommendation system, Decision making

ABSTRACT

Whenever you need to make decision, you may want some opinions from others. Before the era of web we used to ask friends and other family members to recommend what product to purchase, which places are best to travel, which hotels best for to take food. With the growing availability and popularity of information technology, various tool and techniques are evolved which help human for decision making. Artificial intelligence and machine learning applications are implemented for automated decision making. Recommendation systems are systems which provides ranked list of options from available huge list of options. Ecommerce sites like amazon.com uses various techniques and algorithms for to provide recommendations to user. For to develop recommendation system various tools and techniques are in use. In this paper we discussed various techniques and algorithms used for development of recommendation systems.

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INTRODUCTION

Whenever you need to make decision, you may want some opinions from others. We used to ask friends and other family members to recommend what product to purchase, which book to read, which movie to watch or which school to join etc. With the growing availability of usage of information technology, various social sites and E-commerce sites provide lot of information in form of reviews, rating, comments, tweets etc. which created new opportunities and challenges arise as people now can, and do, actively use information technologies to seek out and understand the opinions of others. The amount of information and items got extremely huge, leading to an information overload. It became a big problem to find what the user is actually looking for. Analyzing reviews and discussions from different social media sites like twitter, facebook, finding suitable reviews, comments, ratings for different products from E-commerce sites manually is also very difficult and time consuming. So most of E-commerce sites implemented recommendation systems through which they provide personalized recommendations to their customers based on customers profile, previous purchase history, their social interactions. Recommender systems are computerized systems used for filtering and sorting items and information. These systems provide benefit to both users and vendors, as it enables the user to rapidly find what he needs and the vendors to promote their products. E-commerce sites like amazon.com, flipkart.com, snapdeal.com uses recommendation systems to recommend products to customers in personalized way.

Social site Facebook uses recommendation system to recommend friends. Netflix is a streaming service that allows customers to watch a wide variety of TV shows, movies, documentaries etc. It uses machine learning and recommendation algorithms to recommend online channel programs to the viewers. New York times uses recommendation system to recommend articles to readers. Following fig. shows a Naïve understanding of Recommendation system.

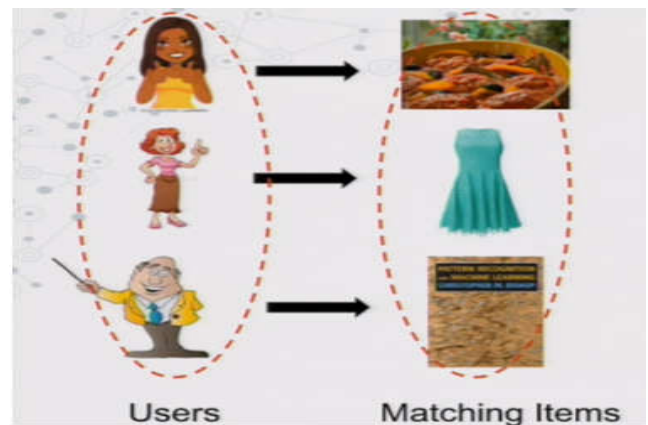


Figure 1 Naive understanding of Recommendation system

Above figure shows that there are users who purchases or gets services which are similar to other users, Recommendation systems uses these similarities between users or similarities between products or services and recommends products or services to other users.

Following fig. shows different types of recommendation systems

*Corresponding author: Huddar R. M
Department of Computer Studies, CSIBER, Kolhapur

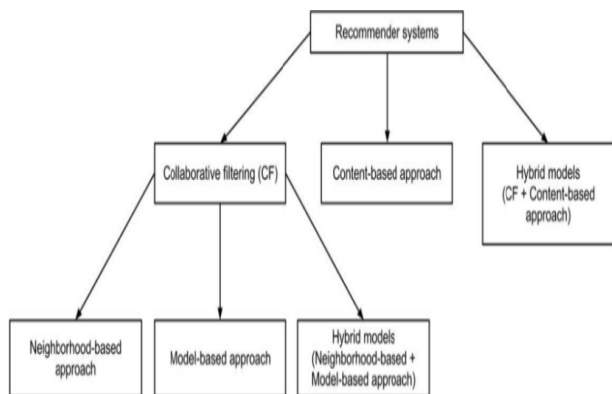


Figure 2 Different Recommendation Techniques

Related Work

Many authors presented different recommendation systems and techniques to improve recommendations given by the system. This section elaborates some of methods proposed by different authors.

P. Devika *et al.*[1] proposed Book recommendation system using frequency pattern Intersect algorithm. In this algorithm Naïve Bayes classifier is used to classify each feedback or review comments as positive or negative. Aansi Kothari *et al.*[2] proposed context sensitive recommendations based on machine learning methodology in which author used support vector machine to split the data in an optimal way and classify the data precisely to aid prediction purpose. Thanatcha Lerttripinyo [3] derived a system that collects data from websites and choose representative reviews by feature-based weighted non-negative matrix factorization method regarding predetermined topics. Pijitra Jomsri *et al.*[4] proposed library book recommendation system based on user profile loaning and applied association rule to create recommendation model. Jingnan Xu *et al.*[5] proposed topic model based collaborative filtering (TMCL) utilizing user’s reviews and ratings. He exploit extended LDA model to generate topic allocations for each review and then obtained each users preference. Hyung Jun Ahn *et al.*[6] in his paper presented a novel approach to automated product recommendation based on the popularity characteristics of products. A three-dimensional model of popularity is used to develop popularity classes of products and created hybrid movie recommendation sytem using MovieLens dataset. Mayur Bhosale at.el.[7] proposed hybrid recommendation system for recommending cars where authors considered external feedback of users and association rule mining is used for finding region-wise on demand car in the market.

Proposed work

The primary purpose of proposed research work is to design and develop an effective and efficient recommendation system with the focus being automated product feature extraction and recommendation of products based on social profile and interactions with E-commerce site. The system will be combination of content based, Item based collaborative filtering and User based collaborative filtering recommendation methods to recommend automobile to the user.

METHODOLOGY

Online customer reviews, blogs and tweets on social networking sites are helping consumers to decide which

products to buy and also companies to understand the buying behavior of consumers. In this author proposed hybrid recommendation system for products and validating this system through feedback analysis of recommended products. The proposed approach can be depicted by following fig.

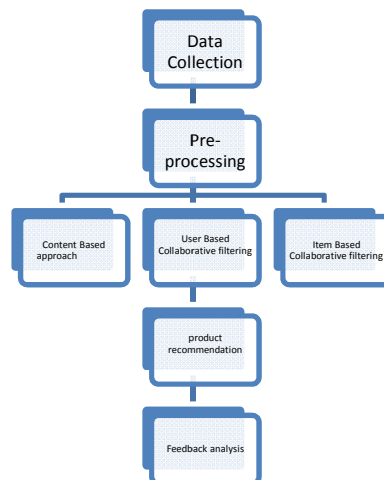


Figure 3 Proposed Method of Hybrid Recommendation system

1. Data collection – At this stage collection of reviews, tweets from different internet sites satisfying users request takes place.
2. Pre-Processing – various natural language processing steps like tokenization, stemming, churning, pos tagging etc. applied to retrieve a) polarity about product feature and b) overall polarity of product opinion
3. Content based approach – from all the collected tweets, reviews summarized polarity about each feature of product is retrieved.
4. User based collaborative filtering – User based collaborative filtering is applied
5. Item based collaborative filtering – Item based collaborative filtering is applied
6. Cumulative results of content based, user based collaborative filtering and item based collaborative filtering are collected and products are recommended to user.
7. Feedback analysis of recommendation – Feedback analysis is done using feedback about products recommended to users.

CONCLUSION

Due to increased usage of web and various web applications huge data is generated. Extracting personalized knowledge from this huge data accurately and efficiently will helpful to businesses. In this regard various approaches and tools are used, one of the important application of web mining is development of recommendation systems based on opinions extracted from tweets, blogs, reviews from social media.

Hybrid recommendation system which is cumulative approach of content based and collaborative filtering methods evaluated by internal and external feedback system will be useful tool for various e-commerce applications.

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How to cite this article:

Huddar R. M and Kulkarni R.V (2018) 'Recommendation System: An Overview', *International Journal of Current Advanced Research*, 07(4), pp. 12079-12081. DOI: <http://dx.doi.org/10.24327/ijcar.2018.12081.2116>
