Chapter 10
Challenges and Applications of Recommender Systems in E-Commerce

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ABSTRACT

E-commerce and online business are getting too much attention and popularity in this era. A significant challenge is helping a customer through the recommendation of a big list of items to find the one they will like the most efficiently. The most important task of a recommendation system is to improve user experience through the most relevant recommendation of items based on their past behaviour. In e-commerce, the main idea behind the recommender system is to establish the relationship between users and items to recommend the most relevant items to the particular user. Most of the e-commerce websites such as Amazon, Flipkart, E-Bay, etc. are already applying the recommender system to assist their users in finding appropriate items. The main objective of this chapter is to illustrate and examine the issues, attacks, and research applications related to the recommender system.

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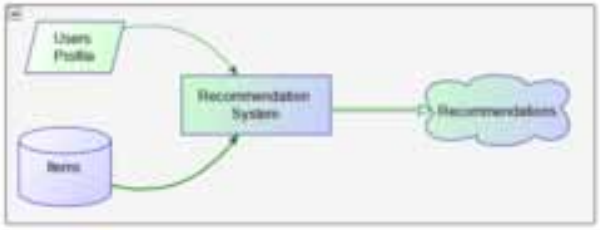
INTRODUCTION

Recommender system (RS) plays a remarkable role in recommending appropriate items, services to users in fields such as e-commerce, e-learning, e-banking etc. A considerable number of applications and web sites, including Netflix, Amazon, e-bay, Flipkart and many others, adopted RS to offer their users more appropriate items according to his/her interests. Nowadays, the rapid increase in the number of internet users and exponential growth of online data create an information overhead problem. They are finding the appropriate information in the proper time has emerged as a problematic and time-ingesting problem because of overhead information problems. Recommender system has been a significant factor in tackling the information overhead problem. RS plays a central role in a broadway of e-commercial services, online shopping, and social networking applications. Numerous big organizations have successfully applied recommendation approach in recommending relevant items or products to the user and evaluate the potential preferences of customers.

Figure 1. Block diagram of a recommender system



According to the knowledge source and way of recommending items, RS can be broadly classified as Collaborative filtering (CF), Content-based filtering (CBF) and Hybrid filtering (HF). Collaborative filtering is a widely implemented and most popular approach, considering its easy implementation in other domains. CF operates based on the user rating and by finding users having a rating history similar to that of the current user. Especially in cross-domain, CF provides a better recommendation than other approaches such as content-based filtering (CBF). CF has the significant limitation of not having the capability of suggesting new items for which ratings are absent (also known as a cold-start problem) ensuing in low customer satisfaction (Kumar, & Thakur, 2018).

The simple idea behind collaborative filtering is to provide item recommendations based on opinions of other related users. The primary assumption of CF is that if the user had a relevant sense of taste in the past, they will have a similar sense of taste in the future (Anwar & Uma, 2019a; Kumar, Kumar, & Thakur, 2019). To similarity in the feeling of two similar users is evaluated on the basis of the similarity of users rating history.

Content-based recommender system also known as cognitive filtering, suggests items on the basis of a comparison between the user profile and content of items. It can suggest items once information about items is available. The content-based recommender system can alleviate the cold-start problem in case of new items. The Content-based recommender system suffer from problems namely overspecialization, Data sparsity, privacy and limited content analysis.