Chapter 11
Designing a Hybrid Approach for Web Recommendation Using Annotation

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ABSTRACT

Web recommendation is the process of providing personalization recommendations to the requirements of specific users. A lot of research is conducted on recommender systems by a broad range of communities including computer scientists and interdisciplinary researchers. In response, a lot of recommender systems have been developed so far. However, the complexity of these systems can lead to information overload and decreased utility for the users. For these reasons, researchers have sought to apply the techniques of recommender systems to deliver personalized views of social annotation systems. In this chapter, the authors cover recent improvements in recommender systems and explore the major challenges. This chapter finally presents a prototype for adaptation to end-users. The model emphasizes an annotation-based recommendation system for generating recommendations.

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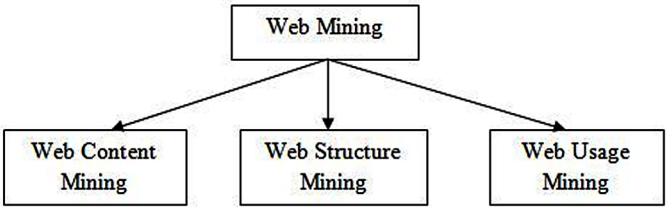
Figure 1. Web mining



INTRODUCTION

With the abundant amount of data present on the web, it becomes very hectic for users to retrieve the intended information. At that time, prominent and sophisticated frameworks like Semantic Web and Web Recommender systems played a significant role to mine valuable information. The Semantic Web i.e. a web of information is an expansion of the current web which aims to make this huge information machine-understandable (Sharma et al., 2021). On the other side, Web recommender systems are advanced tools that are exploited to analyze the user behavior for generating recommendations. These information retrieval tools fall under Web Mining.

Web Mining is the process of providing useful and desired information from the web (Stumme et al., 2006; Aquin et al., 2011). It is enriched with the three mining standards which are depicted in figure 2. Web Content Mining (WCM), Usage Mining (WUM), and Web Structure Mining (WSM). Content Mining is the process of analyzing the contents of web pages. WSM is the process of mining the knowledge about the web pages like the ranking of web pages, how these web pages are interlinked with one another (Sharma et al., 2021). In WUM, information about a user is analyzed while the user surfs the web (Hug, 2020). This usage information is further used to predict the future needs of the user and for the neighboring users. Nevertheless, the abundant amount of information available on the web creates a challenge to both the customers and the companies. The customer is presented with multiple choices of products for a specific need which leads to product overload. Consequently, the need for computing-based advertising strategies like one-to-one marketing and Client Relationship Management (CRM) has been stressed by both researchers and companies. An effective strategy to overcome this product overload is by providing personalized web recommendations in which the user is interested.

Web Recommender Systems (Srivastava et al. 2009; Jannach et al., 2021; Webster et al., 2006) inherit a filtering process to predict the need of users which the users might tend to express. For instance, think of the Netflix model where the users are recommended the contents based on their past behaviors, or how products are shown on Amazon. A general view of such recommendation techniques is depicted in