Chapter V
Metadata for Social Recommendations: Storing, Sharing, and Reusing Evaluations of Learning Resources

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ABSTRACT

Social information retrieval systems, such as recommender systems, can benefit greatly from sharable and reusable evaluations of online resources. For example, in distributed repositories with rich collections of learning resources, users can benefit from evaluations, ratings, reviews, annotations, and so forth that previous users have provided. Furthermore, sharing such evaluation feedback can help attain the critical mass of data required for social information retrieval systems to be effective and efficient. This kind of interoperability requires a common framework that can be used to describe the evaluation approach and its results in a reusable manner. In this chapter we discuss this concept, focusing on the rationale for a reusable and interoperable framework, that can be used to facilitate the representation, management, and reuse of results from the evaluation of learning resources. For this purpose, we review a variety of evaluation approaches for learning resources and study ways in which evaluation results may be characterized, so as to draw requirements for sharable and reusable evaluation metadata. Usage scenarios illustrate how evaluation metadata can be useful in the context of recommender systems for learning resources.

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INTRODUCTION

Internet users are often times overwhelmed by the flow of online information, hence the need for adequate systems that help them manage such situations (Hanani, Shapira, & Shoval, 2001). Recommender systems attempt to guide the user in a personalized way to interesting and useful items in a large space of possible options, by producing individualized recommendations as output (Burke, 2002). They are usually classified into two basic types, according to how recommendations are produced (Adomavicius & Tuzhilin, 2005): content-based recommendation, where a user is recommended items similar to the ones that she preferred in the past; and collaborative recommendation (or collaborative filtering), where a user is recommended items that people with similar tastes and preferences liked in the past. To produce recommendations, these systems require a description of user preferences either in the form of preferred resources’ characteristics (for content-based recommendation) or in the form of evaluations or ratings of resources (for collaborative recommendation).

There is an abundance of real-life applications of recommender systems on the Web that provide users with personalized recommendations regarding online content and services (Miller, Konstan, & Riedl, 2004). In some application domains the information used as input for recommendation (e.g., the characteristics of resources or the evaluations provided by users) may be reused between different user communities or different recommender systems. For example, for content-based systems this can be achieved when standardized descriptions of the resources are used as input. Following that idea, e-commerce recommender systems could potentially be built upon existing standardized ways to describe recommended items, such as the UN/CEFACT UNSPSC catalog of product and services classification (http://www.unspsc.org/). In e-learning recommender systems, interoperability of content-based recommender systems could be facilitated by existing technologies as well. For example, characteristics of digital learning resources could be described by using metadata standards such as the IEEE Learning Object Metadata standard (IEEE LOM, 2002).

However, reuse and shareability of user feedback (such as user opinions, ratings, evaluations, and reviews) has not been the focus of discussion for recommender systems. More specifically, in the case of collaborative recommendation, there are currently no proposals of frameworks or schemas for storing, sharing, and reusing evaluations of resources in a common data format. Such a framework could work to facilitate the reuse and interoperability in several domains, as well as the learning technologies’ one. In this chapter we focus on the case of evaluation approaches for digital learning resources and aims to point out that there is an opportunity to reuse evaluation metadata for recommendation purposes. We attempt to carry out an initial discussion of relevant issues and to describe possible leads to solve this problem in the future.

The structure of this chapter is as follows: First we provide the background to previous work that introduces the use of metadata for digital learning resources and for storing information about the evaluation/quality of digital learning resources. Then, a review of a sample of current approaches used for evaluation of learning resources is carried out. In addition, a tentative classification of evaluation approaches is performed, and their produced evaluation results are studied. Furthermore, we propose a rationale and need for defining a reusable and interoperable metadata framework to store approaches and their results in evaluative metadata, and discusses the benefits of reusing evaluation results in the context of recommender systems. Characteristic scenarios of potential applications in supporting interoperable social recommendation of digital learning resources are given. Finally, the conclusions of this study and the directions of future work are provided.
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