

Chapter 5.11

Social Recommender Systems: Recommendations in Support of E-Learning

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ABSTRACT

Recommendation systems can play an extensive role in online learning. In such systems, learners can receive guidance in locating and ranking references, knowledge bits, test items, and so forth. In recommender systems, users' ratings can be applied toward items, users, other users' ratings, and, if allowed, raters of raters of items recursively. In this chapter, we describe an online learning system—QSIA—an active recommender system for Questions Sharing and Interactive Assignments, designed to enhance knowledge sharing among learners. First, we lay out some of the theoretical background for social, open-rating mechanisms in online learning systems. We discuss concepts such as social versus black-box recommendations and the advice of neighbors as opposed to that of friends. We argue that enabling subjective views and ratings of other users is an inevitable phase of social collaboration systems. We also argue that social recommendations are critical for the exploitation of the value associated with recommendation.

INTRODUCTION

E-learning involves the use of a computer or electronic device in some way to provide educational or learning material. Clark and Mayer (2003) define e-learning as instruction delivered on a computer by way of CD-ROM, Internet, or intranet that is designed to support individual learning or organizational performance goals. The Internet and the World Wide Web (WWW) facilitate e-learning by allowing worldwide communication among learners and transfer of information. They offer opportunities for enhancing ways in which teachers teach and learners learn (Hoffman, Wu, Krajcik, & Soloway, 2003). Among its many applications, the Web serves as a tool for designing new learning environments (Dori, Barak, & Addir, 2003; Eylon, 2000; Rafaeli & Ravid, 1997) and the creation of learning communities (Gordin, Gomez, Pea, & Fishman, 1997; Sudweeks & Rafaeli, 1996). The spectrum of knowledge items on the Internet runs from useful, fascinating, and important to pointless, bizarre, and misleading. For learners who wish to gain knowledge by using information and communication technologies (ICT), the actual benefit of what they stand to gain will be affected by how well they make discerning judgments about what they find (Burbules & Callister, 2000).

Judicious use of ICT can boost learning that is adapted to the abilities of each student and enhance the distribution of knowledge among users. Psychologists make distinctions between explicit and tacit knowledge. Explicit knowledge is the knowledge that can be written down, whereas tacit knowledge is the knowledge that lies in the learners' minds. Capturing and sharing tacit knowledge is extremely difficult and was the aim of various studies (Kakabadse, Kouzmin, & Kakabadse, 2001). While digitized content in any form is explicit knowledge, not many e-learning approaches encourage learners to provide their tacit knowledge.

Recommendation systems can play a large role in online learning as providers of tacit knowledge. In such systems, learners can receive guidance in locating and ranking references, knowledge bits, test items, and the like. The core task of a recommender system is to recommend (in a personalized manner) interesting and valuable items and to help users make good choices from a large number of alternatives without having sufficient personal experience or awareness of the alternatives¹ (Gordon, Fan, Rafaeli, Wu, & Farag, 2003; Grasso, Meunier, & Thompson, 2000; Oard & Kim 1998; Resnick & Varian, 1997).

The task *recommend items to a user*, when referenced in recommender systems research, should be interpreted mostly by personalized manner and not solely by the delivery of popular items, as suggested by Maltz (1994). Konstan et al. (1997) found personalized (rather than impersonal) prediction to be significantly more accepted by users. Recommendations we receive daily rely mainly on human-analyzed sources: movie reviews, rumors, word-of-mouth, surveys, guides, friends, and recommendation literature (Shardanand & Maes, 1995; Resnick & Varian, 1997). Recommender systems approach the problem of helping users find preferred items mainly with the technique of Collaborative Filtering (CF). The basic idea of CF algorithms is to predict the likeliness list of the top-N recommended items based on the opinions (either explicit or implicit) of like-minded users (Sarwar, Karypis, et al., 2001); the task is to predict the utility of items for a particular user (the active user), based on a dataset of users' votes from a sample of population of the other users. However, many recommendation systems produce unsatisfactory results (Herlocker, Konstan, & Riedl, 2000; Oard & Kim, 1998).

Recommendations carry different values for the provider, as contrasted with the recommendation seeker. Rafaeli and Raban (2003) show how the *Endowment Effect* (an extension of the *Prospect Theory*) exists with respect to

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