Evaluation of Recommender Systems for Technology-Enhanced Learning:Challenges and Possible Solutions

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This paper discusses challenges and possible solutions of recommender systems for Technology-Enhanced Learning (TEL). It also briefly presents the the 3A contextual recommender system and explores its applicability and evaluation in the context of learners using multiple Web 2.0 applications.

Background

Web 2.0 social software applications are characterized by their low-entry barrier, user-friendly interfaces and easy-to-use features fostering user-generated content, facilitating information sharing and dissimination as well as online feedback [1]. Their initial success in informal settings for maintaining and building friendship ties, has led to their emerging adoption in institutional and corporate environments (enterprise 2.0, eLearning 2.0) in order to enhance the learning experience. Learners use Web 2.0 applications to find knowledge artifacts, learning activities, individuals and groups that can help them satisfy their learning needs. They also create, share, tag, rate and comment learning content and activities available online helping by that other learners to also find what they need.

Web 2.0 tools open the door for a plethora of information that makes it hard on the learner to get an overview and select what can satisfy their learning needs. Consequently, personalized and contextualized recommender systems should be built on top of Web 2.0 tools, to help each learner find

the most suitable information depending on his/her learning goals. As an example, the 3A contextual recommender system [2] simultaneously ranks knowledge artifacts, individuals and group learning activities according to their global popularity as well as their relevancy to the targer learner's context and their closeness to his/her "trusted" network.

A major challenge related with the application of recommender systems in Technology-Enhanced Learning (TEL), lies in finding proper evaluation frameworks to assess their efficiency and effectiveness [3].

Principal contributions

In this paper, we discuss the challenges related to the evaluation of recommender systems for TEL. An evaluation method for the 3A contextual recommender system that tries to deal with these challenges is also presented.

Researchers working on recommender systems do not necessarily have a social software application involving considerable number of users. That's why they have to rely on external applications that have richer and bigger datasets in order to test their algorithm.

Nevertheless, popular social software applications do not all offer public API (e.g. LinkedIn). Thus, it is not always possible for "independent" third-party recommender systems to perform online longitudinal studies that involve huge and rich datasets with many users. Moreover, even when the API is public, only a subset of data and services are made accessible. In addition, since external recommender systems using API of popular platforms are not directly proposed (or imposed) by the hosting platforms, there ought to be compelling reasons for learners to add them, use them, and possibly provide a direct feedback.

The evaluation of the 3A recommender system is planned to be carried out using the ReMashed environment where learners can specify certain Web 2.0 tools and combine them in a Mash-Up Personal Learning Environment. Using ReMashed, we will be able to evaluate the algorithm using rich and large datasets fetched from different Web 2.0 tools such as Slideshare and Delicious. The fact that learners will be able to receive recommendations for data aggregated from mutiple Web sites is believed to motivate them to use it, check the suggested content and eventually rate it. We are also

considering to extend the ReMashed system to include social networking sites such as LinkedIn (if our request is accepted) and Facebook for a better evaluation of the 3A recommender system in a collaborative setting.

The challenges, and eventual results obtained from this evaluation will be summarized in this paper.

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