Chapter 17
Enhancing e–Learning Environment with Embedded Recommender Systems

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ABSTRACT

A recommender system in an e-learning context is a software agent that tries to "intelligently" recommend actions to a learner based on the actions of previous learners. These recommendation systems have been tried in e-commerce to entice purchasing of goods, but haven't been tried in e-learning. The majority of current web-based learning systems are closed learning environments where courses and learning materials are fixed, and the only dynamic aspect is the organization of the material that can be adapted to allow a relatively individualized learning environment. The proposed framework for building automatic recommendations in e-learning platforms is composed of two modules: an off-line module which preprocesses data to build learner and content models, and an online module which uses these models on-the-fly to recognize the students' needs and goals, and predict a recommendation list.

Recommended learning objects are obtained by using a range of recommendation strategies based mainly on content based filtering and collaborative filtering approaches, each applied separately or in combination.

INTRODUCTION

In this chapter we describe an automatic personalization framework for Virtual Learning Environment (VLE) aiming to provide online automatic recommendations for learners. A recommender system in e-learning context is a software agent that tries to "intelligently" recommend actions to a learner based on two ways. First, the user preferences which gathered while user registers in the system. Second, the tutor recommendations in different forms like links, PDFs etc. These recom-

mendation systems have been tried in e-commerce to entice purchasing of goods, but haven't been tried in e-learning yet practically.

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Recommended learning objects are obtained by using a range of recommendation strategies based mainly on similarity of users preferences and courses categorization also the tutor's recommendation for these courses and collaborative filtering approach, each applied separately or in combination.

By collecting the recommendation according to the user preferences and matching it with courses we can generate a recommendation list that can be displayed to the user as a related topics or courses. Also tutor's recommendation will be displayed for the users when they browse the courses contents for the first time, and by this the achieved target is obtained to minimize the time that users take to find a suitable course.

Research in e-learning has gained increasing attention thanks to the recent explosive use of the Internet. However, Web-based learning environments are becoming very popular. In a virtual classroom, educators provide resources such as text, multimedia and simulations, and moderate and animate discussions. Remote learners are encouraged to peruse the resources and participate in activities.

E-LEARNING SYSTEMS

Distance learning is a general term used to refer to a form of learning in which the instructor and student are separated by space or time where the gap between the two is bridged through the use of online technologies.

E-Learning is used interchangeably in a wide variety of contexts. In distance education Universities like Open University, it is defined as a planned teaching/learning experience that uses a wide spectrum of technologies mainly Internet to reach learners at a distance (Jonathan, 2004). Lately in most Universities, E-Learning is used to define a specific mode to attend a course or programs of study where the students rarely, if ever, attend face-to-face or for on-campus access to educational facilities, because they study on-line.

E-Learning Provider Categories

There are thousands of E-Learning sites on the internet and they fall into two basic categories.

- **Service providers:** Partner with businesses and provide an environment where users can find an array of training-related resources.
- **Content providers:** Develop and sell custom-designed training courses in response to specific information the customer provides.

E-LEARNING SOLUTION SOFTWARE

The E-Learning Solution Software combines both service providers and content providers, but it is much more. It is a concept that places learning and development at the core of organizational sustainability and competitiveness and thus addresses the classic division between the training

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