Improving Personalization In E-Learning Systems

Assma Bezza, Ecole National Supérieure d’Informatique, El Harrach, Algeria
Amar Balla, Ecole National Supérieure d’Informatique, El Harrach, Algeria
Farhi Marir, Faculty of Computing, London Metropolitan University, London, UK

ABSTRACT

Individual learners have different requirements and characteristics, and as a result learning content should be able to be personalized and adaptable to the e-learner’s profile. Little research work undertaken to tackle this issue, and it has been limited to ad-hoc work on personalizing, and adapting learning content in e-Learning. This paper presents two methods for modeling user profile and for personalizing and adapting a given content to match that profile: inductive (without user intervention) and deductive (with user intervention). These methods will be used as a base to review and classify research work undertaken on personalizing content in the domain of knowledge management and e-learning systems. Based on these reviews, especially those undertaken in personalizing knowledge content in knowledge management systems, the paper proposes a comprehensive approach for personalizing learning content.

Keywords: Adaptation, Deductive, E-Learning, Inductive, Introduction, Knowledge Management, Personalization

INTRODUCTION

There are many factors that influence the extent of learning. These would include factors such as the learner’s learning style and motivation for learning. In a learning environment, each individual learner will have different requirements and characteristics. An important role of the learning providers is to recognize that their pedagogy and educational material must cater for the individual learner’s characteristics and requirements. There is a need to move away from the “one size fits all” paradigm and to offer learner’s personalized learning experience. This paper review research work undertaken in personalizing and adapting knowledge and learning content to different requirements and profile of learners. It also analyses these research work to depict a comprehensive approach and overall aspects to take into account when designing learner centered e-learning systems.

With the advance in IT, human knowledge and learning content have had an incredible increase in the quantity and variety of digital content. These trends have implications on the quality and relevance of knowledge and learning
content delivered to organization workers and e-learners. As a result of this growing online knowledge and learning content there is an urgent need for personalizing and adapting this content to the workers and e-learners’ based on their needs and requirements.

According to García Barrios, personalization is an adaptation based on specific characteristics related directly to the user, while adaptation means responding to other entities requirements within the context of adaptive systems, which do not belong to the user (Garcia-Barrios, 2007).

Personalization aims to filter and represent the information in a form that responds to the users’ preferences, interests, or more generally their profile. In the field of knowledge management, there have been many researches on knowledge content personalization and dynamic adaptation to fit the context of the objects of knowledge and to fulfill the needs and requirements in a given situation. Examples of the use of these forms are recommendation systems and digital libraries (Hicks & Tochtermann, 2001), (Tochtermann, 2002), (Westbomke, et al., 2002). In contrast, there have been few investigations on the dynamic creation of content in e-learning systems as most are developed on an ad-hoc basis.

This paper is organized into five sections. The first section will introduce the subject of personalization and adaptation of e-systems in general. Section 2 will present methods for personalization and adaptation, which will be a base for both reviewing and evaluating the work undertaken in personalizing knowledge and learning contents. Section 3 will present a review of research work on the personalization of knowledge content in the design of knowledge management systems. Section 4 will be devoted to similar review of research work undertaken in personalizing learning content in e-learning systems. Section 5 will be devoted to the analysis of both reviews to highlight their achievements and limitations. Section 6 will be devoted to highlight the limitation of e-learning systems and present an approach and a set of recommendations on how to improve personalization in e-learning systems based on the achievements realized in personalizing knowledge content in knowledge management systems. Last section is devoted to references.

Methods for Personalization and Adaptation of Content

A prerequisite for a knowledge management or an e-learning system to provide personalized services and appropriate knowledge or learning content is to acquire the user profile and to represent the content to matches that profile and preferences. To achieve that, we refined Bentayeb (Bentayeb, Boussaid, Favre, & Teste, 2009) principles of personalization into two different methods (as shown in Figure 1): inductive and deductive methods for both modeling the user profile and personalizing and adapting the content to match that profile:

- User modeling (learning or parameterization): The e-system automatically captures the user behavior through his interaction and browsing through it (inductive method) or manually where the user sets his/her own preferences by filling a parameterized form (deductive method).
- Personalizing the content (transformation or recommendation): Based on the captured user profile, the e-system could either automatically by the e-system (inductive method) or manually by the user (deductive method) personalizes the content to match that user profile and adapt the content to match that user profile.

Figure 1 shows the two inductive and deductive methods used for modeling user profile and for personalizing the content to match the preferences of that user profile. The inductive method determines the profile of user automatically without user figure intervention, and the deductive method involves the user input manually to set his/her preferences.
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