Chapter 1
A Comparative Study of the Functionalities and Characteristics of a Learner Model in Adaptive Hypermedia Educational Systems

ABSTRACT

Today’s adaptive hypermedia systems are putting more and more emphasis on the intelligence of the system. One of the most important factors in assessing the quality and usability of the system is the level to meet the needs of the user, the learner. So, the learner model, the component that backs up and manages learner information, becomes more important. The learner model is an essential component for adaptive e-learning systems. The term adaptation in e-learning systems involves the selection and manner of presentation of each learning activity as a function that examines the entity of knowledge, skills, and other information given by each subject taught. The chapter aims at studying the functionalities of the learner model in different adaptive hypermedia educational systems in the three stages of developing and managing this model. The authors present in this comparative study a full analysis of the learner model used in 10 major hypermedia to come up with most appropriate method to treat the dynamic aspect of this model.

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INTRODUCTION

In general, the adaptation process can be described in three steps: retrieving user information, processing information to initialize the user model, and updating the initialized user model; finally, the use of the user model to provide the adaptation. In this chapter, we will only use the user’s model term, which is used because the user profile is simply considered the process of collecting raw data from the user (Kobsa, 1993).

In the process of adaptation, it is possible to distinguish between two different characters. At the beginning, the learner or student with his goal of acquiring knowledge, second: the teacher. The goal of a teacher is to mediate the knowledge covered by a course to learners. Therefore, both points of view must be present in an e-Learning system (Brusilovsky, 2000).

To be able to adapt the presentation of learning and navigation content to the needs of the user, a user model is needed, including objectives or tasks, knowledge, pre-requisites and user preferences. These user properties are used to make adaptive decisions by adaptive hypermedia systems. In addition, the user’s recent templates also store the interests and individual traits.

In this chapter, we will begin by presenting the learner model in Adaptive Hypermedia Educational Systems (AHES), its main role and categories that will form the context of this chapter. The focus then will shift to the study of the main functionalities of the learner model. We will divide these functionalities into six categories and we will present a study in 10 different hypermedias to conclude in which functionalities they’re based. Then, we will put emphasis on the different phases to develop and model the learner model in adaptive educational hypermedia systems, and illustrate the range of application of each functionalities and aspect and its focus area. We aim in this chapter at presenting a comparative study of each aspect and functionalities of the learner model in different adaptive educational systems, and at showing their level/degree of intervention in relation with the components of the learner model and development process.
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