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Chapter 12

# User Modelling and Personalisation of Knowledge Management Systems

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## Abstract

*This chapter focuses on the role of user models and user modelling for enhanced, personalised user support within knowledge management systems (KMSs). Personalisation can bring a utility function as well as a conviviality function with "high touch" impact for the users. From this utility and conviviality perspective, various personalised services enable KMSs to adapt their functionality, structure, and content to match the needs and preferences of users based on a user model that is stored and updated dynamically. The chapter presents a set of examples, different types of adaptations and personalised services specific to KMSs.*

## Introduction

User modelling is a multidisciplinary and broad area of research. Amongst many objectives related to user modelling research, in the last few years, personalisation emerges as an important strand. In general, the goal of personalisation is to improve the

efficiency of interaction with the users, to simplify the interaction, and to make complex systems more usable. Important application areas of personalisation include: customer relationship management (Kobsa, Koenemann, & Pohl, 2001; Fink & Kobsa, 2001; Schafer, Konstan, & Riedl, 2001; Ardissono, Goy, Petrone, & Segnan, 2003), educational software (Brusilovsky, 1998, 2001), and Web search and retrieval (Tanudjaja & Mui, 2002; Ardissono et al., 2003; Kurki, Jokela, Sulonen, & Turpeinen, 1999). Personalisation has already proved its utility in e-commerce and e-learning. For example Clark and Mayer (2002) emphasise the role of personalisation in e-learning. In this sense, they are quoting studies conducted by Moreno et al. (2001) and Atkinson (2002) which prove the role of the coaching agents for learning. In the domain of customer relationship management, Kobsa et al. (2001) provide data from communication reports showing that personalisation based on purchased data and personal data has a considerable payoff.

This chapter focuses on the role of user models and user modelling for enhanced, personalised user support within KMSs. Building and maintaining users' models enable one to capture their competencies, their expertise, their interests, and implicitly to better manage the tacit knowledge and the human capital. User models and user modelling are the key elements in the management of tacit knowledge, but they have a much broader scope that is not limited to human resource management and expertise finding. The user model is extended with certain characteristics of the users (level of activity, type of activity, level of knowledge sharing, etc.), and the rationale for extending the user model is explained.

The main contribution of this work is to emphasise the role of user modelling in KMSs. The chapter presents the different ways in which user modelling can be applied to KMSs. User model and user modelling are identified as key components for supporting: expertise finding, personalisation, collaboration and networking, learning, and change (Razmerita, Angehrn, & Nabeth, 2003a). Examples of specific types of adaptations and personalised services for KMSs are given.

The chapter is structured as follows. The second section introduces briefly the context of the research. It presents some issues, problems, and challenges associated with the design of actual KMSs. KMSs are high functionality systems with limited personalisation features. Personalisation has two main roles. It has utility and conviviality functionality. The main thrust of the chapter is constituted of the third, fourth, and fifth section. The third section introduces the structure of the user ontology and describes specific user modelling processes. The fourth section elaborates on the role of user models and user modelling for enhanced user support and personalisation in KMSs. Personalisation mechanisms specific to KMSs are described and some specific examples are provided. The fifth section overviews various personalised services. Finally, the sixth section includes conclusions and future research work.

# Trends and Challenges for KMSs

KMSs can be defined as a "class of information systems applied to managing organisational knowledge" (Leidner & Alavi, 2001). KMSs are designed to allow their users to access