

# User Models and User Modeling in Knowledge Management Systems (KMSs) – an Ontology-based Approach

## PhD Abstract

Knowledge Management Systems (KMSs) are information systems dedicated to manage organizational knowledge with the purpose to increase the productivity of their knowledge workers. Although a lot of KMSs have been recently developed, to date user modeling issues in KMSs have not been treated in depth either in user modeling literature or in the literature related to KMSs. The thesis explores the role of user models and user modeling in KMSs. The main contributions of the thesis are: (1) identifying aspects of user modeling relevant to KMSs, (2) integrating them in a generic framework based on ontologies (3) illustrating how user modeling can be applied in KMSs.

The thesis proposes an advanced user model implemented as a user ontology using Semantic Web technology. The user ontology is conceptualized based on an extended Information Management Systems Learner Information Package (IMS LIP) specification in order to be generic and reusable in different application domains. Specific characteristics of the users interacting with a KMS such as: `level_of_knowledge sharing`, `type_of_activity` and `level_of_activity` have been identified, modeled and grouped under the Behavior concept. The Behavior concept extends the structure of IMS LIP.

Briefly, we show that the integration of user models and user modeling processes in a KMS enables: personalized interaction, advanced support for learning & change, support for networking & collaboration and expertise discovery.

The user ontology and the user modeling processes are part of ontology-based user modeling framework (OntobUMf). OntobUMf is a user modeling server implemented using Java 2 (sdk 1.4.1), JSPs technology and KAON tool suite as a framework for managing ontologies. A concrete example of the use of OntobUMf in an ontology-based KMS is given; but the framework can be easily adapted to other ontology-aware environments.

**Keywords:** User Modeling, Ontology, Knowledge Representation, Semantic Web, Knowledge Management Systems, Agents, Personalization, Adaptation.