Chapter I

Ontology Frames for IT Courseware Representation

Witold Abramowicz, Marek Kowalkiewicz, and Piotr Zawadzki
The Poznan University of Economics, Poland

ABSTRACT

This chapter introduces topic maps and skill maps technologies as a framework for storing courseware and relevant user profiles. It is a result of research being conducted on creating a knowledge exchange platform for the corporate environment. It briefly describes topic maps and skill maps – a new concept developed by the authors. It then proposes applying ontology frames to latter technologies. The proposition is followed by specification of a proposed solution. This solution is used in the Knowledge e-Marketplace for a Courseware Distribution project that is being developed at The Poznan University of Economics, Poland. The project’s target is to integrate traditional e-Marketplace with topic map technology and to introduce a new technology – skill maps – for representing an individual employee’s knowledge. There is a need to create common ontology frames for topic maps and skill maps in order to coherently represent knowledge and knowledge profiles.
TOPIC MAPS—INTRODUCTION

Topic maps is an ISO standard, which has been established as an answer to the problem of coherent representation of relations between topics (or ideas) and associating those topics with actual documents (topic occurrences). It is based on concepts and relations, as in conceptual graphs. Primarily, the standard was established in order to provide a means for uniform document index representation, but soon it turned out that topic maps can be used in clustering document repositories.

Among many potential topic map applications, the ISO specification enumerates the following:

- Qualifying the content and/or data contained in information objects as topics to enable navigational tools such as indexes, cross-references, citation systems, or glossaries.
- Linking topics together in such a way as to enable navigation between them. This capability can be used for virtual document assembly and for creating thesaurus-like interfaces to corpora, knowledge bases, etc.
- Filtering an information set to create views adapted to specific users or purposes. For example, such filtering can aid in the management of multilingual documents, management of access modes depending on security criteria, delivery of partial views depending on user profiles and/or knowledge domains, etc.
- Structuring unstructured information objects or facilitating the creation of topic-oriented user interfaces that provide the effect of merging unstructured information bases with structured ones. The overlay mechanism of topic maps can be considered as a kind of external markup mechanism, in the sense that an arbitrary structure is imposed on the information without altering its original form (ISO/IEC 13250, 2000).

Topics, associations and occurrences are main topic map components. Using those elements, you can create maps in document repositories. Below, we briefly describe those main components:

- Topics – the term topic refers to the element in the topic map that represents the subject being referred to. Topics can be categorized. They can have zero or more topic types. Topics can also have names. The standard names for topics are: base name, display name and sort name. Each topic can have facets – elements for storing additional information, for example topic profiles (Abramowicz et al., 2002; Ksiezyk, 2000).
- Associations – a topic association is a link element, showing relationships between topics. Associations can have types (influenced by, required by, written in, etc.) and roles (influencer, influenced; prerequisite, result; document, language) (Abramowicz et al., 2002; Ksiezyk, 2000).