Chapter VII

Towards the Educational Semantic Web

Juan Manuel Adán-Coello,
Pontificia Universidade Católica de Campinas, Brazil

Carlos Miguel Tobar,
Pontificia Universidade Católica de Campinas, Brazil

João Luís Garcia Rosa,
Pontificia Universidade Católica de Campinas, Brazil

Ricardo Luís de Freitas,
Pontificia Universidade Católica de Campinas, Brazil

Abstract

The objective of this chapter is to discuss relevant applications of Semantic Web technologies in the field of education, emphasizing experiences that point out trends and paths that can make the educational Semantic Web a reality. The Semantic Web, through metadata, comes to make it possible that resources of every type could be localized, retrieved and processed without human intervention, helping to reduce the information overload of the current Web. The possibility of describing resources using metadata that can be processed by computers simplifies the creation of self-organizing
networks of learners, information, authors, teachers, and educational institutions. The adoption of Semantic Web technologies in the e-learning field contributes to the construction of flexible and intelligent educational systems, allowing reuse, integration, and interoperation of educational and noneducational resources (content and services) distributed over the Web.

Introduction

In our society, everything—information mainly—changes very rapidly, resulting in a continuous cycle of relevant information gathering in order to produce knowledge. Individuals and organizations need mechanisms and processes that can help them to be involved in a constant learning engagement. Mizoguchi (2000) believes that e-learning is one of the keywords in this context.

During the last decade, the Internet and its most important application, the Web, have been the favorite platform for the construction of information objects and information services, including learning systems. The profusion of resources available in the Web and its constant increase offer several opportunities for a wide range of users and applications, but also big challenges for computer professionals.

Since the Web information space is huge, a precise search engine is not sufficient. It is necessary to make available accurate metadata about relevant pieces of information. Traditional search engines, based on keywords, usually retrieve large amounts of documents that have to be filtered by the user without support or with very limited support of automated tools. Moreover, the dynamic nature of the Web requires that the user periodically repeats this search-retrieve-filter process to localize new resources of interest and to update previous ones. This situation led to the development of information agents that continually browse the Web searching for resources of interest to its users.

The construction of information agents faces several obstacles, especially the enormous volume of distributed documents to be processed and the multimedia and unstructured or semi-structured nature of the documents, most of them prepared to be analyzed by people, not by programs.

The idea of a Semantic Web (SW) comes to tackle this problem of information overload. It should be possible that resources of every type could be localized, retrieved, and processed without human intervention.

Tim Berners-Lee, the “father” of the Web, foresees a SW that would allow automatic access to resources using semantic descriptions amenable to be
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