

Semantic Web and Education (Book Review)

Reviewer:

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Because of the Web, we have Web-based Education. Putting Web based Education in the context of the Semantic Web creates the idea of the new generation WBE, or Semantic WBE (SWBE).

The Book "Semantic Web and Education" by Prof. Vladan Devedzic of at the University of Belgrade discusses how to use the results and technology of new fields of research and development, such as Semantic Web and Web intelligence, to make Web-based Education more effective and more appealing to learners, teachers, and authors alike.

The author integrates the examinations of learning-oriented topics such as learner modeling, collaborative learning, learning management, learning communities, ontological engineering of Web-based learning, and related topics with these technical topics.

It is a thorough and highly useful presentation on the confluence of the technical aspects of the Semantic Web and the field of Education or the art of teaching. The book will be of considerable interest to researchers and students in the field of Artificial Intelligence, Information Systems, and Education.

What impressed me first in Chapter 1 are the clear explanations of many commonly-used terms such as Web-based education, e-learning, distance education, virtual classrooms, and intelligent educational systems.

Chapter 2 introduces Semantic Web technologies and explains common prerequisites for creating intelligent Web-based Education systems and applications.

Chapter 3 explains the setting for SWBE replying on existing technologies and technological trends, and starting from the needs and perspectives of the major categories of actors in Web-based Education.

Chapter 4 discusses the architectural issues including architectural reference model, learning object structure and organization, current trends and technologies, and open learning environments.

Chapter 5 discusses the relationship between Learning Technology Standardization efforts and Semantic Web Based Education (SWBE), in particular Semantic Web Issues related to Learning Technology Standards. This chapter is very useful to me as the author pointed out some additional requirements that need to be addressed by standards and specifications. For example, the author mentioned that current standards are not published with formal semantic into existing standards and as a consequence they do not support reasoning and semantic search based on Learning Object metadata. Therefore we should introduce formal semantics into existing standards. However, it is easier said than done.

Chapter 6 deals with a central issue of SWBE --- personalization. Learner modeling enables personalization. The challenge is to capture useful information from the interactions by learners and SWBE systems as automatically as

possible, with minimum efforts from the learner. I enjoyed reading the case study TANGRAM, described in Section 3 of the chapter. It illustrates the process of ontological engineering of SWBE systems by explaining the design of the TANGRAM environment and by suggesting some more general engineering guidelines for building SWBE systems.

Chapter 7 further addresses the important topic --- Ontological engineering, which is a central process in developing any SWBE application or system. It is an excellent material to learn about the structure, context, usability, and technological background for using ontologies in education. This chapter introduces several new tools specific to SWBE that help designers and authors develop their applications and learning material. It also discusses ontology visualization techniques and tools, as well as automatic construction of educational ontologies.

Chapter 8 illustrates the use of SWBE principles, architectures, and technology in practical applications. It covers learning management, collaborative learning, and learning communities. Two newly emerged research topics, personalized educational services and learners' personality, are also introduced in this chapter. I feel that the previous experience from architectural design of more traditional e-Learning systems, virtual classrooms, Web-based ITSs, and AEHSs are very useful to my current research, intelligence in adaptive learning systems.

While many of the related technologies and standards are still under development, Prof. Devedzic's this book already offers both a broad conceptual introduction and lots of points to future application scenarios for researchers in academia and industry as well as for developers of Web-based educational systems. It is an extremely valuable addition to the AI and Software Engineering literature.