Preface

The Knowledge Society is not a utopia or a phrase typically found in political speeches. Computer Science, Semantic Web, and Information Science communities have years of valuable experience that can contribute to the design, implementation, and launch of applications for the awareness and realization of the Knowledge Society.

After working and researching for many years in Web Engineering domains, we have decided to compile an edition which will help students, researchers, and practitioners utilize promising Semantic Web technologies. From the beginning we had in mind to promote a balanced discussion of key theoretical topics combined with a practical orientation. With the support and contribution of more than 40 academics and practitioners around the world, the manuscript “Semantic Web Engineering in the Knowledge Society” is finally in your hands.

Many papers have been written and many statements have been articulated to describe the Semantic Web. From a technical perspective, the current World Wide Web is syntactic and the content itself is only readable by humans. The Semantic Web proposes the mark-up or annotation of the content on the Web using formal ontologies that structure underlying data for the purpose of comprehensive and transportable machine understanding. Academia has been working on several solutions, applications, and examples to illustrate how the use of semantics can greatly enhance the integration and interoperability of information systems. Nevertheless, many professionals in the industry believe that there is a lack of guiding principles that would enable them to deploy end-to-end solutions in a straightforward and effortless way. Having this requirement in mind, this edition describes aspects and issues that have considerable importance in the development of end-to-end solutions. Such contributions include research on knowledge modeling, ontology design methodologies, ontology tools, approaches for semantic annotation, and inferencing and reasoning.

The main objective of the book is to lay the foundations for understanding the concepts and technologies behind the Semantic Web. Organizations and professionals are striving for literature that guides them in the development of end-to-end applications and systems that use semantics. While the industry is willing to use semantics, academia has not yet been shown how to systematically employ Semantic Web technologies to deploy a new breed of systems. This book aims to provide relevant theories, tools, and methodologies to develop semantic applications. It is written for students and professionals who want to improve their understanding of how semantics and ontologies can be used inside organizations. It also studies how semantics are applied to each of the steps of the lifecycle of semantic applications and how semantics can help address critical issues of reuse, integration, and interoperability.

A variety of relevant topics and solutions are discussed in 14 chapters and include the following areas:
• Modeling knowledge
• The Semantic Web Engineering agenda
• Expressing knowledge
• Syntax, semantics, and pragmatics
• Ontology design methodologies
• Ontology languages
• Ontology tools
• Semantic annotation
• Inferencing and reasoning
• Industrial use of semantics: Case studies
• Knowledge society and semantics: Case studies
• Research on semantics: Open fields
• The future of the Semantic Web

This book provides valuable answers to frequent problems that academia and industry commonly face when implementing Semantic Web-based solutions. In each chapter, a key concern of Semantic Web Engineering is discussed.

This edition represents another valuable contribution to the available literature on Semantic Web and knowledge representation on the Web. Therefore, we invite you to be part of the exciting Semantic Web Engineering Community and we look forward to your comments, ideas, and suggestions for upcoming editions.

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