

Preface

In the past decade, the boom of Internet technology has encouraged vast ranges of information be created and shared among peoples, organizations, and enterprises. Most of the information has been written in hypertext markup language (HTML), which mainly follows certain format to express the contents. However, this well-formatted information is normally written for human comprehension. When the information volume grows, the time to locate and to digest the information that fits users' needs increases exponentially. There are many possible solutions to the problem and the attentions are drawn to the data and the meaning of data. The XML (extensible markup language) provides the independence between applications and data, allowing the data to be shared among applications. But, what kinds of information can be shared and how to share the information remain as unsolved problems. This brings the attention to the semantic Web. The semantic Web has rules to automatically reason the needs of information and has XML/RDF (resource description framework) to define the meaning and relationship of data. The new phenomenon provides the possibility of having diversified and machine-processable Web services over Internet, intranet, and extranet. We therefore devote the second volume of the book series, *Advances in Electronic Business*, to the issues of *Semantic Web* and *intelligent Web services*.

The mission of *Advances in Electronic Business* book series is to foster the understanding of management methods, information technology, and their joint application in business processes. The subject coverage includes theories and practices of business technologies, enterprise management, public policies, logistics, privacy and law, business ethics, and information technologies that are related to electronic business. The audience of this book series is to be broadly-based, including professionals, policymakers, academics, researchers, and managers in IT, business and commerce. The first volume of this book series focusing on the issues of *collaborative commerce* has been published in 2005. This second volume is to address the issues of *Semantic Web* and *intelligent Web services*. The organization of this book is as follows.

Chapter I, “From World Wide Web to Semantic Web” by Charles Ling-yu Chou, introduces the incentives for the creation of the Semantic Web, the methodology for its development, and the current status of its development.

Chapter II, “Semantic Descriptions of Web Services” by Farshad Hakimpour, Suo Cong, and Daniela E. Damm, covers the semantic description of Web services. It concentrates on two prevalent specifications in this domain, namely OWL-S (Ontology Web Language for Services) and WSMO (Web Services Modeling Ontology). This chapter briefly introduces Web Services and Semantic Web, the two main technologies underlying the Semantic Web Services technology, and then explains most of the key features of this technology together with simplified examples.

Chapter III, “Developing Intelligent Semantic Web Services” by Sam Lee, presents an approach to the development of intelligent semantic Web services, which are envisioned as system cells that actively discover, learn, and communicate knowledge on the Web.

Chapter IV, “Semantic Web Support for Customer Services” by Quan Thanh Tho, Hui Siu Cheung, and A. C. M. Fong, focuses on the semantic Web support for customer services. It discusses semantic Web support for customer services in which the Web service support is an important operation for most multinational manufacturing companies.

Chapter V, “A Tutorial on RDF with Jena” by Wan-Yeung Wong, Tak-Pang Lau, Irwin King, and Michael R. Lyu, provides a tutorial on resource description framework (RDF), the language (RDF/XML) used by RDF, and a Java API (Jena) for manipulating RDF/XML. RDF is a W3C standard which provides a common framework for describing resources in the World Wide Web and other applications.

Chapter VI, “A Semantic Web Service Architecture for Learning Object Repositories” by José-Manuel López-Cobo, Sinuhé Arroyo, Miguel-Angel Sicilia, and Salvador Sánchez Alonso, aims to describe an architecture of semantic Web service for learning object repositories. In this chapter, provision of computational semantics to metadata is addressed from the perspective of the concept of Semantic Web Service. An architecture based on the specifications of the WSMO project is described, including the definition of an ontology for learning object metadata, and issues of mediation, all under the perspective of the Learning Object Repository as the central entity in learning object reuse scenarios.

Chapter VII, “Using Semantic Web to Facilitate Agent-to-Agent Argumentation for E-Commerce” by Shiu-li Huang and Fu-ren Lin, uses semantic Web to facilitate agent-to-agent argumentation for e-commerce. This study aims to design a multi-agent argumentation system for e-commerce. In this system, buyer and seller agents can argue over product attributes and understand arguments. This study adopts OWL, a Web ontology language, to clearly express arguments and uses a dialectical game approach to support defeasible reasoning. Using this system, a buyer can delegate a buyer agent to search products that exactly match his/her needs, and a seller can delegate a seller agent to present products and persuade buyer agents into believing that the products can satisfy their masters’ needs.

Chapter VIII, “Building Dynamic Business Process in P2P Semantic Web” by Timon C. Du and Eldon Y. Li, builds dynamic business process in a P2P semantic Web. It proposes a framework to implement a dynamic business process in the P2P semantics Web,

which provides the flexibility to dynamically alter business process and to take semantic data into consideration. The system is demonstrated by a case of order processing of a manufacturer.

Chapter IX, “An Intelligent Metasearch Engine with Link Prediction and Page Clipping Generation Capabilities” by Cheng-Jye Luh and Lin-chih Chen, presents an intelligent metasearch engine that can recommend a user’s next hyperlink access and relevant paragraphs extracted from metasearch results. The authors implemented three search methods based on the assumption that users prefer top ranking items in search results.

Chapter X, “Access Control for Web Service Applications: An Example in Collaborative Auditing” by Timon C. Du, Richard Hwang, and Charles Ling-yu Chou, proposes a role-based Chinese Wall model, which organizes the corporate data into four different types of control groups with different access control policies, for the auditors to access the data among collaborating enterprises.

Chapter XI, “Semantics and the Medical Web: Towards Effective Medical Healthcare Search” by Amanda Spink, Robert M. Wolfe, and Bernard J. Jansen, illustrates the semantics and the medical Web. This chapter discusses issues related to semantics and the medical Web, in which much health information is available on the Web, but not always effectively found by users. This chapter examines various aspects of medical Web searching and shows that searchers do not always use correct medical terminology.

Chapter XII, “Web Mining for Protein-to-Protein Interaction Information” by Hsi-Chieh Lee, Szu-Wei Huang, and Eldon Y. Li, introduces a Web mining system finding protein-to-protein interaction literatures. It develops mechanisms for protein name identification and databases for protein names. The experimental results indicate that by using the proposed mining system, a researcher can find protein-to-protein literatures from the overwhelming piece of information available on the biomedical databases over the Internet.

Chapter XIII, “SWAP: A Framework for Ontology Support in Semantic Web Applications” by Arijit Sengupta and Henry Kim, presents Semantic Web Application Pyramid (SWAP) which is a framework for incorporating ontologies in data-oriented semantic Web applications with measurement ontology for a quality management Web service. SWAP facilitates data exchange between these Web services with vendor data stored in databases, and the processing of the data using a combination of RuleML and SQL.

The 13 chapters included in this book cover from basic to advanced concepts of semantic Webs and intelligent Web services. The applications stem from order process to medical diagnosis. A beginner could walk through the first few chapters and become familiar with the subjects. An experienced reader could study the technical details in the last few chapters to implement application systems. The broad spectrum of subjects covered in this book makes it a valuable reference book in your library. We sincerely hope that it could be beneficial to your professional career as well as research endeavour.

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