Preface

The Extensible Markup Language (XML) is used to represent fine-grained data that originates in repositories in machine readable format by providing structure and the possibility of adding type information, such as XML Schema. A Web service is a software system that supports interoperable application-to-application interaction over the Internet. Web services are based on a set of XML standards, such as Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP), and Universal Description, Discovery and Integration (UDDI). Each service makes its functionality available through well-defined or standardized XML interfaces. The result of this approach is a Service-Oriented Architecture (SOA). XML is playing an important role in the data transport protocol for Web services. For example, SOAP messages are used both by service requestors to invoke Web services, and by Web services to answer requests. This book aims to explore and investigate various research issues of XML data and related applications that are encapsulated by Web services over the network. In particular, we call these networked services as XML services.

Many commercial systems built today are increasingly using these technologies together and it is important to understand the various research and practical issues. The goal of this book is to bring together academics and practitioners to describe the use and synergy between the above-mentioned technologies. This book is mainly intended for researchers and students working in computer science and engineering, and for industry technology providers, having particular interests in XML services as well as for users of Web service and grid computing technologies.

This book is structured as follows. Chapter I presents a XML technical framework for administrators to dynamically update a valid XML document without interfering with other documents in the XML database. Then Chapter II describes the mechanism of change detection on semi-structured XML data with various efficient algorithms for the XML databases. Next, Chapter III discusses an active XML transaction approach to support locking protocol, dynamic construction of undo operation and chaining the active peers. Based on the fundamental technologies for handling XML databases, Chapter IV proposes an XML search engine which accepts keyword-based queries and loosely structured queries.

Chapter V presents an enterprise information system which integrates different XML data sources by using Web services in the application domain of the digital libraries. Next, Chapter VI describes an integration technique that embeds a declarative data transformation technique based on Semantic data models. Chapter VII addresses an approach automatically generates the data access components. Further, Chapter VIII proposes a Web service-based framework for transcoding multimedia streams that supports personal and service mobility. Chapter IX applies type-theoretic techniques to the service description and composition verification. Applying the XML technologies into an illustrative example, Chapter X discusses the state-of-the-art technologies for compressing XML data and compacting SOAP messages.

On the other hand, Chapter XI presents some of the existing mining techniques for extracting association rules out of XML documents in the context of Web knowledge discovery area. For illustration,
Chapter XII gives a tutorial on resource description framework (RDF) and Jena for manipulating RDF documents. Chapter XIII demonstrates the support of Web service technologies in Enterprise Architecture Integration (EAI) and Business Integration (BI).

Chapter XIV describes the application of model-driven architecture (MDA) and UML for modeling business-to-business collaborations. Next, Chapter XV presents an enterprise SOA framework for government during the response phase of the disaster. Chapter XVI discusses the cases for using convergent interviews as an appropriate and efficient method for modelling factors impacting the adoption of emerging and under-researched innovations with XBRL.

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