Preface

Considering today’s business environment that emphasizes data, information, and knowledge as essential components of an organization’s resource, database management has quickly become an integral part of many business applications. Information systems development activities enable many organizations to effectively compete and innovate. New database and information systems applications are constantly being developed. Examples of new applications include data warehousing, data mining, OLAP, data visualization, visual query languages, and many more.

Similar to previous advances in database research volumes, we are once again proud to present a compilation of excellent cutting-edge research, conducted by experts from all around the world. This volume, Contemporary Issues in Database Design and Information Systems Development, is a collection of the latest research-focused chapters on database design, database management, and information systems development for researchers and academicians. It is also designed to serve technical professionals in the industry with hopes in enhancing professional understanding of the capabilities and features of new database and information systems applications, and forthcoming technologies.

The following are short descriptions of each chapter:
Chapter I, “Towards an Ontology for Information Systems Development: A Contextual Approach,” presents an ISD ontology that aims to provide an integrated conceptualization of ISD through anchoring it on a contextual approach. The authors believe that the ISD ontology can promote the achievement of a shared understanding of contextual aspects in ISD.

Chapter II, “Ontological Analysis of KAOS Using Separation of References,” applies a structured approach to describe a well-known goal-oriented language, KAOS, by mapping it onto a philosophically grounded ontology. The structured approach facilitates language interoperability because when other languages are described using the same approach, they become mapped onto the same ontology.

Chapter III, “Applying UML for Modeling the Physical Design of Data Warehouses,” presents modeling techniques for physical design of data warehouses using component diagrams and deployment diagrams of UML. The authors illustrate the techniques with a case study.

Chapter IV, “Supporting the Full BPM Life-Cycle Using Process Mining and Intelligent Redesign,” shows that techniques for process mining and intelligent redesign can be used to offer better support for the redesign and diagnosis phases, and thus close the BPM life-cycle. It also briefly reports on the work done in the context of the ProM tool, which is used as framework to experiment with such techniques.

Chapter V, “Efficient Placement and Processing in Shared-Nothing Data Warehouses,” discusses the basic system architecture and the design of data placement and processing strategy. This chapter compares the shortcomings of a basic horizontal partitioning for the environment with a simple design that produces efficient placements. The discussion and results provide important information on how low-cost efficient data warehouse systems can be built.

Chapter VI, “Factors Affecting Design Decisions for Customer Relationship Management Data Warehouses,” presents a robust multidimensional starter model that supports CRM analyses. This chapter also introduces two new measures, percent success ratio and CRM suitability ratio by which CRM models can be evaluated, and identification of and classification of CRM queries can be performed. A preliminary heuristic for designing data warehouses to support CRM analyses is also reported in the chapter.

Chapter VII, “Effective Processing of XML-Extended OLAP Queries Based on a Physical Algebra,” extends previous work on the logical federation of OLAP
and XML data sources by presenting simplified query semantics, a physical query algebra, and a robust OLAP-XML query engine as well as the query evaluation techniques.

Chapter VIII, “Is There a Difference Between the Theoretical and Practical Complexity of UML?” offers the idea that the complexity metrics previously developed and used to analyze UML can be differentiated into theoretical and practical complexities. The chapter also discusses better ways of learning and using UML.

Chapter IX, “Data Quality: An Assessment,” presents results from a large-scale survey of Australian CPA members regarding data quality. The research investigates and reports major stakeholders’ opinions on the importance of critical success factors affecting data quality and the actual performance on each of those factors.

Chapter X, “Cover Stories for Key Attributes: Expanded Database Access Control,” extends the multi-level secure (MLS) data model to include non-key related cover stories so that key attributes can have different values at different security levels. This chapter presents the necessary model changes and modifications to the relational algebra that are required to implement cover stories for key.

The ten chapters in this volume provide a snapshot of top notch research in all areas of the database and information systems development. We are confident that this volume will provide insightful and valuable resources for scholars and practitioners alike.

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