

## SPECIAL ISSUE: AGILE INFORMATION SYSTEMS DEVELOPMENT

# A Retrospective Review of JDM from 2003 to 2005 and a Discussion on Publication Emphasis of JDM for the Next Two to Three Years

Keng Siau, Editor-in-Chief

In the past two years (2003 to 2005), the *Journal of Database Management* has been successful in publishing top-quality articles in database management, systems analysis and design, and software engineering. This reflects my goal of broadening the scope of JDM to incorporate tightly linked areas. I am also happy to report that JDM is now part of the *Science Citation Index*.

In this retrospective review, I will summarize major themes of the articles that were published in JDM in the past two years. The purpose of this review is to assess the state-of-the-art research in the area, and to suggest some research trends in the area.

### DATABASE AREA

The articles published in the database area cover several themes: database design, database management, and the application of databases.

#### Database Design

JDM received a number of submissions related to database design. As database design is a fairly matured research area, the reviewers expect a higher quality of contribution in these submissions. Some published articles in this area proposed ways of designing ad hoc databases. For instance, Ma (2005) proposed a conceptual design methodology for fuzzy relational databases. Wang and Murphy (2004) examined the issue of semantic conflict

resolution in multidatabase system design. In addition, Batra (2005) discussed conceptual data-modeling patterns in an effort to improve pedagogy in conceptual data modeling. These studies extended the research in database design to a more sophisticated level.

#### Database Management

As database systems become more complex and increasingly heterogeneous, the management of databases is emerging as a critical research area. To make things more complicated, mobile and wireless techniques have been used in database systems. The articles dealing with database management can be classified into the following categories: the integration of heterogeneous data sources (Miled, Li, & Bukhres, 2005; Weippl, Klug, & Essmayr, 2003; Zhao & Ram, 2004); database access, including cache management (Huang, Lin, & Deng, 2005; Martin, Powley, Zheng, & Romanufa, 2005), the use of mobile agents (Arcangeli, Hameurlain, Migeon, & Morvan, 2004; Jiao & Hurson, 2004), queries (Bowen, Rohde, & Basford, 2004), and access patterns and control (He & Darmont, 2005; Jukic, Nestorov, Vrbsky, & Parrish, 2005); data and information security (Baskerville & Portougal, 2003; Lloyd, Peckham, Li, & Yang, 2003; Patnaik & Panda, 2003; Reid & Dhillon, 2003; Wilson & Rosen, 2003); and data quality (Lee, Pipino, Strong, & Wang, 2004; Nord, Nord, & Xu, 2005; Shankaranarayan, Ziad, & Wang, 2003). In essence, the research in this area is concerned

about how to improve data integrity, and how to facilitate users' access to data that they need.

### **The Application of Databases**

Database systems have been extensively used in enterprise systems. In view of the pervasive adoption of the Internet and the increasing demand for effective knowledge management, researchers started examining and proposing the application of databases in new areas, such as e-business (Nicolle, Yé tongnon, & Simon, 2003; Pons & Alijifri, 2003), e-government (Bajaj & Ram, 2003), national security (English, 2005; Kim, 2005; Sheth et al., 2005), data warehousing (Sujitparapitaya, Janz, & Gillenson, 2003; Triantafillakis, Kanellis, & Martakos, 2004), and data mining (Fong & Wong, 2004; Orlandic & Yu, 2004; Osei-Bryson & Giles, 2004; Smith & King, 2005; Song & Yoo, 2004; Thompson, 2005; Thuraisingham, 2005). By capitalizing on the latest Internet technologies and knowledge-discovery algorithms, these studies expanded the horizon of database systems.

## **SYSTEMS ANALYSIS AND DESIGN, AND SOFTWARE ENGINEERING**

Systems analysis and design, and software engineering are tightly linked to the database area. The articles published in this area can be grouped into several themes: systems-development methodologies and conceptual modeling methods.

### **Systems-Development Methods and Methodologies**

Dahanayake, Sol, and Stojanovic (2003) proposed a framework for evaluating component-based system-development methodologies. Their work is a first step toward component-oriented systems-development methodology engineering. Bae, Kim, and Huh (2003) developed a federated process framework and its system architecture that provide a conceptual design for the effective implementation of process information sharing. The framework is directly linked to a federated database system (see Heimbigner & McLeod, 1985; Sheth &

Larson, 1990). In addition, the framework uses an object-oriented database and the extensible markup language (XML) to accommodate all the constructs and their interactions within the object-oriented message-exchange model. This work is an illustration of how systems analysis and design research can effectively incorporate database concepts.

### **Conceptual Modeling Methods**

Conceptual modeling is the cornerstone of systems analysis and design. Many researchers make contributions to JDM in this research theme. Some philosophical and psychological concepts are proposed as theoretical foundations of conceptual-modeling research. For instance, some researchers (Green & Rosemann, 2004a, 2004b; Wand & Weber, 2004; Weber, 2003) discussed ontology and its implication on conceptual modeling. Siau (2004) recommended the concept of informational and computational equivalence in comparing information-modeling methods. In a special-theme issue (April-June 2004), researchers reported various research of ontology and conceptual modeling (Dussart, Aubert, & Patry, 2004; Lozano-Tello & Gómez-Pérez, 2004; Milton & Kazmierczak, 2004; Opdahl & Henderson-Sellers, 2004).

There are also some articles that deal with conceptual modeling in action, such as modeling temporal dynamics for business systems (Allen & March, 2003), and modeling workflow activities (Liu, Calton, & Ruiz, 2004). Soffer (2005) looked at equivalence in model-based reuse. Finally, some researchers did research on the unified modeling language (UML; Selonen, Koskimies, & Sakkinen, 2003; Trujillo, Luján-Mora, & Song, 2004; Siau, Erickson, & Lee, 2005).

The articles in this theme may provide valuable references to data modeling in database research.

## **PUBLICATION EMPHASIS OF JDM IN THE NEAR FUTURE**

The above is a retrospective review of the articles published in JDM in the past two to three years. JDM aims to be a top journal in the areas of databases, systems analysis and design, and

software engineering. As such, top-quality articles in these areas will be published. What are the future trends in database research?

First, we will see more articles related to new modeling methods, methodologies, and approaches. For example, this issue of JDM is a special issue on agile information-systems development. A number of new approaches and techniques are being explored in the research arena: agile modeling, extreme modeling, extreme programming, aspect-oriented modeling, and so forth (see Erickson, Lyytinen, & Siau, 2005). This, undoubtedly, will be a fruitful area of research, particularly research on the empirical evaluation of these new methods, methodologies, techniques, and approaches.

Second, the area of database management is still an important area of research. Potential topics on this subject can deal with concurrent database topics such as heterogeneous databases, data integrity and quality, and data access.

Third, the latest Internet technologies, and mobile and wireless techniques will certainly expand the scope of database application. As a result, studies examining or proposing new applications of database systems in these areas will continue to grow in number.

Fourth, database management and knowledge management in organizations are increasingly interlinked. We will need more studies to investigate the integration and synthesis of these two areas.

Fifth, systems analysis and design, and software engineering are highly relevant to the database area. In particular, conceptual modeling is closely linked to data modeling. JDM will continue to encourage academic work in these related areas in an effort to expand the foundation of database management.

Last but not least, we would like to see research studies that assess and discuss database management in the broad context of information-systems development. This is because databases are critical components of most information systems. The development of information systems must effectively incorporate database design and management.

The success of JDM in the past few years is the result of the collective effort of the edito-

rial board. The editorial board members have contributed valuable time and much effort to make JDM a top journal. I sincerely hope that researchers and JDM editorial board members will continue to make invaluable contributions to JDM, and to continue to enhance JDM's visibility, reputation, and ranking. Together, we can sustain JDM as a top journal and one that publishes top-quality and practice-relevant articles in areas related to database management.

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*Keng Siau is a full professor of management information systems (MIS) at the University of Nebraska, Lincoln (UNL). He is currently serving as the editor-in-chief of the Journal of Database Management and as the book series editor for Advanced Topics in Database Research. He received his PhD from the University of British Columbia (UBC), where he majored in management information systems and minored in cognitive psychology. His master's and bachelor's degrees are in computer and information sciences from the National University of Singapore. Dr. Siau has more than 200 academic publications. He has published more than 70 refereed journal articles that have appeared (or are forthcoming) in journals such as Management Information Systems Quarterly, Communications of the ACM, IEEE Computer, Information Systems, ACM SIGMIS's Data Base, IEEE Transactions on Systems, Man, and Cybernetics, IEEE Transactions on Professional Communication, IEEE Transactions on Information Technology in Biomedicine, IEEE Transactions on Education, IEICE Transactions on Information and Systems, Data and Knowledge Engineering, Decision Support Systems, Journal of Information Technology, International Journal of Human-Computer Studies, International Journal of Human-Computer Interaction, Behaviour and Information Technology, Quarterly Journal of Electronic Commerce, and others. In addition, he has published more than 90 refereed conference papers, edited or co-edited 12 scholarly and research-oriented books, edited or co-edited nine proceedings, and written more than 15 scholarly book chapters. He served as the organizing and program chairs of the International Workshop on Evaluation of Modeling Methods in Systems Analysis and Design (EMMSAD) from 1996 to 2005 and on the organizing committees of AMCIS 2005 and AMCIS 2007.*