Foreword

On behalf of the Organizing Committee, we would like to welcome you to the proccedings of the 23rd International Conference on Conceptual Modeling (ER 2004). This conference provided an international forum for technical discussion on conceptual modeling of information systems among researchers, developers and users. This was the third time that this conference was held in Asia; the first time was in Singapore in 1998 and the second time was in Yokohama, Japan in 2001. China is the third largest nation with the largest population in the world. Shanghai, the largest city in China and a great metropolis, famous in Asia and throughout the world, is therefore a most appropriate location to host this conference.

This volume contains papers selected for presentation and includes the two keynote talks by Prof. Hector Garcia-Molina and Prof. Gerhard Weikum, and an invited talk by Dr. Xiao Ji.

This volume also contains industrial papers and demo/poster papers. An additional volume contains papers from 6 workshops.

The conference also featured three tutorials: (1) Web Change Management and Delta Mining: Opportunities and Solutions, by Sanjay Madria, (2) A Survey of Data Quality Issues in Cooperative Information Systems, by Carlo Batini, and (3) Visual SQL – An ER-Based Introduction to Database Programming, by Bernhard Thalheim.

The technical program of the conference was selected by a distinguished program committee consisting of three PC Co-chairs, Hongjun Lu, Wesley Chu, and Paolo Atzeni, and more than 70 members. They faced a difficult task in selecting 57 papers from many very good contributions. This year the number of submissions, 293, was a record high for ER conferences. We wish to express our thanks to the program committee members, external reviewers, and all authors for submitting their papers to this conference.

We would also like to thank: the Honorary Conference Chairs, Peter P. Chen and Ruqian Lu; the Coordinators, Zhongzhi Shi, Yoshifumi Masunaga, Elisa Bertino, and Carlo Zaniolo; Workshop Co-chairs, Shan Wang and Katsumi Tanaka; Tutorial Co-chairs, Jianzhong Li and Stefano Spaccapietra; Panel Co-chairs, Chin-Chen Chang and Erich Neuhold; Industrial Co-chairs, Philip S. Yu, Jian Pei, and Jiansheng Feng; Demos and Posters Co-chair, Mong-Li Lee and Gillian Dobbie; Publicity Chair, Qing Li; Publication Chair cum Local Arrangements Chair, Shuigeng Zhou; Treasurer, Xueqing Gong; Registration Chair, Xiaoling Wang; Steering Committee Liaison, Arne Solvberg; and Webmasters, Kun Yue, Yizhong Wu, Zhimao Guo, and Keping Zhao.

We wish to extend our thanks to the Natural Science Foundation of China, the ER Institute (ER Steering Committee), the K.C. Wong Education Foundation in Hong Kong, the Database Society of the China Computer Federation, ACM SIGMOD, ACM SIGMIS, IBM China Co., Ltd., Shanghai Baosight Soft-

ware Co., Ltd., and the Digital Policy Management Association of Korea for their sponsorships and support.

At this juncture, we wish to remember the late Prof. Yahiko Kambayashi who passed away on February 5, 2004 at age 60 and was then a workshop co-chair of the conference. Many of us will remember him as a friend, a mentor, a leader, an educator, and our source of inspiration. We express our heartfelt condolence and our deepest sympathy to his family.

We hope that the attendees found the technical program of ER 2004 to be interesting and beneficial to their research. We trust they enjoyed this beautiful city, including the night scene along the Huangpujiang River and the postconference tours to the nearby cities, leaving a beautiful and memorable experience for all.

November 2004   Tok Wang Ling
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Preface

The 23rd International Conference on Conceptual Modeling (ER 2004) was held in Shanghai, China, November 8–12, 2004. Conceptual modeling is a fundamental technique used in analysis and design as a real-world abstraction and as the basis for communication between technology experts and their clients and users. It has become a fundamental mechanism for understanding and representing organizations, including new e-worlds, and the information systems that support them.

The International Conference on Conceptual Modeling provides a major forum for presenting and discussing current research and applications in which conceptual modeling is the major emphasis. Since the first edition in 1979, the ER conference has evolved into the most prestigious one in the areas of conceptual modeling research and applications. Its purpose is to identify challenging problems facing high-level modeling of future information systems and to shape future directions of research by soliciting and reviewing high-quality applied and theoretical research findings. ER 2004 encompassed the entire spectrum of conceptual modeling. It addressed research and practice in areas such as theories of concepts and ontologies underlying conceptual modeling, methods and tools for developing and communicating conceptual models, and techniques for transforming conceptual models into effective information system implementations.

We solicited forward-looking and innovative contributions that identify promising areas for future conceptual modeling research as well as traditional approaches to analysis and design theory for information systems development.

The Call for Papers attracted 295 exceptionally strong submissions of research papers from 36 countries/regions. Due to limited space, we were only able to accept 57 papers from 21 countries/regions, for an acceptance rate of 19.3%. Inevitably, many good papers had to be rejected. The accepted papers covered topics such as ontologies, patterns, workflows, metamodeling and methodology, innovative approaches to conceptual modeling, foundations of conceptual modeling, advanced database applications, systems integration, requirements and evolution, queries and languages, Web application modeling and development, schemas and ontologies, and data mining.

We are proud of the quality of this year's program, from the keynote speeches to the research papers, with the workshops, panels, tutorials, and industrial papers. We were honored to host the outstanding keynote addresses by Hector Garcia-Molina and Gerhard Weikum. We appreciate the hard work of the organizing committee, with interactions around the clock with colleagues all over the world. Most of all, we are extremely grateful to the program committee members of ER 2004 who generously spent their time and energy reviewing submitted papers. We also thank the many external referees who helped with the review process. Last but not least, we thank the authors who wrote high-quality

research papers and submitted them to ER 2004, without whom the conference would not have existed.

November 2004   Paolo Atzeni, Wesley Chu, and Hongjun Lu