Foreword

For more than 20 years, the series of Conceptual Modeling – ER conferences has provided a forum for research communities and practitioners to present and exchange research results and practical experiences in the fields of database design and conceptual modeling. Throughout the years, the scope of these conferences has extended from database design and specific topics of that area to more universal or refined conceptual modeling, organizing originally weak or ill-structured information or knowledge in more cultured ways by applying various kinds of principles, abstract models, and theories, for different purposes. At the same time, many technically oriented approaches have been developed which aim to facilitate the implementation of rather advanced conceptual models.

Conceptual modeling is based on the process of conceptualization, and it is the core of system structuring as well as justification for information systems development. It supports and facilitates the understanding, explanation, prediction, and reasoning on information and knowledge, and their manipulation in the systems, in addition to understanding and designing the functions of the systems.

The conceptualization process aims at constructing concepts relevant for the knowledge and information system in question. Concepts in the human mind and concept descriptions in computerized information systems are quite different things by nature, but both should be taken into account in conceptual modeling. Usually concept descriptions are properly observed, but concepts in the human mind and their properties are often neglected quite carelessly.

Conceptual models are created using these concepts. Conceptual modeling means creating conceptual models that describe the abstract system of the Universe of Discourse (UoD) and its information content, in which we are interested. Conceptual models are needed in designing and defining the knowledge content of the UoD. They consist of concepts and rules of the UoD, for example, the concepts and rules of an enterprise.

In recent years a great deal of work has been done in searching for basic systems of concepts for constructing various types of conceptual models, called ontologies, which can be applied to develop advanced, high-quality conceptual-level information systems. It seems that research of various ontology types and construction methods of conceptual-level information systems by using these various ontology types will engage researchers, teachers and philosophers for many years to come.

There are many approaches and aspects to be taken into account in conceptual modeling for information systems and databases. At the 21st International Conference on Conceptual Modeling – ER 2002, three keynote speakers explored special questions of conceptual modeling, and the authors of 30 conference papers presented their latest results in the field. In addition, the conference program

consisted of five tutorials, four workshops, and one panel discussion. There were also poster and industrial presentation sessions.

The technical program of the conference was selected by the program committee consisting of three co-chairs and 68 members. The Program Committee Co-chairs, who also prepared the final program, were Stefano Spaccapietra, Salvatore T. March and Yahiko Kambayashi. The Tutorial Chairs, Veda C. Storey and Vijayan Sugumaran, gathered together five interesting tutorials. The Panel Chair Heinrich C. Mayr prepared the panel on "Do we need an ontology of ontologies?". I warmly thank them all for their excellent work on the conference. I would also like to thank the area liaisons, Tok Wang Ling, Klaus-Dieter Schewe, David W. Embley, and Alberto H.F. Laender, for supportive co-operation and publicity.

The Workshop Co-chairs, Antoni Olivé, Masatoshi Yoshikawa, and Eric S.K. Yu, selected four interesting workshops: "Evolution and Change in Data Management", "Conceptual Modeling Approaches to Mobile Information Systems Development", "Conceptual Modeling Quality", and "Conceptual Modeling Approaches for e-Business: A Web Service Perspective". I appreciate their accurate work very much. The papers of these workshops will be published in a separate LNCS volume.

I would also like to express my appreciation to other members of the organizing committee, Jyrki Nummenmaa (Local Arrangements, Demonstrations and Posters), Olavi Maanavilja (Industrial), Benkt Wangler (Publicity), Erkki Mäkinen (Registration), Martti Juhola (Treasurer), Jarkko Leponiemi and Toni Pakkanen (Webmasters), and Tapio Niemi and Kati Viikki (Social Activities).

In addition, I would like to express my appreciation to the University of Tampere and its Rector, Dr. Jorma Sipilä, for their important support and co-operation. I would like to extend my sincere thanks to the members of the Steering Committee, especially Tok Wang Ling (Chair), Bernhard Thalheim, and Peter P. Chen (Emeritus), who initiated these conferences and showed that there is much interesting work to be done in this field.

Last, but not least, I gratefully thank all the sponsors for their help and support, and the participants, who make a conference successful. I hope that this conference will be fruitful and valuable in the advancement of the research and practice of conceptual modeling.

October 2002 Hannu Kangassalo

Preface

Conceptual modeling is fundamental to the information systems discipline, including new e-world activities. It has become a major mechanism for understanding and representing organizations and the information systems that support them. ER 2002 encompasses the entire spectrum of conceptual modeling. It addresses 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, including advanced applications such as e-commerce, knowledge management, learning environments, telecommunications, and enterprise management systems.

Conceptual models instantiate various levels of abstraction. They must facilitate understanding and foster communication between technology experts and those who would benefit from the application of those technologies. They must enable users of these technologies to understand their current applications and visualize new applications. To do so our understanding and knowledge about information and how to describe, represent, and intelligently utilize it must be further developed. ER conferences are devoted to exposing and promoting advances in such development. They invite researchers and practitioners from both computer sciences and management information systems. Reports of new ideas and approaches, useful experiences and informative experiments are all welcome. Regular and industrial papers are solicited along with proposals for workshops, tutorials, panel sessions and posters. In particular, ER 2002 has emphasized conceptual modeling issues related to enterprise-wide information systems, and information systems to support virtual organizations.

Nearly 130 papers were submitted to the conference. Each paper was reviewed by program committee members and reviewers selected by them. After much electronic discussion and debate the Program Committee selected 30 of them for inclusion in the conference. These are organized into 10 sessions and address both theory and practice. Included are: two sessions dealing with Ontology, two dealing with methods, and one each dealing with applications, XML, quality, Web environments, meta-models, and integration. Research paper presentations are complemented in the conference program with invited keynote talks by three outstanding contributors, one panel on the use of ontology in conceptual modeling, and three tutorials. Abstracts of these additional presentations are included in this volume. The conference is also complemented with a series of workshops, whose proceedings are published as a separate volume.

Thanks are due to many people who worked to make the program a success. These include: the Workshop Co-Chairs, Antoni Olivé, Universitat Politècnica de Catalunya, Spain, Masatoshi Yoshikawa, NAIST, Japan, and Eric S.K. Yu, University of Toronto, Canada; the Tutorial Chairs, Veda C. Storey, Georgia State University, USA and Vijayan Sugumaran, Oakland University, USA; the

Panel Chair, Heinrich C. Mayr, University of Klagenfurt, Austria; the Industrial Chair, Olavi Maanavilja, M-real Corporation, Finland; and the Demonstration and Poster Chair, Jyrki Nummenmaa, University of Tampere, Finland. Since the program committee chairs were located on three different continents and none is located in Finland, coordination and communication were major issues. Jarkko Leponiemi of Tampere Polytechnic, Finland, did an outstanding job of managing the conference Website and the paper review system and coordinating communication with authors. Finally, we would like to thank all authors of submitted papers, who played the key role in materializing our dreams of an excellent conference.

October 2002

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ECDM 2002

2nd International Workshop on Evolution and Change in Data Management

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MobIMod 2002

ER/IFIP WG8.1 Workshop on Conceptual Modeling Approaches to Mobile Information Systems Development

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IWCMQ 2002

International Workshop on Conceptual Modeling Quality

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eCOMO 2002

Joint Workshop on Conceptual Modeling Approaches for e-Business: A Web Service Perspective

Chairs: Heinrich C. Mayr (University of Klagenfurt, Austria)
Willem-Jan van den Heuvel (Tilburg University, The Netherlands)

The proceedings for these workshops are published in a separate LNCS volume.

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