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Preface

In your hands are the results of much effort, beginning with the preparation of papers, panels, demos, and tutorials, going through the review process and the hard work of the program committee and the organizing committee, and ending with the conference itself.

The outstanding results achieved are due largely to the efforts of the dedicated professionals who have spent close to four years preparing for this event, and also to the support of many institutions and individuals. I especially want to thank the VLDB Endowment members for voting in favor of the proposal to bring the conference to Cairo, and for their generosity with offering special support for local and regional participation. Special thanks also go to Peter Lockemann, past VLDB president, for his support for VLDB2000 in Cairo and to John Mylopoulos, the current president, for his continued support of the conference throughout.

We are especially indebted to Maria Orłowska, the VLDB Endowment representative, for all her efforts during the preparation period for the conference.

Special thanks to Dr. Mofied Shehab, Minister of Higher Education and Scientific Research, and Dr. Ahmed Nazif, Minister of Information and Communications, for their support of the conference and for sharing their thoughts and experiences with us during the conference.

Many thanks go to all the members of the Program Committee: Michael L. Brodie, the Program Committee Chair, for his enormous creative effort; Amr El Abbadi, Gunter Schlageter, and Kyu-Young Hwang, the Regional PC Chairs; Umesh Dayal, the Industrial PC Chair; Ahmed ElMagarmid and Opher Etzion, the Panels and Demos Co-chairs; and Susan Davidson and Divvy Agrawal, the Tutorials Co-chairs, for the excellent program they have prepared. Finally, I want to thank Sharma Chakravarthy, the Publications Chair, who was responsible for the final look of the proceedings.

Special thanks to Organizing Committee Chair Dr. Samy Gamal Eldin for his continuous support of the conference, and for a job well done. Thanks to all the members of the Organizing Committee, especially Dr. Ismail Abdel Ghafar, who has shouldered much of the burden; Dr. Ali Moselhi, for managing the VLDB2000 project in the Ministry of Information and Communications; and Dr. Amr Goneid, for his help with local publicity and for supporting our accountant. We are also indebted to Ali Ghoneim and Gamal Gheitas from Al Ahrām Newspaper for supporting the conference and helping to promote it and to derive maximum benefit from it locally. Many thanks to Ali Agoza, also from Al Ahrām, for his help with the CD-ROM.

Much of the success for raising the participation figures for the conference go to Magdi Kamel and Erich Neuhold, the Publicity Co-chairs, for the energetic and effective international publicity campaign they mounted. Many thanks to all the Geographic Area Chairs for helping to raise awareness about the conference in their local regions.

I would like to thank Rana Ayman for the many hours she spent working on the Web site and for the beautiful logo she designed.

Many others have worked on the conference on a paid basis. I also want to thank them for being part of our team. These include Mrs. Amira Iskander, Star of Egypt Travel; Amany Shehab, our accountant; Hakam Kanafany, Datum; Tamer Kamal and Ramy Farid, the registration form designers; and Khaled Nasrallah and Ayman Al Bayaa, the exhibit organizers.

We are very grateful to all of our sponsors, without whose support this conference would not have been possible.

I would like to offer a few final comments regarding the conference itself. The VLDB conference is a unique conference indeed. Not only because it is the most widely recognized conference in databases, but also because of its long and well-established tradition of quality, innovation, variety, and international orientation.

Holding conferences like this in developing countries is extremely beneficial to the hosting country and its surrounding region. The conference brings important technology to the attention of local scientists and practitioners, and offers them a chance to meet with top scientists and developers in the field. Likewise, it also helps place the technical potential of these countries in the spotlight of the industry at large. It does so at an affordable cost to the local delegates, considering the elimination of travel and lodging costs. In the case of VLDB2000, local fees have been further reduced by a special and generous regional promotional offer, co-sponsored by VLDB2000 and the VLDB Endowment. There are also other side benefits to the hosting country—a small boost in tourism and various conference-related business activities.

Organizing VLDB2000 in Cairo has been a truly large and unforgettable international team effort that required collaboration among multiple institutions. Inevitably, the four years of hard work that was put into the conference preparation and organization entailed personal sacrifices from some of its key volunteer officers. It is to these people who have put in so much effort and time that our deepest gratitude should go.

The location of VLDB2000 was unique, at the foot of the great pyramid of Giza, the only surviving wonder of the ancient world and one of Mankind's most remarkable achievements. Delegates have enjoyed the atmosphere. The VLDB2000 Organizing Committee has also incorporated a number of activities outside of the conference hours to introduce delegates to the local history and culture in their spare time.

On behalf of all conference committees, I hope that you will enjoy the work in these proceedings and find it of much benefit.

Nabil Kamel
General Conference Chair
VLDB2000

Foreword

The 26th International Conference on Very Large Databases addressed some of the most critical challenges and achievements in the research and practice of database applications and management, especially those posed by the current Internet revolution. VLDB2000 continues this conference's 26-year tradition as the premier international forum for database researchers, vendors, practitioners, application developers, and users. VLDB2000 included two keynote presentations, a 10-Year Award paper, 53 papers, 16 demonstrations, 3 panels, 5 industrial sessions, 1 domain session, and a VLDB Endowment-sponsored plenary panel on VLDB directions.

Broadening the Database Field

An objective of VLDB2000 was to contribute to broadening the database field. See *Panel: Future Directions of Database Research—The VLDB Broadening Strategy, Part 2* in this volume for a description of the Broadening Strategy. Initially, the Broadening Strategy was controversial. There was concern that since broadening papers did not have established research methodologies as do core database topics, the quality of broadening papers would be below the quality of papers traditionally accepted by VLDB. The VLDB Endowment unanimously accepted this risk in order to expand the database field, at least in VLDB conferences. To maintain VLDB's traditional strength, a minimum quota was set for papers on core research topics. In addition, a minimum quota was set for papers that contributed to the Broadening Strategy. The Broadening Strategy was unexpectedly successful. More than 77% of submitted papers and more than 88% of accepted papers made modest or strong contributions to broadening in contrast to a range of 2% to 19% of accepted papers in previous years. The quality of these papers was on par with or exceeded papers on core database topics. In fact, the papers with the highest overall scores also had the highest broadening scores. The broadening quotas were exceeded in part by strong core papers that included broadening content. In addition, 56% to 100% of all other contributions also contributed to the Broadening Strategy.

Keynotes

VLDB2000 was honored to have as a keynote speaker Dr. Ebbe Nielsen, one of the world's leading biodiversity scientists and an expert in the developing field of biodiversity informatics. Biodiversity, a theme of VLDB2000 as part of the Broadening Strategy, is an excellent and potentially fruitful domain which poses significant data management challenges and in which database researchers could, in cooperation with biodiversity experts, contribute to both good computer science and to improving the world. The purpose of the keynote and the theme was to encourage database researchers to cooperate with biodiversity experts to address data management research challenges that arise in that domain.

10-Year Paper Award

This prestigious annual award is intended for "the most influential paper in the VLDB Proceedings 10 years ago." VLDB2000. The VLDB Endowment was delighted to honor Dr. Stefano Ceri, Dipartimento Di Elettronica, Politecnico di Milano, and Dr. Jennifer Widom, Computer Science Department, Stanford University, as recipients of the VLDB2000 10-Year Paper Award for their VLDB1990 paper:

Ceri, S. and J. Widom, "*Deriving Production Rules for Constraint Maintenance.*" In Dennis McLeod, Ron Sacks-Davis, Hans-Jorg Schek (Eds.): 16th International Conference on Very Large Databases, August 13–16, 1990, Brisbane, Queensland, Australia.

The honor is well deserved by Stefano and Jennifer given their individual and joint contributions to the area of active databases and to other areas of database research over many years. The award winners invited Roberta J. Cochrane, IBM Almaden Research Center, to co-author the invited paper "Practical Applications of Triggers and Constraints: Success Stories and Lingering Issues," which is included in this volume.

The paper was selected by the 10-Year Paper Award Committee, chaired by Dr. Mike Carey, Propel, and consisting of Prof. Frederick H. Lochovsky, University of Science & Technology–Hong Kong; Prof. Dr. Hans-Jorge Schek, ETH–

Zürich; and Dr. H.V. Jagadish, University of Michigan. After an extensive analysis of 10 years of related research literature, the committee found that the paper has had a significant impact on database research and that it has been formative in initiating research on the application of production rules to various aspects of database systems. The paper was cited more than 60 times on www.vldb.org alone. The award winners also won the Best Paper Award at VLDB1991 in Barcelona, Catalonia, Spain, for their paper “Deriving Production Rules for Incremental View Maintenance.” Jennifer also received the Test of Time Award at SIGMOD 2000 for her SIGMOD 1990 paper with Sheldon J. Finkelstein: “Set-Oriented Production Rules in Relational Database Systems.”

Papers

The program committee accepted 53 of the 349 papers submitted. The program committee was divided into three regional program committees: the Americas, chaired by Dr. Amr El Abbadi, University of California, Santa Barbara; Europe, Africa, and the Middle East, chaired by Dr. Gunter Schlageter, Fern Universität, Hagen; and the Far East, Asia, and Australia, chaired by Prof. Kyu-Young Whang, Korean Advanced Institute of Science and Technology. The program committee also selected a best paper of VLDB2000 as well as five papers that will be expanded to form a “Best of VLDB2000” issue of the *VLDB Journal*.

Papers were received from more than 22 countries, with more than 750 co-authors submitting papers. The 53 accepted papers had 163 co-authors. We thank the 105 program committee members and the additional 244 reviewers for their diligence and conscientiousness.

Demonstrations

Dr. Opher Etzion, IBM Research Laboratory in Haifa, and Dr. Ahmed Elmagarmid, Purdue University, chaired the demonstrations program committee. Following the trend of recent database conferences, there was an increased emphasis on demonstrations of prototype systems and software. There were twice as many submissions and acceptances as there were for VLDB1999. Of the 33 demonstrations submitted, 16 were accepted. The 16 accepted demonstrations had 69 co-authors; more than 135 co-authors submitted demonstrations. Demonstrations were reviewed by a program committee of 8 and by 12 additional reviewers whom we thank for their work.

Panels

Dr. Opher Etzion, IBM Research Laboratory in Haifa, and Dr. Ahmed Elmagarmid, Purdue University, were the panel chairs. The model management panel discussed the long-overlooked, open problem of translations between schemas or data representations. The 20/20 panel looked at future directions of database research. The third panel discussed how technology can be used to realize social, educational, and governmental policies. This topic could be particularly valuable for Africa, our host continent.

New for VLDB2000 was a plenary on the topic of broadening sponsored by the VLDB Endowment. This was not part of the regular refereed panels. It is a forum for explaining and discussing the Broadening Strategy used in VLDB2000, and possibly future VLDBs, and the ideas being pursued in the VLDB Endowment’s Future Directions Committee.

Industrial Sessions

The industrial chair, Dr. Umeshwar Dayal, Hewlett-Packard Laboratories, did a superb job of soliciting and assembling the VLDB2000 industrial program in keeping with the Broadening Strategy. Novel for VLDB2000 was the concept of a domain session. A domain session is a session devoted to a specific application domain that poses significant data management challenges. The first VLDB domain session concentrated on the conference theme of broadening in the rapidly growing field of biodiversity and bio-informatics.

Tutorials

The tutorial chairs, Dr. Susan Davidson, University of Pennsylvania, and Dr. Divyakant Agrawal, University of California, Santa Barbara, accepted 5 of the 16 tutorials submitted. The VLDB2000 tutorials are published in a separate volume.

VLDB2000 Proceedings

The VLDB2000 publications chair, Prof. Sharma Chakravarthy, University of Texas, Arlington, edited and assembled the VLDB2000 Proceedings, which this year is being made available in hard copy, on CD, and on the Web. An innovation this year, spearheaded by Sharma, was to produce a CD version of the proceedings.

With Many Thanks

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Michael L. Brodie
General Program Chair
VLDB2000