Lecture Notes in Computer Science 1006
Edited by G. Goos, J. Hartmanis and J. van Leeuwen

Advisory Board: W. Brauer D. Gries J. Stoer

Subhash Bhalla (Ed.)

Information Systems and Data Management

6th International Conference, CISMOD '95
Bombay, India, November 15-17, 1995
Proceedings

Springer

Series Editors

Gerhard Goos
Universität Karlsruhe
Vincenz-Priessnitz-Straße 3, D-76128 Karlsruhe, Germany

Juris Hartmanis
Department of Computer Science, Cornell University
4130 Upson Hall, Ithaca, NY 14853, USA

Jan van Leeuwen
Department of Computer Science,Utrecht University
Padualaan 14, 3584 CH Utrecht,The Netherlands

Volume Editor

Subhash Bhalla
Database Systems Laboratory, University of Aizu
Aizu-Wakamatsu City, Fukushima 965-80, Japan

Cataloging-in-Publication data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Information systems and data management : 6th international conference ; proceedings / CISMOD '95, Bombay, India, November 15 - 17, 1995. - Berlin ; Heidelberg ; New York ; Barcelona ; Budapest ; Hong Kong ; London ; Milan ; Paris ; Tokyo : Springer, 1995
(Lecture notes in computer science ; Vol. 1006)
ISBN 3-540-60584-3
NE: Bhalla, Subhash [Hrsg.]; CISMOD <6, 1995, Bombay>; GT

CR Subject Classification (1991): H.2-4, J.1-2, J.4

ISBN 3-540-60584-3 Springer-Verlag Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer-Verlag. Violations are liable for prosecution under the German Copyright Law.

© Springer-Verlag Berlin Heidelberg 1995
Printed in Germany

Typesetting: Camera-ready by author
SPIN 10487157 06/3142 – 5 4 3 2 1 0 Printed on acid-free paper

Preface

The importance of data management and information systems as areas of technology is increasing with more applications. New research and development efforts are being made in mobile databases, real-time databases, visual databases, and knowledge discovery applications. The two areas form the core among the tools for effective exploitation of computer systems.

The 6th international Conference on Information Systems and Management of Data (CISMOD) is being held on November 15-17, 1995 at Bombay in India. The conference aims to bring together researchers and practitioners in the above areas. The conference received close to 60 papers, of which 15 papers were selected through a rigorous refereeing process. I thank all members of the programme committee for their support. Committee members and referees provided detailed comments for nearly all papers, and deserve credit for excellence. I thank all authors who considered CISMOD 95 for making research contributions.

With great pleasure, I thank the invited speakers, Professor J. Biskup, Dr. U. Dayal, Dr. I.S. Mumick, and Dr. N. Terashima for accepting our invitation to give talks and contribute papers to the proceedings. I thank the authors of invited papers, who accepted the invitation to contribute papers and give presentations at the conference. I also thank the tutorial speakers Dr. S.P. Rana, Dr. C. Rolland, and Dr. F. Andres for agreeing to deliver tutorial talks.

The sponsoring organizations and the organizing committee deserve praise for the support they provided. A number of individuals have contributed to the success of the conference. I thank Dr. T. Viswanathan, Dr. P. Dublish, Dr. N. Prakash, Dr. Patkar, Dr. Savanur, and Mr. J. Bhardwaj, for providing continuous support and encouragement.

I have received invaluable support from the University of Aizu. I thank Professor T.L. Kunii, President, and Professor S. Okawa, Head of Department of Computer Software, for making the support available. I also thank all my colleagues at the university for their cooperation and support.

September 1995 Subhash Bhalla

Programme Committee Members

D. Agrawal, Univ. of California
R. Agrawal, IBM Almaden, USA
S. Bhalla, Univ. of Aizu, Japan
J. Biskup, Universitaet Hildesheim
N.bollu, City Univ. of Hong Kong
J.A. Bubenko, SISU, Sweden
A. Cavarero, CNRS, France
X. Castellani, CEDRIC-IIE, France
U. Dayal, HP Labs., Calif., USA
P. De, Univ. of Dayton, USA
P. Dewan, Univ. of N Carolina, USA
P. Dublish, River Run Sof., India
S. Grumbach, INRIA, France
T. Halpin, Uni of Queensland, Austra
T. Ichikawa, Hiroshima Univ., Japan
Rekha Jain, IIM, Ahmadabad, India
H.V. Jagdish, AT&T, USA
S. Jajodia, George Mason Univ.,USA
M. Kitsuregawa,Univ of Tokyo,Japan
M. Kobayashi, Univ. of Aizu, Japan
P. Krishna Reddy, DIT, India
Akhil Kumar, Univ. of Colorado,USA
H.S. Kunii, RICOH, Japan
A.K. Majumdar, IIT Kharagpur,India
Peter McBrien, King's College London
R. Mehrotra, Univ. of Miss-St. Louis
I.S. Mumick, AT&T, USA
N. Parimala, BITS Pilani, India
B. Pernici, Politecnico di Milano,Italy
T.V. Prabhakar, IIT Kanpur, India
B.E. Prasad, Dow Jones Telerate, USA
S. Ram, Univ. of Arizona, USA
S. P. Rana, IBM, USA
M.P. Reddy, Kenan Technologies,USA
C. Rolland, Univ. of Paris, France
M. Saeki, Tokyo Inst. of Tech.,Japan
M. Scholl, Univ of Konstanz,Germany
A. Solvberg, The NIT, Norway
S. Spaccapietra, EPFL-DI-LBD, Switz.
M.V. Sreenivas, River Run Sof., India
Vijay Kumar, Univ. of Missouri,USA
B. Wangler, SISU,Sweden

Additional Reviewers

M. Ahlsen, SISU, Sweden
K. Asada, RICOH, Japan
L.F. Capretz, Univ. of Aizu, Japan
M. Capretz, Univ. of Aizu, Japan
M Cohen, Univ. of Aizu, Japan
Stephen Davis, Univ. of Tokyo
K. Furuse, RICOH, Japan
T. Grust, Univ. of Konstanz
O. Hammami, Univ of Aizu, Japan
Lilian Harada, Fujitsu, Japan
A. Iizawa, RICOH, Japan
P. Johannesson, Stockholm Univ.
A. Kawaguchi, AT&T, USA
M. Nakano, Univ. of Tokyo
C. Nehaniv, Univ. of Aizu, Japan
Y. Ogawa, RICOH, Japan
T. Ohmori,Univ of Elect-C.,Japan
B. Panda, Univ. of Alabama, USA
Indrakshi Ray, George Mason Univ.
Dr. H. Riedel, Univ. of Konstanz
MH Wong, Chinese Univ of H. Kong

Sponsors
Indian National Scientific Documentation Centre (INSDOC), New Delhi, India

Co-sponsors
IEEE India Council

Table of Contents

Conceptual Modelling

Conflictfreeness as a Basis for Schema Integration 1
L. Ekenberg, P. Johannesson

Invited Talk

Database Schema Design Theory: Achievements and Challenges 14
J. Biskup

Query Processing

Maintaining Surrogate Data for Query Acceleration in Multilevel Secure Database Systems 45
B. Panda, W. Perrizo

Calibration of a DBMS Cost Model with the Software Testpilot 58
F. Andrès, F. Kwakkel, M.L. Kersten

"Favourite" SQL-Statements - An Empirical Analysis of SQL-Usage in Commercial Applications 75
R. Pönighaus

Distributed Systems

Static Allocation in Distributed Objectbase Systems: A Graphical Approach 92
S. Bhar, K. Barker

Estimating Data Accuracy in a Federated Database Environment 115
M.P. Reddy, R.Y. Wang

A Study of Distributed Transaction Processing in an Internetwork 135
B. Bhargava, Y. Zhang, S. Goel

Real-Time Database Systems

The Use of an Object Repository in the Configuration of Control Systems at CERN 153
W. Harris, R. McClatchey, N. Baker

Performance Evaluation

Implementation and Performance Evaluation of Compressed Bit-Sliced Signature Files 164
K. Furuse, K. Asada, A. Iizawa

Partial Migration in an 8mm Tape Based Tertiary Storage File System and its Performance Evaluation through Satellite Image Processing Applications 178
K. Sako, T. Nemoto, M. Kitsuregawa, M. Takagi

Knowledge Discovery

Some Aspect of Rule Discovery in Data Bases 192
L. Fleury, C. Djeraba, H. Briand, J. Philippe

Invited Talk

Telesensation - Fusion of Multi-media Information and Information Highways 206
N. Terashima

Product and Process Design

Relational Database Design Using an ER Approach and Prolog 214
M. Kolp, E. Zimányi

Supporting Distributed Individual Work in Cooperative Specification Development 232
M. Saeki, S. Sureerat, K. Yoshida

Handling Changes in Dynamic Specifications in Object Oriented Systems 248
N. Parimala

Invited Talk

The Rejuvenation of Materialized Views 258
I.S. Mumick

Invited Papers

Normalization of Linear Recursions Based on Graph Transformations 265
X. Du, N. Ishii

Data Retrieval and Aggregates in SQL*/NR 283
Y.-K. Ng, N. Qaraeen

Partitioning Pipelines with Communication Costs 302
S. Ganguly, A. Gerasoulis, W. Wang

Author Index 321