Lecture Notes in Artificial Intelligence 1319

Subseries of Lecture Notes in Computer Science
Edited by J. G. Carbonell and J. Siekmann

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

Enric Plaza Richard Benjamins (Eds.)

Knowledge Acquisition, Modeling and Management

10th European Workshop, EKAW '97
Sant Feliu de Guixols, Catalonia, Spain
October 15-18, 1997
Proceedings

Springer

Series Editors
Jaime G. Carbonell, Carnegie Mellon University, Pittsburgh, PA, USA
Jörg Siekmann, University of Saarland, Saarbrücken, Germany

Volume Editors

Enric Plaza
Campus Universitat Autonoma de Barcelona, IIIA/CSIC
08193 Bellaterra, Catalonia, Spain
E-mail: enric@iiia.csic.es

Richard Benjamins
Campus Universitat Autonoma de Barcelona, IIIA/CSIC
08193 Bellaterra, Catalonia, Spain
E-mail: richard@iiia.csic.es
and
University of Amsterdam, Faculty of Psychology, SWI
Roeterstraat 15, 1018 WB Amsterdam, The Netherlands

Cataloging-in-Publication Data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Knowledge acquisition, modelling and mangagement : 10th European workshop ; proceedings / EKAW '97, Sant Feliu de Guixols, Catalonia, Spain, October 15 - 18, 1997. Enric Plaza ; Richard Benjaminis (ed.). - Berlin ; Heidelberg ; New York ; Barcelona ; Budapest ; Hong Kong ; London ; Milan ; Paris ; Santa Clara ; Singapore ; Tokyo : Springer, 1997
(Lecture notes in computer science ; Vol. 1319 : Lecture notes in artificial intelligence)
ISBN 3-540-63592-0

CR Subject Classification (1991): I.2

ISBN 3-540-63592-0 Springer-Verlag Berlin Heidelberg New York

Typesetting: Camera ready by author
SPIN 10545785 06/3142 - 5 4 3 2 1 0 Printed on acid-free paper

Preface

This book contains the proceedings of the 1997 European Workshop on Knowledge Acquisition, Modeling and Management (EKAW), held at Sant Feliu de Guíxols, Catalonia (Spain), from October 15 to 18. This was the tenth EKAW and the fifth time that the proceedings have been published by Springer-Verlag.

This EKAW marks a broadening of scope and a change in name from "Knowledge Acquisition" to "Knowledge Acquisition, Modeling and Management". In fact, EKAW'97 is the first workshop to apply these changes but its sister workshops KAW (Banff) and PKAW (Pacific Rim) will follow this trend in the future. The changes reflect the fact that in recent workshops the range of topics presented in the articles, panels, and discussion groups was already broader than the name implied. Moreover, a growing interest in Knowledge Management (KM) and in the application of knowledge acquisition (KA) techniques to knowledge management motivated the creation of a common meeting place.

The work reported in this book covers several topics related to knowledge acquisition, modeling and management, some of them being mainstream KA topics, others being more innovative.

More and more enterprises are becoming aware of the potential benefits of Knowledge Management. Issues such as modeling, representing, organizing, accessing, and maintaining corporate information and know-how are now recognized as being essential factors for today's enterprises. Knowledge acquisition has traditionally been concerned with these issues in the context of building knowledge systems, but extension to other bodies of knowledge seems natural. Therefore, it is not surprising that in recent years the application of KA techniques to KM has represented a growing area of work. The papers in this book address several relevant issues in KM including corporate repositories, exploitation of existing documents, and integrating knowledge and enterprise modeling.

A related topic with potentially significant impact is knowledge acquisition from texts. Since many sources from which knowledge is extracted are still text documents, natural language processing (NLP) from written text remains an important KA topic. For this reason, NLP can have an important impact on knowledge management by studying different ways to automatically extract knowledge from existing documents, as shown by some papers in this volume.

Reuse of knowledge components represents a large body of current work on knowledge acquisition and engineering. In particular, problem-solving methods (PSMs) and ontologies have received much attention recently. It is now commonly recognized that reusable knowledge components can significantly reduce development costs and enhance quality of knowledge systems: they can be configured from existing, high-quality components, rather than being built up from scratch. Topics discussed in the papers of this volume include the development of specific ontologies and PSMs, principled approaches to constructing ontologies and PSMs, the explicit interaction between ontologies and PSMs, and reuse and adaptation of PSMs. Our expectation is that reusable knowledge components will continue to be present in future workshops, stimulated by the omni-presence of the Internet. The Web provides an excellent opportunity, and challenge, to scale

up reuse and to make knowledge system technology available on a much larger scale.

Typical KA work relates to eliciting knowledge from domain experts. This can be performed using different techniques, and papers in these proceedings include work on acquiring knowledge for Bayesian networks and acquiring knowledge using ripple-down rules. On the other hand, besides experts, databases are an important source of information for knowledge acquisition. Machine learning (ML) techniques have been developed for this purpose and currently they are commercially exploited (together with statistical techniques) in data-mining applications. Papers dealing with ML cover issues like data clustering techniques and knowledge discovery in rule bases.

Knowledge acquisition research can benefit much from practical experience in specific applications. The papers in this volume discuss several applications such as the planning of an autonomous spacecraft, the design of pharmaceutical tablets, and the design of mixed hardware/software systems. Developing commercial applications with knowledge system technology is still a costly activity. For this reason, the US DARPA project "High Performance Knowledge Bases" (HPKB) is to be reckoned with. The goal of HPKB, which involves 18 different partners, is to develop the technology needed for the rapid construction of efficient and large knowledge systems. A summary of this project is presented in an invited paper by John Kingston from AIAI, the European partner in HPKB.

Acknowledgments

The editors wish to thank the members of the Program Committee who freely gave their time and dedicated attention to the review process:

- Stuart Aitken, University of Glasgow (United Kingdom)
- Hans Akkermans, University of Twente (The Netherlands)
- Nathalie Aussenac, IRIT-CNRS (France)
- Guy Boy, EURISCO (France)
- Joost Breuker, University of Amsterdam (The Netherlands)
- Dieter Fensel, University of Karlsruhe (Germany)
- Brian Gaines, University of Calgary (Canada)
- Jean-Gabriel Ganascia, LAFORIA-University Paris VI (France)
- Frank van Harmelen, Free University Amsterdam (The Netherlands)
- Gertjan van Heijst, CIBIT (The Netherlands)
- Knut Hinkelmann, DFKI (Germany)
- Robert de Hoog, University of Amsterdam (The Netherlands)
- Yves Kodratoff, LRI - University Paris Sud (France)
- Eelco Kruizinga, CIBIT (The Netherlands)
- Ramon López de Màntaras, IIIA-CSIC (Spain)
- Enrico Motta, Open University (United Kingdom)
- Pablo Noriega, LANIA (Mexico)
- Kieron O'Hara, University of Nottingham (United Kingdom)

- Nigel Shadbolt, University of Nottingham (United Kingdom)
- Franz Schmalhofer, DFKI (Germany)
- Guus Schreiber, University of Amsterdam (The Netherlands)
- Yuval Shahar, Stanford University (United States)
- Mildred Shaw, University of Calgary (Canada)
- Derek Sleeman, University of Aberdeen (United Kingdom)
- Maarten van Someren, University of Amsterdam (The Netherlands)
- Rudi Studer, University of Karlsruhe (Germany)
- Jan Treur, Free University Amsterdam (The Netherlands)
- André Valente, University of Southern California (United States)
- Hans Voss, GMD (Germany)

We would also like to thank Mària del Mar Cuñado for her excellent secretarial support and Gemma Sales for designing the EKAW'97 logo.

We gratefully acknowledge the support for EKAW'97 provided by the European Network of Excellence in Machine Learning (MLnet), the Catalan Association for Artificial Intelligence (ACIA), and the Artificial Intelligence Research Institute of the Spanish Scientific Research Council (IIIA-CSIC).

Bellaterra, Catalonia (Spain), July 1997

Enric Plaza

Richard Benjamins

Table of Contents

Long Papers

Short Papers