

**Report on the
First International Conference on
Ontologies, Databases and Applications of Semantics
(ODBASE)
Part of the Federated Conference “On the Move to Meaningful Internet
Systems 2002”**

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ODBASE is a new conference series focussing on semantics, databases and the Web. In this article we provide a short overview of the history and the program of the first ODBASE event.

Introduction to ODBASE

The next step in making the Internet and the Web a more friendly and productive place is to provide more meaning to the vast and continuously growing amount of data on the Net. This is a vision that is shared both by the World Wide Web community, incarnated by the notion of the “Semantic Web” coined by Tim Berners Lee, and researchers from a number of areas including data and knowledge engineering, databases, intelligent agent systems, information retrieval, information sciences, and linguistics. The claim is that the emergence of meaning that is associated with data and documents found on the Internet will boost diverse applications such as e-commerce, enterprise and information integration, knowledge engineering, geographic information systems, digital libraries, ubiquitous computing, and intelligent information access. Data semantics and ontologies for large-scale information systems have thus become an important topic in research communities across several disciplines, research funding agencies, as well as various industries.

The International Conference on Ontologies, DataBases, and Applications of Semantics (ODBASE) was created to provide a forum to exchange views, ideas and experiences on ontologies and data semantics from different disciplines. An important goal of the ODBASE conference is to bring researchers from databases, Semantic Web, and knowledge management together to discuss specific problems and promising approaches to providing more meaning for the growing amount of data on the Internet and in ubiquitous computing.

A unique character of the ODBASE conferences is its specialization on data semantic issues for very large ontology and Internet systems, and its strong emphasis on interdisciplinarity and practical applicability of systems, tools and methods for supporting semantics in large-scale information systems. In the call for papers authors were specifically encouraged to submit papers that bridge traditionally separated areas such as databases, intelligent systems, and knowledge engineering, and papers that address issues of scalability in data semantics on the Internet and ubiquitous computing systems.

ODBASE was created as part of a larger endeavor, the *federated database event*, initiated by Robert Meersman, Zahir Tari, and Michael Papazoglou. The federated database event is unique at providing an opportunity for researchers and practitioners

to understand the recent developments in distributed and ubiquitous computing. In addition to ODBASE it co-locates two conferences on distributed and ubiquity aspects of modern computing systems that have been already successfully running for several years, namely DOA and CoopIS. The primary emphasis for DOA is on the distributed object infrastructure, whereas it is for CoopIS the technological aspects of interaction and cooperation within an organization and networks of organizations. ODBASE is completing the picture by covering knowledge bases and methods for enabling semantically meaningful use of technologies. Within their scope, each of these conferences covers different aspects: theory (i.e. underlying theoretical solutions), conceptual aspects (e.g. technical and conceptual solutions) and applications (e.g. case studies and industrial solutions).

As they must, these subject areas overlap. Therefore an obvious benefit of having a federated conference event is the possibility of "cross-pollination" of related, but different areas. This cross-pollination was stimulated by a common program of representative keynote speakers, a joint tutorial program, and a common Industry Track that ran in parallel with the entire event. In addition, the federated conference concept proved also successful in terms of synergies that could be obtained for both organizers by having a shared organisation, and attendants by having offered a program with a wider scope.

When selecting the program committee the ODBASE PC Chairs, Ling Liu and Karl Aberer, paid particular attention to the creation of a PC covering a variety of disciplines, by inviting leading experts from areas such as formal ontology, databases, geographic information systems, library science, logic and knowledge management. At the end, a strong program committee consisting of 40 experts was formed.

The call for papers was very successful and ODBASE received with 76 submissions a

substantial response for a first time event. The submissions originated from over 10 countries. In a careful evaluation process, in which papers received up to 4 detailed reviews, 21 papers were finally selected as regular research papers. In addition to the regular papers, 4 poster papers gave authors the opportunity to give a brief description of their ongoing research.

The proceedings were published as a joint volume for all three federated conferences volume by Springer in the Lecture Notes in Computer Science series. The result is an impressive collection of works counting 1363 pages and, more importantly, providing a high-quality and representative cross-section of world-wide research in the areas covered by the federated database event. Currently a special issue of a new series of Springer targeting the Semantic Web is in preparation, including a selection of extended version of the top papers from the ODBASE conference.

Conference Overview

ODBASE, as part of the federated conference event, shared the keynote talks and tutorial program with DOA and CoopIS. A total of 6 keynote talks were given. Five of the speakers came from industry, which clearly demonstrates the relevance of this research area to industry as well as the interest of industry in it. The keynote talks grouped around the issues of Web services, large scale information systems and semantics in information systems, corresponding to the orientations of the three conferences. Steve Vinoski, IONA Technologies, spoke on the "dark matter" in middleware, namely non-traditional solutions such as scripting approaches and the resulting problems. Ed Cobb, BEA Systems, argued that the Web Services architecture is ideally positioned to address the integration issues from a business perspective. Christoph Bussler, Oracle, pointed out the importance of having automated tools for managing ontologies as being the key to successful large-scale

enterprise integration. Marek Rusinkiewicz, Telcordia, gave three examples of current developments towards self-managing large scale information systems from recent projects. Michael Brodie, Verizon, identified in his talk entitled “The Grand Challenge of Information Technology and The Illusion of Validity” the necessity of developing a theory for semantics in order to develop semantically aware systems. Dieter Fensel introduced the Web Service Modeling Framework (WSMF) that provides the appropriate conceptual model for developing and describing Web services and their compositions, and thus brings the Semantic Web to its full potential. He also gave interesting insights in the recent European research programs addressing the Semantic Web.

The tutorial program offered three topics of which two were closely related to the theme of ODBASE. Jorge Cardoso, Christoph Bussler, Amit Sheth, and Dieter Fensel gave a full-day tutorial on Semantic Web Services and Processes. Avigdor Gal gave in his tutorial an overview on data management issues when using ontologies on the Internet. In her tutorial, Vana Kalogeraki gave an overview of Peer-to-peer technologies, an area that is also gaining importance with respect to semantic issues.

The ODBASE scientific program itself was organized into seven sessions, of which one was a poster session. The 6 full paper sessions provided a nice structuring of the field. Four sessions were covering the different aspects of the life-cycle of ontologies, namely “Ontology Languages,” “Conceptual Modeling and Ontologies,” “Ontology Management,” and “Ontology Development and Engineering.” One session covered “XML and Data Integration” while another session, “Tools for Intelligent Web”, dealt with applications to the Web. In the following, we highlight some of the issues presented in these sessions.

In “Ontology Languages” the two logical formalisms of frame logic and description

logics were represented by two papers each. Two contributions by Guizhen Yang and Michael Kifer addressed deficiencies of current ontology languages. They provided within F-Logic a precise semantics to nonmonotonic multiple inheritance and to reification and anonymous identity, as it is known in RDF. S. Heymans and D. Vermeir introduced their defeasible ontology language as an extension of the description logic SHOQ(D), allowing preference ordering of axioms. Another extension of SHOQ(D) for supporting extended datatypes was introduced by Jeff Z. Pan and Ian Horrocks.

In the “Conceptual Modelling and Ontologies” session, Boris Motik, Alexander Maedche and Raphael Volz introduced the conceptual model underlying their KOAN system that incorporates support for modularization and meta-modeling for better scalability in enterprise application integration. Giancarlo Guizzardi, Heinrich Herre and Gerd Wagner used the general ontological language GOL and its underlying upper level ontology to provide well-defined semantics to UML and identified possible extensions to UML.

In “Ontology Management,” Yannis Kalfoglou and Marco Schorlemmer proposed the use of the information-flow-based method, which is based on the concept of logic infomorphisms, for modeling and automating the mapping of ontologies in a distributed environment. Sean Bechhofer and his co-authors argued in their presentation that for automating the processing of automatic and human annotations, a better understanding of the semantics of annotations, in terms of their interpretation and presentation, is required and they identified a number of candidate interpretations. Nenad and Ljiljana Stojanovic presented in their paper their approach of taking advantage of the user knowledge in ontology evolution by analyzing user behaviors in annotation and querying. Unfortunately, the authors could not present their paper personally, due to

visa restrictions, and therefore we would like to express our gratitude to York Sure who agreed to give a presentation of their paper.

In the “Ontology Development and Engineering” session then, York Sure presented his own work on OntoEdit, an ontology editor that supports methodology-based ontology construction and takes advantage of inferencing capabilities. Push Singh introduced the Open Mind common Sense project, a knowledge acquisition system designed to acquire commonsense knowledge from the general public over the Web. Finally Mustafa Jaffar and Robert Meersman gave an overview of their DOGMA approach for engineering formal ontologies, whose design goals are scalability and knowledge reusability.

In “XML and Data Integration,” Ramon Lawrence pointed out the fact that an important resource in XML, namely name tags, is heavily underutilized and introduced his methodology to standardize tag naming.

In the final session “Tools for Intelligent Web,” Boris Katz, Jimmy Lin, and Dennis Quan proposed to enhance machine-processable annotations in RDF with natural language for human users and demonstrated the advantages of such an approach with their Haystack system, a Semantic Web platform. Larry Kerschberg introduced the WebSifter meta-search engine that employs ontologies to refine user queries for increasing the precision in Web searches.

The ODBASE program was rounded up by a panel organized by Vipul Kashyap on the question whether semantics is an issue that needs to be tackled in domain-dependent or domain-independent way. The panelists were Amit Shet, Ling Liu, Steve Minton, Sean Bechhofer, and Karl Aberer. Though there existed a common understanding on the observation that the domain models are necessarily domain-specific, a lively discussion evolved around the question

whether the tools to manage them are therefore domain-dependent.

The social program allowed recovering from the dense program of the federated conference event. On Tuesday, a reception took place at the premises of University of Irvine and the following day a dinner cruise was organized, taking us through the bay of Newport Beach. Watching the properties of many rich and famous people passing by the boat provided a nice contrast to the more abstract concerns that were the focus of the conference program.

Acknowledgements

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Conclusions

The ODBASE conference has shown that there exist substantial demand and interest for a forum for exchanging ideas and results on research related to building a scalable Semantic Web. With respect to scope the first event was surprisingly well focused on the links between databases, Semantic Web and knowledge management, but was maybe lacking the broader application aspects. We are in any case confident that ODBASE will be able to broaden up as it evolves in the future. The next federated database event including ODBASE will take place in Sicily, Italy, from November 3 to November 7. The call for papers can be found at

<http://www.cs.rmit.edu.au/fedconf/>