Anne Banks Pidduck
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M. Tamer Ozsu (Eds.)

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Advanced Information Systems Engineering

14th International Conference, CAiSE 2002
Toronto, Canada, May 2002
Proceedings

Springer

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Preface

The explosive growth of the Internet and the Web have created an ever-growing demand for information systems, and ever-growing challenges for Information Systems Engineering. The series of Conferences on Advanced Information Systems Engineering (CAiSE) was launched in Scandinavia by Janis Bubenko and Arne Solvberg in 1989, became an important European conference, and was held annually in major European sites throughout the 1990s. Now, in its 14th year, CAiSE was held for the first time outside Europe, showcasing international research on information systems and their engineering.

Not surprisingly, this year the conference enjoyed unprecedented attention. In total, the conference received 173 paper submissions, the highest number ever for a CAiSE conference. Of those, 42 were accepted as regular papers and 26 as short (poster) papers. In addition, the conference received 12 proposals for workshops of which 8 were approved, while 4 tutorials were selected from 15 submissions.

The technical program was put together by an international committee of 81 experts. In total, 505 reviews were submitted, with every member of the committee contributing. Decisions on all submissions were reached at a program committee meeting in Toronto on January 26-27,2002. Workshop and tutorial proposals were handled separately by committees chaired by Patrick Martin (workshops), and Jarek Gryz and Richard Paige (tutorials).

We wish to extend a great "THANK YOU!" to all members of the program and organizing committees for their volunteer contributions of time and expertise. The fact that so many busy (and famous!) people took the trouble to help us with the organization of this conference and the formation of its technical program speaks well for the future of CAiSE and the field of Information Systems Engineering.

May 2002

Anne Banks Pidduck
John Mylopoulos
Carson Woo
Tamer Özsu

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CAiSE 2002 was organized by the Department of Computer Science, University of Waterloo, and the Department of Computer Science, University of Toronto.

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Roel Wieringa (The Netherlands)
Eric Yu (Canada)

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Presenter: Michael P. Papazoglou, Tilburg University, The Netherlands

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Presenter: H-Arno Jacobsen, University of Toronto, Canada

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Doctoral Consortium
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The Grand Challenge in Information Technology and the Illusion of Validity

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Abstract

Rather than progressing in revolutionary, paradigm-shifting steps, Computer Science and Information Technology (IT) follow the much more mundane path called Normal Science by Thomas S. Kuhn in "The Structure of Scientific Revolutions." Scientific and Industrial Revolutions arise only in rare circumstances. The path so often projected by the Industrial IT and Computer Science communities is of revolutions and paradigm shifts. Notwithstanding the Illusion of Validity, the belief in the visions and the claims based on proponent provided justifications, the track record suggests that most claims for emerging technologies are simply false. What should responsible computer scientists and information technologists do when faced with evaluating claims for purported technical advances and new directions? What is a likely outcome of a hot new technology? For example, when will Cooperative Information Systems (CoopISs) come into being? Will we see the claims for Web Services and the Semantic Web realized? Barring rare Nobel Prize-worthy contributions and genuine revolutions the answer is a qualified no - not as claimed and not in the proposed timeframes. Why? Because at their heart is the Grand Challenge of Computer Science: automatically dealing with the "semantics" of data and of computation, e.g., semantic heterogeneity, on which there has been little progress in decades.
This talk looks at the history of claims for emerging technologies, particularly those that contain the Grand Challenge. It reviews some seldom-applied formal and informal methods that can be used to evaluate the potential success of such claims and asks questions such as: What can we expect from Web Services? and How should national funding agencies invest in these areas? The talk concludes after suggesting practical but not novel steps towards making progress, by announcing the next killer app!

A. Banks Pidduck et al. (Eds.): CAiSE 2002, LNCS 2348, p. 1, 2002.

Metadata and Cooperative Knowledge Management

Matthias Jarke[1,2]

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Abstract

Cooperative knowledge management refers to the work practice or culture facet of information systems engineering; it plays a key role especially in engineering and consulting domains. However, in comparison to technology-centered and business-process-centered meta modeling approaches (exemplified by UML and ERP), this aspect has received significantly less attention in research and is much less mature in terms of international standardization. We claim that additional interdisciplinary research effort is needed in this direction, and discuss different points of attack, largely in terms of their implications for better metadata management and meta modeling.

A. Banks Pidduck et al. (Eds.): CAiSE 2002, LNCS 2348, p. 2, 2002.

Ontology-Driven Conceptual Modeling

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Abstract

Ontology is a discipline of Philosophy concerned with what is, of the kinds and structures of objects, properties, events, processes and relations in every area of reality. The first recognition that the work of this philosophical field was relevant to designing and creating computer systems was made by John McCarthy in 1980, who claimed that one must first "list everything that exists – creating an ontology of our world." The computer science use of the term "ontology" has since undergone some evolution, and today it is normally taken as synonymous with knowledge engineering in AI, conceptual modeling in databases, and domain modeling in object-oriented design. This is not, however, simply a new word for something computer scientists have been doing for 20-30 years; Ontology is hundreds, if not thousands, of years old. We have been working for some time on adapting fundamental notions from this centuries-old field to the younger discipline of conceptual modeling, as the core of a formal (that is, domain independent) methodology for developing ontologies and evaluating ontological decisions. Among other things, we use our methodology to clean taxonomies by exposing inappropriate and inconsistent subumption relations.

A. Banks Pidduck et al. (Eds.): CAiSE 2002, LNCS 2348, p. 3, 2002.

Metadata and Cooperative Knowledge Management

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Abstract. Cooperative knowledge management refers to the work practice or culture facet of information systems engineering; it plays a key role especially in engineering and consulting domains. However, in comparison to technology-centered and business-process-centered meta modeling approaches (exemplified by UML and ERP), this aspect has received significantly less attention in research and is much less mature in terms of international standardization. We claim that additional interdisciplinary research effort is needed in this direction, and discuss different points of attack, largely in terms of their implications for better metadata management and meta modeling.

1 Conceptual Modeling and Meta Modeling

Since its invention in the mid-1970s until relatively recently, conceptual modeling was a manual documentation exercise, at best supported with some drawing tools, sometimes with syntactic correctness checks of the models, sometimes with 'automated' transformation to code frames of usually doubtful quality. Only 20 years later the efforts of standardization organizations and research groups to provide formalizations of conceptual modeling techniques and 'intelligent' tools for supporting these formalizations resulted in reasonably powerful metadata repositories which cannot only store and manipulate such models but have a reasonable formal foundation to explain why and how these models are related to each other by using meta models.

An early example has been the ConceptBase system developed in our group since the late 1980's. ConceptBase was originally developed as a repository for lifecycle-wide metadata management in information systems engineering [Jarke and Rose 1988]. Its formal basis has been a version of the Telos meta modeling language [Mylopoulos et al. 1990] which was re-axiomatized in terms of Datalog with stratified negation [Jeusfeld 1992], thus enabling reuse of all the results on query optimization, integrity checking, and incremental view maintenance developed in the logic and object database communities [Jarke et al. 1995].

On the other hand, Telos itself was an abstraction of the pioneering formalization of the widely used structured methods by [Greenspan 1984]. These methods (and this

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