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# On the Move to Meaningful Internet Systems: OTM 2012

Confederated International Conferences:  
CoopIS, DOA-SVI, and ODBASE 2012  
Rome, Italy, September 10-14, 2012  
Proceedings, Part II

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## General Co-Chairs' Message for OnTheMove 2012

The OnTheMove 2012 event held in Rome, during September 10–14, further consolidated the importance of the series of annual conferences that was started in 2002 in Irvine, California. It then moved to Catania, Sicily in 2003, to Cyprus in 2004 and 2005, Montpellier in 2006, Vilamoura in 2007 and 2009, in 2008 to Monterrey, Mexico, and was held in Heraklion, Crete, in 2010 and 2011. The event continues to attract a diverse and representative selection of today's worldwide research on the scientific concepts underlying new computing paradigms, which, of necessity, must be distributed, heterogeneous, and autonomous yet meaningfully collaborative. Indeed, as such large, complex, and networked intelligent information systems become the focus and norm for computing, there continues to be an acute and even increasing need to address and discuss face to face in an integrated forum the implied software, system, and enterprise issues as well as methodological, semantic, theoretical, and applicational issues. As we all realize, email, the internet, and even video conferences are not by themselves optimal nor sufficient for effective and efficient scientific exchange.

The OnTheMove (OTM) Federated Conference series was created to cover the scientific exchange needs of the community/ies that work in the broad yet closely connected fundamental technological spectrum of Web-based distributed computing. The OTM program every year covers data and Web semantics, distributed objects, Web services, databases, information systems, enterprise workflow and collaboration, ubiquity, interoperability, mobility, grid, and high-performance computing.

OnTheMove does not consider itself a so-called multi-conference event but instead is proud to give meaning to the “federated” aspect in its full title: it aspires to be a primary scientific meeting place where all aspects of research and development of internet- and intranet-based systems in organizations and for e-business are discussed in a scientifically motivated way, in a forum of loosely interconnected workshops and conferences. This year's OTM Federated Conferences event therefore once more provided an opportunity for researchers and practitioners to understand, discuss, and publish these developments within the broader context of distributed, ubiquitous computing. To further promote synergy and coherence, the main conferences of OTM 2012 were conceived against a background of three interlocking global themes:

- Virtual and Cloud Computing Infrastructures and Security
- Technology and Methodology for an Internet of Things and its Semantic Web
- Collaborative and Social Computing for and in the Enterprise.

Originally the federative structure of OTM was formed by the co-location of three related, complementary, and successful main conference series: DOA (Distributed Objects and Applications, since 1999), covering the relevant infrastructure-enabling technologies; ODBASE (Ontologies, DataBases, and Applications of SEMantics, since 2002), covering Web semantics, XML databases and ontologies; and CoopIS (Cooperative Information Systems, since 1993), covering the application of these technologies in an enterprise context through, e.g., workflow systems and knowledge management. In 2011 security issues, originally topics of the IS workshop (since 2007), became an integral part of DOA as “Secure Virtual Infrastructures”, or DOA-SVI. Each of the main conferences specifically seeks high-quality contributions and encourages researchers to treat their respective topics within a framework that simultaneously incorporates (a) theory, (b) conceptual design and development, (c) methodology and pragmatics, and (d) application in particular case studies and industrial solutions.

As in previous years we again solicited and selected quality workshop proposals to complement the more “archival” nature of the main conferences with research results in a number of selected and emergent areas related to the general area of Web-based distributed computing. We were also glad to see that five of our earlier successful workshops (EI2N, OnToContent, ORM, INBAST, and SeDeS) re-appeared in 2012, in some cases for the fifth or even seventh time, and often in alliance with other older or newly emerging workshops. Three brand-new independent workshops could be selected from proposals and hosted: META4eS, SINCOM, and SOMOCO. The Industry Track, started in 2011 under the auspicious leadership of Hervé Panetto and OMG's Richard Mark Soley, further gained momentum and visibility.

Incidentally, our OTM registration format (“one workshop buys all”) actively intends to stimulate workshop audiences to productively mingle with each other and, optionally, with those of the main conferences.

We were most happy to see that once more in 2012 the number of quality submissions for the OnTheMove Academy (OTMA) substantially increased. OTMA implements our unique interactive formula to bring PhD students together, and aims to represent our “vision for the future” in research in the areas covered by OTM. It is managed by a dedicated team of collaborators led by Peter Spyns and Anja Metzner, and of course by the OTMA Dean, Erich Neuhold. In the OTM Academy, PhD research proposals are submitted by students for peer review; selected submissions and their approaches are then presented by the students in front of a wider audience at the conference, and are independently and extensively analyzed and discussed in front of this audience by a panel of senior professors.

As said, all three main conferences and the associated workshops share the distributed aspects of modern computing systems, and the resulting application pull created by the Internet and the so-called Semantic Web. For DOA-SVI 2012, the primary emphasis stayed on the distributed object infrastructure and its virtual and security aspects; for ODBASE 2012, the focus became the knowledge bases and methods required for enabling the use of formal semantics in

web-based databases and information systems; for CoopIS 2012, the focus as usual was on the interaction of such technologies and methods with business process issues, such as occur in networked organizations and enterprises. These subject areas overlap in a scientifically natural fashion and many submissions in fact also treated an envisaged mutual impact among them. As in previous years, the organizers wanted to stimulate this cross-pollination by a program of famous keynote speakers, focusing on the chosen themes and shared by all OTM component events. We were quite proud to announce this year

- Ed Parsons, Google Inc, USA;
- Maurizio Lenzerini, U. di Roma La Sapienza, Italy;
- Volkmar Lotz, SAP Research, France;
- Manfred Reichert, U. of Ulm, Germany;
- Guido Vetere, IBM, Italy.

We received a total of 169 submissions for the three main conferences and 127 submissions in total for the workshops, an almost 20% increase compared with those for 2011. Not only may we indeed again claim success in attracting an increasingly representative volume of scientific papers, many from the USA and Asia, but these numbers of course allow the Program Committees to compose a high-quality cross-section of current research in the areas covered by OTM. In fact, the Program Chairs of CoopIS 2012 conferences decided to accept only approximately 1 full paper for every 5 submitted, while the ODBASE 2012 PC accepted less than 1 paper out of 3 submitted, not counting posters. For the workshops and DOA-SVI 2012 the acceptance rate varies but the aim was to stay consistently at about 1 accepted paper for 2-3 submitted, and this as always subordinated to proper peer assessment of scientific quality. As usual we have separated the proceedings into two volumes with their own titles, one for the main conferences and one for the workshops and posters, and we are again most grateful to the Springer LNCS team in Heidelberg for their professional support, suggestions and meticulous collaboration in producing the files ready for downloading on the USB sticks.

The reviewing process by the respective OTM Program Committees was as always performed to professional standards: each paper submitted to the main conferences was reviewed by at least three referees, with arbitrated email discussions in the case of strongly diverging evaluations. It may be worthwhile to emphasize that it is an explicit OnTheMove policy that all conference Program Committees and Chairs make their selections completely autonomously from the OTM organization itself. As in recent years, proceedings on paper were by separate request and order, and incurred an extra charge.

The General Chairs are once more especially grateful to the many people directly or indirectly involved in the setup of these federated conferences. Not everyone realizes the large number of persons that need to be involved, and the huge amount of work, commitment, and in the uncertain economic and funding climate of 2012 certainly also financial risk, that is entailed by the organization of an event like OTM. Apart from the persons in their roles mentioned above,

we therefore wish to thank in particular explicitly our 7 main conference PC Chairs:

- CoopIS 2012: Stefanie Rinderle-Ma, Peter Dadam, Xiaofang Zhou;
- ODBASE 2012: Sonia Bergamaschi, Isabel F. Cruz;
- DOA-SVI 2012: Siani Pearson, Alois Ferscha.

And similarly the 2012 OTMA and Workshops PC Chairs (in order of appearance on the website): Hervé Panetto, Michele Dassisti, J. Cecil, Lawrence Whitman, Jinwoo Park, Rafael Valencia García, Thomas Moser, Ricardo Colomo Palacios, Ioana Ciuciu, Anna Fensel, Amanda Hicks, Matteo Palmonari, Terry Halpin, Herman Balsters, Yan Tang, Jan Vanthienen, Wolfgang Prinz, Gregoris Mentzas, Fernando Ferri, Patrizia Grifoni, Arianna D'Ulizia, Maria Chiara Caschera, Irina Kondratova, Peter Spyns, Anja Metzner, Erich J. Neuhold, Alfred Holl, and Maria Esther Vidal. All of them, together with their many PC members, performed a superb and professional job in managing the difficult yet existential process of peer review and selection of the best papers from the harvest of submissions. We all also owe a serious debt of gratitude to our supremely competent and experienced Conference Secretariat and technical support staff in Brussels and Guadalajara, Jan Demey, Daniel Meersman, and Carlos Madariaga.

The General Chairs also thankfully acknowledge the academic freedom, logistic support, and facilities they enjoy from their respective institutions, Vrije Universiteit Brussel (VUB); Université de Lorraine CNRS, Nancy; and Universidad Politécnica de Madrid (UPM), without which such a project quite simply would not be feasible. We do hope that the results of this federated scientific enterprise contribute to your research and your place in the scientific network... We look forward to seeing you again at next year's event!

July 2012

Robert Meersman  
Hervé Panetto  
Tharam Dillon  
Pilar Herrero

# Organization

OTM (On The Move) is a federated event involving a series of major international conferences and workshops. These proceedings contain the papers presented at the OTM 2012 Federated Conferences, consisting of three conferences, namely, CoopIS 2012 (Cooperative Information Systems), DOA-SVI 2012 (Secure Virtual Infrastructures), and ODBASE 2012 (Ontologies, Databases, and Applications of Semantics).

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# The Coming Age of Ambient Information

Ed Parsons  
Google Inc, USA

## Short Bio

Ed Parsons is the Geospatial Technologist of Google, with responsibility for evangelising Google's mission to organise the world's information using geography, and tools including Google Earth, Google Maps and Google Maps for Mobile. In his role he also maintains links with Universities, Research and Standards Organisations which are involved in the development of Geospatial Technology.

Ed is based in Google's London office, and anywhere else he can plug in his laptop.

Ed was the first Chief Technology Officer in the 200-year-old history of Ordnance Survey, and was instrumental in moving the focus of the organisation from mapping to Geographical Information.

Ed came to the Ordnance Survey from Autodesk, where he was EMEA Applications Manager for the Geographical Information Systems (GIS) Division. He earned a Masters degree in Applied Remote Sensing from Cranfield Institute of Technology and holds a Honorary Doctorate in Science from Kingston University, London.

Ed is a fellow of the Royal Geographical Society and is the author of numerous articles, professional papers and presentations to International Conferences and he developed one of the first weblogs in the Geospatial Industry at [www.edparsons.com](http://www.edparsons.com).

Ed is married with two children and lives in South West London.

## Talk

"The coming age of ambient information"

With the growing adoption of Internet Protocol Version 6 (IPv6) applications and services will be able to communicate with devices attached to virtually all human-made objects, and these devices will be able to communicate with each other. The Internet of Things could become an information infrastructure a number of orders of magnitude larger than the internet today, and one which although similar may offer opportunities for radically new consumer applications. What are some of the opportunities and challenges presented by ambient information.

# Inconsistency Tolerance in Ontology-Based Data Management

Maurizio Lenzerini

Università di Roma La Sapienza, Italy

## Short Bio

Maurizio Lenzerini is a professor in Computer Science and Engineering at the Università di Roma La Sapienza, Italy, where he is currently leading a research group on Artificial Intelligence and Databases. His main research interests are in Knowledge Representation and Reasoning, Ontology languages, Semantic Data Integration, and Service Modeling. His recent work is mainly oriented towards the use of Knowledge Representation and Automated Reasoning principles and techniques in Information System management, and in particular in information integration and service composition. He has authored over 250 papers published in leading international journals and conferences. He has served on the editorial boards of several international journals, and on the program committees of the most prestigious conferences in the areas of interest. He is currently the Chair of the Executive Committee of the ACM Symposium of Principles of Database Systems, a Fellow of the European Coordinating Committee for Artificial Intelligence (ECCAI), a Fellow of the Association for Computing Machinery (ACM), and a member of The Academia Europaea - The Academy of Europe.

## Talk

“Inconsistency tolerance in ontology-based data management”

Ontology-based data management aims at accessing, using, and maintaining a set of data sources by means of an ontology, i.e., a conceptual representation of the domain of interest in the underlying information system. Since the ontology describes the domain, and not simply the data at the sources, it frequently happens that data are inconsistent with respect to the ontology. Inconsistency tolerance is therefore a crucial feature of an in the operation of ontology-based data management systems. In this talk we first illustrate the main ideas and techniques for using an ontology to access the data layer of an information system, and then we discuss several issues related to inconsistency tolerance in ontology-based data management.

# Towards Accountable Services in the Cloud

Volkmar Lotz

SAP Research, France

## Short Bio

Volkmar Lotz has more than 20 years experience in industrial research on Security and Software Engineering. He is heading the Security & Trust practice of SAP Research, a group of 40+ researchers investigating into applied research and innovative security solutions for modern software platforms, networked enterprises and Future Internet applications. The Security & Trust practice defines and executes SAP's security research agenda in alignment with SAP's business strategy and global research trends.

Volkmar's current research interests include Business Process Security, Service Security, Authorisation, Security Engineering, Formal Methods and Compliance. Volkmar has published numerous scientific papers in his area of interest and is regularly serving on Programme Committees of internationally renowned conferences. He has been supervising various European projects, including large-scale integrated projects. Volkmar holds a diploma in Computer Science from the University of Kaiserslautern.

## Talk

“Towards Accountable Services in the Cloud”

Accountability is a principle well suited to overcome trust concerns when operating sensitive business applications over the cloud. We argue that accountability builds upon transparency and control, and investigate in control of services in service-oriented architectures. Control needs to reach out to different layers of a SOA, both horizontally and vertically.

We introduce an aspect model for services that enables control on these layers by invasive modification of platform components and upon service orchestration. This is seen as a major constituent of an accountability framework for the cloud, which is the objective of an upcoming collaborative research project.

# Process and Data: Two Sides of the Same Coin?

Manfred Reichert

University of Ulm, Germany

## Short Bio

Manfred holds a PhD in Computer Science and a Diploma in Mathematics. Since January 2008 he has been appointed as full professor at Ulm University, Germany. Before, he was working in the Netherlands as associate professor at the University of Twente. There, he was also leader of the strategic research orientations on “E-health” and “Applied Science of Services”, and member of the Management Board of the Centre for Telematics and Information Technology - the largest ICT research institute in the Netherlands.

His major research interests include next generation process management technology, adaptive processes, process lifecycle management, data-driven process management, mobile processes, process model abstraction, and advanced process-aware applications (e.g., e-health, automotive engineering). Together with Peter Dadam he pioneered the work on the ADEPT process management technology and co-founded the AristaFlow GmbH. Manfred has been participating in numerous BPM research projects and made outstanding contributions in the BPMfield. His new Springer book on “Enabling Flexibility in Process-aware Information Systems” will be published in September 2012. Manfred was PC Co-chair of the BPM’08 and CoopIS’11 conferences and General Chair of the BPM’09 conference.

## Talk

“Process and Data: Two Sides of the Same Coin?”

Companies increasingly adopt process management technology which offers promising perspectives for realizing flexible information systems. However, there still exist numerous process scenarios not adequately covered by contemporary information systems. One major reason for this deficiency is the insufficient understanding of the inherent relationships existing between business processes on the one side and business data on the other. Consequently, these two perspectives are not well integrated in existing process management systems.

This keynote emphasizes the need for both object- and process-awareness in future information systems, and illustrates it along several case studies. Especially, the relation between these two fundamental perspectives will be discussed,

and the role of business objects and data as drivers for both process modeling and process enactment be emphasized. In general, any business process support should consider object behavior as well as object interactions, and therefore be based on two levels of granularity. In addition, data-driven process execution and integrated user access to processes and data are needed. Besides giving insights into these fundamental properties, an advanced framework supporting them in an integrated manner will be presented and its application to complex process scenarios be shown. Overall, a holistic and generic framework integrating processes, data, and users will contribute to overcome many of the limitations of existing process management technology.



# Experiences with IBM Watson Question Answering System

Guido Vetere

Center for Advanced Studies, IBM, Italy

## Short Bio

Guido Vetere has attained a degree in Philosophy of Language at the University of Rome ‘Sapienza’ with a thesis in computational linguistics. He joined IBM Scientific Center in 1989, to work in many research and development projects on knowledge representation, automated reasoning, information integration, and language technologies. Since 2005, he leads the IBM Italy Center for Advanced Studies. He is member of Program Committees of various international conferences on Web Services, Ontologies, Semantic Web. Also, he represents IBM in several joint research programs and standardization activities. He is the author of many scientific publications and regularly collaborates with major Italian newspapers on scientific divulgation. He is co-founder and VP of ‘Senso Comune’, a no-profit organization for building a collaborative knowledge base of Italian.

## Talk

“Experience with IBM Watson Question Answering System”

The IBM “Watson” Question Answering system, which won the Jeopardy! contest against human champions last year, is now being applied to real business. Watson integrates Natural Language Processing, Evidence-based Reasoning and Machine Learning in a way that makes it possible to deal with a great variety of information sources and to move beyond some of the most compelling constraints of current IT systems. By developing Watson, IBM Research is focusing on various topics, including language understanding, evidence evaluation, and knowledge acquisition, facing some of the fundamental problems of semantic technologies, which ultimately root in open theoretical questions about linguistic practices and the construction of human knowledge. Experiences with Watson show how it is possible to effectively use a variety of different approaches to such open questions, from exploiting ontologies and encyclopedic knowledge to learning from texts by statistical methods, within a development process that allows evaluating the best heuristics for the use case at hand.

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