



HAL
open science

Enterprise Interoperability

Will van Der Aalst, John Mylopoulos, Norman M. Sadeh, Michael J. Shaw,
Clemens Szyperski, Marten Van Sinderen, Pontus Johnson

► **To cite this version:**

Will van Der Aalst, John Mylopoulos, Norman M. Sadeh, Michael J. Shaw, Clemens Szyperski, et al.. Enterprise Interoperability. Springer, LNBIP-076, 2011, Lecture Notes in Business Information Processing, 10.1007/978-3-642-19680-5 . hal-01572092

HAL Id: hal-01572092

<https://inria.hal.science/hal-01572092v1>

Submitted on 3 Jul 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Lecture Notes in Business Information Processing

76

Series Editors

Wil van der Aalst

Eindhoven Technical University, The Netherlands

John Mylopoulos

University of Trento, Italy

Michael Rosemann

Queensland University of Technology, Brisbane, Qld, Australia

Michael J. Shaw

University of Illinois, Urbana-Champaign, IL, USA

Clemens Szyperski

Microsoft Research, Redmond, WA, USA

Marten van Sinderen
Pontus Johnson (Eds.)

Enterprise Interoperability

Third International
IFIP Working Conference, IWEI 2011
Stockholm, Sweden, March 23-24, 2011
Proceedings

Volume Editors

Marten van Sinderen
University of Twente
Centre for Telematics and Information Technology (CTIT)
7500 AE Enschede, The Netherlands
E-mail: m.j.vansinderen@utwente.nl

Pontus Johnson
KTH - Royal Institute of Technology
Industrial Information and Control Systems
10044 Stockholm, Sweden
E-mail: pontus@ics.kth.se

ISSN 1865-1348
ISBN 978-3-642-19679-9
DOI 10.1007/978-3-642-19680-5
Springer Heidelberg Dordrecht London New York

e-ISSN 1865-1356
e-ISBN 978-3-642-19680-5

Library of Congress Control Number: 2011922266

ACM Computing Classification (1998): J.1, H.3.5, H.4, D.2.12

© IFIP International Federation for Information Processing 2011

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. Violations are liable to prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

One of the characteristics of our economy today is that enterprises increasingly (need to) compete and collaborate in a global market, using the Internet and other technical means to overcome the traditional barrier of geographical distribution. Another characteristic is continuous and rapid change and innovation, which may be internal or external to individual enterprises, but nevertheless affecting the way these enterprises can perform in relation to other enterprises and their market environment. The success of an enterprise therefore more and more depends on its ability to seamlessly interoperate with other agile enterprises, and to be able to adapt to actual or imminent changes, instead of making some product or providing some service in the most efficient way.

The role of the current Internet for enterprise interoperability is essential but at the same time still limited in light of its potential. The future Internet should be much more than a universal access and communication infrastructure. It should be able to empower enterprises to innovate by creating new business value in competition and together with other enterprises, based on relevant knowledge about each other and the market. It should do so in a sustainable and socially responsible fashion, making efficient use of physical resources with a minimal environmental footprint. Therefore, the Internet as we know it should evolve into a universal business support system in which enterprises enjoy interoperability services that can be invoked on the fly according to their business needs. Such interoperability services may require physical sensing capabilities as well as extensively exploiting knowledge assets.

This background provided the inspiration for the International IFIP Working Conference on Enterprise Interoperability, IWEI 2011, held March 22–23, 2011, in Stockholm, Sweden. IWEI 2011 was the third in a series of international events on enterprise interoperability. Previous events took place in Munich, Germany (2008), and Valencia, Spain (2009). The IWEI series of events aim at identifying and discussing challenges and solutions with respect to enterprise interoperability, with the purpose of achieving flexible cross-organizational collaboration through integrated support at business and technical levels. Contributions to the development of the following results are highlighted: a scientific foundation for specifying, analyzing and validating interoperability solutions; an architectural framework for addressing interoperability challenges from different viewpoints and at different levels of abstraction; a maturity model to evaluate and rank interoperability solutions with respect to distinguished quality criteria; and a working set of practical solutions and tools that can be applied to interoperability problems to date.

The special theme chosen for IWEI 2011 was “Interoperability and Future Internet for Next-Generation Enterprises.” This means that special attention

was given to the interoperability needs of next-generation enterprises and how these needs are shaped and supported by the emerging Future Internet.

IWEI 2011 was organized by the IFIP Working Group 5.8 on Enterprise Interoperability in cooperation with INTEROP-VLab. The objective of IFIP WG5.8 is to advance and disseminate research and development results in the area of enterprise interoperability. The IWEI series of events provide an excellent platform to discuss the ideas that have emerged from IFIP WG5.8 meetings, or, reversely, to transfer issues that were raised at the conference to the IFIP community for further contemplation and investigation.

This volume contains the proceedings of IWEI 2011. Out of 47 submitted full papers, 15 papers were selected for oral presentation and publication (31.91% acceptance rate). In addition, five short papers were selected for oral presentation and publication in a companion book. The selection was based on a thorough reviewing process, in which each paper was scrutinized by at least three experts in the field. The papers are representative of the current research activities in the area of enterprise interoperability. The papers cover a wide spectrum of enterprise interoperability issues, ranging from foundational theories, frameworks, architectures, methods and guidelines to applications and case studies.

The proceedings also include the abstracts of the invited talks at IWEI 2011, given by two renowned keynote speakers: Andreas Friesen (Research Program Manager of Service Science, SAP) and Gérald Santucci (Head of the Unit on Networked Enterprise & Radio Frequency Identification, INFOSO DG, EC).

We would like to take this opportunity to express our gratitude to all those who contributed to IWEI 2011. We thank the keynote speakers for their excellent and forward-looking talks; we thank the authors for presenting the accepted papers, which resulted in valuable information exchange and stimulating discussions; we thank the reviewers for providing useful feedback on the submitted papers, which undoubtedly helped the authors to improve their work; and we thank the attendants for their interest in this working conference. We are indebted to IFIP TC5 and WG5.8 for recognizing the importance of enterprise interoperability as a research area with high economic impact. Finally, we are grateful to KTH, the Royal Institute of Technology, for hosting IWEI 2011.

March 2011

Marten van Sinderen
Pontus Johnson

Organization

IWEI 2011 was organized by IFIP Working Group 5.8 on Enterprise Interoperability, in cooperation with INTEROP VLab.

Executive Committee

General Chair	Pontus Johnson	KTH, Sweden
Program Chair	Marten van Sinderen	University of Twente, The Netherlands
IFIP Liaison	Guy Domeingts	INTEROP-VLab/University Bordeaux 1, France
Local Organization	Joakim Lilliesköld	KTH, Sweden

International Program Committee

Stephan Aier	University of St. Gallen, Switzerland
Khalid Benali	LORIA – Nancy Université, France
Peter Bernus	Griffith University, Australia
Ricardo Chalmeta	University of Jaume I, Spain
David Chen	Université Bordeaux 1, France
Antonio DeNicola	LEKS-IASI-CNR, Italy
Guy Doumeingts	INTEROP-VLab/GFI, France
Yves Ducq	Université Bordeaux 1, France
Ip-Shing Fan	Cranfield University, UK
Ricardo Goncalves	New University of Lisbon, UNINOVA, Portugal
Claudia Guglielmina	TXT e-solutions, Italy
Sergio Gusmeroli	TXT e-solutions, Italy
Axel Hahn	University of Oldenburg, Germany
Jenny Harding	Loughborough University, UK
Roland Jochem	University of Kassel, Germany
Paul Johannesson	KTH, Sweden
Leonid Kalinichenko	Russian Academy of Sciences, Russian Federation
Bernhard Katzy	University of Munich, Germany
Kurt Kosanke	CIMOSA Association, Germany
Lea Kutvonen	University of Helsinki, Finland
Jean-Pierre Lorre	PEtALS Link, France
Michiko Matsuda	Kanagawa Institute of Technology, Japan
Kai Mertins	Fraunhofer IPK, Germany
Jörg Müller	Technische Universität Clausthal, Germany

VIII Organization

Philipp Offermann	Deutsche Telecom T-Labs, Germany
Andreas Opdahl	University of Bergen, Norway
Angel Ortiz	Polytechnic University of Valencia, Spain
Hervé Panetto	UHP Nancy I, France
Hervé Pingaud	École des Mines d'Albi-Carmaux, France
Raul Poler	Polytechnic University of Valencia, Spain
Raquel Sanchis	Polytechnic University of Valencia, Spain
Ulrike Steffens	OFFIS, Germany
Raymond Slot	Hogeschool Utrecht, The Netherlands
Bruno Vallespir	Université Bordeaux 1, France
Alain Wegmann	Ecole Polytechnique Federal de Lausanne, Switzerland
Xiaofei Xu	Harbin Institute of Technology, China

Additional Reviewers

Camlon Asuncion	Thomas Knothe
Alexis Aubry	Holger Kohl
Luiz Olavo Bonino da Silva Santos	Mario Lezoche
Markus Buschle	Pia Närman
Moustafa Chenine	Matthias Postina
Michele Dassisti	Waldo Rocha Flores
Luís Ferreira Pires	Brahmananda Sapkota
Christian Fischer	Teodor Sommestad
Ulrik Franke	Vikram Sorathia
Bettina Gleichauf	Sergey Stupnikov
Sven Glinizki	Johan Ullberg
Hannes Holm	Sven Wusher
Frank Jaekel	Esma Yahia

Sponsoring Organizations

IFIP TC5 WG5.8
INTEROP-VLab
KTH, Royal Institute of Technology
CTIT, Centre for Telematics and Information Technology

Table of Contents

Keynotes

On Challenges in Enterprise Systems Management and Engineering for the Networked Enterprise of the Future	1
<i>Andreas Friesen</i>	
Research Roadmap for Future Internet Enterprise Systems	3
<i>Gérald Santucci</i>	

Full Papers

Session 1

A Manufacturing Core Concepts Ontology for Product Lifecycle Interoperability	5
<i>Zahid Usman, Robert Ian Marr Young, Nitishal Chungoora, Claire Palmer, Keith Case, and Jenny Harding</i>	
A Construction Approach of Model Transformation Rules Based on Rough Set Theory	19
<i>Jin Li, Dechen Zhan, Lanshun Nie, and Xiaofei Xu</i>	
Third Party User Interaction Control in SIP Networks	36
<i>Ivaylo Atanasov and Evelina Pencheva</i>	

Session 2

A Process Interoperability Method for SMEs	50
<i>Cuiling Liu, Chengwei Yang, Shijun Liu, Lei Wu, and Xiangxu Meng</i>	
A Modeling Language for Interoperability Assessments	61
<i>Johan Ullberg, Pontus Johnson, and Markus Buschle</i>	
Development of Innovative Services Enhancing Interoperability in Cross-Organizational Business Processes	75
<i>Stefan Huber, Cyril Carrez, and Hannes Suttner</i>	

Session 3

An Approach for Interoperability Requirements Specification and Verification	89
<i>Sihem Mallek, Nicolas Daclin, and Vincent Chapurlat</i>	

<i>On the Move to Business-Driven Alignment of Service Monitoring Requirements</i>	103
<i>Patrício de Alencar Silva and Hans Weigand</i>	
A Trust Model for Services in Federated Platforms	118
<i>Francisco Javier Nieto</i>	
Session 4	
Towards Pragmatic Interoperability in the New Enterprise — A Survey of Approaches	132
<i>Camlon H. Asuncion and Marten van Sinderen</i>	
Contexts for Concepts: Information Modeling for Semantic Interoperability	146
<i>Paul Oude Luttighuis, Roel Stap, and Dick Quartel</i>	
Anatomy of the Unified Enterprise Modelling Ontology	163
<i>Andreas L. Opdahl</i>	
Session 5	
Model-Driven Development of Service Compositions for Enterprise Interoperability	177
<i>Ravi Khadka, Brahmananda Sapkota, Luís Ferreira Pires, Marten van Sinderen, and Slinger Jansen</i>	
A Data-Centric Approach for Privacy-Aware Business Process Enablement	191
<i>Stuart Short and Samuel Paul Kaluvuri</i>	
Agent-Supported Collaboration and Interoperability for Networked Enterprises	204
<i>Ingo Zinnikus, Xiaoqi Cao, and Klaus Fischer</i>	
Author Index	217