



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 Lezoeche |
| 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 |