

Lecture Notes in Business Information Processing

268

Series Editors

Wil M.P. van der Aalst

Eindhoven Technical University, Eindhoven, The Netherlands

John Mylopoulos

University of Trento, 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

More information about this series at <http://www.springer.com/series/7911>

A Min Tjoa · Li Da Xu
Maria Raffai · Niina Maarit Novak (Eds.)

Research and Practical Issues of Enterprise Information Systems

10th IFIP WG 8.9 Working Conference, CONFENIS 2016
Vienna, Austria, December 13–14, 2016
Proceedings

Editors

A Min Tjoa
Vienna University of Technology
Vienna
Austria

Li Da Xu
Old Dominion University
Norfolk, VA
USA

Maria Raffai
Szechenyi Istvan University
Gyor
Hungary

Niina Maarit Novak
Vienna University of Technology
Vienna
Austria

ISSN 1865-1348 ISSN 1865-1356 (electronic)
Lecture Notes in Business Information Processing
ISBN 978-3-319-49943-7 ISBN 978-3-319-49944-4 (eBook)
DOI 10.1007/978-3-319-49944-4

Library of Congress Control Number: 2016957480

© IFIP International Federation for Information Processing 2016

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, 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.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

International Conference on Research and Practical Issues of Enterprise Information Systems

**10th IFIP WG 8.9 Working Conference,
CONFENIS 2016**

December 13–14, 2016
Austrian Computer Society, Vienna, Austria

Preface

This year's CONFENIS 2016 marked the 10th anniversary of the IFIP WG 8.9 Working Conference on Research and Practical issues of Enterprise Information Systems. It was a great pleasure that on this special occasion the conference returned to its birthplace and was held at the Austrian Computer Society in downtown Vienna, Austria, during December 13–14, 2016.

On the occasion of the anniversary we would like to take some time to look back. The idea for a new conference series was born in Portugal, Guimarães, in 2005 at an IFIP TC8 meeting (International Federation for Information Processing, Technical Committee for Information Systems) with the aim of building a forum to deal with the increasingly important area of enterprise information systems (EIS). In this particular meeting, the committee members intensively discussed the initiative and proposal of professors A Min Tjoa, Maria Raffai, and Li Da Xu, and agreed that enterprise information systems is an important and dominant scientific subdiscipline. Hence, in this meeting it was decided by the TC8 members that the community involved in this area of information systems had to organize its first International Conference on Research and Practical Issues of Enterprise Information Systems (CONFENIS 2006) in order to prove its ability to be a leading organization for professionals in this area. This conference was held in Vienna, Austria, in April 2006 with around 86 accepted papers that were published by Springer in a proceedings book. This first conference was more successful than expected, and thus a new Working Group, the WG 8.9, was established in 2006 at the TC8 meeting in Santiago de Chile.

At that time a new conference series was born! It is worth reviewing the venues of these conferences:

- 2006 Vienna, Austria
- 2007 Beijing, China
- 2008 Milan, Italy
- 2009 Győr, Hungary
- 2010 Natal, Brazil
- 2011 Aalborg, Denmark
- 2012 Ghent, Belgium

- 2013 Prague, Czech Republic
- 2014 Hanoi, Vietnam
- 2015 Daejeon, South Korea
- 2016 Vienna, Austria

On the occasion of the jubilee we would like to express our thanks to all Program Committee members, conference and workshop organizers, and the colleagues who reviewed the papers very thoroughly during this 10-year period. Looking back over the past decade we can establish that because of the high number of submissions and the quality of the submitted papers, the reviewing process was an extraordinarily challenging task. We are therefore deeply grateful to many individual reviewers who worked with us so diligently. Without their efforts, support, and helpfulness the CONFENIS Series would have never been so successful.

The 2016 edition of the International Conference on Research and Practical Issues of Enterprise Information Systems (CONFENIS 2016) focused mainly on aspects of semantic concepts, open data, customer relationship management, security and privacy issues, advanced manufacturing and management aspects, business intelligence as well as decision support in EIS and EIS practices. This conference provided an international forum for the broader IFIP community to discuss the latest research findings in the area of EIS. The conference specifically aimed at facilitating the exchange of ideas and advances on all aspects and developments of EIS.

CONFENIS 2016 received 63 high-quality papers from 15 countries on five continents. After a rigorous peer-reviewing process, a total of 24 papers were accepted. We believe that the selected papers will trigger further EIS research and improvements. We express our special thanks to the authors for their valuable work and to the Program Committee members for their advice and support. At the same time, we would like to acknowledge the great support by the Austrian Computer Society, the TU-WIEN, and the organization team for their timely contribution and help, which made this edition of the conference proceedings possible.

Finally, we believe that this 10-year jubilee conference organized again in Vienna contributed toward innovative approaches to the various issues of EIS, and will continue to offer a platform for further discussions among researchers in the different EIS areas in the future, too.

December 2016

A Min Tjoa
Maria Raffai
Li Da Xu
Niina Maarit Novak

Organization

General Chair

Li Da Xu

Old Dominion University, USA

Chair

A Min Tjoa

Vienna University of Technology, Austria

Program Committee

Stephan Aier

University of St. Gallen, Switzerland

Gabriele Anderst-Kotsis

Johannes Kepler University Linz, Austria

Amin Anjomshoaa

Massachusetts Institute of Technology (MIT), USA

Rogério Atem de Carvalho

Instituto Federal Fluminense, Brazil

Josef Basl

University of Economics Prague, Czech Republic

Larisa Bulysheva

Old Dominion University, USA

Sohail S. Chaudhry

Villanova University, USA

Ba Lam Do

Hanoi University of Science and Technology, Vietnam

Petr Doucek

University of Economics, Prague, Czech Republic

Frederik Gailly

Ghent University, Belgium

Jingzhi Guo

University of Macau, Macau, SAR China

Wu He

Old Dominion University, USA

Dimitris Karagiannis

University of Vienna, Austria

Nittaya Kerdprasop

Suranaree University of Technology, Thailand

Subodh Kesharwani

Indira Gandhi National Open University, India

Ismail Khalil

Johannes Kepler University, Austria

Elmar Kiesling

Vienna University of Technology, Austria

Ling Li

Old Dominion University, USA

Lisa Madlberger

Vienna University of Technology, Austria

Milos Maryska

University of Economics, Prague, Czech Republic

Young Moon

Syracuse University, USA

Charles Möller

Aalborg University, Denmark

Niina Maarit Novak

Vienna University of Technology, Austria

Alex GC Peng

University of Sheffield, UK

Jan Pries-Heje

Roskilde University, Denmark

Lene Pries-Heje

IT University of Copenhagen, Denmark

Maryam Rabiee

Columbia University, USA

Maria Raffai

Szechenyi University, Hungary

Aryan Peb Ruswono

Institut Teknologi Bandung, Indonesia

Lisa Seymour

University of Cape Town, South Africa

Christine Strauß	University of Vienna, Austria
Zhaohao Sun	PNG University of Technology, Papua New Guinea
A Min Tjoa	Vienna University of Technology, Austria
Tuan-Dat Trinh	Vienna University of Technology, Austria
Pan Wang	Wuhan University of Technology, China
Peter Wetz	Vienna University of Technology, Austria
Kefan Xie	Wuhan University of Technology, China
Li Da Xu	Old Dominion University, USA
Win Zaw	Yangon Technological University, Myanmar
Chris Zhang	University of Saskatchewan, Canada
Shang-Ming Zhou	Swansea University, UK

Organizing Chair

Niina Maarit Novak	Vienna University of Technology, Austria
--------------------	------------------------------------------

Contents

Semantic Concepts and Open Data

Semantic Audit Application for Analyzing Business Processes	3
<i>Ildikó Szabó and Katalin Ternai</i>	
Using Application Ontologies for the Automatic Generation of User Interfaces for Dialog-Based Applications	16
<i>Michael Hitz and Thomas Kessel</i>	
Semantic-Based Recommendation Method for Sport News Aggregation System	32
<i>Quang-Minh Nguyen, Thanh-Tam Nguyen, and Tuan-Dung Cao</i>	
Using SPEM to Analyze Open Data Publication Methods	48
<i>Jan Kučera and Dušan Chlapek</i>	
OGDL4M Ontology: Analysis of EU Member States National PSI Law.	59
<i>Martynas Mockus</i>	

Customer Relationship Management

Social Media and Social CRM	77
<i>Antonín Pavlíček and Petr Doucek</i>	
An Approach to Discovery of Customer Profiles.	88
<i>Iłona Pawełoszek and Jerzy Korczak</i>	

Security and Privacy Issues

Cyber Security Awareness and Its Impact on Employee's Behavior.	103
<i>Ling Li, Li Xu, Wu He, Yong Chen, and Hong Chen</i>	
Lessons Learned from Honeypots - Statistical Analysis of Logins and Passwords	112
<i>Pavol Sokol and Veronika Kopčová</i>	
Towards a General Information Security Management Assessment Framework to Compare Cyber-Security of Critical Infrastructure Organizations	127
<i>Edward W.N. Bernroider, Sebastian Margiol, and Alfred Taudes</i>	

Advanced Manufacturing and Management Aspects

From Web Analytics to Product Analytics: The Internet of Things as a New Data Source for Enterprise Information Systems 145
Wilhelm Klat, Christian Stummer, and Reinhold Decker

Enterprise Information Systems and Technologies in Czech Companies from the Perspective of Trends in Industry 4.0 156
Josef Basl

Internet of Things Integration in Supply Chains – An Austrian Business Case of a Collaborative Closed-Loop Implementation 166
Andreas Mladenow, Niina Maarit Novak, and Christine Strauss

Application of the papiNet-Standard for the Logistics of Straw Biomass in Energy Production. 177
Jussi Nikander

A Case-Base Approach to Workforces’ Satisfaction Assessment 191
Ana Fernandes, Henrique Vicente, Margarida Figueiredo, Nuno Maia, Goreti Marreiros, Mariana Neves, and José Neves

Effective Business Process Management Centres of Excellence 207
Vuvu Nqampoyi, Lisa F. Seymour, and David Sanka Laar

Business Intelligence and Big Data

Measuring the Success of Changes to Existing Business Intelligence Solutions to Improve Business Intelligence Reporting 225
Nedim Dedić and Clare Stanier

An Architecture for Data Warehousing in Big Data Environments. 237
Bruno Martinho and Maribel Yasmina Santos

Decision Support in EIS

The Reference Model for Cost Allocation Optimization and Planning for Business Informatics Management 253
Petr Doucek, Milos Maryska, and Lea Nedomova

An Entropy Based Algorithm for Credit Scoring. 263
Roberto Saia and Salvatore Carta

Visualizing IT Budget to Improve Stakeholder Communication in the Decision Making Process 277
Alexia Pacheco, Gustavo López, and Gabriela Marín-Raventós

EIS-Practices

Implementing an Event-Driven Enterprise Information Systems
 Architecture: Adoption Factors in the Example of a Micro
 Lending Case Study 293
Kavish Sookoo, Jean-Paul Van Belle, and Lisa Seymour

Software Innovation Dynamics in CMSs and Its Impact on Enterprise
 Information Systems Development 309
Andrzej M.J. Skulimowski and Inez Badecka

Optimization of Cloud-Based Applications Using Multi-site
 QoS Information 325
Hong Thai Tran and George Feuerlicht

Author Index 339