


# Lecture Notes in Business Information Processing

369

## Series Editors

Wil van der Aalst 

*RWTH Aachen University, Aachen, Germany*

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>

Jaap Gordijn · Wided Guédria ·  
Henderik A. Proper (Eds.)


# The Practice of Enterprise Modeling

12th IFIP Working Conference, PoEM 2019  
Luxembourg, Luxembourg, November 27–29, 2019  
Proceedings

*Editors*

Jaap Gordijn   
Vrije Universiteit Amsterdam  
Amsterdam, Noord-Holland  
The Netherlands

Wided Guédria  
Luxembourg Institute of Science  
and Technology  
Esch-sur-Alzette, Luxembourg

Henderik A. Proper   
Luxembourg Institute of Science  
and Technology  
Esch-sur-Alzette, Luxembourg

ISSN 1865-1348                      ISSN 1865-1356 (electronic)  
Lecture Notes in Business Information Processing  
ISBN 978-3-030-35150-2              ISBN 978-3-030-35151-9 (eBook)  
<https://doi.org/10.1007/978-3-030-35151-9>

© IFIP International Federation for Information Processing 2019

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, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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

# Preface

The 12th IFIP Working Conference on the Practice of Enterprise Modeling (PoEM 2019), was held during November 27–29, 2019, in Luxembourg, hosted by the Luxembourg Institute of Science and Technology (LIST).

PoEM is supported by the IFIP WG 8.1 and is a conference to stimulate the interaction between practitioners in the field of enterprise modeling, and researchers in this interesting discipline, with the goal to inform and learn from each other. After all, enterprise modeling methods and approaches should be usable in practice.

Concretely, the conference presented a wide variety of topics in the realm of enterprise modeling (EM) including requirements engineering, modeling and ontologies, reference architectures and patterns, methods for developing models and architectures, and security and privacy. Additionally, two interesting EM related workshops preceded the conference: the Third International Workshop on Practicing Open Enterprise Modeling within OMiLAB (PrOse 2019) and the Second Workshop on Teaching and Learning Conceptual Modelling (TLCM 2019). Finally, interesting new topics were presented using the format of PoEM Forum papers with their own online proceedings. These Forum papers were integrated in the main program of the conference using a slightly different format.

This year, PoEM received 35 paper submissions covering a wide variety of EM topics. Each paper was evaluated by at least three members of our expert Program Committee, providing constructive feedback. In total 15 high-quality papers were accepted, which can all be found in this volume. The acceptance rate for full papers was thus below 43%.

This conference would not have been possible without the hard work of the Program Committee members and additional reviewers. Additionally, we are thankful to the authors of the papers who submitted and presented their high-quality papers at the conference. We thank the session chairs for ensuring a smooth organization of the sessions and stimulating interesting discussions. We also acknowledge the PoEM Steering Committee chairs for their continuous assistance and the chairs of the Forum for creating an exciting event. Finally, we thank LIST/Luxembourg for the organization of the PoEM conference this year.

September 2019

Jaap Gordijn  
Wided Guédria  
Erik Proper

# Organization

## Steering Committee

Anne Persson	University of Skövde, Sweden
Janis Stirna	Stockholm University, Sweden
Kurt Sandkuhl	University of Rostock, Germany

## General Chair

Erik Proper	LIST, Luxembourg
-------------	------------------

## Program Chairs

Jaap Gordijn	VUA Amsterdam, The Netherlands
Wided Guédria	LIST, Luxembourg

## Forum Chairs

Paul Johannesson	University of Stockholm, Sweden
Christophe Feltus	LIST, Luxembourg

## Industry Chairs

Frank Harmsen	PNA Group, The Netherlands
Hans Mulder	Antwerp University, Belgium
Yannick Naudet	LIST, Luxembourg

## Organization Chair

Noémie Courtois	LIST, Luxembourg
-----------------	------------------

## Program Committee

Wided Guedria	LIST, Luxembourg
Sybren De Kinderen	University of Luxembourg, Luxembourg
Moonkun Lee	Chonbuk National University, South Korea
Keng Siau	Missouri University of Science and Technology, USA
Jelena Zdravkovic	Stockholm University, Sweden
Janis Stirna	Stockholms Universitet, Sweden
Andrea Polini	University of Camerino, Italy
Ana-Maria Ghiran	Babes-Bolyai University of Cluj-Napoca, Romania
Robert Andrei Buchmann	Babes-Bolyai University of Cluj Napoca, Romania

Paul Johannesson	University of Stockholm, Sweden
Henderik Proper	LIST, Luxembourg
Sergio de Cesare	University of Westminster, UK
Haralambos Mouratidis	University of Brighton, UK
Dimitris Karagiannis	University of Vienna, Austria
Costin Badica	University of Craiova, Romania
Ulrike Lechner	Universität der Bundeswehr München, Germany
Hans-Georg Fill	University of Fribourg, Switzerland
Roel Wieringa	The Value Engineers, The Netherlands
Geert Poels	Ghent University, Belgium
Frederik Gailly	Ghent University, Belgium
Selmin Nurcan	Université Paris 1 Panthéon – Sorbonne, France
Robert Woitsch	BOC Asset Management, Austria
Oscar Pastor Lopez	Universitat Politècnica de València, Spain
Raimundas Matulevicius	University of Tartu, Estonia
Raian Ali	Bournemouth University, UK
Manfred Jeusfeld	University of Skövde, Sweden
Rimantas Butleris	Kaunas University of Technology, Lithuania
Jānis Grabis	Riga Technical University, Latvia
Eric Yu	University of Toronto, Canada
Marite Kirikova	Riga Technical University, Latvia
Heinrich C. Mayr	Alpen-Adria-Universität Klagenfurt, Austria
Jaap Gordijn	Vrije Universiteit Amsterdam, The Netherlands
Nikolay Shilov	SPIIRAS, Russia
Birger Lantow	University of Rostock, Germany
Lutz Kirchner	Scape Consulting GmbH, Germany
Jolita Ralyté	University of Geneva, Switzerland
Khurram Shahzad	University of the Punjab, Pakistan
Michael Fellmann	University of Rostock, Germany
Judith Barrios Albornoz	University of Los Andes, Venezuela
Joao-Paulo Almeida	Federal University of Espírito Santo, Brazil
Jennifer Horkoff	Chalmers and the University of Gothenburg, Sweden
Ivan Jureta	University of Namur, Belgium
Monika Kaczmarek	University Duisburg Essen, Germany
Tony Clark	Aston University, UK
Yoshinori Hara	Kyoto University, Japan
Stijn Hoppenbrouwers	HAN University of Applied Sciences, The Netherlands
Kurt Sandkuhl	The University of Rostock, Germany
Giuseppe Berio	Université de Bretagne Sud and IRISA UMR 6074, France
Estefanía Serrall	Katholieke Universiteit Leuven, Belgium
Herve Pingaud	Institut National Universitaire Champollion, France
Graham Mcleod	Inspired.org, South Africa
Monique Snoeck	Katholieke Universiteit Leuven, Belgium

Anne Persson

Pnina Soffer

Darijus Strasunskas

Colette Rolland

Robert Lagerström

University of Skövde, Sweden

University of Haifa, Israel

HEMIT, Norway

University of PARIS-1, France

KTH Royal Institute of Technology, Sweden



# Contents

## Requirements

Evaluating the Impact of User Stories Quality on the Ability to Understand and Structure Requirements . . . . .	3
<i>Yves Wautelet, Dries Gielis, Stephan Poelmans, and Samedi Heng</i>	
Requirements for Observing, Deciding, and Delivering Capability Change . . .	20
<i>Georgios Koutsopoulos, Martin Henkel, and Janis Stirna</i>	
Towards Architecting a Knowledge Management System: Requirements for an ISO Compliant Framework . . . . .	36
<i>Dmitry Kudryavtsev and Dinara Sadykova</i>	

## Modeling and Ontologies

The OntoREA© Accounting and Finance Model: Inclusion of Future Uncertainty. . . . .	53
<i>Walter S. A. Schwaiger, Aqif Nasufi, Natalia Kryvinska, Christian Fischer-Pauzenberger, and Ömer Faruk Dural</i>	
A Role-Based Capability Modeling Approach for Adaptive Information Systems . . . . .	68
<i>Hendrik Schön, Jelena Zdravkovic, Janis Stirna, and Susanne Strahringer</i>	
A Financial Reporting Ontology for Market, Exchange, and Enterprise Shared Information Systems . . . . .	83
<i>Ivars Blums and Hans Weigand</i>	

## Reference Architectures and Patterns

Towards a Cross-Border Reference Architecture for the Once-Only Principle in Europe: An Enterprise Modelling Approach . . . . .	103
<i>Jaak Tepandi, Eric Grandry, Sander Fieten, Carmen Rotuna, Giovanni Paolo Sellitto, Dimitris Zeginis, Dirk Draheim, Gunnar Piho, Efthimios Tambouris, and Konstantinos Tarabanis</i>	
Identifying HCI Patterns for the Support of Participatory Enterprise Modeling on Multi-touch Tables . . . . .	118
<i>Anne Gutschmidt, Valentina Sauer, Kurt Sandkuhl, and Alexey Kashevnik</i>	

Assessing the Adoption Level of Agile Development Within Software Product Lines: The AgiPL-AM Model . . . . .	134
<i>Hassan Haidar, Manuel Kolp, and Yves Wautelet</i>	

**Methods for Architectures and Models**

Developing a Structured Approach to Converging Business Process Management and Customer Experience Management Initiatives . . . . .	151
<i>Dino Pavlić and Maja Ćukušić</i>	

A Modeling Approach for Bioinformatics Workflows . . . . .	167
<i>Laiz Heckmann Barbalho de Figueroa, Rema Salman, Jennifer Horkoff, Soni Chauhan, Marcela Davila, Francisco Gomes de Oliveira Neto, and Alexander Schliep</i>	

Process Algebra to Control Nondeterministic Behavior of Enterprise Smart IoT Systems with Probability . . . . .	184
<i>Junsup Song and Moonkun Lee</i>	

**Enterprise Architecture for Security, Privacy and Compliance**

Using an Enterprise Architecture Model for GDPR Compliance Principles . . .	199
<i>Gaëlle Blanco-Lainé, Jean-Sébastien Sottet, and Sophie Dupuy-Chessa</i>	

Challenges for Risk and Security Modelling in Enterprise Architecture . . . . .	215
<i>Gudmund Grov, Federico Mancini, and Elsie Margrethe Staff Mestl</i>	

Cybersecurity Evaluation of Enterprise Architectures: The e-SENS Case . . . .	226
<i>Tanja Pavleska, Helder Aranha, Massimiliano Masi, Eric Grandry, and Giovanni Paolo Sellitto</i>	

<b>Author Index . . . . .</b>	<b>243</b>
-------------------------------	------------