Lecture Notes in Business Information Processing

305

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

Geert Poels · Frederik Gailly Estefania Serral Asensio · Monique Snoeck (Eds.)

The Practice of Enterprise Modeling

10th IFIP WG 8.1. Working Conference, PoEM 2017 Leuven, Belgium, November 22–24, 2017 Proceedings



Editors
Geert Poels (D)
Ghent University
Ghent
Belgium

Frederik Gailly (5)
Ghent University
Gent
Belgium

Estefania Serral Asensio (D)
KU Leuven

Leuven Belgium

Monique Snoeck D
KU Leuven
Leuven
Belgium

ISSN 1865-1348 ISSN 1865-1356 (electronic) Lecture Notes in Business Information Processing ISBN 978-3-319-70240-7 ISBN 978-3-319-70241-4 (eBook) https://doi.org/10.1007/978-3-319-70241-4

Library of Congress Control Number: 2017957841

© IFIP International Federation for Information Processing 2017

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. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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

Preface

Enterprise modelling has established itself as the research discipline that aims at producing knowledge and solutions to effectively integrate information and communication technologies into business operations and the management of enterprises. Through the design of novel concepts, models, methods, and techniques, enterprise modelling offers the frameworks and instruments required to analyze the application of innovative IT solutions and to engineer them into the business. Empirical studies on the use of enterprise modelling provide insights into the effectiveness of these artefacts and their relationship to the context of application, including the human factor. Over the years, considerable progress has been made regarding knowledge creation and solution design. Many of those actively involved in enterprise modelling research and application meet at the annual Practice of Enterprise Modelling (PoEM) conference, which was created by the International Federation for Information Processing (IFIP) Working Group 8.1 to offer a forum for knowledge transfer and experience-sharing between the academic and practitioner communities.

We are proud to present the proceedings of the 10th IFIP WG 8.1 Working Conference on the Practice of Enterprise Modelling (PoEM 2017), held in Leuven (Belgium) during November 22–24, 2017, and jointly organized by two of Flanders' most outstanding universities: KU Leuven and Ghent University. Both universities have research teams actively involved in enterprise modelling research and we were very honoured by the invitation of PoEM's Steering Committee to host the 10th anniversary conference. A decennium of PoEM conferences indicates that enterprise modelling is not only a lasting phenomenon but also a field that has matured and continues to attract the interest of researchers and practitioners. We believe that this anniversary could not be celebrated better than in Leuven, which is –with its almost 800 year's old university and over 40,000 students– not only a place of wisdom and scholarship, but also of joy, pleasure, and good living. An ideal place for people to meet, exchange ideas, discuss, explore new avenues, strengthen existing collaborations, and establish new ones.

We were happy to receive for this anniversary edition of PoEM 70 submissions for the main conference, including research papers, practitioner/experience papers, and work-in-progress papers. Submissions were received from all corners of the globe. There were submissions from newcomers to the field as well as from established scholars in enterprise modelling. Each paper was sent to three anonymous reviewers who scrutinized them using strict criteria of scientific quality to uphold the standard we are used to for PoEM. Over 60 Program Committee members were involved in the review process. Their hard work resulted in the acceptance of 20 full papers and four short papers, i.e., an acceptance rate of 28% (or 34% including the short papers).

These 24 accepted papers were organized into eight sessions covering diverse topics related to enterprise modelling and its application in practice. Other conference events included a PhD consortium, an industry track, and the PrOse workshop for enterprise

VI Preface

modelling in the OMiLAB scientific experimentation phase. We further invited two keynote speakers. On Thursday, November, 23, Steven Alter, Professor Emeritus of the University of San Francisco, gave a keynote entitled "A Work System Perspective for Enterprise Modelling." Steve is the originator of the work system theory (WST) that grew out of the work system method, which is a systems analysis method intended for use by business professionals without the help of IT professionals or consultants. The WST has been applied in many fields including information systems, service and service systems, business process management, work-arounds and noncompliance, adoption and diffusion of technology, enterprise engineering, and agile development. Steve's keynote showed how WST can be used as a basis for enterprise modelling, identified some of its limitations for that purpose, and illustrated how it can be used as a point of comparison for deciding what to include in an enterprise modelling effort.

A second keynote speech was given on Friday, November 24, by Mia Vanstraelen, now HR director at IBM, who has a long-standing experience in enterprise modelling, in particular with the foundation of IBM's Insurance Application Architecture (IAA) Framework. She shed light on a somewhat underexposed topic in enterprise engineering: how changing an enterprise model impacts workforce. She discussed challenges in how to deal with the impact of enterprise re-engineering on human resources and proposed a research agenda.

September 2017

Geert Poels Frederik Gailly Monique Snoeck Estefania Serral

Organization

Steering Committee

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

General Chair

Monique Snoeck KU Leuven, Belgium

Program Chairs

Geert Poels Ghent University, Belgium Frederik Gailly Ghent University, Belgium

Organizing Chair

Estefanía Serral Asensio KU Leuven, Belgium

Doctoral Consortium Chairs

Jolita Ralyte University of Geneva, Switzerland Ben Roelens Ghent University, Belgium

Industrial Chair

Serge Demeyer University of Antwerp and Inno.com Institute, Belgium

Program Committee

Hans Akkermans Vrije Universiteit Amsterdam, The Netherlands Pouya Aleatrati Technische Universität München, Germany

Khosroshahi

Raian Ali Bournemouth University, UK

Joao Paulo Almeida Federal University of Espirito Santo, Brazil

Judith Barrios Albornoz University of Los Andes, Colombia

Giuseppe Berio Université de Bretagne Sud and IRISA UMR, France

Dominik Bork University of Vienna, Austria

Xavier Boucher Ecole Nationale Supérieure des Mines de Saint Etienne,

France

Robert Andrei Buchmann Babeş-Bolyai University of Cluj Napoca, Romania

VIII Organization

Rimantas Butleris Kaunas University of Technology, Lithuania

Albertas Caplinskas Vilnius University, Lithuania Sheffield Hallam University, UK Tony Clark

Université Paris 1 Panthéon Sorbonne, France Rolland Colette

Sergio De Cesare The University of Westminster, UK

Wolfgang Deiters Fraunhofer ISST, Germany Serge Demeyer Universiteit Antwerpen, Belgium **Dulce Domingos** Universidade de Lisboa, Portugal University of Rostock, Germany Michael Fellmann University of Bamberg, Germany Hans-Georg Fill University of Delaware, USA Guido Geerts

Marcela Genero University of Castilla-La Mancha, Spain Universidad Tecnológica de Chile, Chile Giovanni Giachetti Vrije Universiteit Amsterdam, The Netherlands Jaap Gordijn

Riga Technical University, Latvia Jānis Grabis

Federal University of Espirito Santo (UFES), Brazil Giancarlo Guizzardi

Yoshinori Hara Kyoto University, Japan

HAN University of Applied Sciences, The Netherlands Stijn Hoppenbrouwers

Jennifer Horkoff Chalmers University of Gothenburg, Sweden

University of Skövde, Sweden Manfred Jeusfeld

Royal Institute of Technology, Sweden Paul Johannesson

Ivan Jureta University of Namur, Belgium Commitment AS, Norway Håvard Jørgensen

University of Duisburg Essen, Germany Monika Kaczmarek

University of Vienna, Austria Dimitris Karagiannis Scape Consulting GmbH, Germany Lutz Kirchner Marite Kirikova Riga Technical University, Latvia

IDI, NTNU, Norway John Krogstie

Robert Lagerström Royal Institute of Technology, Sweden

University of Rostock, Germany Birger Lantow

Facultés Universitaires Saint-Louis, Belgium Wim Laurier Ulrike Lechner Universität der Bundeswehr München, Germany Chonbuk National University, South Korea Moonkun Lee Technische Universität München, Germany Florian Matthes

University of Tartu, Estonia Raimundas Matulevicius

Alpen-Adria-Universität Klagenfurt, Austria Heinrich C. Mayr

Graham Mcleod Inspired.org, South Africa Haralambos Mouratidis University of Brighton, UK

Nellborn Management Consulting AB, Sweden Christer Nellborn Université Paris 1 Panthéon Sorbonne, France Selmin Nurcan

Andreas L Opdahl University of Bergen, Norway

Universitat Politecnica de Valencia, Spain Oscar Pastor Lopez

Anne Persson University of Skövde, Sweden University of Namur, Belgium Michael Petit The University of Manchester, UK Ilias Petrounias

ISTI - CNR, Italy Andrea Polini

Simon Polovina Sheffield Hallam University, UK

Henderik Proper Public Research Centre Henri Tudor, Luxembourg

Jolita Ralyte University of Geneva, Switzerland

Ben Roelens Ghent University, Belgium

Kurt Sandkuhl The University of Rostock, Germany Ulf Seigerroth Jönköping University, Sweden

Estefania Serral Assensio KU Leuven, Belgium

Khurram Shahzad University of the Punjab, Pakistan Nikolay Shilov SPIIRAS, Russian Federation

Keng Siau Missouri University of Science and Technology, USA

Pnina Soffer University of Haifa, Israel
Janis Stirna Stockholm University, Sweden
Darijus Strasunskas POSC Caesar Association, Norway
Eva Söderström University of Skövde, Sweden

Victoria Torres Universidad Politécnica de Valencia, Spain

Irene Vanderfeesten Technische Universiteit Eindhoven, The Netherlands

Jan Vanthienen KU Leuven, Belgium

Olegas Vasilecas Vilnius Gediminas Technical University, Lithuania

Hans Weigand Tilburg University, The Netherlands
Eric Yu University of Toronto, Canada
Jelena Zdravkovic Stockholm University, Sweden

Contents

| Regular | Papers |
|---------|---------------|
|---------|---------------|

| Domain Modelling in Bloom: Deciphering How We Teach It Daria Bogdanova and Monique Snoeck | 3 |
|---|-----|
| Information Security Risk Management | 18 |
| Using Grounded Theory for Domain Specific Modelling Language Design: Lessons Learned from the Smart Grid Domain | 34 |
| Towards Meta Model Provenance: A Goal-Driven Approach to Document the Provenance of Meta Models | 49 |
| Light Touch Identification of Cost/Risk in Complex Socio-Technical Systems | 65 |
| The OntoREA© Accounting and Finance Model: A Retroactive DSRM Demonstration Evaluation | 81 |
| Goals, Workflow, and Value: Case Study Experiences with Three Modeling Frameworks | 96 |
| An Evaluation Framework for Design-Time Context-Adaptation of Process Modelling Languages | 112 |
| Capability-Driven Digital Service Innovation: Implications from Business Model and Service Process Perspectives | 126 |
| Designing Process Architectures for User Engagement with Enterprise Cognitive Systems | 141 |

| An Analysis of Enterprise Architecture for Federated Environments | 156 |
|---|-----|
| From Indicators to Predictive Analytics: A Conceptual Modelling Framework | 171 |
| Product Life-Cycle Assessment in the Realm of Enterprise Modeling Mario Nolte and Monika Kaczmarek-Heß | 187 |
| Towards Reasoning About Pivoting in Startups and Large Enterprises with i* | 203 |
| Evolution Models for Information Systems Evolution Steering Jolita Ralyté and Michel Léonard | 221 |
| Toward GDPR-Compliant Socio-Technical Systems: Modeling Language and Reasoning Framework | 236 |
| Development of Capability Driven Development Methodology: Experiences and Recommendations | 251 |
| Management Structure Based Government Enterprise Architecture Framework Adaption in Situ | 267 |
| NEXT: Generating Tailored ERP Applications from Ontological Enterprise Models | 283 |
| An Integrated Enterprise Modeling Framework Using the RUP/UML Business Use-Case Model and BPMN | 299 |
| Short Papers | |
| A Method for Effective Use of Enterprise Modelling Techniques in Complex Dynamic Decision Making | 319 |

| | Contents | XIII |
|--|----------|------|
| Streamlining Structured Data Markup and Agile Modelling M Ana-Maria Ghiran, Robert Andrei Buchmann, Cristina-Clau and Dimitris Karagiannis | | 331 |
| Integrating Local and Global Optimization in Capability Deliv Kurt Sandkuhl | /ery | 341 |
| The Digital Business Architect – Towards Method Support for Digital Innovation and Transformation | | 352 |
| Author Index | | 363 |