

Selmin Nurcan · Pnina Soffer
Marko Bajec · Johann Eder (Eds.)

Advanced Information Systems Engineering

28th International Conference, CAiSE 2016
Ljubljana, Slovenia, June 13–17, 2016
Proceedings

Editors

Selmin Nurcan
Université Paris 1 Panthéon-Sorbonne
Paris
France

Pnina Soffer
Department of Information Systems
University of Haifa
Haifa
Israel

Marko Bajec
University of Ljubljana
Ljubljana
Slovenia

Johann Eder
Alpen-Adria Universität Klagenfurt
Klagenfurt
Austria

ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-319-39695-8 ISBN 978-3-319-39696-5 (eBook)
DOI 10.1007/978-3-319-39696-5

Library of Congress Control Number: 2016939988

LNCS Sublibrary: SL3 – Information Systems and Applications, incl. Internet/Web, and HCI

© Springer International Publishing Switzerland 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 Switzerland

Contents

Collaboration

View-Based Near Real-Time Collaborative Modeling for Information Systems Engineering	3
<i>Petru Nicolaescu, Mario Rosenstengel, Michael Derntl, Ralf Klamma, and Matthias Jarke</i>	
A Framework for Model-Driven Execution of Collaboration Structures	18
<i>Christoph Mayr-Dorn and Schahram Dustdar</i>	
Social Business Intelligence in Action	33
<i>Matteo Francia, Enrico Gallinucci, Matteo Golfarelli, and Stefano Rizzi</i>	

Business Process Modeling

To Integrate or Not to Integrate – The Business Rules Question	51
<i>Wei Wang, Marta Indulska, and Shazia Sadiq</i>	
Micro-Benchmarking BPMN 2.0 Workflow Management Systems with Workflow Patterns	67
<i>Marigianna Skouradaki, Vincenzo Ferme, Cesare Pautasso, Frank Leymann, and André van Hoorn</i>	
Improving Understandability of Declarative Process Models by Revealing Hidden Dependencies	83
<i>Johannes De Smedt, Jochen De Weerd, Estefanía Serral, and Jan Vanthienen</i>	

Innovation, Gamification

The Authentication Game - Secure User Authentication by Gamification? . . .	101
<i>Frank Ebbers and Philipp Brune</i>	
Improving the Length of Customer Relationships on the Mobile Computer Game Business	116
<i>Erno Vanhala and Jussi Kasurinen</i>	
ADInnov: An Intentional Method to Instil Innovation in Socio-Technical Ecosystems	133
<i>Mario Cortes-Cornax, Agnès Front, Dominique Rieu, Christine Verdier, and Fabrice Forest</i>	

Mining and Business Process Performance

A Visual Approach to Spot Statistically-Significant Differences in Event Logs Based on Process Metrics. 151
Alfredo Bolt, Massimiliano de Leoni, and Wil M.P. van der Aalst

Business Process Performance Mining with Staged Process Flows. 167
Hoang Nguyen, Marlon Dumas, Arthur H.M. ter Hofstede, Marcello La Rosa, and Fabrizio Maria Maggi

Minimizing Overprocessing Waste in Business Processes via Predictive Activity Ordering 186
Ilya Verenich, Marlon Dumas, Marcello La Rosa, Fabrizio Maria Maggi, and Chiara Di Francescomarino

Requirements Engineering

Formalizing and Modeling Enterprise Architecture (EA) Principles with Goal-Oriented Requirements Language (GRL) 205
Diana Marosin, Marc van Zee, and Sepideh Ghanavati

Engineering Requirements with *Desiree*: An Empirical Evaluation 221
Feng-Lin Li, Jennifer Horkoff, Lin Liu, Alex Borgida, Giancarlo Guizzardi, and John Mylopoulos

A Modelling Language for Transparency Requirements in Business Information Systems 239
Mahmood Hosseini, Alimohammad Shahri, Keith Phalp, and Raian Ali

Process Mining

The ROAD from Sensor Data to Process Instances via Interaction Mining . . . 257
Arik Senderovich, Andreas Rogge-Solti, Avigdor Gal, Jan Mendling, and Avishai Mandelbaum

Correlating Unlabeled Events from Cyclic Business Processes Execution 274
Dina Bayomie, Ahmed Awad, and Ehab Ezat

Efficient and Customisable Declarative Process Mining with SQL. 290
Stefan Schönig, Andreas Rogge-Solti, Cristina Cabanillas, Stefan Jablonski, and Jan Mendling

Conceptual Modeling

- Using a Well-Founded Multi-level Theory to Support the Analysis and Representation of the Powertype Pattern in Conceptual Modeling 309
Victorio Albani Carvalho, João Paulo A. Almeida, and Giancarlo Guizzardi
- Mutation Operators for UML Class Diagrams 325
Maria Fernanda Granda, Nelly Condori-Fernández, Tanja E.J. Vos, and Oscar Pastor
- Automated Clustering of Metamodel Repositories 342
Francesco Basciani, Juri Di Rocco, Davide Di Ruscio, Ludovico Iovino, and Alfonso Pierantonio

Mining and Decision Support

- Predictive Business Process Monitoring Framework with Hyperparameter Optimization. 361
Chiara Di Francescomarino, Marlon Dumas, Marco Federici, Chiara Ghidini, Fabrizio Maria Maggi, and Williams Rizzi
- Decision Mining Revisited - Discovering Overlapping Rules 377
Felix Mannhardt, Massimiliano de Leoni, Hajo A. Reijers, and Wil M.P. van der Aalst
- An Adaptability-Driven Model and Tool for Analysis of Service Profitability 393
Ouh Eng Lieh and Stan Jarzabek

Cloud and Services

- Optimizing Monitorability of Multi-cloud Applications 411
Edoardo Fadda, Pierluigi Plebani, and Monica Vitali
- CloudMap*: A Visual Notation for Representing and Managing Cloud Resources. 427
Denis Weerasiri, Moshe Chai Barukh, Boualem Benatallah, and Cao Jian
- Keep Calm and Wait for the Spike! Insights on the Evolution of Amazon Services. 444
Apostolos V. Zarras, Panos Vassiliadis, and Ioannis Dinos

Variability and Configuration

Comprehensive Variability Analysis of Requirements and Testing Artifacts 461
Michal Steinberger and Iris Reinhartz-Berger

Comprehensibility of Variability in Model Fragments for Product Configuration 476
Jorge Echeverría, Francisca Pérez, Carlos Cetina, and Óscar Pastor

Static Analysis of Dynamic Database Usage in Java Systems 491
Loup Meurice, Csaba Nagy, and Anthony Cleve

Open Source Software

A Longitudinal Study of Community-Oriented Open Source Software Development 509
Kateryna Neulinger, Anna Hannemann, Ralf Klamma, and Matthias Jarke

OSSAP – A Situational Method for Defining Open Source Software Adoption Processes 524
Lidia López, Dolors Costal, Jolita Ralyté, Xavier Franch, Lucía Méndez, and Maria Carmela Annosi

Business Process Management

Narrowing the Business-IT Gap in Process Performance Measurement 543
Han van der Aa, Adela del-Río-Ortega, Manuel Resinas, Henrik Leopold, Antonio Ruiz-Cortés, Jan Mendling, and Hajo A. Reijers

A Configurable Resource Allocation for Multi-tenant Process Development in the Cloud 558
Emna Hachicha, Nour Assy, Walid Gaaloul, and Jan Mendling

Context-Aware Analysis of Past Process Executions to Aid Resource Allocation Decisions 575
Renuka Sindhgatta, Aditya Ghose, and Hoa Khanh Dam

Author Index 591