Series Editors

Wil van der Aalst
  *Eindhoven Technical University, The Netherlands*

John Mylopoulos
  *University of Trento, Italy*

Norman M. Sadeh
  *Carnegie Mellon University, Pittsburgh, PA, USA*

Michael J. Shaw
  *University of Illinois, Urbana-Champaign, IL, USA*

Clemens Szyperski
  *Microsoft Research, Redmond, WA, USA*
Preface

These proceedings contain the final versions of papers accepted for the workshops that were held in conjunction with the 6th International Conference on Business Process Management (BPM 2008) that took place in Milan, Italy. Thirteen workshop proposals were submitted for this conference, nine of which were selected, and ultimately they ran concurrently on September 1, 2008. This was the fourth year running for BPM workshops, a testament to the continued success of the workshop program.

This year the workshops included some new emerging areas:

**Business Process Management and Social Software** focused on the interaction of social software and the underlying paradigm of social production with business processes, by exploring how social software and social production interact with business process management, how business process management has to change to comply with social production, and how business processes may profit from social techniques.

**Model-Driven Engineering for Business Process Management** was about the application of model-driven engineering to business process management, by focusing on research problems that arise when the model-driven engineering and development methodology is applied to automate the whole lifecycle of business process modeling artifacts (e.g., automatically mapping high-level business process models to executable IT-level workflows).

**Process Management for Highly Dynamic and Pervasive Scenarios** recognized how nowadays process management systems are also being used in pervasive and highly dynamic situations, such as emergency management, pervasive healthcare and ambient intelligence, thus requiring novel approaches merging traditional BPM with artificial intelligence, agent programming and robotics.

**QoS of Self-healing Web Services** attacked the emerging area of Web service composition, QoS management and diagnosis, by focusing on distributed and centralized solutions for the diagnosis and repair of choreographed and/or orchestrated Web services, QoS management in choreographed and/or orchestrated Web services, ontologies for QoS.

In addition several well-established workshops completed the program, namely:

**Collaborative Business Processes** (the second edition) studied how, in these times in which organizations have been undergoing a thorough transformation towards highly flexible and agile collaborations, the business processes of different organizations are required to be integrated seamlessly, while the constructed business process network dynamically evolves to adapt to the continuously changing business conditions.
Business Process Design (the fourth edition) addressed process design, by focusing, besides methodologies, on constraints in process design, user involvement, process reference models and process design quality.

Business Process Intelligence (the fourth edition) considered the application of various measurement and analysis techniques in the area of business process management, by taking into account tools for managing process execution quality by offering several features such as analysis, prediction, monitoring, control, and optimization.

Process-Oriented Information Systems in Healthcare (the second edition) recognized the importance of patient-centered process support in healthcare and looked into the potential benefits and limitations of IT support for healthcare processes.

Semantics for Web Services (the third edition) considered some of the latest research efforts in the field of Semantic Web services including relevant tools and techniques and real-world applications of such services.

We would like to thank the workshop organizers for their tremendous efforts in the preparation for the workshops, the organization of the reviews, the onsite moderation of the workshops, and the publication process. It would not have been possible to hold such successful workshops without their dedication and commitment. We also extend our thanks to the authors for their submissions to the workshops, to the Program Committee members and the additional reviewers for their reviews, and last but not least to the invited speakers for contributing to an interesting overall program.

September 2008

Danilo Ardagna
Jian Yang
Massimo Mecella
Organization

Workshop Organizing Committee

Danilo Ardagna
Publication Chair
Dipartimento di Elettronica e Informazione
Politecnico di Milano, Italy

Jian Yang
Workshop Co-chair
Department of Computing
Macquarie University, Sydney, Australia

Massimo Mecella
Workshop Co-chair
Dipartimento di Informatica e Sistemistica ANTONIO RUBERTI
SAPIENZA Università di Roma, Italy

Fourth International Workshop on Business Process Design (BPD 2008)

Hajo Reijers
Eindhoven University of Technology, The Netherlands

Selma Limam Mansar
Carnegie Mellon University, Qatar

Michael Rosemann
Queensland University of Technology, Australia

Fourth International Workshop on Business Process Intelligence (BPI 2008)

Malu Castellanos
Hewlett-Packard Laboratories, USA

Ana Karla Alves de Medeiros
Eindhoven University of Technology, The Netherlands

Jan Mendling
Queensland University of Technology, Australia

Barbara Weber
Universität Innsbruck, Austria
First International Workshop on Model-Driven Engineering for Business Process Management (MDE4BPM 2008)

Cesare Pautasso
University of Lugano, Switzerland

Jana Koehler
IBM Zurich Research Lab, Switzerland

First International Workshop on Process Management for Highly Dynamic and Pervasive Scenarios (PM4HDPS 2008)

Massimiliano de Leoni
SAPIENZA Università di Roma, Italy

Schahram Dustdar
Vienna University of Technology, Austria

Arthur ter Hofstede
Queensland University of Technology, Australia


Richard Lenz
University of Erlangen and Nuremberg, Germany

Mor Peleg
University of Haifa, Israel

Manfred Reichert
University of Ulm, Germany

First International Workshop on QoS of Self-healing Web Services (QSWS 2008)

Liliana Ardissono
Università di Torino, Italy

Danilo Ardagna
Politecnico di Milano, Italy

Khalil Drira
University of Toulouse, France
Third International Workshop Semantics for Web Services (semantics4ws 2008)

Steven Battle
Hewlett-Packard Labs, UK

John Domingue
The Open University, UK

Martin Hepp
Bundeswehr University Munich, Germany

Dumitru Roman
STI Innsbruck, Austria

Second International Workshop on Collaborative Business Processes (CBP 2008)

Chengfei Liu
Swinburne University of Technology, Australia

Wasim Sadiq
SAP Research, Australia

Xiaohui Zhao
Swinburne University of Technology, Australia

First International Workshop on Business Process Management and Social Software (BPMS 2008)

Selmin Nurcan
University Paris 1 Panthéon Sorbonne, France

Rainer Schmidt
Aalen University, Germany
Table of Contents

BPD Workshop

Introduction to the Fourth Workshop on Business Process Design (BPD 2008) ................................................................. 3
  *Hajo A. Reijers, Selma Limam Mansar, and Michael Rosemann*

Detecting Regulatory Compliance for Business Process Models through Semantic Annotations .................................................. 5
  *Guido Governatori, Jörg Hoffmann, Shazia Sadiq, and Ingo Weber*

Crosscutting Concern Documentation by Visual Query of Business Processes ................................................................. 18
  *Chiara Di Francescomarino and Paolo Tonella*

Real Support for Perspective-Compliant Business Process Design ........ 32
  *Agnes Koschmider, Francois Habryn, and Florian Gottschalk*

Elicitation of Requirements for a Business Process Model Repository ... 44
  *Khurram Shahzad, Birger Andersson, Maria Bergholtz, Ananda Edirisuriya, Tharaka Ilayperuma, Prasad Jayaweera, and Paul Johannesson*

Issues in Modeling Process Variants with Provop .......................... 56
  *Alena Hallerbach, Thomas Bauer, and Manfred Reichert*

On the Alignment of Business Models and Process Models .............. 68
  *Ananda Edirisuriya and Paul Johannesson*

Dimensions of Business Processes Quality (QoBP) ......................... 80
  *Mitra Heravizadeh, Jan Mendling, and Michael Rosemann*

BPI Workshop

Introduction to the Fourth International Workshop on Business Process Intelligence (BPI 2008) .................................................. 95
  *Malu Castellanos, Ana Karla Alves de Medeiros, Jan Mendling, and Barbara Weber*

Bayesian Classification of Events for Task Labeling Using Workflow Models ................................................................. 97
  *Scott Buffett and Liqiang Geng*

Trace Clustering in Process Mining ........................................... 109
  *Minseok Song, Christian W. Günther, and Wil M.P. van der Aalst*
XII Table of Contents

Mining Based on Learning from Process Change Logs ....................... 121
    Chen Li, Manfred Reichert, and Andreas Wombacher

Checking Compliance of Execution Traces to Business Rules .......... 134
    Federico Chesani, Paola Mello, Marco Montali, Fabrizio Riguzzi,
    Maurizio Sebastianis, and Sergio Storari

Detecting Intrinsic Inefficiency on Process Level: Benchmarking of
Transactions in Banking .................................................. 146
    Andreas Burger and Jürgen Moormann

Abductive Workflow Mining ............................................. 158
    Scott Buffett and Bruce Hamilton

New Quality Metrics for Evaluating Process Models ....................... 164
    Zan Huang and Akhil Kumar

MDE4BPM Workshop

Introduction to the First International Workshop on Model-Driven
Engineering for Business Process Management (MDE4BPM 2008) .... 173
    Cesare Pautasso and Jana Koehler

Business to IT Transformations Revisited ............................. 176
    Sebastian Stein, Stefan Kühne, and Konstantin Ivanov

A Model-Driven Approach to Implementing Coordination Protocols in
BPEL ............................................................................. 188
    Oliver Kopp, Branimir Wetzstein, Ralph Mietzner, Stefan Pottinger,
    Dimka Karastoyanova, and Frank Leymann

Towards Transformations from BPMN to Heterogeneous Systems ...... 200
    Tobias Küster and Axel Heßler

Business Process Modelling with Continuous Validation ............... 212
    Stefan Kühne, Heiko Kern, Volker Gruhn, and Ralf Laue

On the Formal Generation of Process Redesigns ........................ 224
    Mariska Netjes, Hajo A. Reijers, and Wil M.P. van der Aalst

Translating BPMN Models into UML Activities .......................... 236
    María Agustina Cibrán

PM4HDPS Workshop

Introduction to the First International Workshop on Process
Management for Highly Dynamic and Pervasive Scenarios (PM4HDPS
2008) ............................................................................. 251
    Massimiliano de Leoni, Schahram Dustdar, and
    Arthur H.M. ter Hofstede
Towards Process Models for Disaster Response .......................... 254
  Dirk Fahland and Heiko Woith

Workflows in Dynamic Development Processes ......................... 266
  Thomas Heer, Christoph Briem, and René Wörzberger

Hypergraph-Based Modeling of Ad-Hoc Business Processes .......... 278
  Artem Polyvyanyy and Mathias Weske

Domain-Driven Process Adaptation in Emergency Scenarios ............ 290
  Marcello La Rosa and Jan Mendling

Supporting Emergency Management through Process-Aware Information Systems ........................................ 298
  Dirk Hagebölling and Massimiliano de Leoni

ProHealth Workshop

  Richard Lenz, Mor Peleg, and Manfred Reichert

Process Mining in Healthcare: A Contribution to Change the Culture of Blame .................................................. 308
  Silvana Quaglini

A Concept for the Assessment of Electronic Communication in Integrated Information Systems ........................................ 312
  Samrend Saboor and Elske Ammenwerth

Management of Knowledge-Intensive Healthcare Processes on the Example of General Medical Documentation ........................ 324
  Danny Ammon, Dirk Hoffmann, Tobias Jakob, Ekkehard Finkeissen, Vesko Detschew, and Thomas Wetter

From Paper Based Clinical Practice Guidelines to Declarative Workflow Management ........................................... 336
  Karen Marie Lyng, Thomas Hildebrandt, and Raghava Rao Mukkamala

Petri Nets as a Formalism for Comparing Expressiveness of Workflow-Based Clinical Guideline Languages ..................... 348
  María Adela Grando, David W. Glasspool, and John Fox

Flexibility Schemes for Workflow Management Systems ............. 361
  R.S. Mans, W.M.P. van der Aalst, N.C. Russell, and P.J.M. Bakker

Integrating Healthcare Ontologies: Inconsistency Tolerance and Case Study .................................................. 373
  Fahim Imam and Wendy MacCaull
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promoting Process-Based Collaboration Awareness to Integrate Care</td>
<td>385</td>
</tr>
<tr>
<td>Teams</td>
<td></td>
</tr>
<tr>
<td><em>Federico Cabitza, Marco P. Locatelli, and Carla Simone</em></td>
<td></td>
</tr>
<tr>
<td>Session-Aware Clinical Information Systems</td>
<td>397</td>
</tr>
<tr>
<td><em>Øystein Nytrø, Inger Dybdahl Sørby, and Ole A. Alsos</em></td>
<td></td>
</tr>
<tr>
<td>Integrating Humans, Devices, and Events in Clinical Workflow</td>
<td>408</td>
</tr>
<tr>
<td>Processes</td>
<td></td>
</tr>
<tr>
<td><em>Jan-Christian Kuhr, Jan Pretzel, Dierk A. Vagts, and Lachlan Aldred</em></td>
<td></td>
</tr>
<tr>
<td>QSWS Workshop</td>
<td></td>
</tr>
<tr>
<td>Introduction to the First Workshop on QoS in Self-healing Web Services (QSWS 2008)</td>
<td>419</td>
</tr>
<tr>
<td><em>Liliana Ardissono, Danilo Ardagna, and Khalil Drira</em></td>
<td></td>
</tr>
<tr>
<td>On Modeling and Maximizing Business Value for Autonomic Service-Oriented Systems</td>
<td>422</td>
</tr>
<tr>
<td><em>Vladimir Tosic</em></td>
<td></td>
</tr>
<tr>
<td>On Combining WS-Policy4MASC and ASF to Support Business-Driven Autonomic Service-Oriented Computing</td>
<td>434</td>
</tr>
<tr>
<td><em>Vladimir Tosic, Yan Liu, and Liming Zhu</em></td>
<td></td>
</tr>
<tr>
<td>Self-healing Systems and Web Services: The WS-Diamond Approach</td>
<td>440</td>
</tr>
<tr>
<td><em>Barbara Pernici</em></td>
<td></td>
</tr>
<tr>
<td>Probabilistic Time Management of Choreographies</td>
<td>443</td>
</tr>
<tr>
<td><em>Johann Eder, Horst Pichler, and Amirreza Tahamtan</em></td>
<td></td>
</tr>
<tr>
<td>Reasoning about Repairability of Workflows at Design Time</td>
<td>455</td>
</tr>
<tr>
<td><em>Gaston Tagni, Annette ten Teije, and Frank van Harmelen</em></td>
<td></td>
</tr>
<tr>
<td>Enhancing Web Service Composition by Means of Diagnosis</td>
<td>468</td>
</tr>
<tr>
<td><em>Liliana Ardissono, Stefano Bocconi, Luca Console, Roberto Furnari, Anna Goy, Giovanna Petrone, Claudia Picardi, Marino Segnan, and Daniele Theseider Dupré</em></td>
<td></td>
</tr>
<tr>
<td>semantics4ws Workshop</td>
<td></td>
</tr>
<tr>
<td>Introduction to the Third Edition of the Workshop Advances in</td>
<td>483</td>
</tr>
<tr>
<td>Semantics for Web Services 2008 (semantics4ws 2008)</td>
<td></td>
</tr>
<tr>
<td><em>Steven Battle, John Domingue, Martin Hepp, and Dumitru Roman</em></td>
<td></td>
</tr>
<tr>
<td>Semantically Annotated EPC within Semantic Business Process</td>
<td>486</td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td><em>Agata Filipowska, Monika Kaczmarek, and Sebastian Stein</em></td>
<td></td>
</tr>
</tbody>
</table>
ARIS for Semantic Business Process Management .............................. 498
  Sebastian Stein, Christian Stamber, and Marwane El Kharbili

Auto-completion for Executable Business Process Models ............. 510
  Matthias Born, Christian Brelage, Ivan Markovic,
  Daniel Pfeiffer, and Ingo Weber

Service Discovery in Ubiquitous Environments: Approaches and
Requirements for Context-Awareness ........................................ 516
  Mohamed Sellami, Samir Tata, and Bruno Defude

Ontology-Based Data Mediation in BPEL (For Semantic Web
Services) .................................................................................. 523
  Jörg Nitzsche and Barry Norton

A Framework for Dependency Based Automatic Service Composition ... 535
  Abrehet M. Omer and Alexander Schill

Ontology-Based Behavioural Reasoning for Business Processes ........ 542
  Barry Norton

CBP Workshop

Introduction to the Second Workshop on Collaborative Business
Processes (CBP 2008) ................................................................. 557
  Chengfei Liu, Wasim Sadiq, and Xiaohui Zhao

Quality Contracts for Cooperative Services and Associated Resources... 561
  Marco Comuzzi, Mariagrazia Fugini, and Stefano Modafferi

Recursive Construction and Evolution of Collaborative Business
Processes .................................................................................. 573
  Nikolay D. Mehandjiev, Iain D. Stalker, and Martin R. Carpenter

Towards a BPMN Semantics Using UML Models ......................... 585
  Oana Nicolae, Mirel Cosulschi, Adrian Giorca, and Gerd Wagner

Distribution and Composition of Collaborative Business Processes
through Peer-to-Peer Networks .................................................. 597
  Dirk Werth, Philipp Walter, and Peter Loos

Dynamic Selection of Service Peers with Multiple Property
Specifications ............................................................................. 609
  Jun Shen, Shuai Yuan, and Aneesh Krishna

Characterization of Methods for Process-Oriented Engineering of
SOA ......................................................................................... 621
  Jan Ricken and Michaël Petit
A Case Study of Business Process Interoperability in a Logistics Supply Chain Environment ................................................................. 633  
Simon Martin and Laurent Bagnoud

BPMS2 Workshop

Introduction to the First International Workshop on Business Process Management and Social Software (BPMS2 2008) ...................... 647  
Selmin Nurcan and Rainer Schmidt

BPMS2 Workshop

BPM and Social Software ........................................ 649  
Rainer Schmidt and Selmin Nurcan

Business Process Management with Social Software Systems – A New Paradigm for Work Organisation ........................................... 659  
Paul Johannesson, Birger Andersson, and Petia Wohed

Social Software for Modeling Business Processes ....................... 666  
Agnes Koschmider, Minseok Song, and Hajo A. Reijers

Automating Knowledge Transfer and Creation in Knowledge Intensive Business Processes ................................................................. 678  
Michael Granitzer, Gisela Granitzer, Klaus Tochtermann, Stefanie Lindstaedt, Andreas Rath, and Wolfgang Groiß

Digital Identity and Reputation in the Context of a Bounded Social Ecosystem ................................................................. 687  
Ben Jennings and Anthony Finkelstein

From a Social Wiki to a Social Workflow System ............................ 698  
Gustaf Neumann and Selim Erol

Utilizing Firm-Hosted Online Communities in Software Product Business: A Dimensional View ........................................ 709  
Sami Jantunen, Kari Smolander, Sanna Malinen, Tytti Virtanen, and Sari Kujala

Workflow Enactment in a Social Software Environment .................... 716  
Davide Rossi and Fabio Vitali

Author Index ........................................................................ 723