BIR 2023 Workshops and Doctoral Consortium

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The International Conference on Perspectives in Business Informatics Research (BIR) series focuses on the fields of business informatics, business information systems and information systems. It targets research at the intersection of business applications and information systems engineering with an ambition to facilitate knowledge exchange between experienced scientists, junior researchers and practitioners. The 22nd BIR conference was organized by University of Camerino, Italy, in Ascoli Piceno during September 13–15, 2023, with the central theme being Business Informatics for Sustainable Innovation.

This volume contains publications presented during the conference workshops and the Doctoral Consortium:

- The 13th workshop on Business and IT Alignment (BITA) investigates the enterprise dimensions and governance mechanisms involved in aligning business and IT. The event received 11 submissions out of which it accepted 3 regular papers and 4 short papers;
- The 8th workshop on Managed Complexity (ManComp) continued a workshop series that is traditional to BIR, addressing the challenge of conceptualizing and tackling complexity from the perspective of applied informatics. The event attracted 4 submissions, accepting 3 regular papers and one short paper;
- The 1st workshop on Domain-specific Modeling Methods and Tools (OMiLAB-KNOW) was initiated by the OMiLAB community of practice (http://omilab.org) to stimulate experience and knowledge exchanges on domain-specific modeling methods, tools, associated requirements, challenges and empirical observations. The event invited not only OMiLAB community members but also welcomed contributors from other conceptual modeling-centric communities and attracted a total of 12 submissions of different types - from novel modeling tool prototypes to position papers and empirical analyses. The workshop finally selected 7 regular papers and one short paper;
- The 3rd workshop on Blockchain for Trusted Data Sharing (B4TD) continued a series of workshops dedicated to blockchain technologies and aiming to break technological barriers to data management on blockchains. The event received 3 submissions; accepting only one regular paper;
- The Doctoral Consortium of BIR 2023 was an occasion for PhD researchers to present their doctoral research plan and current progress and to receive feedback and ideas from senior researchers in Business Informatics acting as doctoral mentors. This year the doctoral consortium received 6 submissions, out of which 3 regular papers and one short paper were selected for inclusion in the proceedings.

Each workshop was independently chaired and had its own international program committee of experts who evaluated each submission with 2-3 reviews. A doctoral mentor evaluated and supervised each doctoral paper submission. As a result, out of 36 initial submissions, this volume

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contains a total of 17 regular papers and 7 short papers presented on the Workshops Day at BIR 2023.

As coordinators of the BIR 2023 workshops, we express our gratitude to the chairs initiating these satellite events, to their program committees, to the authors who submitted their work for evaluation and to the hosts at University of Camerino who included the Workshops Day in the BIR 2023 program.

We are also thankful to the team at CEUR-WS that provided for many years now a reliable open-access dissemination channel for the BIR satellite events.

September 2023

Andrea Morichetta
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Preface: 13th Workshop on Business and IT Alignment (BITA)

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A contemporary challenge for enterprises is to keep up with the pace of changing business demands imposed on them in different ways. There is today an obvious demand for continuous improvement and alignment in enterprises but unfortunately many organizations don't have proper instruments (methods, tools, patterns, best practices etc.) to achieve this. Enterprise modeling, enterprise architecture, and business process management are three areas belonging to business informatics traditions where the mission is to improve business practice and Business and IT Alignment (BITA). BITA is many times manifested through the transition of taking an enterprise from one state (AS-IS) into another improved state (TO-BE), i.e. a transformation of the enterprise and it's supporting IT into something that is regarded as better.

Recent developments within digitalization and digital transformation have brought new dimensions to BITA where BITA becomes an important step in relation to smart products and smart business ecosystems. A continuous challenge with BITA is to move beyond a narrow focus on one tradition or technology. There is a need to be able to deal with multidimensions of the enterprise in order to create alignment between business and IT.

Examples of such dimensions are organizational structures, strategies, architectures, business models, work practices, processes, and IS/IT structures. IT governance is also a dimension that traditionally has had a strong impact on BITA. There are ordinarily three governance mechanisms that an enterprise needs to have in place, 1) decision-making structures, 2) alignment process, and 3) formal communications.

This workshop aims to bring together people who have an interest in BITA. For this purpose, we invited researchers and practitioners from both, industry and academia, to submit original results of their completed or ongoing projects and encouraged to a broad understanding of possible approaches and solutions for BITA. Specific focus in the 2023 edition was on practices of business and IT alignment, i.e., case study and experiences papers.

The workshop received 11 submissions and after the review process seven of these submissions have been accepted for the workshop, three as full papers and four as short papers. The following topics are addressed by the seven papers:

- Workflow Optimization at Financial Institutions: Survey and Case Study
- Information Security Management Systems in Small Public Sector Organizations
- The Role of Aggregators in the Ecosystem of Energy Flexibility
- Business Intelligence in Wearable Health with focus on Transforming Smartwatch Data into Actionable Insights
- Orchestrating progression of Enterprise Data into Actionable Intelligence using Conceptual Modelling
- Workplace Safety Know-How with focus on Enhancing Workplace Safety through the Capability Driven Solution

- A Methodological Approach for Ontology-based Meta-Modelling

Acknowledgements

BITA Organization

Program Committee Chairs

- Ulf Seigerroth, University of Jönköping, Sweden
- Kurt Sandkuhl, University of Rostock, Germany, and University of Jönköping, Sweden

Program Committee

- Per Backlund, University of Skövde, Sweden
- Chiara Di Francescomarino, University of Trento, Italy
- Michael Fellmann, Rostock University, Germany
- Peter Forbrig, Rostock University, Germany
- Aurona Gerber, University of the Western Cape, South Africa
- Janis Grabis, Riga Technical University, Latvia
- Stijn Hoppenbrouwers, HAN University of Applied Science, The Netherlands
- Christina Keller, Lund University, Sweden
- Hasan Koç, Berlin International University of Applied Science, Germany
- Andreas Martin, FHNW University of Applied Science and Arts Northwestern Switzerland
- Jens Myrup Pedersen, Aalborg University, Denmark
- Achim Reiz, Rostock University, Germany
- Janis Stirna, Stockholm University, Sweden
- Wieslaw Wolny, University of Economics in Katowice, Poland

Workshop's webpage:

https://www.wirtschaftsinformatik.uni-rostock.de/forschung/veranstaltungen/selbst-organisierte-workshops/bita-2023/

Preface: 8th Workshop on Managed Complexity (ManComp)

Mārīte Kirikova[1], Peter Forbrig[2], Charles Møller[3]

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Managing Complexity and ManComp as a workshop within the International Conference on Perspectives in Business Informatics Research (BIR) has come to its eighth edition.

The workshop is focused on approaches and methods for managing complexity in the domain of applied informatics that may concern the interplay of systems and ecosystems of various sizes and substances. Its purpose is to share and transfer knowledge on complexity identification, representation, controlling and reduction as well as to exploit possible synergies in the development of innovative complexity handling strategies, approaches, and methods.

The goal of the workshop is bringing together researchers and practitioners to discuss theoretical approaches or real-life case studies featuring success and/or failure stories in managing complexity. Purpose of these discussions is to deepen the understanding of strategies, approaches, and methods in managing complexity in enterprise and software and hardware engineering. A cross-pollination of experiences in both domains is assumed.

This year we have accepted 4 contributions. The first paper, by Ahmed Dehne and Kurt Sandkuhl, "Variability modelling in Enterprise Architecture Management – survey on existing approaches" addresses variability modeling in enterprise architecture modeling. It contributes a structured overview of existing research work in this area and ponders over further research needs. Also, the second paper, by Umut Kandemir and Marite Kirikova, "Handling variability of maritime IT solutions" addresses variability, but from a different viewpoint. Here the Enterprise Architecture representation language ArchiMate and graph database are used to capture and make comfortable for analysis the variety of reported IT solutions in the maritime domain. The third paper, by Erik Heiland, Peter Hillmann, and Andreas Karcher, "Constraint based modeling according to reference design" proposes an environment that supports the designers using techniques based on reference building blocks. The fourth paper, by Aritha Kumarasinghe and Marite Kirikova, "Generic requirements template for data analytics" contributes an inductively derived template for stating requirements for data analytics projects.

The papers of ManComp 2023 help reducing complexity in their target domains by amalgamating and structuring scientific knowledge and proposing approaches to practical use of this knowledge.

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ManComp Organization

Program Committee Chairs:

- Peter Forbrig, Rostock University, Germany
- Marite Kirikova, Riga Technical University, Latvia
- Charles Møller, Aalborg University, Denmark

Program Committee:

- Robert Andrei Buchmann, Babeş-Bolyai University of Cluj Napoca, Romania
- Bertrand David, Ecole Centrale de Lyon, France
- Janis Grundspenkis, Riga Technical University, Latvia
- Saulius Gudas, Vilnius University, Lithuania
- Igli Hakrama, University of Metropolitan Tirana, Albania
- Markus Helfert, Maynooth University, Ireland
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- Bartosz Marcinkowski, University of Gdansk, Poland
- Malgorzata Pankowska, University of Economics in Katowice, Poland
- Khurram Shahzad, University of the Punjab, Pakistan
- Chris Stary, JKU, Austria
- Helena Vallo, Hult University West, Sweden
- Jelena Zdravkovic, Stockholm University, Sweden
- Iryna Zolotaryova, Simon Kuznets Kharkiv National University of Economics, Ukraine

Workshop's webpage:

https://wwwswt.informatik.uni-rostock.de/ManComp2023/

Preface: 1st Workshop on Domain-specific modeling methods and tools - OMiLAB nodes experience & knowledge exchange (OMiLAB-KNOW)

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OMILAB-KNOW – "OMiLAB Nodes experience & knowledge exchange" is the first workshop on Domain-specific Modeling Methods and Tools initiated by members of the OMiLAB community of practice (https://www.omilab.org/network/).

The goal of the workshop is to stimulate discussions on the requirements, use, design decisions, tooling and evaluations regarding domain-specific conceptual modeling methods in the context of Business Informatics Research. With this workshop we hope we paved the way to future editions to discuss the increasing importance of domain specific modeling and model-driven engineering.

The workshop also welcomes researchers outside the OMiLAB network that have a general focus on conceptual models to further enrich the knowledge exchange with other modeling-centric communities. We welcome submissions from those who would like to share developments and experience with modeling tools, modeling methods, model-driven artifacts, applications of domain-specific modeling, and empirical evaluation approaches.

This year we received 12 quality papers and each submission was reviewed by 2-3 reviewers. Seven papers were accepted as full papers and one as short paper.

The paper "Using the Fractal Enterprise Model for Analyzing and Predicting Effects from Introducing IT solutions" authored by G. Maratsi and I. Bider, uses an established enterprise modeling approach and describes its application it in a project-based use case.

Another paper that is grounded in project-based investigations is "Towards a Democratic AI-based Decision Support System to Improve Decision Making in Complex Ecosystems" authored by R. Woitsch, C. Muck, W. Utz and H. Zeiner. The paper describes a concept proposed by the EU-funded FAIRWork project.

The paper "Comparison of General-Purpose and Domain-Specific Modeling Languages in the IoT domain" written by A. Fedeli, N. Beutling, E. Laurenzi and A. Polini provides a knowledgeable comparison of the benefits and drawbacks of modeling languages according to the traditional dichotomy between general-purpose and domain-specific.

The IoT topic is also tackled as a modeling domain in a paper focusing on air conditioning facilities: "MIoTA: Modeling IoT Applications for Air Conditioning Facilities with ADOxx" by B. Nast, K. Sandkuhl, S Paulus and H. Schiller.

This application area extends towards cyber-physical systems in A. Völz, C. Muck, D. M. Amlashi and D. Karagiannis, through their paper "Bridging Haptic Design Thinking and Cyber-Physical Environments through Digital Twins using Conceptual Modeling", discussing the need for a model-driven smart innovation environment for future Digital Leaders.

Conceptual Modeling education is also investigated by I. Maslov and S. Poelmans in "Advancing the BPMN 2.0 Standard with an Extended Animated Notation: A Research Program for Token-

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CEUR Workshop Proceedings (CEUR-WS.org)

Based Process Modeling Education", which discusses techniques to improve the understandability of the BPMN standard by enhancing its notation.

The paper "Semantically annotated Learning Paths" by C. Unternährer, K. Hinkelmann and S. Schlick aims to help teachers to design courses using an ontology-supported modeling method.

The paper "A modeling method for strategic design of induced Semantic Digital Nudging" by Ş. Uifălean and R. A. Buchmann proposes a modeling method to design digital nudging solutions attached to user experience workflows.

OMILAB-KNOW Organization

Program Committee Chairs:

- Dr. Anne Gutschmidt, University of Rostock, Germany
- Dr. Ana-Maria Ghiran, Babeş-Bolyai University, Romania

Program Committee:

- Robert Buchmann, Babeş-Bolyai University, Romania
- Hans-Georg Fill, University of Fribourg, Switzerland
- Adrian Florea, Lucian Blaga University of Sibiu, Romania
- Fabrizio Fornari, University of Camerino, Italy
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- Cristina Osman, Babeş-Bolyai University, Romania
- Achim Reiz, University of Rostock, Germany
- Kristina Rosenthal, University of Hagen, Germany
- Fabiana Pirola, University of Bergamo, Italy
- Kurt Sandkuhl, University of Rostock, Germany
- Herwig Zeiner, Joanneum Research Graz, Austria

Workshop's webpage:

https://bir2023-ws.omilab.org/

Preface: 3rd Workshop on Blockchain for Trusted Data Sharing (B4TDS)

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In the last few years, many software systems are moving towards blockchain technologies since they bring many advantages in different sectors. Thanks to smart contracts, data can be manipulated and accessed by users similar to databases with enhanced trust capabilities.

This opportunity, combined with the blockchain potentialities, such as the integrity and the immutability of data, guarantees trusted evidence of the information stored and exchanged in the blockchain without relying on a central authority. This makes the blockchain the ideal technology for auditing, verification and sharing purposes, significantly changing how to design and implement next-generation distributed applications.

Recently, both academia and industry have shown an increasing interest in blockchain, looking for innovative blockchain-based technical solutions for enabling data sharing in a trusted and decentralized way. The scientific results of the workshop have the ambition to change the way to organize, store, retrieve and share data. This is towards strengthening the decentralized access to data for any businesses, organizations, or participants in worldwide distributed networks. Thus, reflecting also in the development of business information systems in which decentralization and data sharing are key challenges. For these reasons, the workshop aims to break the technological barriers to data management on blockchain technology, proposing novel approaches and solutions.

This year, the workshop received three submissions covering a wide range of blockchain technologies from foundational proposals to practical instruments. The authors' contributions concretely support the creation and deployment of blockchain-based systems, providing advanced configuration and permission mechanisms towards enabling novel kinds of trusted application systems. We thank the program committee members for the high-quality reviews contributing to the quality of the workshop.

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B4TDS organization

Program Committee Chairs:

- Alessandro Marcelletti, University of Camerino, Italy
- Felix Härer, University of Fribourg, Switzerland

Program Committee:

- Johannes Sedlmeir, University of Luxembourg, Luxembourg
- Marco Comuzzi, Ulsan National Institute of Science and Technology, South Korea
- Bernhard Haslhofer, Complexity Science Hub Vienna, Austria
- Andreas Hein, Technical University of Munich, Germany
- Julius Köpke, University of Klagenfurt, Austria
- Francesco Tiezzi, University of Florence, Italy
- Andrea Morichetta, University of Camerino, Italy
- Yue Liu, Data61 CSIRO, Australia
- Abhimanyu Mukerji, Amazon, United States

Workshop's webpage:

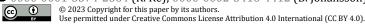https://pros.unicam.it/B4TDS2023/

Preface: Doctoral Consortium

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The Doctoral Consortium of Business Informatics Research BIR 2023 is a forum for doctoral students with the purpose of discussing their Ph.D. research work. The participants in the Doctoral Consortium have the opportunity to present their research proposals, engage in discussions with peers and experienced researchers, and receive feedback for improving their research proposal and, thereby, their doctoral theses.

The participants in the Doctoral Consortium have the opportunity to identify research issues that are related to their research interests and exchange knowledge with other doctoral students.

The proposals submitted to the Doctoral Consortium reflect the current status of the author's Ph.D. project. All proposals were reviewed by a senior researcher in business informatics. The papers were evaluated based on the following criteria: relevance, originality, appropriate research methodology, research contribution, and clarity. This year we were able to accept four contributions for publication, and two additional ones participated in the DC discussions without publication. The participants are from Italy, Germany, Romania, and Spain.

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Doctoral Consortium Organization

Doctoral Consortium Chairs:

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- Barbara Re, University of Camerino, Italy

Doctoral Consortium Faculty Members

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- Emanuele Laurenzi, FHNW University of Applied Sciences and Arts Northwestern Switzerland
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