

## Preface

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 the communication between scientists and practitioners. The 20th BIR conference was organized (due to the Covid-19 pandemic) as virtual, online event by Vienna University, Austria, during September 22–24, 2021. The theme of the conference was “Artificial Intelligence in Business Informatics”. This volume contains publications presented during the conference workshops and the Doctoral Consortium. More specifically:

- The 6th workshop on Managed Complexity (ManComp). ManComp focuses on approaches and methods for managing complexity in the domain of applied informatics. The goal is to discuss theoretical approaches and real-life case studies featuring success and/or failure stories in managing complexity representation, control and reduction;
- The 12th workshop on Information Logistics and Digital Transformation (ILOG). The digital transformation of organizations poses new requirements to optimized information supply and emphasizes the importance of information logistics solutions. ILOG’s major objective is to discuss approaches for digital transformation, information logistics, semantic technologies and knowledge-based systems;
- The 1st Workshop on Blockchain for Trusted Data Sharing (B4TDS). B4TDS focuses on the blockchain as technology for auditing, verification and sharing purposes, and to design and implement next-generation distributed applications. The main goal of this workshop is to discuss theoretical and practical approaches or real-life successful case studies in this field;
- The Doctoral Consortium of BIR 2021, where young researchers are invited to present their results and receive constructive feedback from senior researchers and experts in their field of work.

Each workshop as well as the Doctoral Consortium had own organizers and an international program committee. After the peer-review process, the BIR 2021 workshop program committees have selected 11 scientific papers for the presentation and inclusion to this volume. In addition, six papers were selected by the BIR2021 Doctoral Consortium organizers. All contributions address significant and emerging topics of the business informatics field.

As chairs of BIR 2021 workshops, we would like to express our great thanks to all workshop organizers, organizers of the Doctoral Consortium, program committee members of all workshops, BIR conferences organizers, and all the BIR 2021 workshop and Doctoral Consortium authors for their crucial contributions.

September 2021

Marite Kirikova  
Kurt Sandkuhl

## **ManComp 2021 Workshop Preface**

Managing complexity has a long tradition for algorithms and general problems. However, it is an important issue also in Business Informatics domain. Here the complexity of different systems and systems of systems has to be managed. While complexity usually associates with large- or very large-scale systems, still managing complexity is important even for systems with small sizes operating in complex environment. Nowadays informatics requires handling complexity at different levels and configurations of social, physical, enterprise, software, and hardware systems. The workshop is focused on approaches and methods for managing complexity in the domain of applied informatics that may concern 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 development of innovative complexity handling strategies, approaches, and methods.

The ultimate 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, software and hardware engineering. A cross-pollination of experiences in both domains is assumed.

This year we have the 6th edition of the ManComp workshop. An international program committee provided reviews that allowed accept six from nine submissions. We believe that we have an interesting program and will have fruitful discussions.

September 2021

Marite Kirikova  
Peter Forbrig  
Charles Møller

## ILOG 2021 Workshop Preface

ILOG 2021 is the 12th workshop in a series that initially focused only on information logistics but extended the scope in 2017 to the neighboring topic of digital transformation. The mission of information logistics is to improve information flow in organizations by reducing information overflow and facilitating information supply that meets the demand of organizational stakeholders.

In recent years, many organizations are rethinking what customers value most and developing operating models that exploit the possibilities of big data, social media, artificial intelligence, and other new technologies for competitive differentiation. This often leads to a digital transformation of large parts of the enterprise targeting seamless integration of digital services/products with digitized and optimized operations. Efficient and target-oriented information flows are a major contribution to digital transformation.

Knowledge-intensive industry and service sectors, public organizations, and governmental bodies are dependent on accurate and timely information supply for efficient and high-quality processes and services. Intelligent information supply has become an important issue that is characterized by just-in-time, demand-oriented, and context-sensitive information. The digital transformation of organizations poses new requirements to optimized information supply and emphasizes the importance of information logistics solutions. In this context, ILOG 2021 encouraged the submission of papers addressing these requirements and potential solutions as well as submissions addressing the use of semantic technologies, like ontologies, semantic nets, semantic web standards, and other knowledge technologies. Such technologies and related methods have proven to be an important element of information logistics and solutions supporting digital transformation. Many information logistics applications would not be feasible without moving from data processing to also interpreting the meaning of this data.

The ILOG workshop aims to bring together people who have a strong interest in digital transformation, information logistics, semantic technologies, information systems, enterprise solutions, and knowledge-based systems. A broad understanding of possible approaches and solutions for information logistics and digital transformation was encouraged.

Based on at least three reviews per submission, the international Program Committee selected three high-quality papers for inclusion in the workshop and this volume. The authors of these papers include both researchers and practitioners from different disciplines. We dedicate special thanks to the members of the international Program Committee for promoting the workshop, their support in attracting high-quality submissions, and for providing excellent reviews of the submissions. Without their committed work, a workshop like ILOG 2021 would not have been possible. Our thanks also include the external reviewers supporting the paper selection process and the authors of submissions and presenters at the workshop.

September 2021

Birger Lantow  
Kurt Sandkuhl  
Ulf Seigerroth

## **B4TDS 2021 Workshop Preface**

Answer questions related to when and what data should be shared, with whom, and how the data owner should get credit or incentive to share their data are increasingly a matter of intense debate and research. In this direction, the B4TDS (Blockchain for Trusted Data Sharing) workshop has the ambition to propose new solutions strategies, approaches, and methods to organize, store, retrieve and share data exploiting the blockchain and distributed ledger technologies (DLTs).

This necessity arises since software systems are moving towards blockchain and DLTs. Indeed, thanks to smart contracts, data can be manipulated and accessed by users like in standard databases. This opportunity, combined with the blockchain and DLTs potentialities, such as the integrity and 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 and DLTs ideal for auditing, verification, and sharing purposes, changing significantly the way to design and implement next-generation distributed applications.

The workshop aims to bring together researchers and practitioners to discuss theoretical/practical approaches or real-life successful case studies.

The B4TDS workshop accepted 2 papers from researchers affiliated in Italy and Latvia. The authors cover different aspects of blockchain and trusted data sharing. The papers were reviewed and selected by the program committee after a rigorous reviewing process. Each paper was assigned to at least three members of the program committee. More information about the selection process can be found via <http://pros.unicam.it/b4tds2021/>.

September 2021

Andrea Morichetta  
Pierluigi Plebani

## **BIR 2021 Doctoral Consortium Preface**

The Doctoral Consortium of Business Informatics Research BIR 2021 is a forum for doctoral students with the purpose to discuss their PhD research work. The participants in the Doctoral Consortium have the opportunity to present their papers, engage in discussions with peers and experienced researchers and receive feedback for improving their doctoral theses. Moreover, the participants in the Doctoral Consortium have the opportunity to identify research issues that are related to their research interest and exchange knowledge with other doctoral students.

The papers submitted to the Doctoral Consortium reflect the current status of the author's PhD project. All papers were reviewed by two senior researchers in business informatics. The papers were evaluated based on the following criteria: relevance, originality, appropriate research methodology, research contribution, and clarity.

September 2021

Knut Hinkelmann  
Barbara Re

## Organization

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Björn Johansson                      Linköping University (Sweden)  
Dimitris Karagiannis              University of Vienna (Austria)

### Program Chairs

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Andrea Polini                        University of Camerino (Italy)

### Workshop Chairs

Marite Kirikova                      Riga Technical University (Latvia)  
Kurt Sandkuhl                        University of Rostock (Germany)

### Organization Chair

Victoria Döllner                      University of Vienna (Austria)

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Knut Hinkelmann                    FHNW University of Applied Sciences and Arts  
Northwestern Switzerland (Switzerland)

### BIR 2021 Doctoral Consortium Faculty Members

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(South Africa)  
Retha de la Harpe                    Cape Peninsula University of Technology  
(South Africa)  
Aurora Gerber                        University of Pretoria (South Africa)  
Emanuele Laurenzi                   FHNW University of Applied Sciences and Arts  
Northwestern Switzerland (Switzerland)  
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Hanlie Smuts                        University of Pretoria (South Africa)  
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Northwestern Switzerland (Switzerland)

### **ManComp 2021 Workshop Program Committee Chairs**

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Peter Forbrig	University of Rostock (Germany)
Charles, Møller	Aalborg University (Denmark)

### **ManComp 2021 Workshop Program Committee**

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Kurt Sandkuhl	University of Rostock (Germany)
Ulf Seigerroth	University of Jönköping (Sweden)

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