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430

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# Perspectives in Business Informatics Research


20th International Conference  
on Business Informatics Research, BIR 2021  
Vienna, Austria, September 22–24, 2021  
Proceedings

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ISSN 1865-1348                      ISSN 1865-1356 (electronic)  
Lecture Notes in Business Information Processing  
ISBN 978-3-030-87204-5              ISBN 978-3-030-87205-2 (eBook)  
<https://doi.org/10.1007/978-3-030-87205-2>

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# Preface

The 20th anniversary of the International Conference on Perspectives in Business Informatics Research (BIR 2021) was organized by the University of Vienna and held during September 22–24, 2021.

This is an important milestone in the history of European Business Informatics research, highlighted with a retrospective keynote presentation. It confirms BIR as one of the flagship conferences for this interdisciplinary field, which is at the intersection of Business Administration and Computer Science. BIR was born from a workshop series launched in the late 90s and since then it has provided a forum for scientific inquiry—primarily interested in the convergence of innovative business ecosystems and rapidly shifting technological paradigms. Business-IT alignment is therefore a core concern of the BIR community, together with its supporting methods, both conceptual and computational.

This year, the main conference received 49 submissions out of which 16 were selected after a review process involving at least 3 reviewers for each paper. This translates to a 33% acceptance rate for the main conference proceedings. The papers are grouped into the following topics: Technology Adoption and Acceptance during COVID-19 Times, Conceptual Modeling for Enterprise Systems, Enterprise Modeling Methods and Frameworks, Compliance and Normative Challenges, and Empirical Investigations on Digital Innovation and Transformation Prerequisites.

These topical headings indicate a balance between design-oriented research and empirical investigation, with the second category being boosted by challenges emerging from the pandemic conditions, especially in educational (e-learning) contexts. In the future, we hope to have less of the real challenge and more preventive or reactive treatments which must, of course, be informed by the observational research reported during these times. By balancing the empirical and design-oriented research, BIR 2021 advocates a unified view on the two types of research, as opposed to the more prominent dichotomous perception of the two approaches—empirical observation should inform innovative design and innovative design should be tweaked according to empirical experimentation. Conference and workshop papers may limit their scope to one or the other of these phases, but it is an explicit goal of conferencing to foster discussions that reveal bridges between these papers and will hopefully inspire the methodologically holistic research that we need in Business Informatics.

Traditionally, the conference has included a number of satellite events which help promote its status as a scientific networking hub that stimulates critical discussion and knowledge exchange on topics related to Business Informatics. This year, three workshops were open to submissions: the 6th edition of Managed Complexity (ManComp), the 12th edition of Information Logistics and Digital Transformation (ILOG) and the 1st edition of Blockchain for Trusted Data Sharing (B4TDS). In addition, the traditional doctoral consortium section attracted doctoral papers subjected to mentoring and recommendations that will prove insightful for junior researchers. The BIR workshops and the doctoral consortium publish a joint proceedings volume in the CEUR-WS series.

We express our gratitude to the BIR Steering Committee members who agreed to have BIR 2021 managed by our team. In particular, we thank Prof. Marite Kirikova and Prof. Kurt Sandkuhl for their decision-making assistance and for acting as this year's workshop chairs.

We thank all the authors who submitted their work and the Program Committee members who contributed timely reviews to the paper selection process. Many strong papers were submitted and the selection, aiming to preserve the traditional acceptance threshold of BIR, was particularly difficult this year.

We also thank the Open Models Laboratory (OMiLAB, [www.omilab.org](http://www.omilab.org)) community of practice for contributing either submissions or reviews to this anniversary edition of BIR.

The Springer team lead by Ralf Gerstner and Christine Reiss again provided prompt support regarding the proceedings production. We are thankful to them for the continuous partnership with BIR, which is a major factor for the conference longevity and the prestige of its proceedings.

Last but not least, the University of Vienna team led by Victoria Döller deserves congratulations for managing the successful event, which this year hosts presentations for papers accepted during both the 2020 and 2021 editions as well as the satellite events that had to be postponed last year.

August 2021

Björn Johansson  
Dimitris Karagiannis  
Robert Andrei Buchmann  
Andrea Polini

# Organization

BIR 2021 was organized and hosted at the University of Vienna, Austria, during September 22–24, 2021.

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# **The 20-years Odyssey of the Perspectives in Business Informatics Research (BIR) Conference (Keynote Talk)**

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The BIR series of conferences traces its origin back to a collaboration that took place between researchers at universities in Berlin, Rostock (Germany) and Växjö (Sweden) during the late nineties. The group in Växjö was led by professor Bengt G. Lundberg, the initiator of a workshop series on “perspectives in business informatics research”. The last workshop in this series was organized in Rostock, 2000, and became actually the starting point of the conference series “Perspectives in Business Informatics Research (BIR). The professors in Berlin, Rostock and Växjö wanted to create a forum where researchers in business informatics, junior as well as senior, could meet and discuss with each other. The primary focus was PhD students and junior researchers. The term Business Informatics was chosen as a translation of the German “wirtschaftsinformatik”.

After professor Lundberg passed away 2001, the initiative on the Swedish side was passed on to a research network named Knowledge in Organizations (KiO) also led by professor Lundberg together with two of the authors of this piece of text, Benkt Wangler and Sven Carlsson. The latter two together with their colleagues in Berlin and Rostock, and supported by PhD students, decided to continue with BIR conferences, and a second conference was then organized in Berlin 2003. From that time on the conference has been organized each year with the exception of 2020, when the conference was postponed for one year due to the Covid-19 pandemic.

The original idea was to have a series of seminars/workshops/conferences mainly for PhD students to make it possible for them to write papers, get them evaluated by senior researchers and to present the PhD students’ work. The conference should be for two full days, which was later complemented by an initial day of half or full day specialized workshops. It was also in part based on the idea of supporting PhD students and junior researchers at colleges, new universities, and other universities without strong BIR-research traditions. For example, Växjö university did not have a PhD education in business informatics (the students were enrolled at Stockholm University). However, gradually from one year to the next the ambition with the conference, the number of papers submitted and the quality of accepted papers increased. The quality of papers presented in the conference proceeding has also increased by gradually having a lower acceptance rate - the recent years this has been 30-35%. Nevertheless, the conference has always had a generous attitude towards letting junior researchers present their ideas,

if so in some special forum session not included in the official proceedings. The first focus has been extended to also include more senior researchers, but the original focus has been important and supported over the years.

Another idea was related to conference themes and research. It was said that each conference could have a specific theme, but that at the same time each conference should be eclectic regarding what to address (not bounded by the conference theme), what research approaches and methods to use, what particular theories to employ, what the philosophical underpinnings are, etc. It was decided that the conference should welcome contributions addressing immediate areas of concern (e.g., as stated in a conference's theme), situational areas of concern (e.g., business-to-business commerce), and classical areas of concern (e.g., the systems development process). Looking at the accepted papers we conclude that the BIR conferences have fulfilled the "conference themes and research" idea well.

A third idea was related to "after working hours" activities. The intention was that the conferences should arrange informal after working hours activities, not only a formal welcome reception and a conference dinner. The intention was to make it possible for more informal networking. This has been fulfilled in different forms, for example, visits to breweries with tasting, boat trips, visits to museums and guided city tours.

Gradually it also became evident that albeit the conferences welcome papers from all over the world, BIR had its domicile in the Baltic Sea region, a fact that was also explicitly stated in the conference policy. However, it was also stated that this should not hinder that it is sometimes organized elsewhere, as long as it frequently returns to the Baltic Sea region. The conference is always organized by some university local to the place where the conference is held. Looking backwards, the conference has stayed in the Baltic Sea region, but on a few occasions it has also been organized outside this area. Table 1 lists the conferences and where they were held.

At the conference in **Kaunas 2006** a formal steering committee for the conference series was set up. Benkt Wangler was elected chairman, a position that he held until 2009. Stanislaw Wrycza was then chairman 2009–2010, Kurt Sandkuhl 2010–2016 and since 2016 Marite Kirikova has been the chair of the steering committee. When Marite Kirikova was elected as chair it was also decided to have a vice chair, a position that fell upon Björn Johansson 2016. The same two persons still hold these positions.

In **Rostock 2010** the conference was complemented with a doctoral consortium to give PhD students the opportunity to present papers and PhD project ideas, and to get feedback from senior researchers on their overall PhD project. The organizers of that conference also managed to get acceptance for the BIR proceedings to be published with Springer. Hence, starting from the conference in **Rostock 2010**, the conference proceedings are published in the Springer series Lecture Notes in Business Information Processing (LNBIP). Before Springer proceedings papers were published in local proceedings according to each organizing university's policy. Occasionally complementary proceedings have also been published as CEUR Proceedings (CEUR-WS.org).

**Table 1.** BIR conferences 2003–2021

Year	Conference place	Organizing university	Conference chair/s	Proceedings editor/s	Number of accepted papers
2003	Berlin	Humboldt University of Berlin and University of Potsdam, Germany	Bernd Viehweger	Bernd Viehweger	18 full papers
2004	Rostock	University of Rostock, Germany	Hans Röck	Hans Röck	17 full papers
2005	Skövde	University of Skövde, Sweden	Benkt Wangler	Per Backlund, Sven Carlsson, Eva Söderström	13 full papers
2006	Kaunas	Kaunas University of Technology, Lithuania	Rimantas Butleris	Lina Nemuraitė, Benkt Wangler, Rita Butkienė	18 full papers plus 6 poster papers
2007	Tampere	University of Tampere, Finland	Jyrki Nummenmaa	Jyrki Nummenmaa; Eva Söderström	14 full papers
2008	Sopot	University of Gdansk, Poland	Stanislaw Wrycza	Stanislaw Wrycza	35 full papers
2009	Kristianstad	Kristianstad University, Sweden	Harald Kjellin	Jan Aidemark, Sven Carlsson, Björn Cronquist	20 full papers plus 6 short papers
2010	Rostock	University of Rostock, Germany	Peter Forbrig, Horst Gunther	Peter Forbrig, Horst Gunther	14 full papers plus 4 short papers published in the Springer LNBIP series.
2011	Riga	Riga Technical University, Latvia	Janis Grabis, Marite Kirikova	Janis Grabis, Marite Kirikova	25 full papers published in LNBIP

*(continued)*

**Table 1.** *(continued)*

Year	Conference place	Organizing university	Conference chair/s	Proceedings editor/s	Number of accepted papers
2012	Nizhny Novgorod	NRU HSE in Nizhny Novgorod, Russia	Oleg Kozyrev	Natalia Aseeva, Eduard Babkin, Oleg Kozyrev	15 full papers published in LNBIP
2013	Warsaw	Warsaw School of Economics, Poland	Andrzej Kobyliński, Andrzej Sobczak	Andrzej Kobyliński, Andrzej Sobczak	19 full papers and 5 short papers published in LNBIP
2014	Lund	Lund University, Sweden	Björn Johansson	Björn Johansson, Bo Andersson, Nicklas Holmberg	27 full papers published in LNBIP
2015	Tartu	University of Tartu, Estonia	Raimundas Matulevičius, Marlon Dumas	Raimundas Matulevičius, Marlon Dumas	16 full papers and four short papers published in LNBIP
2016	Prague	University of Economics, Czech Republic	Václav Řepa, Tomáš Bruckner	Václav Řepa, Tomáš Bruckner	22 full papers and two short papers published in LNBIP
2017	Copenhagen	Aalborg University, Denmark	Björn Johansson, Charles Møller	Björn Johansson, Charles Møller, Atanu Chaudhuri, Frantisek Sudzina	17 full papers and three short papers published in LNBIP
2018	Stockholm	Stockholm University, Sweden	Selmin Nurcan, Janis Stirna	Jelena Zdravkovic, Jānis Grabis, Selmin Nurcan, Janis Stirna	17 full papers published in LNBIP
2019	Katowice	University of Economics in Katowice, Poland	Małgorzata Pańkowska, Kurt Sandkuhl	Małgorzata Pańkowska, Kurt Sandkuhl	17 full papers published in LNBIP

*(continued)*

**Table 1.** (continued)

Year	Conference place	Organizing university	Conference chair/s	Proceedings editor/s	Number of accepted papers
2020	No physical event (presentations merged with the 2021 event)	University of Vienna, Austria	Björn Johansson, Dimitris Karagiannis	Robert Andrei Buchmann, Andrea Polini, Björn Johansson, Dimitris Karagiannis	14 full papers published in LNBIP
2021	Vienna	University of Vienna, Austria	Björn Johansson, Dimitris Karagiannis	Robert Andrei Buchmann, Andrea Polini, Björn Johansson, Dimitris Karagiannis	16 full papers published in LNBIP

From the start until 2009 presented papers were published in local proceedings.

From the conference in 2010 accepted papers have been published by Springer in Lecture Notes in Business Information Processing (LNBIP) in the series “Perspectives in Business Informatics Research”.

The LNBIP BIR proceedings can be found at

<https://link.springer.com/conference/bir>

At the conference in **Riga 2011**, the organizers introduced a pre-conference day that included workshops and the doctoral consortium. The team of this conference also did a great job in attracting papers and participants. So far, the **Riga 2011** conference has had the highest number of both papers and participants. At the conference there were four workshops organized during a pre-conference day. Since that the BIR conference has included workshops on topics such as: Information logistics and digital transformation, Alignment of business process and security modeling, Intelligent educational systems, User oriented information integration, Ontologies and information systems, Business processes in the cloud, Managed complexity, Security and compliance in business processes, Resilient enterprise architecture and Security analytics.

In **Lund 2014** there was for the first time a keynote by an industry representative. This was a highly appreciated initiative. The keynote organization was also involved in two special workshops that had the character of being more hands-on. The workshops had students from the informatics program (both bachelor and master) as well as junior and senior researchers attending the conference as participants. This interaction between students and researchers was highly appreciated. To the best of our knowledge the Lund 2014 conference is so far the only conference that have had students listening to paper presentations at the main conference.

In **Copenhagen 2017** the pre-conference day included a pre-BIR forum day, in which borderline papers that did not fit into the organized workshops were presented and

discussed. For each paper discussants were appointed who read the papers beforehand and the main focus was on discussing papers. This was seen, from the participants, as a very good way of getting more substantial feedback and a good discussion around the individual paper. This is something that future BIR conferences could benefit from doing again.

In 2020 the organizer decided, due to the pandemic situation, to postpone the "happening". This decision was made from the fact that the BIR conference – with its satellite events – has always been a scientific networking hub, encouraging elaborated critical discussion and providing knowledge exchange opportunities. The organizers did not see that this could happen if having the conference as a virtual event. Therefore, the organization team decided to postpone BIR 2020 event but still create the 2020 proceedings and have the papers presented as part of an extended event to take place during BIR 2021.

Over the years, the conference has gained in reputation and interest among researchers in Business Informatics. Gradually from one year to the next the ambition with the conference, and the number of papers submitted and the quality of accepted papers has increased. At the same time the initial focus of having the conference support PhD students and junior researchers in their academic journey in a friendly and stimulating environment has been kept. The ambition is that future conferences will continue to do so.

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