

Lecture Notes in Business Information Processing

106

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Workshops on Business Informatics Research

BIR 2011 International Workshops
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Revised Selected Papers

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Foreword

The book consists of a selection of papers presented at the Workshops and Doctoral Consortium associated with the 10th International Conference on Perspectives in Business Informatics Research (BIR 2011), held in Riga, Latvia, October 6–8, 2011.

The BIR conference series was established 11 years ago with the aim of providing researchers in the field of business informatics with an international forum for exchanging their achievements.

Four one-day workshops and doctoral consortium associated with the BIR 2011 conference were organized:

- 4th International Workshop on Information Logistics and Knowledge Supply for Viable Enterprises (ILOG 2011)
- First International Workshop on Alignment of Business Process and Security Modeling (ABPSM 2011)
- Second International Workshop on Intelligent Educational Systems and Technology-Enhanced Learning (INTEL-EDU 2011)
- First International Workshop on User-Oriented Information Integration (UOII 2011)
- BIR 2011 Doctoral Consortium (BIR 2011 DC)

The 4th Workshop on Information Logistics and Knowledge Supply for Viable Enterprises (ILOG) brought together researchers and practitioners from both industry and academia that have a strong interest in viable enterprises, information logistics and knowledge supply. ILOG 2011 received 16 submissions. The Program Committee selected four submissions for publication in this volume.

The First International Workshop on Alignment of Business Process and Security Modeling (ABPSM) intended to gather researchers and practitioners in the field of business process and security modeling. The main goal of this workshop was to build a common understanding about the interplay between business processes and security. Nine papers were accepted for presentation at the workshop and three of them are included in the proceedings.

The main aim of the Intelligent Educational Systems and Technology-Enhanced Learning (INTEL-EDU) series of workshops is to provide an international platform for the presentation of research on intelligent educational systems theory, development of advanced tools and technologies, and their innovative applications. In all, 36 participants from 12 European countries took part in the Second International Workshop (INTEL-EDU 2011) and 20 presentations were made, with seven papers selected for publication in the proceedings.

The main goal of the First User-Oriented Information Integration (UOII) workshop was to provide a forum for academics and practitioners for the presentation of their research in the fields of information integration and user modeling.

The goal of the workshop was to bring together these two parties—users and information—considering the requirement for information rather than information supply as a key factor. Ten papers were accepted for presentation at the workshop. Four of the best papers were selected for publication in this volume.

The Doctoral Consortium associated with the BIR 2011 conference brought together researchers and doctoral students and provided an opportunity to the doctoral students to discuss the current state of their research. Five papers were accepted for presentation at the Doctoral Consortium and two best papers are included in these proceedings.

We would like to express our thanks to all the people that contributed to the success of the workshops and Doctoral Consortium.

We thank all the authors for their submitted papers, the members of the Program Committees and external reviewers for their time and contribution to ensuring the quality of the scientific program. We are particularly grateful to those Program Committee members of the Doctoral Consortium who also agreed to be discussants at the Doctoral Consortium sessions.

We thank all members of the conference and workshops organizing teams for their support to ensure the success of the conference. We express our thanks to the company Baltic Data, whose financial support covered the registration fees for doctoral students of accepted papers, and we thank Baltisch-Deutsches Hochschulkontor for financing the Local Proceedings of BIR 2011 Associated Workshops and Doctoral Consortium.

We would like to thank all Workshop and Doctoral Consortium Chairs and their Program Committees for their diligence in selecting the best papers and reviewing the extended versions of the papers included in this volume.

January 2012

Laila Niedrite
Renate Strazdina
Benkt Wangler

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Preface

The following preface is a collection of the prefaces of the proceedings of individual workshops and the doctoral consortium. The actual workshop and doctoral consortium papers, grouped by event, form the body of this volume.

4th Workshop on Information Logistics and Knowledge Supply for Viable Enterprises (ILOG 2011)

Organizers: Kurt Sandkuhl, Marite Kirikova, and Ulf Seigerroth

For viable enterprises, optimized information flow and efficient reuse of existing knowledge is part of the business strategy. Particularly in knowledge-intensive industry and service sectors, information is a major factor in production processes, and knowledge constitutes an important asset of the enterprise. Similarly, 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.

Experience shows that successful solutions for intelligent information supply involve several ingredients: a sound business case with clearly defined benefits and returns for the (networked) organization, a clear understanding of the users' demands including the organizational context, and the right use of "enabling technologies" like semantic technologies, knowledge management or ubiquitous computing.

The workshop on Information Logistics and Knowledge Supply for Viable Enterprises (ILOG 2011) addressed the above subject area with a specific focus on practices, i.e., submission of case study and experiences papers were encouraged, and contributions bringing together business cases and enabling technologies were given priority. ILOG 2011 was the fourth workshop on this subject following events in 2004, 2007 and 2010. The first ILOG workshop was organized in conjunction with "Multikonferenz Wirtschaftsinformatik 2004." In November 2007, the second event in this series was located at Jönköping University. The third edition was part of the international conference on Business Information Systems (BIS) in Berlin. Each of the three workshops had roughly 25 participants.

ILOG 2011 received 16 submissions. The Program Committee selected four submissions for publication in this volume.

We thank all members of the Program Committee, the authors and local organizers for their efforts and support.

January 2012

Kurt Sandkuhl
Marite Kirikova

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First International Workshop on Alignment of Business Process and Security Modeling (ABPSM 2011)

Organizers: Raimundas Matulevičius and Guttorm Sindre

The First International Workshop on Alignment of Business Process and Security Modeling (ABPSM 2011) served as a forum to gather researchers and practitioners working in the intersection between these two fields. Often, business process modeling, on the one hand, and IS security issues, on the other hand, stand out as quite separate research topics, seldom addressed together in the same research projects or publications. The main goal of this workshop was to create an arena where researchers in these two domains could meet and build a common understanding about the interplay between business processes and security. The workshop was of interest both for researchers who have already done research combining business process modeling and security, and for those who have primarily worked in one of these areas and wanted to learn more about the other.

The call for the workshop included the following topics:

- Security challenges in business process management
- Inclusion of security in business process modeling techniques
- Security modeling approaches
- Techniques for secure software engineering
- Security risk management
- Alignment between business process and security
- Models and methods for measuring such alignment
- Connection between business process modeling and security modeling
- Cost–benefit analysis of alignment between business process and security
- Security and SOA
- Security challenges in enterprise IS (e.g., ERP, SCM)
- Security challenges in e-commerce, e-gov, etc.

The call resulted in 14 submissions, and out of these, nine papers¹ were presented at the workshop. The extended versions of three selected papers are included in these proceedings.

¹ Matulevičius, R., Sindre, G., (eds): 1st International Workshop on Alignment of Business Process and Security Modelling (ABPSM 2011). In: Local Proceedings of the 10th International Conference, BIR 2011, Associated Workshops and Doctorial Consortium: JUMI Publishing House Ltd. MI, 2011, 97-170.

Paja et al. introduce a method to understand security needs through participants' objectives and interactions.² Security requirements are captured in terms of social commitments between the actors of the system. These security requirements are then used to annotate business processes modeled in BPMN.

Herrmann et al. propose a method for risk-based requirements prioritization (RiskREP).³ The security requirements are understood by considering the business goals, analyzing their potential risks, and defining security counter-measures. An important step of the approach is the prioritization activity, where effectiveness of the security counter-measures is assessed in terms of costs, dependencies, and reduced risk of the misuse case.

While the previous two studies focused on the link between security goals and security requirements, Gaaloul et al. introduce security controls that are applied in the workflow specification.⁴ More specifically, this paper presents an extended role-based access control model (RBAC) for workflow systems. Here a task delegation construct is introduced into a formal security model. Then, such a model can be applied to implement security requirements for task delegations and to define the security authorization constraints on the workflow specifications.

The organizers want to thank all reviewers, authors, and workshop participants for their contributions and hope that this workshop can contribute to a closer integration of research in security and business process modeling in the future.

January 2012

Raimundas Matulevičius
Guttorm Sindre

² Paja, E., Giorgini, P., Paul, S., Meland P. H.: Security Requirements Engineering for Secure Business Processes. In Proceedings of the Selected Papers from Workshops and Doctoral Consortium of the 10th International Conference BIR 2011, LNBIP, Springer, (2012).

³ Herrmann, A., Morali, A., Etalle, S., Wieringa, R.: Risk and Business Goal Based Security Requirement and Countermeasure Prioritization. In Proceedings of the Selected Papers from Workshops and Doctoral Consortium of the 10th International Conference BIR 2011, LNBIP, Springer, (2012).

⁴ Gaaloul, K., Proper, H.A. (Erik), Charoy, F.: An Extended RBAC Model for Task Delegation in Workflow Systems. In Proceedings of the Selected Papers from Workshops and Doctoral Consortium of the 10th International Conference BIR 2011, LNBIP, Springer, (2012).

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Second International Workshop on Intelligent Educational Systems and Technology-Enhanced Learning (INTEL-EDU 2011)

Organizers: Janis Grundspenkis and Leonids Novickis

The Second International Workshop on Intelligent Educational Systems and Technology-Enhanced Learning (INTEL-EDU 2011) continued the first workshop held in Riga in 2009 in conjunction with the 13th East-European Conference on Advances in Databases and Information Systems (ADBIS 2009).

The main goal of the INTEL-EDU series of workshops is to provide an international platform for the presentation of research on intelligent educational systems theory, development of advanced tools and technologies, and their innovative applications. In all, 36 participants from 12 European countries (Austria, Belgium, Latvia, Estonia, Finland, France, Germany, Lithuania, The Netherlands, Norway, Sweden, Switzerland) took part in INTEL-EDU 2011 and 20 presentations were made.

The accepted papers cover a wide spectrum of topics on social media features added to e-learning, remote collaborative working of teachers and students, psychophysiological model-based adaptive tutoring systems, estimation of quality and exploitation effectiveness of e-learning systems, integration of intelligent tutoring and knowledge assessment systems.

The Baltic Sea Region INTERREG Programme project's BONITA RTU Showroom launch event was organized as a special session of the INTEL-EDU 2011 workshop. During this session both physical exhibits in e-learning (IKAS system), e-logistics (www.elogmar.eu), robotics devices, virtual interactive platforms and virtual showroom prototypes to promote innovative ICT solutions were demonstrated to the participants.

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Janis Grundspenkis
Leonids Novickis

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First International Workshop on User-Oriented Information Integration (UOII 2011)

Organizers: Guntis Arnicans and Laila Niedrite

The main aim of the First User-Oriented Information Integration (UOII) workshop was to provide a wide international forum for academics and practitioners for the presentation of their research. Ten papers were accepted for presentation at the workshop. Selected papers for this issue cover different aspects of data integration taking into account users' needs as much as possible. The term "user" is used in different meanings starting from several groups of users and ending with individuals or a particular device that consumes integrated data.

The paper "A Formal Quality Framework for Data Integration Incorporating User Requirements" presents a framework for the specification of data integration quality criteria and associated user requirements with quality factors and metrics relating to completeness and consistency. A description language formalization with associated reasoning capabilities is used, which enables a data integration setting to be tested to identify those elements that are inconsistent with users' requirements.

Two papers describe results of real applications. The paper "Timely Report Production from WWW Data Sources" presents a case study of data integration for reporting within the World Health Organization. In order to automate the production of the reports, the authors have introduced a method of integrating data from multiple sources by using an RDF (resource description framework) format. The model of the data is described using RDF ontology, making possible the validation of the data from multiple sources. A graphical tool is developed for the end user to hide the technical level of RDF and to reduce the complexity configuring the data sources of a given report. The paper "Toward Introducing User Preferences in OLAP Reporting Tool" presents an OLAP reporting tool and an approach for determining and processing user OLAP preferences, which are useful for generating recommendations on potentially interesting reports. The authors explain the metadata layers of the reporting tool including their proposed OLAP preferences meta-model, which supports various scenarios of formulating preferences of two different types: schema-specific and report-specific.

The paper "A Multimodal Approach for Determination of Vehicle Position" shows that consumers of integrated data can be humans but also electronic devices. One of the most important tasks during the development of hardware/software systems for assisted and automatic driving is the determination of a vehicle's position with sufficient accuracy in real time. Usually, a device alone cannot satisfy user requirements. By data integration from various

external data sources, the device can correct its own measurements and reach the required precision of measurements.

During discussions at the workshop, the participants established a fact that users demand data integration satisfying the individual user rather than the user group. This means that the integration problem becomes more difficult and new research is needed.

January 2012

Guntis Arnicans
Laila Niedrite

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BIR 2011 Doctoral Consortium (BIR DC 2011)

Organizers: Gundars Alksnis

The aim of the Doctoral Consortium which was organized in association with the 10th International Conference on Perspectives in Business Informatics Research (BIR2011) held October 6–8, 2011, in Riga, Latvia, is to facilitate research contributions in business informatics from doctoral students and to give them a feedback from experienced researchers of the field. This year the Doctoral Consortium attracted submissions from three countries, namely, Lithuania, Latvia and Poland.

These proceedings include two revised Doctoral Consortium papers that were extended to include detailed ideas in the area of business informatics research. Each paper covers its own problem domain. The first paper by Askoldas Podviezko discusses the enhancements in the evaluation of the level of soundness and stability of commercial banks. By proposing to use multicriteria decision-aid methods, it is possible to observe both the strength and weaknesses of commercial banks by means of different performance criteria. The second paper by Peteris Rudzajs describes the architecture of the system for education information extraction by means of automated document analysis. Such a system is supposed to monitor educational demand and offer. Its distinction is the use of various approaches in order to extract and analyze information from unstructured or semistructured textual information sources, such as university vacancy and course descriptions.

The Organizers want to thank all members of the Doctoral Consortium Program Committee for their contributions, especially Per Backlund from the University of Skövde, Sweden, and Horst Günther from the University of Rostock, Germany, for their comments on the paper versions that were selected for these proceedings. Their reviews and feedback provided valuable information for the doctoral students.

January 2012

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