Special section of business process modeling, development and support (BPMDS) 2018: new perspectives for business process modeling, development and support

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The Business Process Modeling, Development and Support (BPMDS) working conference series serves as a meeting place for researchers and practitioners in the areas of business development and business applications (software) development. By incorporating these multiple views, BPMDS offers a unique community venue that integrates different streams of research on business processes and business information systems, and enables to take in a view on the whole range of BPMDS research and interrelationships among different perspectives. This makes it attractive for authors to publish cutting edge research results at BPMDS. This special section contains a selection of the most influential contributions from the 2018 edition of the working conference.

The goals, format, and history of BPMDS can be found at <http://www.bpmds.org/>.

1 Scope

A series of workshops and working conferences since 1998, mostly in conjunction with the CAiSE conference series, have made BPMDS one of the most established research venues in the business process and business information systems communities. From the set of high-quality papers published at the working conference, every year a selection of the most outstanding contributions is made, and the authors are given the opportunity to elaborate their research in an extended article in this special section.

In June 2018, the BPMDS working conference took place in Tallin, Estonia, under the focus theme “New Perspectives

for Business Process Modeling, Development and Support”. The 19th edition of the BPMDS series received 29 submissions by authors from 24 countries, and 13 papers were selected in a blind review process to be published in the Springer LNBIP 318 volume. It is our pleasure to introduce six extended contributions from the 2018 working conference, which have made their way into this special section. They have been extended and intensively revised and went through another two-round blind review process for the journal publication.

2 Selected articles for this special section

We could win six groups of authors who presented outstanding research at the BPMDS 2018 working conference to create an extended version of their conference contribution as a journal article for this special section.

The article *Specification-driven predictive business process monitoring* by Ario Santoso and Michael Felderer puts automatic analysis of business processes into focus. Their work presents a language for specifying business process prediction tasks, which allows them to express domain-specific prediction requirements for different business domains and automatically generate corresponding analysis setups from the prediction task descriptions.

Three articles are specifically concerned with the evaluation of business process modeling techniques. *An interdisciplinary comparison of sequence modeling methods for next-element prediction* by Niek Tax, Irene Teinemaa, and Sebastiaan van Zelst starts with the observation that techniques for sequence prediction have independently developed in the fields of machine learning, process mining and grammar inference. The article then performs a comparative empirical evaluation of representative algorithms from these three fields. It turns out that approaches from the machine learning area perform best in comparison with process mining and grammar inference techniques.

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Toward a methodology for case modeling by Marcin Hewelt, Luise Pufahl, Sankalita Mandal, Felix Wolff, and Mathias Weske presents three alternative modeling approaches for fragment-based case management: process-first, object lifecycle-first, and goals-first. These three are subsequently empirically evaluated regarding their understandability, ease-of-use, and usefulness in a within-subjects experiment with two groups. It turns out that the process-first approach is easiest to learn, the object lifecycle-first method is most flexible compared to the two others, and the goals-first approach leads to the most accurate modeling results.

The article *Empirical evaluation of CMMN models: a collaborative process case study* by Ioannis Routis, Mara Nikolaidou, and Dimosthenis Anagnostopoulos performs an empirical examination on human modeling behavior during the application of the Case Management Model and Notation (CMMN) modeling language. Following the design of a between-subjects experiment, the article describes how two groups of modelers apply CMMN to solve the same modeling task. Based on the observation of two fundamentally different solutions created by the two groups, conclusions on different modeling styles of the modelers and influential characteristics of CMMN are derived.

Two further articles address the field of context awareness in business processes. *The RALph Miner for automated discovery and verification of resource-aware process models* by Cristina Cabanillas, Lars Ackermann, Stefan Schöning, Christian Sturm, and Jan Mendling introduces an approach for mining information about (human) resource involvement during process execution. The approach consists of a process mining technique that infers resource allocation constraints from process log data, together with a graphical representation language for process resource assignments and a corresponding validator. The article is a good example that the field of process mining offers a vast potential for development, and it widens the understanding of process mining from mere control flow detection to a multi-criteria analysis of interrelated information on business processes.

To further improve the support of business applications by business process technology, the article *IoT meets BPM: a bidirectional communication architecture for IoT-aware process execution* by Stefan Schöning, Lars Ackermann, Stefan Jablonski, and Andreas Ermer presents an approach for integrating Internet of Things (IoT) technology with business process execution. This is done by suggesting an architecture in which IoT data is made available to a process execution engine in a process-compatible way. The approach gets exemplified in a practical application scenario with wearable user interfaces for context specific IoT data provision. By providing this impressive application case, the article elegantly manages to combine general architectural considerations with appealing practical examples.

The range of contributions which form this special section, as well as their scientific depth and methodical variety, shows that the field of business process modeling, development and support remains a lively and fast developing area which is far from having matured to a static methodical core of business informatics and information systems research. We regard this as our mission to continue with the BPMDS working conference series and this special section, and let these go together with a dynamic and creative research community from which one can expect many more innovative and ground-breaking contributions in the future.

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