

GUEST EDITORIAL PREFACE

# Special Issue from BPMDS'2011: Making BPM Theories Work in Practice

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The BPMDS series has produced 11 workshops from 1998 to 2010. Nine of these workshops were held in conjunction with CAiSE conferences. From 2011 BPMDS has become a two-day working conference attached to CAiSE (Conference on Advanced Information Systems Engineering). The topics addressed by the BPMDS series are focused on IT support for business processes. This is one of the keystones of Information Systems theory. The goals, format, and history of BPMDS can be found on the web site <http://www.bpmds.org/>

This Special Issue follows the 12th edition of the BPMDS (Business Process Modeling, Development, and Support) series, organized in conjunction with CAiSE'11, which was held in London, United Kingdom, June 2011. For BPMDS'2011, the prospective authors of research papers have been invited to discuss on

how theoretical results discussed can be used in practice and to submit papers connected –wherever possible– to the following theme:

*Making BPM Theory Work in Practice: "There is nothing more practical than a good theory" (Kurt Levin)*

BPMDS'2011 received a record number of 61 submissions from 25 countries and 22 papers were selected and published in Springer LNBI 81 volume.

The special issue is targeted at both researchers and practitioners in the information systems (in the broad sense) community with a focus on business process development and business application software development. The papers in this special issue reflect this focus; they are extensively modified and blind

reviewed versions of five research papers that were initially presented at the BPMDS'2011 working conference.

The first paper by Setiawan and Sadiq, 'A Methodology for Improving Business Process Performance through Positive Deviance', addresses the importance of process improvement and the role that best practice reference models play in the achievement of process improvement. The authors draw our attention to the fact that best practice can be implicitly derived from the work practices of actual workers within the organisation, especially when there is an opportunity for variance within the work, i.e. there may be different approaches to achieve the same process goal. They propose to support improvement of process performance intrinsically by utilizing the experiences and knowledge of business process users to inform and improve the current practices. The proposed methodology is inspired by the theory of positive deviance. By utilizing a multiple criteria decision making approach and Shannon's entropy method of information theory in determining useful information from uncertain data within execution log of business process, the authors suggest defining the "best" and most suitable previous practices as a recommendation that fits with the current competence/experience levels of individuals. They demonstrate that the proposed method is capable to generate meaningful recommendations from large data sets and effectively facilitating learning within organisation leading to process performance improvement. Rather than forcing users to make design decisions to handle particular cases, the approach promotes the use of the existing knowledge within the organisation to adopt practices that best meet specific requirements. Such an approach can guide the future user to improve productivity from both individual perspective as well as organisational perspective. The basic idea is to enhance the capacity of each individual to reach their full potential in performing activities within business processes based on their skills and through access to knowledge of successful past practices.

The second paper by Zugal et al., 'Empirical Evaluation of Test Driven Modeling', draws our attention on the fact that in dynamic business environment, the economic success of an enterprise depends on its ability to react to various changes like shifts in customer's attitudes or the introduction of new regulations. Declarative approaches to process modeling are regarded well suited for highly volatile environments as they provide a high degree of flexibility. However, problems in understanding and maintaining declarative process models impede their usage. To compensate for these shortcomings, authors propose Test Driven Modeling (TDM). This paper extends a previous work from the authors and reports on an empirical investigation in which TDM is viewed from two complementary perspectives. First, the impact of TDM on communication is explored in a case study. Results indicate that domain experts are inclined to use test cases for communicating with the model builder (system analyst) and prefer them over the process model. The second part of the investigation, a controlled experiment, investigates the impact of TDM on process model maintenance. Data gathered in this experiment indicates that the adoption of test cases significantly lowers cognitive load and increases the perceived quality of changes.

The third paper by Soffer, 'A State-based Intention Driven Declarative Process Model', addresses the importance of flexibility for business processes. Flexibility is particularly important in organizations that face frequent changes and variable stimuli from their environment. One of the promising approaches handle the flexibility requirements is declarative process models. The most common approach to declarative process specification (although not the only one existing) is based on Linear Temporal Logic (LTL), which sets constraints on temporal relations among activities. The paper starts by a motivating example, demonstrating the limitations of a representative LTL-based declarative model. Soffer argues that the dominant declarative approaches lack expressiveness for addressing the environment effects. The paper proposes a declarative model, which

addresses activities as well as states, external events, and goals. The model is based on the Generic Process Model, which is an ontology-based theoretical process analysis framework, extended by a notion of activity, which includes a state change aspect and an intentional aspect. The achievement of the intention of an activity may depend on events in the environment and is hence not certain. The paper provides a formalization of the model and describes an execution mechanism. It emphasizes the usefulness of specifying the intentional aspect of activities, by using it as a basis for semantic validation of the model at design time and for a planning module that can guide execution at runtime. These are illustrated by an example from the medical domain.

The fourth paper by Hens et al., ‘Process Evolution in a Distributed Process Execution Environment’, addresses the distribution of control and visibility of cross-organizational process models. Authors argue that to increase availability and performance of the processes, a process model can be fragmented into logically different parts and distributed in the enterprise architecture. Using a central execution scheme to operate the complete process flow implies that the responsibility of the entire process execution lies with one organizational entity. However, it is not uncommon that processes are cross-departmental or cross-organizational, where it is not viable that one single entity has full control over the entire process flow. Also, the process may be designed centrally as one unit, but off-shoring and outsourcing process capabilities may require the fragmentation of this process model. Fragmentation algorithms and execution environments, which connect the fragmented process model parts together, recreating the original process execution semantics, have been proposed in the literature. Hens et al. argue that a critical challenge that is left open is the ability of the distributed process execution environment to respond effectively to process changes. Processes

evolve over time and the execution environment should adequately support these changes. The distributed execution environment adds additional difficulties in process change support: a global process overview is unavailable since execution is fragmented, instances are created for fragments and not for the global process model and extra overhead is introduced since coordination between physically distributed fragments is needed to propagate changes in the execution environment. This paper describes the difficulties, advantages and issues of process model change support in a fragmented and distributed environment. Authors propose a system, which tackles the identified issues and allows the propagation and coordination of process changes at runtime in the distributed process execution architecture. The change support system is based on an approach, previously proposed by the authors, for distributed process execution, where a non-intrusive fragmentation algorithm is used; with dedicated, lightweight process engines for fragment execution, and an event-based communication paradigm between process fragments to ensure a scalable, loosely coupled and flexible runtime environment.

The fifth paper by Sampathkumaran and Wirsing ‘Financial Evaluation and Optimization of Business Processes’, addresses the optimization of business processes based on their financial parameters. The authors consider Business Processes represented through the Business Process Modeling Notation with their Costs evaluated through a pattern-based methodology. Using this concept of Cost calculation they analyze the effect of different well-known best practices on the financial parameters of the process, i.e. Resequencing of Tasks, Knock-Out Order, Task Elimination, Order Type and Triage, and Parallelism. The authors also evaluate the impact of each task in a process on the overall Cost through Sensitivity Analysis leading to a structured approach to parameter variation to achieve financial optimization. They vary the reliability of each task in a Business Process

which results in changing the overall cost. The study briefly introduces the Business Process Modeling Notation, Workflow Patterns, and available Performance Measures Evaluation Techniques and recommends an adaptation of Devils Quadrangle suitable for impact evaluation.

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