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Knowledge Infrastructures for the Support of Knowledge Intensive Business Processes

J.UKM Special Issue

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The area of business process oriented knowledge infrastructures aims to design and develop infrastructures that provide support for knowledge intensive business processes in organizations. Technological systems, such as information systems or knowledge technologies, represent a promising instrument and fundament for that purpose. However, the effective application of these technologies in organizational contexts is a pressing and current research challenge. Concrete questions in this field include but are not limited to knowledge oriented business process modeling and –optimization, integration of process-, task- and information management as well as business process communication and visualization. The emergence of these challenges led to the development of the *Business Process Oriented Knowledge Infrastructures* (BPOKI) special track series, which started in 2004 and continued successfully in 2005 in Graz, Austria. The special issue "*Knowledge Infrastructures for the Support of Knowledge Intensive Business Processes*" makes elaborated versions of five selected contributions of BPOKI'05 available (http://www.i-know.at/BPOKI).

The purpose of this special issue is to provide readers with an overview of up-to-date research on the intersection between business process and knowledge management.

The paper "*Challenges for Business Process and Task Management*" by Uwe V. Riss, Alan Rickayzen, Heiko Maus and Wil M. P. van der Aalst introduces five research questions that they consider to be of highest importance to the domain of BPOKI. The authors provide arguments and deficits of current approaches that underpin the relevance of these questions for future research. Their overall claim is that in order for process-aware information systems to be effective, they need to pursue a bottom up approach to business process support. Such systems would need to have capabilities that allow *task executers* to design and develop models of processes, instead of *specialist process engineers*. Furthermore, the authors reason that the conceptualization of processes as a set of tasks and corresponding task information units allows for supporting a broad range of business processes that vary

in their characteristics e.g. in terms of action complexity and/or context variability. The contribution concludes that support for different types of processes is essential and will need to be considered in future commercial workflow management systems.

The contribution "*From Lightweight, Proactive Information Delivery to Business Process-Oriented Knowledge Management*" by the authors Harald Holz, Heiko Maus, Ansgar Bernardi and Oleg Rostanin focuses on the information delivery perspective of business process support. The authors claim that it is necessary to work on approaches and concepts that are capable of providing both light- and heavyweight information support for knowledge workers. Here, lightweight approaches are considered to require no or only little investments in upfront modeling of information needs, as opposed to heavyweight approaches. Based on this observation, the authors introduce a strategy for the incremental introduction of process-oriented knowledge management concepts. Starting from lightweight approaches, they introduce a seven step procedure that continuously adds detail and modeling complexity. To point out the feasibility of their concepts, they introduce a series of prototypes that already combine some of the principles introduced.

"*Considering the Knowledge Factor in Agile Software Development*" by Claudia Müller, Julian Bahrs and Norbert Gronau introduces an experience report of applying the knowledge oriented business process modeling language KMDL in a software development setting. KMDL consists of a description language and a procedural model and is accompanied by the K-Modeler that represents an implementation of the description language. KMDL is utilized to improve business processes from a knowledge perspective on top of process models that are generated to analyze existing situations. Based on such AS-IS analysis, patterns and reports aid in the identification of weak spots and improvement potentials. The authors introduce a case study in a software development environment that demonstrated the viability of their approach as well as a set of areas for improvement.

Cornelia Richter-von Hagen, Dietmar Ratz and Roman Povalej entitled their paper "*Towards Self-Organizing Knowledge Intensive Processes*". They introduce the notion of knowledge intensive process improvement KnowiΠ and based on that, introduce a series of indexes that aim to allow assessments of the performance of knowledge intensive business processes. They claim that an improvement of these indexes always involves a series of trade-offs. Therefore, their approach is to utilize multi-objective (beneath single objective), genetic optimization algorithms to address this problem. Finally, they report on the successful application of a multi-sexual genetic algorithm to the special class of knowledge intensive processes with constrained resources.

"*Impulse: Using Knowledge Visualization in Business Process Oriented Knowledge Infrastructures*" by Remo Aslak Burkhard represents an experience report on a novel business process visualization type. The author utilizes a tube map metaphor to visualize a complex process by means of a traditional tube- and station map. He compares his approach to the more prevalent Gantt chart approach and identifies a set of advantages in a conducted case study. The findings suggest that the

tube map approach especially helps in catching the attention of and in motivating project staff. The author concludes that the use of innovative visualization techniques for business processes (such as the tube map) contributes to business process oriented knowledge infrastructures by easing the process of communicating knowledge about processes.

This special issue introduces latest reports on cutting edge research in the domain of business process oriented knowledge infrastructures. We hope that you will find fruitful stimuli as well as valuable insights when reading the articles. The special track series BPOKI will be continued in 2006 with new contributions introducing and discussing new developments in the field.

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