Journal of Universal Computer Science, vol. 11, no. 4 (2005), 426-428
submitted: 17/2/05, accepted: 8/3/05, appeared: 28/4/05

Integrating Business Processes and Knowledge Infrastructures

J.UCS Special Issue

Markus Strohmaier
(Know-Center Graz, Austria
mstrohm@know-center.at)

Stefanie N. Lindstaedt
(Know-Center Graz, Austria
slind@know-center.at)

The integration of available knowledge management technologies, concepts and methods into organizational business processes is a pressing and challenging research issue today. Researches and practitioners in the areas of process and knowledge management alike seek for solutions that aid the flexible alignment of knowledge management efforts to an organization's most value generating activities. The advantages inherent in such efforts are manifold: The execution of business processes is supported from a knowledge perspective, the economic benefit of knowledge management can be illustrated more easily and knowledge management activities become "alive" because of the integration in organizational business processes - which in turn thrives business performance.

The special issue "*Integrating Business Processes and Knowledge Infrastructures*" makes more detailed versions of the contributions to BPOKI'04 available. BPOKI'04 is a special track series on Business Process Oriented Knowledge Infrastructures that took place the first time during I-Know'04, the 4th International Conference on Knowledge Management (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. Contributions of this special issue consider both, organizational as well as technological aspects of this topic, and fall in one of the following four categories: 1) Business Process Modelling 2) Business Process Learning 3) Business Process Support and 4) Business Process Execution.

Business Process Modeling

Business Process Modeling aims to integrate the knowledge perspective into traditional business process modeling approaches. The paper "*Modeling Knowledge Work for the Design of Knowledge Infrastructures*" by Ronald Maier introduces characteristics of knowledge work and knowledge infrastructures. Based on an

introduction of different perspectives on modeling in knowledge management, the novel concept "knowledge stance" for modeling knowledge work is presented. This concept combines instruments from process and activity modeling in an integrative way. The author demonstrates that knowledge stances act as an important instrument in knowledge infrastructure design efforts.

The paper "*KMDL – Capturing, Analysing and Improving Knowledge-Intensive Business Processes*" by Norbert Gronau, Claudia Müller and Roman Korf represents an approach in this category, too. The authors argue that existing approaches have a significant improvement potential concerning the modeling of tacit and explicit knowledge and knowledge conversions. The introduced KMDL consists of the K-Modeler, the KMDL Object Model, and a KMDL Procedural Model. Several projects already utilized KMDL to achieve a better integration of knowledge management applications within companies or to deduce requirements for anticipated knowledge management systems.

Business Process Learning

Business Process Learning focuses on the development of infrastructures that aid transfer of knowledge within or about business processes to process agents taking cognitive aspects into account. Remo A. Burkhard and Michael Meier entitled their paper *"Tube Map Visualization: Evaluation of a Novel Knowledge Visualization Application for the Transfer of Knowledge in Long-Term Projects"* which introduces an approach for the communication of complex business processes within a project team. Based on the concept of knowledge visualization, which is defined as aided knowledge transfer between at least two people, the authors utilize the visual metaphor "tube map" to communicate a set of strongly interconnected work activities. To evaluate their approach, Burkhard and Meier successfully utilized the tube map visualization in a health care education center.

Business Process Support

Business Process Support focuses on the establishment of support for an organization's value generating activities and processes through knowledge infrastructures spanning cultural, organizational and technological interventions. The paper "*A Methodology and a Toolkit that Integrate Technological, Organisational and Human Factors to Design Knowledge Management within Knowledge-Intensive Networks*" by Tomaso Forzi and Meikel Peters introduces a description model, a map of knowledge management methods and an integrative methodology for the design of knowledge management within inter-organizational networks. The authors employed their set of concepts in a case study with a regional network of 20 small and medium enterprises.

Valentina Janev and Sanja Vraneš entitled their paper "*The Role of Knowledge Management Solutions in Enterprise Business Processes*". Based on an extensive literature review, the authors introduce a comprehensive set of classified knowledge management software providers. A distinction between operational and strategic processes represents the fundament for an assignment of supportive knowledge management technologies to categories of business processes.

„*A Knowledge Infrastructure Hierarchy Model for Call Centre Processes*" by Greg Timbrell, Stefan Koller, Nev Schefe and Stefanie Lindstaedt explores a process view on knowledge management in call centres. The authors introduce a set of indicators (such as the size of call-centres) for the determination of appropriate knowledge management instruments that provide support for call centre agents. Insights from three conducted case studies corroborate the theoretical findings of this contribution.

Business Process Execution

Business Process Execution typically represents technological knowledge infrastructures that leverage available formal, contextual information of business processes (from e.g. Workflow Management Systems) to provide relevant knowledge to process agents.

The paper "*Process Oriented Knowledge Management: A Service Based Approach*" by Robert Woitsch and Dimitris Karagiannis introduces PROMOTE, a framework and a platform enabling and supporting the execution of knowledge intensive business processes. The authors utilize semantic technologies and vector functions in order to match knowledge management requirements and knowledge management services. An introduced concept for a service-based and process oriented architecture of an enterprise knowledge management system integrates the elements of the theoretical framework.

"*Reconciling Knowledge Management and Workflow Management Systems: The Activity-Based Knowledge Management Approach*" by Schahram Dustdar introduces "Caramba", an activity based knowledge management approach. Based on a framework that classifies different knowledge management technologies, the author motivates the need for a consideration of activities as the central concept for the integration of knowledge and workflow management systems. The presented Caramba software demonstrates the viability of the introduced concepts.

"*Modeling and Implementing Pre-built Information Spaces. Architecture and Methods for Process Oriented Knowledge Management*" by Karsten Böhm, Wolf Engelbach, Jörg Härtwig, Martin Wilcken and Martin Delp presents "PREBIS", an implementation of a business process oriented knowledge infrastructure that focuses on information provision for process agents based on contextual information about the user. The authors introduce the PREBIS modules, the kernel and a phase model that allow for the configuration of pre-built information spaces. An evaluation indicates the practical applicability of the PREBIS implementation.

We hope that this special issue gives the reader an insightful overview of current concepts, methods and implementations in the emerging area of business process oriented knowledge infrastructures. The special track series BPOKI is continued in 2005 with new contributions introducing latest developments and research in the field.

Markus Strohmaier
Graz, Austria Stefanie N. Lindstaedt
March 2005 Know-Center, Graz, Austria