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Technology-Oriented Knowledge Management

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It is widely recognized that the transitions to an information society and a global knowledge economy will be the most important social and economic changes of the next decade. The global knowledge economy with its high innovation speed and an increasing demand of knowledge intensive products and services calls for new management tools and methods. Therefore, efficient management of knowledge has become imperative for almost all types of organizations.

Knowledge management can be addressed from two different perspectives. The first perspective places the emphasis on information technologies as enabling technologies. The second perspective is more people-oriented as it focuses on people and organizations. The difference between these two perspectives is the level at which knowledge management is applied.

The objective of technology-oriented knowledge management is to support knowledge workers at an operational level. That is, information technologies are used to provide the knowledge somebody needs to perform a specific task as well and as efficiently as possible. Often, this requires a careful and smooth integration of knowledge management tools with business process management tools.

While the May issue of J.UCS addressed people-oriented knowledge management, this issue focuses on the role information technologies play in knowledge management. With this special issue we want to give the reader the possibility to get an overview of the leading edge technologies in knowledge management and how these technologies can be applied for knowledge management. To achieve this objective this issue covers the following thematic areas. *Metadata and retrieval* help users to find the knowledge they need to perform their tasks efficiently. *Visualization techniques* reduce the complexity of heterogeneous and complex

knowledge spaces. The management of knowledge in *heterogeneous and distributed settings* is a further challenging field in knowledge management research.

In detail, the papers address the following topics:

Kurt Schneider from DaimlerChrysler (Germany) reports in his contribution *"What to Expect from Software Experience Exploitation"* DaimlerChrysler's attempts to capture, engineer, and reuse experiences in the realm of software quality and software process improvement.

The importance of metadata (i.e. data about data) as an additional knowledge source is highlighted by Wolf-Fritz Riekert from University of Applied Sciences in Stuttgart (Germany) in his paper *"Automated Retrieval of Information in the Internet by Using Thesauri and Gazetteers as Knowledge Sources"*.

A new way to improve the retrieval process is to save user information retrieval experiences or instances and to reuse them in future similar cases. Lobna Jéribi and Béatrice Rumpler from LISI-INSA de Lyon (France) describe this approach in their paper *"Instance Cooperative Memory to Improve Query Expansion in Information Retrieval Systems"*.

Howard Wactlar from Carnegie Mellon University (USA), one of the leading multimedia experts world-wide, shows in his contribution *"Extracting and Visualizing Knowledge from Film and Video"* how knowledge can be extracted and visualized from multimedia archives. The key idea is to aggregate and integrate video content on-demand to enable summarization and visualization in response to queries.

"Efficient Content-Based and Metadata Retrieval in Image Database" is the title, Solomon Atnafu, Richard Chbeir and Lionel Brunie from LISI-INSA de Lyon (France) have chosen for their paper. They report on their approach for multi-criteria image retrieval based on metadata.

Karsten Böhm, Gerhard Heyer, Uwe Quasthoff, Christian Wolff from Leipzig University (Germany) focus in their paper *"Topic Map Generation Using Text Mining"* on how text mining can be used for automatic topic map generation.

"Usage-Centered Interface Design for Knowledge Management Software", is an industry paper written by Harald Karner and Georg Droschl from the knowledge management software company Hyperwave (Austria). The authors report on a user interface case study conducted for an inbound call center.

Knowledge management in heterogeneous and distributed settings calls for new methods to synchronize different groups of knowledge workers. This is topic is addressed in the paper *"Shark – a System for Management, Synchronization and Exchange of Knowledge in Mobile User Groups"* from Thomas Schwotzer and Kurt Geihs from Technical University Berlin (Germany).

"Knowledge Nodes: the Building Blocks of Distributed Approach to Knowledge Management" is the title of the paper written by Matteo Bonifacio, Paolo Bouquet and Roberta Cuel from University of Trento (Italy). The authors criticize the objectivistic approach that underlies most current systems for Knowledge Management. Alternatively, they propose a different approach in which subjective and social aspects of knowledge are taken into account.

Rudi Studer, York Sure and Raphael Volz from University of Karlsruhe, (Germany) entitled their contribution *"Managing Focused Access to Distributed knowledge"*. They present a novel framework, SEAL (SEmantic portAL) that builds on Semantic Web standards. Ontologies are used to integrate many different

information sources and an adequate web site management system for community web sites.

With this selection the readers will get a very broad overview of the state-of-the art in selected fields of technology-oriented knowledge management. We hope that this Special Issue does not only trigger further research activities in this field but that also the papers from industry companies help institutions which want to introduce a technical knowledge management system.

Klaus Tochtermann and Hermann Maurer Graz, June 2002
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