

# Ubiquitous Developments in Knowledge Management: Integrations and Trends

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The results reported in this chapter were obtained through the study of 43 work-units belonging to five business firms in a large group of Tunisian companies. Using the declarative, procedural and judgmental dimensions of organizational memory, interaction effects were detected between IT and organizational memory. Analyses of the data support the view that storage technologies interact with declarative memory contributing to reduce organizational information needs. But, contrary to expectations, storage technologies interact negatively with declarative memory on information provision. Furthermore, network technologies interact negatively with judgmental memory on information provision. These results raise issues that have been rarely encountered in the literature.

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Organizational memories play a significant role in knowledge management, but several challenges confront their use. Artifacts of OM are many and varied. Access and use of the stored artifact are influenced by the user's understanding of these information objects as well as their context. Theories of distributed cognition and the notion of community of practice are used to develop a model of the knowledge management system. The present work looks at a model for managing organizational memory knowledge. Topic maps are used in the model to represent user cognition of contextualized information. A visual approach to topic maps proposed in the model also allows for access and analysis of stored memory artifacts. The design and implementation of a prototype to test the feasibility of the model is briefly examined.

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*Jens Gammelgaard, Copenhagen Business School, Denmark*

This chapter investigates the phenomenon of virtual communities of practice, and proposes them to be efficient for individual's knowledge retrieval, when they work in a geographically dispersed organization, such as a multinational corporation. The virtual community of practice is likely to reduce the contextual gaps that typically exist between senders and receivers of knowledge, as it includes the possibility of feedback loops in the information exchange process. However, the organization must provide a knowledge-sharing friendly culture, and an institutional protectionism, in order to establish the required level of trust, being the foundation for knowledge exchanges within the virtual community.

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Knowledge is increasingly being viewed as a critical component for organizations. It is largely people-based and the characteristics of groups of individuals, in the form of organizational cultures, may play a key role in the factors that lead to either the acceptance or rejection of knowledge management systems (KMS). The primary objective of this research is to explore how dimensions of organizational culture influence factors that lead to the acceptance of KMS. While researchers have agreed that culture plays an important role in KMS, the literature has only recently begun to examine organizational culture within this context. This chapter examined the effects of three dimensions of organizational culture through a research model that was tested and analyzed utilizing a field survey of corporate knowledge management users. Results indicate that both process-oriented and open communication system organizational cultures significantly influenced the factors that led to the acceptance of KMS.

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*Uday Kulkarni, Arizona State University, USA*

Knowledge assets are an important organizational resource. Both research and practice literature has recognized that, if managed properly, knowledge resources have the potential to contribute to a firm's performance. Yet, the way in which organizations build knowledge management (KM) capability is relatively poorly understood. The diversity of knowledge assets existing within organizations makes it difficult to have a common understanding of how to utilize the knowledge resource most effectively. Drawing from both Resource Based View and Organizational Learning literature, the authors present a Knowledge Management (KM) framework that describes distinctly different types of knowledge assets within organizations. KM traditionally encompasses a range of activities associated with the knowledge lifecycle, including creation and capture of knowledge, transfer or sharing of this knowledge, and its

application and reuse in organizations. While explicating the characteristics of the different knowledge assets, our KM framework describes the unique activities required to manage these assets. Using this framework, organizations can evaluate their knowledge needs and selectively invest in knowledge resources, focusing on the activities required to manage them effectively. The authors believe that this framework will allow organizations to build optimal KM capabilities dictated by their business needs and goals, and in alignment with their overall business strategy.

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*Seokwoo Song, Weber State University, USA*

Intraorganizational units play a critical role in KM processes of acquiring, creating, exchanging, and utilizing knowledge assets. While much attention has been directed to effective knowledge strategies for supporting organizational KM processes, there is a lack of insightful research on knowledge strategy and its implementation at the work-unit level. This study examines two types of work unit knowledge processing styles (i.e., codification and personalization) and explores the relationship between critical determinants (i.e., task, organizational culture, and technology) and knowledge processing styles. The results showed that task variety and task analyzability were strongly associated with both knowledge processing styles. Interestingly, task interdependence and autonomy were significantly related only to personalization, whereas IT support was strongly associated with codification. The findings from this study suggest that the unit's organizational variables should harmonize appropriately with its knowledge processing styles.

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Knowledge capitalization has become a major economic driver in business today and has created enormous requirements for organizations as they reconsider their goals and adapt their business strategies. However, the definition of knowledge management in an organizational context is a difficult task to realize (Spiegler, 2000). Although knowledge is a critical resource, it is generally poorly managed (Earl, 2001). Good knowledge management in an organization is likely to help achieve business goals, but require an alignment of knowledge management strategies (KMS) and business strategies (BS). Such alignment can be an effective approach to enhancing interactions and to applying knowledge. This chapter provides, first, a KMS and BS alignment framework and taxonomy in which concepts, links (contextual links among concepts), actors, actions and processes are defined and described to show how they provide the potential for effective knowledge management through alignment and interaction in an organization. Secondly, a KM capabilities framework and taxonomy in which three main dimensions and specific features is presented. The framework presented here is for managers in companies and organizations to use to align their KM strategies with business strategies to improve performance involving financial growth, cost reduction, and customer satisfaction.

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Knowledge is based on fact and is often obtained from experience or via association. Knowledge organization is the systematic management and organization of knowledge (Hodge, 2000). With the advent of Web 2.0, mashups have become a hot new thing on the Web. A mashup is a Web site or a Web application that combines content from more than one source and delivers it in an integrated way (Fichter, 2006). This chapter will first discuss knowledge and knowledge organization and review literature on these topics. Then the authors will explore the concept and look at the components of a typical mashup. In addition, they will provide an overview of various mashups on the Internet. From these facts, the chapter proceeds to draw some connections between knowledge organization and mashups, solidifying the authors' assertions with an elaboration on their real-world, a mashup experiment in an enterprise environment. The authors will describe how they mixed the content from two sets of data and created a new source of data: a novel way of organizing and displaying HP Labs Technical Reports. The findings from this project will be included and some best practices for creating enterprise mashups will be given. Finally, they will discuss the future of enterprise mashups.

## Chapter 9

Knowledge Sharing Model of 24-Hour Knowledge Factory..... 141

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*Amar Gupta, University of Arizona, USA*

In order to improve the level of decision making and competitive advantage, organizations are actively trying to develop and incorporate new knowledge management techniques that are suited for the evolving global economy; the notion of globally distributed team environments represents one area of heavy focus. In implementing a globally distributed work environment, decision makers are faced with an increasingly daunting task of reconciling disparate distributed and heterogeneous data sources. Further, these data sources are growing every day as corporations dedicate more of their resources to a multinational scenario, rather than to a domestic or geographically-specific focus. In order to address this growing problem of knowledge sharing, the authors propose a knowledge sharing model that incorporates the notion of the 24-Hour Knowledge Factory, in conjunction with grid computing and case-based reasoning (CBR). This chapter begins with a description of the 24-Hour Knowledge Factory, the Enterprise Common Knowledge Shared (ECKS) methodology, and the evolving time-shift sharing model. Next, a CBR-adapted approach, based on grid computing, is presented for use in a 24-Hour Knowledge Factory environment. Finally, several types of enterprise knowledge transfer mechanisms are presented in this paper.

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It is widely acknowledged that knowledge management (KM) strategy is a desired precursor to developing specific KM initiatives. Strategy development is often difficult due a variety of influences and constraints. Using KM influences as a foundation, this case study describes issues involved in developing a KM strategy for the Air Force Material Command, including issues to be considered for future strategy development such as leadership support and understanding, conflicts with IT organizations, funding, technology usage and configuration, and outsourcing.

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*Murray E. Jennex, San Diego State University, USA*

This is a longitudinal case study that explored the relationship between use of organizational memory and knowledge, knowledge management, and knowledge worker productivity within the engineering group at a nuclear power plant. Three data points were taken over 5 years. The group used a knowledge management system (KMS) and it was found that the system improved effectiveness/productivity of the organization. The organization had not identified measures for determining productivity improvements, so the key results of the case study are models showing the impact of knowledge use on productivity.

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This chapter seeks to develop a model for understanding Knowledge Management (KM) practice in an Arab socio-economic context. To achieve the objectives of the study, a conceptual KM model was proposed and described; it was then illustrated using a case study. The chapter adopts a case study approach as a powerful source of understanding the KM specificities. Twelve interviews were conducted with executives of a telecommunications company, and then were systemically analyzed.

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*Bonnie Wai-yi Cheuk, Environmental Resources Management (ERM), UK*  
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This chapter introduces readers to Dervin's Sense-Making Methodology (SMM) and demonstrates how it has been applied to design knowledge management projects for the public sector. The projects described in this chapter were implemented between November 2005 to June 2006 when the main author was the Head of Knowledge Management for the Improvement Service for the Scottish Government, a company limited by guarantee with a budget provided by the Scottish Executive, with the aim to improve the efficiency, quality and accountability of public services in Scotland through learning, sharing knowledge and delivering improvement solutions. Sense-Making Methodology is based on a set of assumptions which challenge some fundamental knowledge management thinking. The SMM assumptions imply the need for alternative procedures to be implemented to promote knowledge sharing. Three primary applications are discussed: (a) conducting user study to understand user needs; (b) designing web-

based KM systems; and (c) facilitating dialogue to nurture communities of practice. This chapter aims at stimulating further thinking and debate in adopting theoretically informed approaches to implement knowledge management practices.

#### **Chapter 14**

Using Soft Systems Methodology to Reveal Socio-Technical Barriers to Knowledge

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*Alan C. Gillies, University of Central Lancashire, UK*

*Jeanette Galloway, North Mersey Health Informatics Service, UK*

This study uses Checkland's Soft systems Methodology (SSM) to consider the local factors operating within a case study from a local NHS health informatics service organization to assess the need to take account of local factors when applying knowledge management techniques in such cases, with a particular focus on managing the tacit knowledge components, highlighted by Nonaka.

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*Sara Värlander, Stockholm University, Sweden*

The increased reliance on Knowledge Management systems has made certain theorists to suggest that this will enable a surpassing of proximal knowledge creation, unequivocally leading up to more effective knowledge creation by easy codification and sharing of knowledge. However, in general, too much focus has been put on the potential of KM systems rather than its limits and the role of supporting social processes of knowledge creation has been largely ignored. The aim of the current research is to start to fill this gap in the KM literature by examining how social processes of knowledge creation are used in banking, taking the point of departure in an approach inspired from phenomenology. The paper illustrates how the increased use of KM systems has not decreased the need for relying on locally embedded service production, due to the invaluable knowledge creation processes that are generated through the embodiments of co-present interactions.

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*Shyamanta M. Hazarika, Tezpur University, India*

This chapter describes semantic search of unstructured data through a qualitative pre-processor. Using the spatial representation language Region Connection Calculus, qualitative relationships inherent in the background knowledge is made explicit. The pre-processor obtained by exploiting such qualitative information can overcome some fundamental problems associated with information retrieval and is an efficient approach to retrieve relevant results.

## **Chapter 17**

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Knowledge workers are often employed to extract knowledge from domain experts in order to codify knowledge held by these experts. The extent to which workers rely on tacit or explicit knowledge may produce inefficiencies and reduce productivity if the information is not shared among those who need it or if it encapsulates strategic goals and is inadvertently shared with those who might undermine the firm's competitive advantage. This chapter discusses the nature of tacit versus explicit knowledge in terms of the dimensions thought to contribute to its degree of tacitness. The authors present the results of an exploratory study in which they develop an instrument designed to elicit perceptions regarding the nature of knowledge used by workers and their degree of reliance on tacit knowledge. It is an indirect form of measurement that eliminates the need to render the knowledge entirely explicit prior to measurement. As an additional benefit, it allows the classification of knowledge along a continuum, ranging from entirely tacit to entirely explicit or somewhere in between. Use of this instrument by managers will help them identify pockets of tacit knowledge within the firm that could either be made explicit so that other workers can benefit from it or that could be prevented from becoming explicit should its strategic value require protection.

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*David A. Gadish, California State University Los Angeles, USA*

The internal validity of a spatial database can be discovered using the data contained within one or more databases. Spatial consistency includes topological consistency, or the conformance to topological rules. Discovery of inconsistencies in spatial data is an important step for improvement of spatial data quality as part of the knowledge management initiative. An approach for detecting topo-semantic inconsistencies in spatial data is presented. Inconsistencies between pairs of neighboring spatial objects are discovered by comparing relations between spatial objects to rules. A property of spatial objects, called elasticity, has been defined to measure the contribution of each of the objects to inconsistent behavior. Grouping of multiple objects, which are inconsistent with one another, based on their elasticity is proposed. The ability to discover groups of neighboring objects that are inconsistent with one another can serve as the basis of an effort to understand and increase the quality of spatial data sets. Elasticity should therefore be incorporated into knowledge management systems that handle spatial data.

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*Dan Zhu, Iowa State University, USA*



Finding the right software is often hindered by different criteria as well as by technology changes. The authors performed an AHP (Analytic Hierarchy Process) analysis using Expert Choice to determine which data mining package was most suitable. Deliberating a dozen alternatives and objectives led them to a series of pair-wise comparisons. When further synthesizing the results, Expert Choice helped provide a clear rationale for the decision. The issue is, data mining technology is changing very rapidly. This chapter focused only on the major suppliers typically available in the market place. The method and the process that was used can be easily applied to analyze and compare other data mining software or knowledge management initiatives.

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*D. Sandy Staples, Queen’s University, Canada*

Knowledge sharing is a popular research topic; however, the construct has not been well defined theoretically or in terms of how to operationalize it, as there appears to be little consistency. This apparent lack of consistency is problematic for developing a cumulative understanding of the predictors and outcomes of this behavior. This study examines how other researchers have operationalized knowledge sharing, and conduct a qualitative study to further understand this construct. A knowledge sharing and hoarding classification system is developed, and six knowledge sharing behavioral categories are identified. Finally, recommendations are made for future research in knowledge management.

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*Elham Mousavidin, University of Houston, USA*  
*Lakshmi Goel, University of North Florida, USA*

This study draws on literature in knowledge management and communities of practice to arrive at properties of a community that make it sustainable. These properties can then be viewed as a blueprint of what a community needs to have to achieve its function of fostering collaboration and hence, generating knowledge. In sum, this research is intended to help practitioners arrive at how best to design communities in knowledge management systems.

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*Suzanne Zyngier, La Trobe University, Australia*

This chapter develops an argument for and provides case study evidence to demonstrate that knowledge management (KM) governance is a mechanism that strengthens the development and implementation of KM strategies. It achieves this through locating and formalizing risk management as a function of governance, establishing reporting structures and mechanisms to ensure feedback into the ongoing development of organizational KM. The author concludes that the operationalization of KM governance formalizes, locates and authorizes risk management as a structured response to the resolution of the cultural and

structural risks and obstacles to KM strategy, and that it achieves this through developed capacity for analysis, articulation, strategic alignment and activity to address risks to effective, sustainable KM.

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This chapter reports on types and roles of information and communication technologies (ICT) implemented in knowledge management (KM) solutions in local governments. A sample of nine local councils were rated on usage of various generic and KM specific ICT in supporting knowledge exploitation or exploration, and codification or personalization strategies. The results indicate a marked preference for generic types of ICT, and support for knowledge exploitation and codification approaches. These findings and their implications are further interpreted in terms of three stages of KM development in organizations.

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This chapter reviews the plethora of user-generated video activity and the issues it creates for knowledge management activities. The ability for individuals to create and post videos online has become prolific and it has now become a source of potential liability for employees and the firm. Video can be used convey rich narratives that can facilitate sensemaking and knowledge sharing and transfer, but their needs to be standards and controls for content development and distribution. When video content is developed, structure and culture are important factors that must be considered in storytelling activities to increase the opportunity for effective sensemaking and message retention and to ensure the accuracy, relevance, and legitimacy of video content. Evidence and arguments are presented that should motivate organizations and academics to review video generation activities both internal and external to the organization. Issues concerning video content delivery, liability, spam, and search engine capabilities are discussed. Opportunities for new research inquiries are identified.

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