Preface

This book is the result of the Innovative Internet Information Systems (IIIS) workshop held in conjunction with the 7th European Conference on Information Systems (ECIS’99). The workshop is the second of a series that aims at bringing together people interested in discussing the opportunities and challenges for Internet-based information systems.

The focus of the 1999 workshop that led to this book was on Internet technology for knowledge management, and Internet-based solutions that can be used as enabler for the effective creation and use of organizational memories. This theme was selected acknowledging that knowledge management is fast becoming a crucial issue and key factor in the growth of organizations. Managing disparate, heterogeneous knowledge, and making it available in an appropriate manner across the organization is a daunting task. The Internet, intranets, and the World Wide Web have been significant catalysts in the development of new Knowledge Management (KM) technologies and have contributed immensely to the level of awareness in organizations and their perceived need to create and leverage Organizational Memories (OM).

The workshop aimed at discussing the many aspects that are associated with both the development and use of organizational memories and knowledge management systems based on Internet technologies. Topics of interest included the use of organizational memories for cooperation and learning; knowledge representation, visualization and brokering; distributed knowledge management; cross-border and multicultural issues for Internet-based KM systems; and case studies of building Internet-based OMs in corporate environments.

As pointed out by many researchers, knowledge management can be approached from different standpoints. In selecting the papers for this book, we have tried to acknowledge this aspect of knowledge management and the importance of understanding the problem by combining different perspectives. The workshop gathered 20 participants both from academia and industry, with competencies in Internet technologies, organization theory, knowledge management, enterprise systems, management theory, artificial intelligence, information systems, information retrieval, and CSCW. The different backgrounds of the participants contributed to an interesting and vibrant workshop. Following the workshop, each paper underwent a revision process in which the authors were able to take into account the new perspectives and feedback gained from the workshop presentations and discussions.

We have tried to preserve the presence of multiple voices in this book, hoping that it will motivate you, the reader, to reexamine your own understanding of Internet-based KM/OM systems from a perspective that you may not have considered before. In particular, we have combined theoretically and empirically based contributions, so that the theory can inform practice and vice-versa. We believe that this kind of dialog is essential in a young domain such as knowledge management.
How this book is organized

The book starts with an introduction in which we formalize a model of knowledge management that resulted from an elaboration of the discussions at the workshop. Integrating the diverse streams of research that were presented, the model sheds light on both the current state of Internet-based knowledge management research and on directions for the future.

The rest of the book is divided into three parts: Utilizing Knowledge; Acquiring Knowledge and Building Organizational Memories; and Knowledge in Virtual Organizations. Each part ends with case studies that provide an insight to actual experience in Internet-based knowledge management. This grouping of the contributions is not free from overlaps and could have been done in several different ways. Some additional connections between the papers, and therefore alternative keys for the reading of this book, are provided in the Introduction.

Part I: Utilizing Knowledge

Let’s start at the very beginning, it’s the very best place to start...

Contrary to the musical wisdom of Rodgers and Hammerstein it is often helpful to start at the end. The end, in our case, is knowledge utilization. The only thing we want to do is get the right knowledge to the right person at the right time. So the first part of this book focuses on just that — getting people to use the knowledge found in our organizations. Looking at knowledge utilization first serves an important purpose — it allows us to visualize how the complex indexes, acquisition techniques, filtering methods, delivery mechanisms, and organizational structures that we will examine afterward, can actually be used.

The first contribution of this part, “Internet Enabled Corporate Sharing and Utilization” by Tschaitschian, Abecker, Hackstein and Zakraoui, presents a system that allows the definition of several models for describing an object. These models are graphically constructed and are the result of collaboration among domain experts during face-to-face meetings. Each user has available several of these models and can use them interactively when classifying an object. The system they present is implemented in Java, and is shown in the context of a case study.

Chou and Chow, in “Essential Factors in Knowledge Management with COTS products,” share their experience of introducing knowledge management to NASA’s Jet Propulsion Laboratories (JPL). The JPL experience highlights the people-process that often gets obscured by our drive to implement new technologies. The utilization of Internet-based knowledge cannot be disassociated from the human participants in the organization, and we generally do not have the luxury of assuming that no prior systems are in use. This chapter outlines a detailed process in which oﬀ-the-shelf tools can be used to bring knowledge management functions to a diverse user population.

The final chapter in this part presents Saward’s case study, “The Challenge for Customer Service: Navigating Heterogeneous Knowledge.” By combining KM with
distributed information systems and information retrieval techniques, AFI, the financial institution presented by Saward, is extending knowledge management to the front lines of its operation. This chapter illustrates with great clarity that “publishing on the net does not constitute knowledge management,” and after dissecting the major KM issues facing the target company, goes on to provide a step-by-step account of how Internet-based knowledge utilization can be realized in a dynamic corporate environment.

Part II: Acquiring Knowledge and Building Organizational Memories

While Internet technologies almost trivialize the process of making information available, it has made it substantially more difficult to find an efficient way to organize, describe and classify this information for later retrieval and use. The challenges in this respect are many and particular problems arise due to the increasing volume and heterogeneity of the information available to “connected” users. The contributions in this part address some of these problems, considering how to acquire (automatically or semi-automatically) knowledge and how knowledge should be structured to allow for effective utilization.

We begin this part with Gao and Sterling’s “Semi-Structured Data Extraction from Heterogeneous Sources.” In this chapter they attack one of the leading problems in Internet-based knowledge management – extracting usable concepts from text and HTML-based documents. The sheer quantity of HTML documents being fielded by the minute necessitates an effective means of analyzing those documents to identify relevant knowledge. Their hands-on work has resulted in a method that is Web-site independent and can structure partial and incomplete knowledge as well.

In contrast to Gao and Sterling’s focus on newly created Web-based knowledge, Polovina and Veneziano have gone back to the grandfather of all modern information systems – accounting systems, and are “adding knowledge to accounting systems for virtual enterprises.” There is no higher legacy than accounting data, and it is fascinating to see how much knowledge is implicit in the balance sheets and income statements of an organization. We expend a tremendous effort seeking out and acquiring usable knowledge for a KM system. Polovina and Veneziano show how structured financial data can be superimposed with conceptual graphs to create a new knowledge resource for us to use.

The next chapter “Collaborative Information Management Using Concept Indexes” by Voss, Nakata and Juhnke, describes a system where users collaboratively define concepts by attaching them to text, phrases and other concepts. Software agents find occurrences of concepts in a document collection, enabling users to navigate documents based on concepts. This way, concepts are defined by way of their (con)textual occurrences in the document collection to be described. Software agents support the users and increase the efficiency of such a solution. The “Concept Index” system is available as a prototype, running across the Web. The chapter concludes by exploring a set of usage scenarios for the system.

The two last chapters in this part investigate, through case studies, the activities
of knowledge workers in order to arrive at general requirements and recommendations for IT support in KM.

"Facilitating Knowledge Transfer in an R & D Environment — A Case Study" by Barrett, Lau and Dew explores the R&D unit of an international steel company and the testing of an Internet-based solution for facilitating knowledge transfer. This chapter presents a theoretical framework for the dynamics of knowledge transfer, and in particular the search strategies applied by employees in order to locate appropriate resources. The authors present a prototype and show how their approach affects the search strategies for special queries.

The last chapter of this part, "On Knowledge Management — A Field Study" by Carstensen and Snis, investigates the activities performed by a quality support group in a Danish pharmaceutical company. In particular, they explain the various knowledge bases used by the support group and explore their activities to distribute knowledge from these sources. The paper concludes with requirements for the design of IT-supported KM.

Part III: Knowledge in Virtual Organizations

The relationship between knowledge management and virtual organizations is highly synergistic. Depending on your definition of a virtual organization, it may not even exist apart from its ability to leverage organizational knowledge. A more typical definition of a virtual organization, in which ad-hoc teams are created within or across organizations to perform a specific task, necessitates knowledge management of the highest order to allow for efficient operation. As the need for physical assets decreases and is replaced by intellectual assets, managing those assets becomes paramount.

This part is composed of three chapters that extend the issue of managing knowledge to virtual organizations. The clear relationship between virtual organizations and knowledge management emerges from these chapters. On the one hand, the success of virtual organizations depends heavily on their ability to quickly adapt to new demands in the market and be open to new business opportunities. This requires an intensive and creative use of knowledge, making KM essential to their survival. On the other hand, virtual organizations point out in a critical way issues connected to KM and therefore are important to gain a better understanding of knowledge management also in non-virtual organizations.

McKay and Marshall, in "The Challenges of Interorganizational Management: An Emerging Issue in the Virtual Organization" provide an interesting overview of the literature on virtual organizations and contribute to the understanding of the key terms. Despite the high potential for this type of organization, the authors warn of some problematic issues, some of which have plagued Information System development for years. In this chapter they provide a set of “warnings” useful to whomever wants to navigate in the rough sea of virtual organizations and emphasize the importance of requirements analysis.

The chapter by Burn and Ash, “Managing Knowledge in an ERP Enabled Virtual Organization,” adds to the understanding of virtual organizations provided in the previous chapter. It goes into more detail on the issue of knowledge management, pointing the finger on the need for knowledge creation and sharing, rather than
extraction. Change is identified as the only constant in virtual organizations and the issue of knowledge management is faced starting from this standpoint. The connection between ERP systems and knowledge management is one that will clearly grow in significance as the larger organizations investing in an ERP system reach the conclusion that this investment can and should be leveraged for KM systems.

“Knowledge in Virtual Organizations,” and the book as a whole, concludes with Jennex’ discussion of “Using an Intranet to Manage Knowledge for a Virtual Project Team.” Managing the knowledge of a project team characterized by high geographical distribution, limited resources and strict time constraints sets the stage for this applied look at intranet-based knowledge management. Jennex provides both a theoretical basis and useful metric to measure the success of KM/OM activity. He deals with questions such as how to determine what knowledge should be made available and how to relate relevant knowledge to the appropriate stage of an ongoing project. We expect that some of the lessons learned here will be useful in any organization that has Internet resources and infrastructures, and seeks to leverage them through knowledge management.

Taken together the three chapters of this part provide an interesting overview of the problems that are connected to knowledge management in virtual organizations and indicate directions for solving them. An increasing amount of organizational activity and knowledge work is virtual in nature. These chapters not only provide important insights into what has been done, but move us a step closer to a future in which Internet-based knowledge management and organizational memories become an integral part of our standard working environment.

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