Preface

In the 21st century, successful organizations are competitive, fast-paced, first-to-market, and global in nature. Creating strategic advantage requires a new type of organization that has the capability to create knowledge to maximize organizational competitiveness and strategic success. Knowledge is viewed as a resource that is critical to an organization's survival and success in the global market. Therefore, organizations need mechanisms to create and manage knowledge as an asset. However, the bulk of organizations have still not approached knowledge management (KM) activity formally or deliberately. The cause of this inattention could be that most organizations are struggling to comprehend the KM concept. KM is still defining itself because the body of theoretical literature and research in this area is small, but growing. According to IDC, the worldwide spending on knowledge management services will grow from US$776 million in 1998 to more than $12.7 billion in 2005. As the industry moves into the so-called "second-generation" phase, managers are being challenged to have more of an in-depth understanding of the issues and the need to demonstrate business performance and learning gains from investing in knowledge-based projects and initiatives.

The New Wealth of Organizations is total quality management, re-engineering, and intellectual capital. The companies that will succeed in the 21st century are those that master the knowledge agenda. While most business leaders appreciate the strategic value of knowledge and the need to manage their knowledge assets, many of them seem unable to derive real benefits from their efforts.

In recent years, an increasing amount of global business school research and literature has focused on concepts such as the "knowledge based economy," "organizational learning," "knowledge workers," "intellectual capital," "virtual

teams," and the like. Yet, much of the organizational understanding of these concepts is not based on empirical research; rather, the order of the day does seem to be anecdotal evidence of seemingly successful stories, hearsay, and theory unrelated to actual practice and implementation issues, challenges, successes and failures. Creating knowledge-based organizations will not be an easy exercise because organizations have to overcome tremendous hurdles in bringing disparate enterprise data sources into a cohesive data warehouse or knowledge management system.

The purpose of this book is to bring together some high quality concepts that are closely related to "organizational learning," "knowledge workers," "intellectual capital," and "virtual teams." It includes the methodologies, systems, and approaches needed to create and manage knowledge-based organizations of the 21st century.

The presentations in the book are divided into five sections. The first section, *Knowledge Based Organizations*, presents the evolution and review of knowledge management and information technology available to create and manage knowledge in organizations. This section consists of two chapters.

In Chapter 1, Jatinder Gupta, Sushil Sharma and Jeffrey Hsu take a broad view of the topic of knowledge management and provide a comprehensive overview of the concepts and future challenges related to knowledge management. The authors argue that the categorization and organization of knowledge will become a core competency of every organization and will necessitate strategic thinking about what knowledge is important. Development of a knowledge vocabulary, search tools and navigation aids, and knowledge editors that add context and transform information into knowledge will be needed to be successful in creating and managing knowledge-based organizations.

Chapter 2 describes a technology assessment model for knowledge management. In this chapter, Sushil Sharma, Jatinder Gupta and Nilmini Wickramasinghe highlight the importance of addressing both the subjective and objective perspectives of knowledge management and describe the type of computer and communication systems needed to implement sound knowledge management approaches in organizations.

The second section of the book is titled *Evolving Electronic Markets*. As the title indicates, this section presents the concepts, models, and tools related to the electronic markets. The four chapters in this section cover such topics as: the models for e-marketplace, financial markets in the Internet age, the modeling and interpretations of electronic markets and the evolution of the Application Service Provider (ASP) industry that provides essential infrastructure for the Internet-based e-business transactions.

In Chapter 3, Hamada Ghenniwa and Michael Huhns describe a business-centric and knowledge-oriented architecture for *eMarketplaces* that integrates the interests of an autonomous enterprise into a single open-market environment. The proposed *eMarketplace* architecture exists as a collection of eco-

nomically motivated software agents. It enables and supports common economic services, such as brokering, pricing, and negotiation, and the cross-enterprise integration and cooperation in an electronic supply-chain.

In Chapter 4, Ross Lumley provides a review of the effect of new technologies on the financial markets. He shows that, time and again, technological advances have impacted the very workflow of the financial market processes including the available financial instruments. An overview of multi-agent systems is provided followed by several examples of multi-agent systems supporting investors in financial markets.

In Chapter 5, Murat Baygeldi and Steve Smithson use the Actor Network Theory (ANT) to describe the actors, intermediaries, framing and power that are the most important components of an electronic market. They highlight the uses and limitations of ANT to define various components involved within an electronic market, especially in modeling computer-trading systems.

In the last chapter of the second section, Dohoon Kim discusses the evolution of the Application Service Provider (ASP) industry that provides essential infrastructure for the Internet-based e-business transactions. Thus, in Chapter 6, the emerging ASP business models are classified and analyzed in order to assess their positions in the competitive landscape based on the economies of scale. This chapter also identifies the prerequisites for the ASP business models to develop themselves into XSPs (eXtended Service Providers). It also develops a scenario for that evolutionary path.

The third section of the book, *Knowledge Management*, presents the state-of-the art developments in knowledge management that are useful to enhance the efficiency and effectiveness of the intelligent enterprises for the 21st century.

In Chapter 7, Maria Manuel Mendes, Jorge Gomes and Bernardo Bátiz-Lazo describe the use of the knowledge process as a means to examine issues relating to knowledge identification, creation, storage, dissemination, and application in new product development. Results from their case study suggest that while the knowledge process may be valuable in assessing the structural elements of knowledge management, it may fail to provide a more comprehensive explanation of the dynamics and complexities involved. The authors suggest that more elaborate models may be needed to explain how knowledge is created, shared and used in knowledge-intensive processes.

Chapter 8 by Karen Neville and Philip Powell outlines the development of a "knowledge base support system" for a university that allows every end user the opportunity to interactively extract from and add to the system. The proposed system can test a student's problem-solving skills with "real world" simulations and cases providing feedback to both lecturers and students.

The importance and development of a model to help induce enterprise knowledge flows are discussed in Chapter 9 by Mark Nissen. Because of the time-critical nature of most knowledge work in modern enterprises, this chap-

ter focuses in particular on knowledge dynamics to help the enterprise become more knowledge-based. Using a global manufacturing firm as an example to illustrate how the knowledge-flow model provides practical guidance, Mark Nissen identifies knowledge elements that are critical to effective performance in an unpredictable and dynamic business environment. The chapter also illustrates how the multi-dimensional model can be augmented to depict the relative flow times associated with various knowledge elements to provide a roadmap for requisite knowledge flows for the knowledge-based organization.

In Chapter 10, Lisa Burnell, John Priest and John Durrett describe appropriate tools, methods, architectural issues and development processes for knowledge management systems (KMS), including the application of organizational theory, knowledge-representation methods, and agent architectures. Details for systems development of KMS are provided and illustrated with a case study from the domain of university advising.

In Chapter 11, Bonnie Rubenstein Montano focuses on those organizations that have not been as successful at knowledge management as they originally planned. She argues that organizations can look to virtual communities as role models for successful knowledge management because many of the features that have been identified in the literature as important for successful knowledge management are present in virtual communities.

The impact of technology and knowledge management in creating and sustaining *Learning Organizations* is the topic of presentations in the next section of the book. The two chapters in this section explore the issues of the development of a theory of learning and intelligence in organizations and explore the relationship between a learning organization and organizational learning.

Chapter 12 by Gary Templeton suggests that the learning theory has not adequately addressed the technology variable in its framework, models, or propositions. The body of theory derived here centers around "learning maturity," the capacity of an actor to effectively exhibit intelligent behavior in a wide range of situated actions. The proposed theory is significant because it uniquely includes technology as a meaningful element in learning and intelligence.

The relationship and interaction between the learning organization and organizational learning is discussed in Chapter 13 by Juin-Cherng Lu and Chia-Wen Tsai. The authors argue that the dynamic process between the learning organization and organizational learning is an important issue in knowledge management and practice. Therefore, the authors explore the relationship and interaction between the learning organization and organizational learning in terms of knowledge management processes in business.

The fifth and final section of the book, termed *Future Organizations*, takes a look at the use of knowledge management in defining the coming of the future organizations. It consists of two chapters.

In Chapter 14, J. Daniel Sherman develops the theoretical basis for achieving optimal levels of cross-functional integration in new product development.

He discusses the structural modes of integration and presents a theoretical framework based on degree of integration required, progressive combined information processing capacity, and cost.

In the final chapter of the book, Kwangyeol Ryu and Mooyoung Jung introduce a fractal-based approach to managing intelligent enterprises. Faced with intense competition in the growing global market, fundamental changes are mandatory in business models, management approaches, and technology resources. In this chapter, therefore, several strategic issues for managing intelligent enterprises are discussed in a comprehensive manner, including: (1) fractal models of an intelligent enterprise with new hierarchies and structures for future organizations, (2) strategic supply chain models of e-biz companies based on fractal architectures, and (3) fractal manufacturing system (FrMS) as a type of a future manufacturing system. The authors hope that understanding the proposed methodologies and approaches based on the fractal concept will facilitate the realization of fractal-based systems and give the readers an insight into the requirements of future organizations.

We believe that the book will be a comprehensive compilation of the thoughts and vision required to create knowledge-based organizations. There is thorough discussion of a variety of information technologies required for knowledge creation and management. The presentations illustrate the concepts with a variety of public, private, societal, and organizational applications. They offer practical guidelines for designing, developing, and implementing knowledge creating and management systems. Thus, the book should benefit undergraduate and graduate students taking knowledge management and related courses and practitioners seeking to better support and improve their decision-making. Hopefully, the book will also stimulate new research about knowledge-creating organizations by academicians and practitioners.