

Preface

E-commerce and Internet's growth is bringing fundamental changes to business models, societies, and economies. With the increasing advancements of information and communication technologies, customers, suppliers, and business partners are demanding more from business enterprises. Organizations are exploring new markets, new services and new products in response to forces such as advances in information and communication technologies, business strategies such as mass customization, globalization and shorter production cycles. Enterprises of the 21st century need to offer high demand of services and have to increase revenue and productivity through reduced expenditures and a better level of service with fewer resources. In the electronic business environment, organizations are expected to achieve greater profit, reduce overhead and have flexible workflow processes by collaborating business information, partners, and physical resources in a more effective manner. To cope with these growing and complex requirements, enterprises of tomorrow need new types of specialized tools and advanced services and new advanced approaches to support their business activities. The technologies can be leveraged to create *intelligent enterprises* which will not only provide better-focused and customized services to customers, but also, create business efficiency for building relationships with suppliers and other business partners on a long term basis.

Intelligent enterprises are where knowledge management and other business intelligence solutions provide in-depth analytical capabilities needed to turn raw data into actionable knowledge for an enterprise. In an intelligent enterprise, various information systems are integrated with knowledge gathering and analyzing tools for data analysis and dynamic end-user querying from a variety of enterprise data sources. These solutions enable an enterprise to improve customer service and partner relationships and to create marketable knowledge products from a firm's own internal data. Creating intelligent enterprises will not be an easy exercise as organizations will have to overcome tremendous hurdles in bringing disparate data sources into a cohesive data warehouse or knowledge management system.

The purpose of this book is to bring together some high quality expository discussions from experts in this field to identify, define, and explore the subject matters

closely related to the intelligent enterprises. It will include the methodologies, systems, and approaches needed to create and manage intelligent enterprises of the 21st century. For the first time, it will bring all these concepts, tools, and techniques into one volume so that the reader can comprehend the requirements to create an intelligent enterprise.

The contributions in this book are organized into four sections. The first section, consisting of two chapters, is titled *Intelligent Enterprises* and sets the stage for the intelligent enterprises of the 21st century. It describes the knowledge economy, the emergence and the macroeconomic benefits of intelligent enterprises.

In Chapter 1, Sushil Sharma and Jatinder Gupta argue that intelligent enterprises are essential in a knowledge-based economy. They suggest that intelligent enterprises are evolving because of the developments in knowledge management where business intelligence solutions provide in-depth analytical capabilities to turn raw data into actionable knowledge in an enterprise.

Chapter 2, by Thomas Siems, explores the macroeconomic benefits that intelligent enterprises can have on the U.S. economy. He argues that in becoming intelligent enterprises through the use of new information technologies and knowledge management strategies, the firms lower inventory levels relative to sales, leading to higher productivity growth, lower prices, and more competitive markets.

The second section of the book, titled *Electronic Enterprises*, discusses the evolution and development of intelligent enterprises. This section consists of five chapters that describe the tools, techniques, and software available to realize the potential of intelligent enterprises.

In Chapter 3, Sandeep Krishnamurthy presents a comparative study of eBay and Amazon. Even though amazon.com has received most of the hype and publicity surrounding e-commerce, eBay has quietly built an innovative business truly suited to the Internet. While Amazon sought to merely replicate a catalog business model online, eBay recognized the unique nature of the Internet and enabled both buying and selling online with spectacular results. Its auction format was a winner and clearly demonstrated that profits do not have to come in the way of growth.

Chapter 4, by Lei-Da Chen and Justin Tan, argue that virtual stores provide great efficiency in the retail value chain and their existence has paved the way for the diffusion of electronic commerce. In addition to providing new theoretical grounds for studying the virtual store phenomena, they also supply virtual stores with a number of operative critical success factors to remain competitive in the volatile electronic marketplace.

In Chapter 5, Kaushal Chari and Saravanan Seshadri suggest that success in business endeavors requires that the underlying information technology infrastructure in enterprises be intelligent and flexible enough to adapt to various changes in the market opportunities quickly. The authors propose an agents-based architecture to support B2B commerce. Their proposed architecture covers electronic exchanges and enterprise systems for B2B commerce.

Liang-Jie Zhang and Jen-Yao Chung discuss the need and ways to build adaptive e-business infrastructure for intelligent enterprises in Chapter 6. They introduce a conceptual architecture of building adaptive e-business infrastructure using Web services and present an overview of Web services creation and invocation, federated Web services discovery and Web services flow composition. They conclude the chapter by introducing our vision on the future adaptive e-business infrastructure for intelligent enterprise.

Chapter 7, by Edward Watson, Michael Yoho, and Britta Riede, argues that enterprise systems will serve as the foundation for the intelligent enterprise of the 21st century. Therefore, the authors provide a review of several core areas of enterprise systems and many challenges for the firms to realize the benefits of these systems.

The third section consists of seven chapters and is devoted to the *technologies and tools for intelligent enterprises*.

In Chapter 8, Zaiyong Tang, Bruce Walters, and Xiangyun Zeng establish a conceptual framework for intelligence infrastructure, which is an indispensable foundation to intelligent enterprises. They review intelligent agents' research and applications, identify their role in intelligence infrastructure, discuss the concepts and issues behind the intelligent agent supported intelligence infrastructure, and point out future developments that may help intelligent enterprises become more efficient.

Chapter 9, Jose Framinan, Jatinder Gupta, and Rafael Ruiz-Usano argue that an enterprise resource planning (ERP) system is a fundamental tool in the intelligent enterprise and therefore constitutes an important element for knowledge management. The authors describe the advantages and disadvantages of ERP systems, as well as major problems encountered during their implementation.

While it is essential that intelligent enterprises deliver added value to their customers, it is also important for them to consider new challenges in electronic payments. Therefore, Chapter 10 by Martin Reichenbach describes an approach to evaluate possible risks associated with electronic payment. The proposed solution assists users in choosing a convenient payment system in the long term during individual portfolio-setup and in the short term while conducting payment transactions.

Leo Tan Wee Hin and R. Subramaniam, in Chapter 11, discuss the experience of using an advanced broadband telecommunications infrastructure in both the landline and wireless domains to support the growth of intelligent enterprises in Singapore. A pro-business environment modeled on a slew of policy frameworks, the presence of an e-government, and the entrenching of a transparent e-commerce ecosystem, have led to the rise of intelligent enterprises as well as encouraged other businesses to re-engineer various aspects of their operations to tap new business opportunities and improve their operational efficiencies. The authors emphasize the need for state intervention to drive growth and applications.

In Chapter 12, Matthew Guah and Wendy Currie suggest that Application Service Providers (ASPs) deliver personal productivity software and professional support systems, assist an intelligent enterprise in processing information, solve business problems, develop new products, and create new knowledge. Using existing IS literature by Markus, Porter, Checkland, and others, they provide a framework for exploiting ASP capabilities to preserve and enhance organizational knowledge.

As small businesses struggle to survive in the face of intense competitive pressures, an emerging strategy to help them involves using knowledge management tactics to harness their intellectual capital and improve their sustainable competitive advantage. Therefore, Chapter 13, by Nory Jones and Jatinder Gupta, discusses the issues involved in the transformation of small businesses into intelligent enterprises via knowledge management tools and strategies. However, because a "build it and they will come" approach usually leads to failed initiatives, this chapter further addresses the issues of how small businesses can successfully incorporate adoption and diffusion theories to help them effectively transform themselves into successful learning organizations or intelligent enterprises.

To compete in today's environment, many companies have adopted business intelligence tools in decision making. However, these tools are woefully inadequate at analyzing data patterns. Thus, superior tools and methods are required. In the last chapter of this section, Nilmini Wickramasinghe, Sushil Sharma, and Jatinder Gupta discuss the tools required to enable the organization to go through the key processes of knowledge sharing, knowledge distribution, knowledge creation as well as knowledge capture and codification.

The fourth and final section of the book, called *Managing Intelligent Enterprises*, consists of five chapters and deals with the strategies and operational issues involved in the management of intelligent enterprises. It consists of five chapters.

Chapter 15, by Mahesh Raisinghani, argues that intelligent enterprises should use the power of the Internet to collect and process information to rethink their pricing strategy and gear it to the customer perception of value. This chapter explores the impact of the Internet on pricing and demonstrates that rather than pushing prices universally downward and squeezing margins, the Internet provides unique opportunities in pricing to enhance margins and generate growth. The chapter discusses some models of real time and dynamic pricing which are explored and provide implications for theory and practice.

The environmental uncertainties and the dynamics associated with the strategic context make it important for organizations to carve out a clear e-commerce strategy. In Chapter 16, Shivraj Kanungo argues that developing and deploying an e-commerce strategy is like chasing a moving and changing target. He develops a framework to understand e-commerce and relates it to theories and case studies.

In Chapter 17, Henry Aigbedo analyzes the inter-relationship between e-commerce and operations, and assesses the role operations should play to ensure the success of business-to-consumer and business-to-business e-commerce. It also proposes how to address key issues in order to harness the full capability of the Internet for commerce.

Chapter 18, by Denis Trček, gives a methodology for proper risk management that is concentrated on human factors management that starts with technology-based issues. Afterwards, business dynamics are deployed to enable a quantitative approach for handling security of contemporary information systems. The whole methodology encompasses business intelligence and presents appropriate architecture for human resources management.

The last chapter of the book by Adlofo Crespo-Marquez and Jatinder Gupta explores the impact of modern maintenance management in the global organizational efficiency of an enterprise. They argue that maintenance requires the proper development of relationship competencies with technological partners and suppliers and with the end customers. Finally, the chapter discusses the role of modern maintenance planning within operations planning, according to the relative weight of maintenance cost.