

# Preface

The evolution of Internet and Communication Technologies (ICT), most notably Web Services, has played a significant role in enabling enterprises to carry out their intra- and inter-organizational activities with dramatic efficiency and effectiveness. Global firms, in particular, have taken this opportunity to reengineer their business processes, enabling them to sustain their global competitive challenge. While a large part of the reengineering literature appears to be focusing on the customer side of the business processes, it is vital to consider in greater detail the supply side of the processes, as well. ICTs provide excellent opportunities for integration of processes, and supply chains are the ones that stand to benefit from this integration. A more comprehensive Enterprise Application Integration (EAI) than was previously achieved with technologies such as CORBA and DCOM can be envisaged. This edited book in your hand draws on the best of thoughts and practices in this vital supply chain aspect of business processes.

The focus in this book is the analysis and design aspect of development and implementation of global integrated supply chain systems. This is in contrast with most of the current literature that focuses on traditional operations and development of supply chain management systems. The book, however, discusses and documents the technical and managerial aspects of global integrated supply chain systems and provides insights into how the latest information technologies, such as Web services and mobile technology, could be incorporated within the supply chain systems. Furthermore, the chapters in this book also address the need for process improvement required to implement global integrated supply chain systems and how organizations handle the challenges of changes to their processes during the implementation of supply chain systems. Of particular interest should be the chapters that exchange concepts, new ideas, research results, experience, and other related issues that contribute not only to the academic domain but also benefit the corporate business community.

This edited work is addressed to a range of audiences, including senior managers, IT planners, consultants, and academic researchers. Specifically, this book provides valuable information to executives and operational managers in the industry in order to play a proactive role in global supply chain processes. Furthermore, higher degree students as well as academics will find the research base of this book quite attractive.

This book contributes to the literature on global integrated supply chain systems by addressing the need to understand, analyze, configure, develop, and manage the integrated supply chain systems to a global organization. We believe it fulfills a lacunae in the domain of integrated supply chain systems.

## Organization of the Book

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The systematic presentation of the 19 contributory chapters in this book provides an organized approach to the material. The chapters, embodying global research and experience reports, are summarized as follows:

Chapter I exposes some myths proposed by vendors with regard to the implementation of Integrated Supply Chain Environments (ISCE). It is followed by a proposed analysis methodology for Integrated Supply Chain Management systems. The chapter also examines some of the available literature regarding ISCE and proposes an analysis methodology, which intends to address some of the issues identified previously and construct a theoretical model for enterprises to adopt in the analysis phase of developing ISCM systems.

Chapter II highlights the current challenge of developing a process to deliver products in a timely fashion and of ensuring availability of items. It starts with exploring the impact of telecommunications, customer relationship management (CRM), and supply chain management (SCM) and their impact on meeting customers' expectations, regardless of location. The challenges, advantages, and future trends in each of these areas are also addressed and investigated. The chapter concludes with suggestions to help companies implement strategies that will effectively overcome the challenges of globalization.

Chapter III explores the role played by demand forecasting for the Internet age—an age where customers can be anywhere and want to have their needs addressed the moment they think about them. The organization that can fulfill the needs of the customers/consumers in the easiest, fastest, and most cost-effective way will win their business. The chapter helps the reader understand the challenges faced by organizations in forecasting demand in the net age, gives real life examples of these challenges, provides solutions for addressing them, and takes a look into the future.

Chapter IV initiates the concept of the customer-centric model in supply chain systems. It discusses various constraints of the present-day supply chain systems resulting from their roots being in logistics management and suggests an alternative next-level paradigm of a customer-centric matrix model. The chapter further demonstrates how this model would add value to the customer by taking the example of a healthcare information management system. It also delves into the limitations of and anticipated issues and challenges in implementing the suggested model.

Chapter V considers the importance of information sharing techniques and strategies employed by industry sectors. Well-developed supply chain management often brings with it improved buyer-supplier communication processes, and we consider the impact of these not only from an inter-sector point of view, but also from a cross-sector viewpoint. The chapter examines the particular perspectives of the small business within a supply chain structure and of the supply chain customer. The authors conclude that information sharing is a critical component of business success both inside and outside the supply chain structure. However, while globally and at the large business level, both development and implementation of such technologies have mushroomed, smaller enterprises have tended to be left behind to cope as best they can with multiple pressures to conform.

Chapter VI discusses the integrated operations of supply chain functions and highlights the procurement function as a crucial link between the sources of supply and the organization. The chapter identifies four main challenges in e-procurement implementation coming from business process integration, technological issues, value creation, and change management.

Chapter VII discusses the concept of Supply Chain Management. It provides broad definitions of supply chain, the drivers for integrated supply chains design, and current challenges in global supply chains. More importantly, this chapter provides the reader an insight into aligning corporate strategy, people mindset, process design, and technology in designing integrated supply chain. A real-life example in health care industry is provided. The case example aims to give readers the identification of supply chain bottlenecks, the right methodology to map the as-is processes, and the redesign of simplified supply chain processes. Finally, the guidelines for Supply Chain Management implementation issues such as vendor selections and team building are further addressed.

Chapter VIII discusses the technologies that enable corporations to share information externally and to improve material flow within the supply chain. It identifies many benefits that can be realized from an integrated supply chain environment. On the other hand, many factors also are identified that lead to failed integrated supply chain implementations. The focus of this chapter is to introduce the Interaction Approach methodology as a framework for analyzing supply chains in the hope of improving the design, development, and implementation of integrated supply chain environments.

Chapter IX explores and evaluates the performance of supply chain management in using global logistics information technologies in Hong Kong firms. It reviews the role of functional information systems for supply chain management and identifies the characteristics of information systems utilized for supply chain management through survey data collected from 71 Hong Kong firms. A conceptual model and hypothesis relating to utilization of information systems, information technology, and SCM performance is developed. The chapter concludes with discussion and recommendations based on the research results.

Chapter X discusses the current status of supply chain management, challenges and solutions to supply chain management, critical issues, and the role of technology used in supply chain operations in China.

Chapter XI proposes a multi-objective model of global distribution for the Taiwan notebook computer. The proposed two-stage approach involves a mixed integer linear programming model and the fuzzy analytic hierarchy process (AHP) approach. The analytic method provides quantitative assessment of the relationships between manufacturers and customer services. To show the effectiveness of the proposed approach, a Taiwan notebook computer model is solved. The results of this multi-objective model show some dynamic characteristics among various performance criteria of the outbound logistics.

Chapter XII focuses on the development of an object-oriented enterprise business blueprint for e-supply chain inter-enterprise process integration. The approach described in this chapter will illustrate how the enterprise applications can be developed and woven into the very fabric of business practices by using object-oriented techniques. In contrast to an isolated IT system, this approach allows business processes

to permeate different organizations, and communication in this system becomes process-to-process oriented.

Chapter XIII presents a software simulator, called LOSIMOPU. LOSIMOPU allows users to build a supply chain model and analyze the sensitivity of logistics on assigned policy and capacity under uncertainty. LOSIMOPU consists of five kinds of participants (end-customer, intermediate supplier, end-supplier, transportation server, and electronic payment server) and an e-marketplace for the supply chain. Each participant is implemented as a distributed object such that it runs concurrently and has capacity and policy for playing its role. The e-marketplace defines the trade protocol for the workflow management and transaction analysis. LOSIMOPU visualizes expected indices of assigned parameters for decision support. This chapter discusses the background of proposal, goal of simulator, milestone, technical issues for development, and the prototype system.

Chapter XIV deals with a time-dependent supply chain network equilibrium (TD-SCNE) problem, which allows product flows to be distributed over a network not only between two successive sectors in the same time period (a transaction) but also between two successive periods for the same agency (an inventory). This chapter proposes a three-loop nested diagonalization method, along with a specially designed super network representation, and the framework is demonstrated with a numerical example.

Chapter XV applies the multi-agent system paradigm to collaborative negotiation in a global manufacturing supply chain network. Multi-agent computational environments are suitable for dealing with a broad class of coordination and negotiation issues involving multiple autonomous or semi-autonomous problem-solving agents. An agent-based multi-contract negotiation system is proposed for global manufacturing supply chain coordination. This chapter includes a case study of mobile phone global manufacturing supply chain management.

Chapter XVI identifies the critical success factors in supply chain implementation through the empirical research. The authors studied the infrastructures enhancing the success of supply chain implementation, which influence the supply chain performance and adopt three categories of infrastructure as the critical success factors of supply chain implementation.

Chapter XVII discusses the applications of mobile technologies in various areas of supply chain management, the potential benefits of those technologies along the dimensions of reduced replenishment time, and transactions and billing cycles. Among other discussions, the role of mobile procurement, inventory management, product identification, package tracking, sales force, and field service automation technologies is highlighted. To substantiate the basis for adopting mobile technologies for supply chain management, different market drivers for mobile applications are exemplified and applied to the three macro level processes of supplier relationship management, internal supply chain management, and customer relationship management, and a resulting typology of mobile supply chain management applications is presented.

Chapter XVIII determines the critical success factors for the e-ISCS and examines their performance in supply chain. It adopts a factor analysis to determine four success factors: work performance quality, system quality, information quality, and service quality. A critical analysis of areas that require improvement also is conducted.

Chapter XIX discusses the significance of business continuity, a crucial ingredient of supply chain management, and the impact of business continuity on supply chain systems. The discussion is based on the author's experience of working in an environment that is dependent on supply chains, as well as helping many of his clients achieve uninterrupted business continuity.