

# E-Supply Chain Technologies and Management

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## **Section I** **Concepts and Modeling of E-Supply Chain**

### **Chapter I**

<b>Procedure for Modelling and Improving E-SCM Processes / <i>Patcharee Boonyathan and Latif Al-Hakim</i> .....</b>	<b>1</b>
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The chapter develops a procedure, eSCM-I, to improve the supply chain business process. It is based on the supply chain operations reference (SCOR) model and IDEF0 technique. A four-step procedure is proposed: (1) process standardization, (2) business process modeling, (3) benchmarking of best practices, and (4) gap determination. The procedure identifies process interdependencies and coordinates supply chain activities.

### **Chapter II**

<b>Dynamic Transshipment in the Digital Age / <i>Shilei Yang, Bintong Chen, and Charles L. Munson</i>.....</b>	<b>22</b>
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The chapter models transshipments in the supply chain and particularly explores the shipments among distribution centers in a geographically dispersed network. The authors investigate transshipment strategies in a continuous review system under dynamic demand. They propose three heuristic decision rules for making transshipment decisions. By using numerical experiments and simulation analysis, the authors identify a best heuristic rule to determine effective transshipment policies.

### **Chapter III**

<b>E-Com Supply Chain and SMEs / <i>Ron Craig</i>.....</b>	<b>34</b>
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The chapter deals with the issues for small and medium-sized enterprises (SMEs) in supply chains. It provides an overview of literature on the role of SMEs in economy, supply chain management (SCM), information and communication technologies (ICTs), and e-business. The author discusses both opportunities and challenges for supply chains in general and also SMEs in particular.

## **Chapter IV**

Building and Managing Modern E-Services / <i>John Hamilton</i> .....	54
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The chapter addresses the development cycles of e-services. The service cycles progress from supply and demand chains, to value chains, to service value chains, and finally to service value networks. The service cycles enable service businesses to develop competitive business solutions over time. The chapter also offers a balanced scorecard mechanism to manage e-services.

## **Chapter V**

Service Value Networks: Delivering Competitive E-Services / <i>John Hamilton</i> .....	80
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The chapter defines service value networks as flexible delivery arrangements of services and/or products by a firm and its supply chains such that target-specific and value-adding services can be effectively and efficiently delivered to the individualized customers. The author regards service value networks as a key to establishing and maintaining a strong competitive position. The author also describes a procedure to develop a service value network.

## **Section II**

### **E-Supply Chain Technologies and Infrastructure**

## **Chapter VI**

Automated Data Capture Technologies: RFID / <i>Vidyasagar Potdar, Chen Wu,</i> <i>and Elizabeth Chang</i> .....	112
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The chapter introduces the main components of RFID technology that includes transponders, readers, middleware, and labels. The authors discuss applications and benefits of RFID and its adoption challenges such as security, privacy, cost, scalability, and deployment. Some successful RFID deployment case studies are described. A comprehensive list of RFID vendors and in-depth technical details of RFID technologies are also provided.

## **Chapter VII**

Information Security Risk in the E-Supply Chain / <i>Wade H. Baker, Gregory E. Smith,</i> <i>and Kevin James Watson</i> .....	142
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The chapter identifies and categorizes the sources of IT threats in supply chains through a large-scale survey of companies across various supply chain functions. The authors argue that the integration of information flows facilitates supply chain collaboration and also increases supply chain risks. The authors suggest that in order for supply chain collaboration to succeed, the benefits of IT integration must exceed the increase in supply chain risk affected by IT.

## **Chapter VIII**

The Use of Collaboration Tools in Supply Chain: Implications and Challenges / *Ozlem Bak*..... 162

The chapter addresses supply chain integration by the use of collaboration tools. The author explains the concept of collaboration tools and its importance in the supply chain integration, evaluates the requirements for supply chain management, and emphasizes the collaborative problem areas within the supply chain. A case study for an application of collaboration tools is presented. The author argues that supply chain collaboration is effective only if the collaboration tools are integrated and used jointly by supply chain partners.

## **Chapter IX**

Negotiation, Trust, and Experience Management in E-Supply Chains /

*Gavin Finnie and Zhaohao Sun*..... 172

The chapter introduces the concept of experience management in multi-agent systems for supply chain management. The authors argue that agents in the supply chain must be capable of dynamically adapting their behavior. The chapter discusses issues in agent negotiation and cooperation, and provides an example of multi-agent architecture. The role of trust and deception in supply chains for real-time enterprises is also discussed.

## **Chapter X**

Trading E-Coalition Modeling for Supply Chain / *Pierre F. Tiako* ..... 194

The chapter proposes an infrastructure for modeling and coordinating e-business processes using e-coalitions (i.e., support for collaborations with supply chain partners over the Internet). It discusses traditional EDI systems and modern EDI systems over the Internet. It also describes a typical scenario where e-coalitions involve a travel agency and its partners for supplying flight tickets. The open software infrastructure for supporting supply chain and e-commerce includes CORBA, DCOM, and JVM.

## **Section III**

### **Best Practices and Performance Management**

## **Chapter XI**

E-Supply Chain System at Valvex and Its Integration with ERP Systems / *Raktim Pal, Indranil Bose,*

*and Alex Ye*..... 208

The chapter presents a case study on a leading Chinese manufacturer of industrial valves that successfully integrated ERP and SCM systems. The integration of ERP and SCM improved the company's operations and resulted in many benefits. The process of implementation and integration also poses many challenges, some of which are unique to a Chinese manufacturing organization. The authors conclude with several lessons learned from the company's experience.

## **Chapter XII**

Coordination of a Supply Chain with Satisficing Objectives Using Contracts / <i>Chunming (Victor) Shi and Bintong Chen</i> .....	232
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The chapter studies a supply chain consisting of one supplier and one retailer with satisficing objectives for each player. The authors examine the supply chain under three types of contracts: wholesale price, buy back, and quantity flexibility contracts. They show that under the satisficing objectives, wholesale price contracts can coordinate the supply chain, whereas buy back contracts cannot. In addition, quantity flexibility contracts must degenerate into wholesale price contracts to coordinate the supply chain. The authors also discuss possible extensions to their model.

## **Chapter XIII**

Information Feedback Approach for Maintaining Service Quality in Supply Chain Management / <i>R. Manjunath</i> .....	252
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The chapter discusses a feedback mechanism that conveys the information of the supply chain starting from the end customer with the pre-specified service quality. The chapter suggests using a predicted and shifted slippage or loss rate as being the feedback signal. Based upon the feedback, the upstream players are expected to change the transfer rate of materials over the supply chain. Thus the resources will be effectively utilized and the service quality will be improved.

## **Chapter XIV**

Performance Management / <i>Srikanth Srinivas</i> .....	261
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The chapter develops a performance management framework that helps firms choose and implement e-supply chain technologies. The author organizes the framework using a balanced scorecard revolving around the five critical variables of value, variety, velocity, variability, and visibility. The maturity level of each of these critical variables is classified using a capability maturity continuum of ignorance, awareness, understanding, approach, action, and culture. The framework can help firms identify their performance gaps.

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