

Foreword

The dynamic and fast changing pace of global business has resulted in increased need and attention being placed on the role of supply chains, supply chain management (SCM), and supply networks.

The notion of a supply network goes beyond buyer-supplier relationships to a much more complex set of suppliers and firms which are intertwined and connected, and depend on each other in a multitude of ways. The success of many firms today can be contingent on a collaborative culture which includes the need for tightly coupled suppliers. In addition, a sharing of trust and cultures are challenges which need to be met.

Moreover, supply chains and networks have evolved from internal operations to encompass those of external partners, which have resulted in greater opportunities, as well as greater challenges. The business functions which are involved in this can span sales, order processing, inventory, marketing, production, logistics, and various others as well.

The effects of a well managed supply network can yield benefits including lower costs, improved quality, innovations, and increased flexibility. On the other hand, a poorly run supply network can produce the opposite effect, including problems with inventory, forecasting, and customer service, and delays in various aspects of the process.

As illustrated by the case of Toyota in 2010, and with many other firms which have suppliers from different regions, countries, and industries, the management and coordination of supply chains, and in their broader definition, that of supply networks, have become both a source of efficiency, promise, and also, of critical complexity and challenges.

In particular, the potential for complexity has made the coordination a formidable task, including the need to manage collaborative cultures; coordinate teams, tasks, partners, and functions; and also to find new approaches, technologies, and techniques to manage the challenges which exist.

This book brings together a wide variety of relevant and useful research, case studies, and perspectives to the applications and problems associated with supply chain and supply network management, especially with the impact of electronic networks and technology.

The chapters in this book are grouped into three main sections: Advances in Supply Network Coordination, Modeling and Analysis of Supply Chain Coordination, and Intelligent Agent Approaches to Supply Network Coordination.

The first section looks at the interrelation between e-business, supply chain intelligence, RFID, and technology for supply networks.

E-business is closely related to and supported by supply chain and network management, and so the two are linked together, particularly for applications including purchasing and e-procurement. The

maintenance of inventory, and the flow and exchange of information are also relevant issues which are examined and analyzed in a chapter by Wagner and Sweeney.

Planning, analytics and monitoring are an important set of functions when coordinating a supply network, as an effective supply network needs to be aligned, adaptable, and agile. Stefanovic et al. present a chapter on the role that an integrated supply chain intelligence (SCI) system can play in improving supply networks, through process monitoring, web-based analytics, and planning functions.

RFID has been touted as an important tool for improving real time communication and visibility when used in conjunction with a supply network. While there are both positive and negatives related to the use of this technology for supply network management, the study by Gnoni and Rollo evaluates the effectiveness of RFID in different kinds of supply networks, using an evaluation framework.

The role and use of technology can figure prominently in supply networks. However, there are issues and consideration which can influence the decision whether or not to use technology for these functions, and this is discussed in a chapter by Evangelista looking at the factors involved, for third party logistics service providers (3PLs).

The second major section focuses on the role of analysis and modeling and other related research, and their impact on studies in the areas of supply chain network management.

Rao and Subbaiah use fuzzy goal programming and mixed integer programming models to examine a multi-echelon supply chain. Tuzkaya et al. look at reverse logistics network design, through the use of genetic algorithms and simulated annealing (HGASA). Fazlollahtabar et al. take the approach of optimizing a web-based order delivery system using fuzzy mathematical programming. The simulation and modeling of a partnership network for an intelligent supply chain using AHP is the subject of the chapter by Ounnar et al. The topic of supply chain coordination under price competition is the topic of the chapter by Sarmah and Sinha.

Another area which has become of great importance to the area of supply networks is that of intelligent agents. Mohebbi et al. look at the implementation of intelligent agents for buyer-supplier-supplier coordination, while Cho et al. examine it from the perspective of buyer-buyer-supplier coordination. Renna and Argoneto discuss an agent-based coordination policy in a co-opetitive network using multi-agent architecture. Zacharewicz et al. look at a multi agent/HLA platform for enterprise interoperability, based on the method of Short-Lived Ontology. The section concludes with a chapter on agent-based route selection for multilayer electronic supply networks by Mahdavi et al.

In summary, this book is a compilation of innovative work focused on the cutting edge of supply chain management and supply network research, examining issues using new techniques, approaches, and methods to help bring about higher levels of coordination, efficiency, and effectiveness.

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