

MANAGEMENT SCIENCE - THEORY AND APPLICATIONS

SUPPLY CHAIN MANAGEMENT
APPLICATIONS FOR MANUFACTURING
AND SERVICE INDUSTRIES

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EDITOR

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PREFACE

Supply Chain Management (SCM) has been widely researched in numerous application domains in manufacturing and service industries during the last decades. There are several attempts made by researchers and practitioners to appropriately define SCM and its applications. This book entitled "*Supply Chain Management: Applications for Manufacturing and Service Industries*" is comprised of twelve (12) chapters.

Chapter 1 develops a mathematical model in a four layer supply chain using the product life cycle factors to obtain the optimal number of products and the fulfillment of an activity in product life cycle. In the proposed four layer supply chain including supplier, manufacturer, distributor and customers' product life cycle encompasses several operations.

Integration between different supply chain management functions has recently received increasing consideration. It was found that focusing on cost reduction in one area of the supply chain often leads to higher costs in other areas. Chapter 2 presents a recent and exhaustive review on important integrated supply chain management problems and the current research on them.

The objective of chapter 3 is to introduce a comprehensive Multi Criteria Decision Making (MCDM) methodology for the selection of a third party logistics service provider. The methodology presented in a simple style with an illustrative industry based case study so that logistics managers and decision-makers can easily apply the present methodology in their organization.

Chapter 4 illustrates the capabilities of Google Spreadsheet as a tool for integrated operation of the supply chain. Using this tool inventory distribution management, risk pooling and transshipment at retailer levels are modelled. The analysis shows that the Google Spreadsheet-based supply chain management can provide online and real-time visibility to geographically different locations for integrated operations.

Chapter 5 describes the agent-based modelling approach to simulate the interaction and negotiation behavior of palm oil supply chain (POSC) actors. Actors will attempt to obtain highest added-value, but must consider overall supply chain profitability and sustainability. Added-value was formulated as an exponential function of investment, risk and technology factors. Netlogo software was used to develop the model.

The study of various approaches used in developing the performance measurement system has gained enormous importance among scientific community. Chapter 6 intends to signify the performance measurement practices in the industries. The chapter also contributes in presenting different approaches used for developing the performance measurement system,

different criteria used for evaluating the performance of supply chain management and various techniques to evaluate the performance.

In chapter 7, a generic method has been developed in order to assist and assess complex supply chain network design and analysis considering different types of uncertainty factors. The chapter introduces a novel measure to quantify the reliability rate of the overall supply chain network and the reliability of each member involved in the network. The chapter provides an optimization approach to develop reliability of each entity in the supply chain network such that the reliability rate requirement of the overall supply chain network is ensured.

Chapter 8 proposes a mathematical model to determine the optimal location for a warehouse. Several factors like locations of distributors, nature of demand etc. have been considered to formulate the optimization model, which has been solved using Differential Evolution. Two case studies have been presented, solved using this model, which show considerable cost savings by the implementation of results obtained from the model.

Chapter 9 is a study of sport-related location and layout strategies as they related to the important questions that management needs to answer by focusing on location of a firm (i.e., intermediate variables/functions, superior firm performance).

Chapter 10 illustrates the various approaches to implement the green principles by different researchers. The main objective of the green supply chain management (GSCM) approach is to eliminate/minimize the impact of the GHG emissions into the environment throughout the supply chain process. How the different companies have benefited using GSCM for achieving this strategic fit between the environment and the economy.

Chapter 11 focuses on increasing the supply chain value by looking into the color, image and typography of wafer product in influencing customers' intention to purchase. Study was done on samples of teenagers and young adults. The results show positive relationship between package design and respondents' purchase intention.

Chapter 12 aims to investigate scenarios for new setting of the Center of Sterilized Material (CSMs) of the health system of city of Rio de Janeiro, Brazil. It was assumed as goals understand the models of the current CSMs; understand the CSMs alternatives; and formulate consistent operating models for the CSMs, identifying the relevant parameters of cost and performance associated to the models, subsidizing the decision of the model(s) to be adopted.

I am honored to be editing such a valuable book, which contains contributions of a selected group of researchers presenting the best of their works. I would like to thank all the authors for their valuable contributions in various aspects of supply chain management's arena. The editor truly hopes that this book would be fruitful for researchers, scientists, students, academicians and practitioners those are involved in the area of supply chain management.

I would like to convey heartiest thanks to my family members, especially my beloved parents, wife and two kids for their excellent cooperation. Finally, I express my gratitude to the Almighty Allah for the successful completion of this book in the schedule time.

Assoc. Prof. Dr. Md. Mamun Habib
The Editor