EcoProduction

Environmental Issues in Logistics and Manufacturing

Series editor
Paulina Golinska, Poznan, Poland

For further volumes:
http://www.springer.com/series/10152
About the Series

The EcoProduction Series is a forum for presenting emerging environmental issues in Logistics and Manufacturing. Its main objective is a multidisciplinary approach to link the scientific activities in various manufacturing and logistics fields with the sustainability research. It encompasses topical monographs and selected conference proceedings, authored or edited by leading experts as well as by promising young scientists. The Series aims to provide the impulse for new ideas by reporting on the state-of-the-art and motivating for the future development of sustainable manufacturing systems, environmentally conscious operations management and reverse or closed loop logistics.

It aims to bring together academic, industry and government personnel from various countries to present and discuss the challenges for implementation of sustainable policy in the field of production and logistics.
Paulina Golinska
Editor

Logistics Operations,
Supply Chain Management
and Sustainability

Springer
Nowadays, logistics and supply chain management are influenced by the sustainable policy challenge. Managers and scientists search for innovative approaches to eco-friendly organization and coordination of the logistics processes and the supply chain configuration, which allow to pollute less.

In order to do this, companies have to fix their common environmental objectives, sharing technical information about products, planning, and processes or starting common programs to reduce adverse impacts on the environment. In order to meet the sustainability goals the following areas have to be taken into consideration:

- green supplier selection,
- collection of used products and their reuse,
- reduction of hazardous substances,
- optimal location of logistics and manufacturing facilities for minimizing unnecessary transport,
- reduction of CO₂ emission.

The book entitled “Logistics Operations, Supply Chain Management and Sustainability” aims to present state-of-the art researches and practical applications. In this book the focus is placed on a multidisciplinary approach. It presents viewpoints of the academic and the industry personnel on the challenges for implementation of sustainable police in logistics. Authors present in the individual chapters the result of the theoretical and empirical research related to the following topics:

- Supply Chain Management and Sustainability,
- Reverse Logistics and Environmental Sustainability,
- Modeling and Optimization of the Manufacturing Operations,
- Optimization of the Location Problems, the Inventory Management, and the Vehicle Routing Problems.

This book includes research contributions of geographically dispersed authors from Europe, North America, Africa, and Asia. It is a clear indication of a growing interest in sustainable development in logistics. The high scientific quality of the
chapters was assured by a rigorous blind review process implemented by leading researchers.

This monograph provides a composition of theoretical trends and practical applications. The advantage of this book is presentation of country-specific applications from a number of different countries around the world.

I would like to thank all the authors who responded to the call for chapters and submitted manuscripts to this volume. The International Congress on Logistics and SCM Systems has for 10 years provided an international forum for leading researchers, educators, and practitioners to discuss ideas, exchange experiences on the latest development, and seek opportunities for collaboration on the latest implementation and enhancement of sustainable logistics and SCM systems in the dynamic market. This book presents selected papers from authors who attend the 9th International Congress on Logistics and SCM Systems (ICLS 2014). Although not all of the received chapters appear in this book, the efforts spent and the work done for this book are much appreciated.

I would like to express my gratitude to the Board of the International Federation of Logistics and SCM Systems (IFLS) for the valuable contribution to the volume:

- Honorary Chairman—Prof. Karasawa, Yutaka, Kanagawa University, Japan
- Advisor—Prof. Katayama, Hiroshi, Waseda University, Japan
- Chairman—Prof. Lee, Young Hae, Hanyang University, Korea
- Senior Vice Chairman—Prof. Kachitvichyanukul, Voratas, Asian Institute of Technology, Thailand
- Vice Chairmen—Prof. Lai Kin Keung, City University of Hong Kong; Prof. Rim Suk-Chul, Ajou University, Korea; Prof. Wakabayashi Keizo, Nihon University, Japan and Wu Yen-Chen Jim, National Sun Yat-Sen University, Taiwan.

I would like to thank all reviewers whose names are not listed in the volume due to the confidentiality of the process. Their voluntary service and comments helped the authors to improve the quality of the manuscripts.

Paulina Golinska
Contents

Part I Supply Chain Management and Sustainability

The Impact of Demographic Changes on Human Resources Management in European Supply Chains-Selected Aspects ............ 3
Halina Brdulak

Barriers of the Supply Chain Integration Process .................. 15
Anjali Awasthi and Katarzyna Grzybowska

The Essence of Integration in Supply Chains and Reverse Supply Chains: Similarities and Differences .................... 31
Martyna Kupczyk, Łukasz Hadaś, Piotr Cyplik and Żaneta Pruska

Supply Chain Integration in View of Secondary Raw Materials .......................................... 47
Żaneta Pruska, Łukasz Hadaś, Piotr Cyplik and Martyna Kupczyk

Integration Level Measurement System in Modeling Forward and Backward Supply Chains ........................................ 59
Łukasz Hadaś, Piotr Cyplik and Michał Adamczak

Green Supplier Selection Criteria: From a Literature Review to a Flexible Framework for Determination of Suitable Criteria .... 79
Izabela Ewa Nielsen, Narges Banaeian, Paulina Golińska, Hossein Mobli and Mahmoud Omid

A Model for Optimizing Traceability of Product in a Supply Chain Based on Batch Dispersion .......................... 101
Muhammad Saad Memon, Young Hae Lee and Sonia Irshad Mari

Investigating the Readiness of the Grocery Retail Chains for Virtual Supply Chain Technology in Egypt ................. 115
Sama Gad, Khaled Hanafy and Sara Elzarka
Fuzzy TOPSIS/SCOR-Based Approach in Assessment of RFID Technology (ART) for Logistics of Manufacturing Companies ............................................. 129 Bartłomiej Gładysz and Krzysztof Santarek

Comarch EDI Platform Case Study: The Advanced Electronic Data Interchange Hub as a Supply-Chain Performance Booster ............................................. 143 Piotr Reichert

Modelling Integration Process Planning in the Supply Chain Using SOP Approach .......................................................... 157 Michał Adamczak, Łukasz Hadaś, Roman Domaniński and Piotr Cyplik

Problems of Logistic Systems Vulnerability and Resilience Assessment .......................................................... 171 Tomasz Nowakowski and Sylwia Werbińska-Wojciechowska

The Category of Risk Management in a Company with High Level of Customization .................................................. 187 Anna K. Stasiuk-Piekarska, Łukasz Hadaś and Magdalena K. Wyrwicka

Literature Study Overseas on SCM Strategy with a State of Art SCM Strategy Model ........................................ 201 Angela Y. Y. Chen, Yutaka Karasawa, Nobunori Aiura, Kuninori Suzuki and Keizo Wakabayashi

Part II Reverse Logistics and Environmental Sustainability

Single Forward and Reverse Supply Chain ............................................... 229 Ahmad E. Alozn, Moza S. Al Naimi and Omar Y. Asad

A Case Study of H&M’s Strategy and Practices of Corporate Environmental Sustainability ............................................... 241 Danny C. K. Ho

Efficient Chemical Management in Global Paint Industry: A Case Study in Sri Lanka ............................................... 255 T. Sunil Somasiri Gomes
A Consideration on the Functions of Logistic Parks Against Great Disasters ........................................... 269
Keizo Wakabayashi, Kuninori Suzuki, Akihiro Watanabe, Yutaka Karasawa and Koichi Murata

A Consideration of a Reverse Logistics Network Over a Wider Area ............................................. 277
Kuninori Suzuki, Keizo Wakabayashi, Akihiro Watanabe and Yutaka Karasawa

A Consideration on an Effective Reverse Logistics System for Discarded Tires ........................................ 285
Kuninori Suzuki, Nobunori Aiura and Yutaka Karasawa

Analysis of Effective Recycle System for Used Personal Computers in Japan ................................ 293
Akihiro Watanabe, Kuninori Suzuki, Keizo Wakabayashi and Yutaka Karasawa

Optimal Reutilization of the Leased Products in a Closed Loop Supply Chain ....................................... 303
Hsiao-Fan Wang and Chang-Fu Hsu

Part III  Modeling and Optimization of the Manufacturing Operations

A Pareto-Archived Differential Evolution Algorithm for Multi-Objective Flexible Job Shop Scheduling Problems .......... 325
Warisa Wisittipanich and Voratas Kachitvichyanukul

Sugarcane Harvest Scheduling to Maximize Total Sugar Yield with Consideration of Equity in Quality Among the Growers ................................................................. 341
Kanchana Sethanan, Somnuk Theerakulpisut and Woraya Neungmatcha

Production Scheduling in Food Freezing Process Under the Effect of Freezer-Door Opening ..................... 353
Pachara Chatavithee and Supachai Pathumnakul

Redefinition of Tasks to Increase the Process Capacity of Bottlenecks: Adjustment to a Real Case of Cutting Process of Structural Profiles of Carbon Steel ................................. 363
Clemente Lobato Carral and Carlos Andrés Romano
Examining Effect of JITP Implementation on Performance of Jordanian Firms ........................................ 381
Abbas Al-Refaie and Nour Bata

Analysis and Improvement of the Process Engineer’s Levels of Competence in a Manufacturing Company ........ 395
Małgorzata Spychała

Modeling and Performance Improvement: The Remedy to Treat Social and Environment Issues for Enterprises in Today’s Difficult Economic Climate ........................................ 411
Paul-Eric Dossou and Philip Mitchell

Energy Audit Methodology and Energy Savings Plan in the Nautical Industry ............................................ 425
Gilles Dedeban, Philip Mitchell and Paul-Eric Dossou

Part IV Optimization of the Location Problems, the Inventory Management and the Vehicle Routing Problems

Strategic Inventory Positioning for MTO Manufacturing Using ASR Lead Time ........................................ 441
Suk-Chul Rim, Jingjing Jiang and Chan Ju Lee

Improving Efficiency of a Process in Warehouse with RFID: A Case Study of Consumer Product Manufacturer 457
Natanaree Sooksaksun and Sriyos Sudsertsin

Model of Forklift Truck Work Efficiency in Logistic Warehouse System ..................................................... 467
Paweł Zającz

The Integration of Environmental Foot-Printing Strategies to the Capacitated Warehouse Location Problem with Risk Pooling . 481
Noura Al Dhaheri, Maria Polo Alvez and Shin Ju-Young

Storage Location Assignment Considering Three-Axis Traveling Distance: A Mathematical Model ................. 499
Chompoonoot Kasemset and Pongsakorn Meesuk

Solving a Multi-objective, Source and Stage Location-Allocation Problem Using Differential Evolution ............ 507
Rapeepan Pitakaso and Thongpoon Thongdee
Contents

A Study on the Optimum Location of the Central Post Office in Bangkok: Applying the Travelling Salesman Problem .......................... 525
Keizo Wakabayashi, Akihiro Watanabe, Jun Toyotani, Kuninori Suzuki, Koichi Murata and Sarinya Sala-ngam

A Closed-Loop Capacitated Warehouse Location Model with Risk Pooling ................................................................. 539
Nabil Kenan, Marwa Attiya and Bedoor AlShebli

A Joint Inventory-Location Model with CO₂ Emission Taken into Account in Design of a Green Supply Chain .............................. 553
Faisal Alkaabneh, Abdullah Kaya and Jasem AlHammadi

Keizo Wakabayashi, Kuninori Suzuki, Akihiro Watanabe and Yutaka Karasawa

A Simulated Annealing Heuristic for the Vehicle Routing Problem with Cross-docking .......................................................... 575
Vincent F. Yu, Parida Jewpanya and A. A. N. Perwira Redi

Pollution-Inventory Routing Problem with Perishable Goods .......... 585
Ahmed Al Shamsi, Ammar Al Raisi and Muhammad Aftab

A Meta-heuristic Approach for VRP with Simultaneous Pickup and Delivery Incorporated with Ton-Kilo Basis Saving Method ...... 597
Yoshiaki Shimizu and Tatsuhiko Sakaguchi

Inventory Routing Problem with CO₂ Emissions Consideration ...... 611
Nasir Alkawaleet, Yi-Fang Hsieh and Yanxiang Wang