

Lecture Notes in Logistics

Series Editors: Uwe Clausen · Michael ten Hompel · Robert de Souza

Jorge Luis García Alcaraz ·

Diego Fernando Manotas Duque ·

Rosa Guadalupe González-Ramírez ·

Mario Gustavo Chong Chong ·

Irineu de Brito Junior *Editors*

Supply Chain Management Strategies and Methodologies

Experiences from Latin America

 Springer


Jorge Luis García Alcaraz ·
Diego Fernando Manotas Duque ·
Rosa Guadalupe González-Ramírez ·
Mario Gustavo Chong Chong ·
Irineu de Brito Junior
Editors


Supply Chain Management Strategies and Methodologies

Experiences from Latin America


 Springer


Editors

Jorge Luis García Alcaraz 
Autonomous University of Ciudad Juárez
Ciudad Juárez, Chihuahua, Mexico

Rosa Guadalupe González-Ramírez 
Universidad de Los Andes, Chile
Santiago de Chile, Chile

Irineu de Brito Junior 
São Paulo State University—ICT UNESP
São José dos Campos—SP, Brazil

Diego Fernando Manotas Duque 
Universidad del Valle—Ciudad
Universitaria Meléndez
Cali, Valle del Cauca, Colombia

Mario Gustavo Chong Chong 
Universidad del Pacífico (Perú)
Lima, Peru

ISSN 2194-8917

ISSN 2194-8925 (electronic)

Lecture Notes in Logistics

ISBN 978-3-031-32031-6

ISBN 978-3-031-32032-3 (eBook)

<https://doi.org/10.1007/978-3-031-32032-3>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2023

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Chapter 4

Artificial Intelligence-Based Analysis of Material Supply Costs in ETO Companies Shifting to Mass Customization



Francisco Javier Bermejo, Julio Blanco Fernández, Eduardo Martínez Cámara, Emilio Jiménez Macías, Juan Carlos Sáenz-Díez, and Jorge Luis García-Alcaraz

Abstract Currently, it is necessary to compete with other strategies, such as Mass Customization (MC), in modern and competitive environments characterized by market uncertainty. Industrial companies that work with engineering-to-order (ETO) production systems need appropriate “supply management” to achieve operational excellence, which allows for remarkable improvements in supply chain performance. The factors and practical improvements in the Supply Management function of ETO companies working in MC environments are identified in this study. These factors and practical improvements affect the raw margin of the operating account and the evolution of the purchase prices of repetitive parts. This paper presents the case of an ETO company shifting to MC strategies by applying the Cross-Industry Standard Process for Data Mining (CRISP-DM) methodology. The findings show that the introduction of component standardization programs has a direct and significant impact on account operations in a company. Thus, the cost of merchandise sold in total sales decreases by 1.34%, and the percentage of repetitive parts purchased increases by 10% if Early Purchasing Involvement (EPI) is used. This involvement employs a multidisciplinary team of design assessments (MTDA), improving more

F. J. Bermejo · J. B. Fernández · E. M. Cámara
Department of Mechanical Engineering, University of La Rioja, Logroño, Spain
e-mail: julio.blanco@unirioja.es

E. M. Cámara
e-mail: e.camara@eolicas.net

E. J. Macías · J. C. Sáenz-Díez
Department of Electrical Engineering, University of La Rioja, Logroño, Spain
e-mail: emilio.jimenez@unirioja.es

J. C. Sáenz-Díez
e-mail: juan-carlos.saenz-diez@unirioja.es

J. L. García-Alcaraz (✉)
Department of Industrial Engineering, Autonomous University of Ciudad Juárez, Ciudad Juárez, México
e-mail: jorge.garcia@uacj.mx