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F O U R T H E D I T I O N

INTEGRAL LOGISTICS MANAGEMENT

**Operations and Supply Chain
Management Within and
Across Companies**



Series on Resource Management

P A U L S C H Ö N S L E B E N



30809205

Integral LOGISTICS MANAGEMENT

**Operations and Supply Chain
Management Within and
Across Companies**

FOURTH EDITION

PAUL SCHÖNSLEBEN



CRC Press

Taylor & Francis Group

Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business
AN AUERBACH BOOK

CRC Press
Taylor & Francis Group
6000 Broken Sound Parkway NW, Suite 300
Boca Raton, FL 33487-2742

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CRC Press is an imprint of Taylor & Francis Group, an Informa business

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Printed in Great Britain on acid-free paper
Version Date: 20110627

International Standard Book Number: 978-1-4398-7823-1 (Hardback)

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Foreword to the Fourth Edition

It is a great pleasure to release this fourth edition of *Integral Logistics Management — Operations and Supply Chain Management Within and Across Companies*. Issues in strategy and design of supply chains have once again gained importance. For this reason, this new edition contains a greatly expanded chapters on supply chain design, with new sections on

- Assessing the economic value added of supply chain initiatives
- Local content regulations and tariff orientation in a supply chain
- Total Cost of Ownership (TCO) in a global supply chain
- Facility location planning (expanded)
- Sustainable supply chains
- Supply chain risk management

A chapter on information management has been added. The other chapters have been revised, aiming for more focused content.

In the past, the term supply chain management referred mainly to the specific tasks entailed in *cross-company* cooperation in R&D and production. As the term is now used in all areas of industry and more and more for all objects in the product life cycle, the definition of SCM has been adapted to accord with its newer, wider meaning.

You can download interactive Macromedia Flash elements from the Web site to this book at: intlogman.ethz.ch. The Web site is updated with further learning materials that the reader may like to use. The comprehensive index of the book has been expanded in this edition. The material covers most of the key terms in the five CPIM modules contained in the *APICS CPIM Exam Content Manual*, as well as in the CSCP program.

Readers are invited to send suggestions and comments to me at Paul.Schoensleben@ethz.ch. If you like to do so, you can also visit my home page www.lim.ethz.ch/schoensleben/index_EN.

In parallel to this fourth English edition of the book, Springer is publishing the sixth edition in German, *Integrales Logistikmanagement – Operations- und Supply Chain Management innerhalb von Unternehmen und unternehmensübergreifend* (ISBN 9783-642-20380-0).

Zurich, March 2011

Prof. Dr. Paul Schönsleben

Foreword to the First Edition

Changes in the world outside the company alter the way that we look at problems and priorities in the company itself. This presents new challenges to company logistics and to planning & control of corresponding business processes.

While logistics was once understood as storing and transport, today — in the course of the reorganization of business processes — an integral perspective on company logistics is making headway. Naturally, products must still be stored and transported. But now these processes are seen as disturbing factors that should be reduced as greatly as possible. The current focus lies on that part of the logistics chain that adds value. This chain, from sales logistics to research and design logistics, production and procurement logistics, distribution logistics, service and maintenance logistics, and — a recent development — disposal logistics, now stands as a whole as the subject for discussion. We seek improvements at the level of the comprehensive, coordinated business process. Moreover, more and more networks of companies arise that develop and manufacture products in cooperation. The logistics of these coupled companies must work together closely and rapidly. This also demands integral management of logistics.

These recent tendencies do not only affect the logistics of the flow of goods itself, but rather also its planning & control, or, in other words, *administrative* and *planning logistics*. The term PPC (for production planning & control) has in reality long since been expanded to become planning & control of the entire logistics network.

Changing requirements in the world of practice often call for new theories and methods, particularly if earlier theories seem to have lost their connection to that world. This impression indeed often arises when we look at what is happening in company logistics. Close examination reveals that behind the methods and techniques that are sold on today's market with new and rousing catchwords there is seldom anything that is really new. It seems reasonable to assume that the attempt to match existing knowledge against the rapidly changing reality and — in the sense of continuous improvement — to expand and adapt it has met with failure. Here lies the crux of the challenge to company logistics today.

The methods and techniques implemented in planning & control are, interestingly enough, not dependent on classification of the tasks and

competencies in the organization of the company. For example, techniques of capacity planning do not change according to whether control tasks are executed by central operations planning and scheduling or, in decentralized fashion, by the job shops. The algorithms also remain in principle the same despite being either realized manually or with the aid of software. The algorithms in a comprehensive software package are also the same as those of a locally implemented planning board. In contrast, methods and techniques do indeed change in dependency on the entrepreneurial objectives, which the choice of logistics should support. These objectives relate to key areas such as quality, costs, delivery, or various aspects of flexibility.

The present volume aims to present the differing characteristics, tasks, methods, and techniques of planning & control in company logistics as comprehensively as possible. Development and change in operational management for company performance should become transparent. However, we will not be content with a wide-ranging, general treatment of the subject at the cost of depth and scientific elucidation of the matter at hand. Because of logistics and planning & control take place at the operational level of a company, competency in the details is absolutely necessary. Effective plans at the strategic level should not lead to contradictions and inconsistency at the operational level.

Consultants and the software industry, as well as widespread circles in educational institutions, produce constant pressure for novelty — which should not be confused with innovation. There is no need to allow ourselves to be irritated by such influences, which are often just short-lived trends. As always, after all, broad, detailed, methodological, and operational knowledge continues to lead to competency. It is this competency that makes it possible to classify and relate the various business processes and the tasks people in companies carry out and to continuously adapt this system of relations and categorizations to changing entrepreneurial objectives, market situations, product ranges, and employee qualifications.

Today, IT-supported planning & control enjoys a very high status in small-to medium-sized companies. And this is usually rightly so, for the large amounts of data can often not be handled quickly enough by another means. For this reason, presentation of the methods of planning & control in detail will include references to possible IT support.

The present volume is a textbook for industrial engineers, business managers, engineers and practitioners, and computer scientists as part of

their studies. It also aims to serve the further education of professionals in business practice in industry and the service industries.

The book is a translation of my book *Integrales Logistikmanagement — Planung & Steuerung umfassender Geschäftsprozesse*, published in 1998 by Springer. The first edition has sold out. The second edition will appear simultaneously and with the same content as the English version.

You will find a part of the bibliography referring to German books or papers. This means that I am still looking for English literature on the specific topic. I would be grateful for any indication of additional English sources of such a specific topic. In parts, the book reflects the work of my esteemed colleague Prof. Dr. Alfred Büchel, to whom I am greatly obliged. This is the case particularly with regard to the area of his great interest, statistical methods in planning & control. These are treated mainly in Chapter 9 and Sections 10.3, 10.4, and 12.2.

Zurich, January 2000

Prof. Dr. Paul Schönsleben

Acknowledgments (3rd and 4th Edition)

My thanks go first of all to you, my readers, for your numerous suggestions. And then to my colleagues and fellow members of the APICS Curricula and Certification Council: you have enriched my work through your many ideas. Here, special thanks go to Merle Thomas and Roly White. I am grateful to the members of my staff at the BWI Center for Industrial Management at the Swiss Federal Institute of Technology Zurich (ETH), for their valuable input to the new Sections and chapters: Oliver Schneider (Section 1.7.3), Johannes Plehn (Section 2.1.2), Philipp Bremen (Section 2.1.3), Robert Alard (Section 2.2), Sören Günther and Nikolai Iliev (Section 2.4), Katharina Bunse, Josef Oehmen and Matthias Vodicka (Section 2.5), Arne Ziegenbein (Section 2.6), Alexander Verbeck (chapter 17). And I would like to thank my colleagues Hugo Tschirky, Hans-Peter Wiendahl, and Markus Bärtschi for their continuing support of my work.

The work of translating and proofreading was again done by Ellen Russon, East Sandwich, MA (EllenRusson@comcast.net), to whom I extend many thanks. Roger Cruz, Dipl. Ing., and his team again took on ready-to-print production of this edition. To them also I express my thanks.

Zurich, January 2007 and March 2011

Prof. Dr. Paul Schönsleben

Acknowledgments (1st and 2nd Editions)

For the first and second editions, I wish to thank numerous scientific colleagues here and abroad, for valuable discussions and suggestions. Special thanks are due to many of the active and engaged experts in the APICS community.

In particular, I would like to thank

- Barry Firth, CPIM, Melbourne, for his invaluable help in updating the classification of fundamental concepts in logistics management (branches in dependency on characteristic features, production types, and concepts for planning & control within the enterprise), as well as for many other contributions.
- Prof. Merle Thomas, CFPIM, Faimont State College, West Virginia, for his ongoing support of my work.
- Prof. Dr. Alfred Büchel and Prof. Markus Bärtschi, my colleagues at the chair of Logistics and Information Management at ETH.
- Paul Bernard, Rapistan Systems, Grand Rapids, Michigan.
- Prof. Dr. Hans-Peter Wiendahl, University of Hannover, Germany.
- Prof. Dr. Thomas M. Liebling, ETH Lausanne, Switzerland.

For help with the manuscript, particularly for their critical questions, I wish to thank all previous and current scientific associates and postgraduate students of the chair of Logistics and Information Management of the Department of Manufacturing, Industrial Engineering and Management at the Swiss Federal Institute of Technology ETH in Zurich. They make up far too great a number to list individually here. Instead, I am pleased to refer to many of their doctoral theses and further scientific works in the text and bibliography of this book.

And for their untiring help in creating, translating, and correcting the manuscript, I give hearty thanks to Dipl. Ing. Roger Cruz and all the many professionals and assistants that participated in this undertaking.

Zurich, April 2003 and January 2000

Prof. Dr. Paul Schönsleben

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