

The Supply Chain Professional

Concepts and Analytics

SECOND EDITION

F. Robert Jacobs, PhD, Rhonda R. Lummus, PhD

HERCHER PUBLISHING Inc.

Naperville, Illinois

Richard T. Hercher Jr., *Publisher*
Elizabeth Hercher, *Editorial Assistant*
Carol Rose, *Managing Editor*
Laurie Entringer, *Composition*
LSC Communications, *Printing*

Cover Illustration, Fotolio Inc.

© 2019 by Hercher Publishing Incorporated
All rights reserved
Printed in the United States of America

ISBN: 978-1-939297-17-4
VS E-book ISBN 978-1-939297-18-9

The goal of *The Supply Chain Professional: Concepts and Analytics, 2nd edition* is to provide an intensive overview of supply chain management, including demand management, and supply and distribution, along with analytic models used in managing the supply chain. Whether you are a manager in a functional area who needs to quickly come up to speed on supply chain concepts or a student working to grasp the tools needed to run operations and supply chains, the book presents the important terms and concepts to quickly build your knowledge

Supply chain management is the process of planning, implementing, and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods, and related information, from point of origin to point of consumption, for the purpose of meeting customer requirements.

The book highlights supply chain system design and planning, and introduces the field of supply chain management through an understanding of the managerial issues and challenges faced in developing and implementing a supply chain strategy for a firm. The objective is to familiarize you with the decisions involved in designing and controlling material flow in the supply chain system, along with presenting a sample of tools available to use in making those decisions. The book introduces and applies current concepts (such as supplier partnerships, capacity planning, demand planning, inventory planning, manufacturing planning, etc.) that have significant implications for a firm's competitiveness. Case studies and exercises are included to reinforce the concepts.

Completing a course using this book will provide you:

1. An understanding of the elements of a supply chain system (including the in- and outbound flows of material and information) and the strategic decisions that go into the design, implementation, and modification of such a system;
2. The ability to apply relevant analytical tools, especially spreadsheet modeling, that support strategic supply chain design and implementation;
3. The skills needed to analyze ill-structured supply chain problems and apply sound reasoning in determining appropriate courses of action.

This second edition *The Supply Chain Professional* has strengthened coverage by way of including:

- a more thorough discussion of supply chain strategy,
- better linkage between customer needs and product design,
- broader coverage of process improvement and process mapping,
- a focus on supply chain design and global logistics,
- a new overview of material requirements planning,
- expanded coverage of risk and sustainability,
- an added discussion of capacity including waiting lines.

The book incorporates a number of figures to help you understand the concepts and includes study questions at the end of each chapter to test your knowledge. Templates have been developed for many of the examples and end-of-chapter problems to aid your understanding of the analytic supply chain models. Other online activities provide interesting additions to help you study.

Contents

1—Introduction and Strategy

- Introduction and Strategy
- Supply Chain Management
- Supply Chains and Value Creation
- Operations and Supply Chain Strategy
- Jobs in Supply Chain Management
- Study Questions, Exercise-Gartner, Exercise-Ikea, Case-Fastcom Submersibles

2—Financial Analysis and Performance Measurement

- Financial Analysis
- Performance Measurement
- Common Financial Performance Measures
- Common Operational Performance Measures
- Analyzing the Impact of Changes
- Financial Impact Problems
- Study Questions

3—Product Design

- Meeting Customer Expectations
- Design for the Supply Chain
- The Product Life Cycle
- Cost of Ownership
- Product Cost of Ownership Problems
- Study Questions, Exercise-Smart Companies

4—Process Analysis and Improvement

- Process Improvement
- Value-Stream Mapping
- Process Mapping and Little's Law
- Study Questions, Exercise-VSM Slim Line Blinds

5—Forecasting and Demand Management

- Data Analysis
- Forecasting
- Statistical Demand Forecasting Techniques
- Data Analysis Problems

Forecasting Problems
Study Questions, Exercise-Performance Lawn Equipment

6—The Manufacturing Environment

Decision Models in Manufacturing Supply Chains
Break-Even Decision Model
Product Mix Model
Break-Even Problems
Product Mix Problems
Study Questions

7—Supply Chain Design

Logistics
Supply Chain Design Models
Vehicle Routing
Location Problems
Vehicle Routing Problem
Study Questions, Exercise-Supply Chain Design-Listerine

8—Managing Customer and Supplier Relationships

International Trade Agreements
Formal Arrangements Between Companies
Supplier Relationships
Customer Relationships
Revenue Management
Landed Cost Problem
Study Questions

9—Supply Chain Information Technologies

Enterprise Resource Planning Systems
Supply Chain ERP Modules
Software to support Supply Chain Systems
Doing Business over the Internet
Study Questions

10—Materials Management

Inventory Buffers
Managing Inventory
Risk Inventory Models for Independent Demand
Multiperiod Inventory Models
Safety Stock in Inventory Models
Average Inventory and Inventory Turns
Inventory Problems
Study Questions, Exercise-The E-Game

11—Supply Chain Inventory Planning

- Supply Chain Inventory
- Factory Inventories
- MRP Example-Inventory Planning
- MRP Problem-Cost Analysis and Optimization
- MRP Problems
- Study Questions

12—Strategic Capacity Management

- Capacity Planning Concepts
- Capacity Flexibility
- Capacity Planning
- Learning Curves
- Capacity and Waiting Lines
- Decision Trees
- Learning Curve Problems
- Waiting Line Problem
- Decision Tree Problems
- Study Questions

13—Risk and Sustainability

- Risk in Supply Chains
- Supply Chains and Sustainability
- Product-Process Design
- Reduce-Reuse-Recycle Materials
- Supply Chain Design
- Carbon Footprint
- Study Questions, Risk Assessment Exercises, Carbon Footprint Case

14—Integrative Supply Chain Analysis

- Exercise-US Electronics

Appendix A—Excel Tutorials**Index**