

Contents

Preface.....	ix
Author.....	xi
1. Designing and Engineering the Supply Chain for Competitive Advantage	1
1.1 Overview.....	1
1.2 Supply Chain Types.....	4
1.3 Supply Chain Design.....	12
1.4 Supply Chain Process Model	16
1.5 Supply Chain Drivers.....	20
Problem: Dr. Smart's Supply Chain Strategy.....	23
References	24
2. Understanding Customer Demand: Forecasting.....	25
2.1 Overview.....	25
2.2 Time Series Forecasting	27
2.2.1 Constant Process.....	27
2.2.2 Trend Process	34
2.2.3 Seasonal Process	38
2.3 Error Analysis.....	42
2.4 Case Studies.....	45
Problem: Oriental Trading Company	55
Exercises	57
References	58
3. Matching Supply with Demand: Aggregate Planning.....	59
3.1 Overview.....	59
3.2 Elements of Aggregate Planning.....	60
3.3 Aggregate Planning Strategies.....	62
3.3.1 Level Strategy.....	62
3.3.2 Capacity Strategy.....	67
3.3.3 Chase Strategy.....	70
3.4 Linear Programming Approach to Aggregate Planning.....	71
3.4.1 Problem Formulation	71
3.4.2 Gurobi Optimizer	75
3.4.3 Solving Aggregate Planning Problems Using Gurobi Optimizer.....	77

3.5	Case Studies	87
	Problem: Plastic Bottle Inc.	99
	Exercises	100
	References	102
4.	Satisfying Customer Demand: Inventory Management	103
4.1	Overview	103
4.2	Economic Order Quantity	104
4.2.1	Basic Concept of Economic Order Quantity	104
4.2.2	EOQ Calculation under Different Scenarios	106
4.2.3	Multiple Types of Products.....	109
4.2.4	Quantity Discounts	112
4.3	Safety Inventory	117
4.3.1	Continuous Review	117
4.3.2	Periodic Review.....	120
4.3.3	Impact of Demand Correlation	122
4.3.4	Impact of Lead Time Uncertainty	125
4.4	Optimal Product Availability.....	127
4.5	Case Studies.....	130
	Problem: Business Attire Store.....	136
	Exercises	137
	References	138
5.	Moving Products across Supply Chain: Distribution Network Design and Transportation Decision Making.....	139
5.1	Overview	139
5.2	Frameworks for Distribution Network Design and Transportation Decision Making.....	144
5.3	Distribution Network Design Models	147
5.4	Transportation Decision Making.....	154
5.5	Case Studies.....	165
	Problem: Dragon Furniture Enterprise.....	175
	Exercises	176
	References	178
6.	Supplier Selection Methodology.....	179
6.1	Overview	179
6.2	Supplier Performance Measures.....	180
6.3	Supplier Selection Methods.....	183
6.3.1	Analytical Hierarchy Process Approach.....	185
6.3.2	Multiattribute Utility Theory Approach	197
6.4	Contracts to Increase Supply Chain Profitability	200
6.5	State of the Art in Supplier Selection	202
	References	203

Contents

7. Supply Chain Simulation Game	205
7.1 Overview	205
7.2 Sales Contract and Aggregate Plan	209
7.3 Simulation and Profit Analysis	213
7.4 Notes for Using the Simulation Game	218
Index	221