

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Research Background and Significance.	1
1.1.1	Class-Based Storage	1
1.1.2	Maintenance Support Strategies.	2
1.2	Related Literature	3
1.3	Research Contents and Methodologies	4
1.3.1	Research Contents.	5
1.3.2	Research Methodologies.	5
1.4	Outline of the Book.	6
	References	7
 <b>Part I Optimizing the Storage Policies of Warehousing Systems</b>		
<b>2</b>	<b>Class-Based Storage with a Finite Number of Items in AS/RS</b>	<b>11</b>
2.1	Research Background.	11
2.2	Problem Description and Conventional Travel-Time Model.	15
2.2.1	Problem Description	15
2.2.2	Conventional Travel-Time Model	18
2.3	Travel-Time Model with a Finite Number of Items	18
2.3.1	Required Storage Space Function and Relationship Between $R_k$ and $i_k$ .	19
2.3.2	Basic Travel-Time Model with a Finite Number of Items	22
2.3.3	Solution Methodology	22
2.4	Model Extensions	23
2.4.1	NSIT Storage Racks	24
2.4.2	Bender's ABC Demand Curve	25
2.4.3	Discrete Racks and Stochastic Demand	27
2.5	Numerical Illustrations	29
2.5.1	Base Examples: Results for Basic Model	29
2.5.2	Results for Extended Models	31

2.6	Chapter Summary . . . . .	34
	References . . . . .	35
<b>3</b>	<b>Performance of Class-Based Storage in a Unit-Load Warehouse . . .</b>	<b>37</b>
3.1	Research Background. . . . .	37
3.2	Problem Description . . . . .	39
3.3	Travel Distance Model Considering Realistic RSS. . . . .	41
3.4	Solution Methodology for Class-Based Storage Policy . . . . .	44
3.5	Performance Evaluation . . . . .	46
3.6	Chapter Summary . . . . .	50
	References . . . . .	52
 <b>Part II Optimal Maintenance Support Strategies for Warehousing Equipment</b>		
<b>4</b>	<b>Optimal Maintenance Decisions in a Self-Maintenance Scenario. . .</b>	<b>55</b>
4.1	Research Background. . . . .	55
4.2	Problem Description and Modeling . . . . .	56
4.3	Optimal Spare Inventory. . . . .	58
	4.3.1 Decision Analysis . . . . .	58
	4.3.2 Numerical Illustration . . . . .	61
4.4	Extension: An Alliance Model with Multiple Enterprises . . . . .	63
4.5	Chapter Summary . . . . .	65
	References . . . . .	66
<b>5</b>	<b>Equipment Maintenance Support Under Performance-Based Contracts . . . . .</b>	<b>69</b>
5.1	Research Background. . . . .	70
5.2	Literature Review . . . . .	72
5.3	Problem Description and Performance-Based Contracts . . . . .	73
5.4	Decision Analysis . . . . .	75
	5.4.1 Supplier's Decision . . . . .	76
	5.4.2 Customer's Decision . . . . .	77
5.5	Supply Chain Coordination. . . . .	79
5.6	Numerical Illustrations . . . . .	80
	5.6.1 Equilibrium with Single Customer. . . . .	81
	5.6.2 Equilibrium with Multiple Customers . . . . .	83
	5.6.3 Supply Chain Coordination . . . . .	84
5.7	Chapter Summary . . . . .	85
	References . . . . .	87
<b>6</b>	<b>Conclusions . . . . .</b>	<b>89</b>
6.1	Book Summary . . . . .	89
6.2	Directions for Future Research . . . . .	91

**Erratum to: Storage Policies and Maintenance Support  
Strategies in Warehousing Systems . . . . . E1**

**Appendix A: Finding  $\varepsilon$  Using Simulation . . . . . 93**

**Appendix B: Details of Solution Methodology in Sect. 2.3.3. . . . . 97**

**Appendix C: Proofs . . . . . 99**

Storage Policies and Maintenance Support Strategies  
in Warehousing Systems

Guo, X.

2016, XXIII, 104 p. 29 illus., 12 illus. in color., Hardcover

ISBN: 978-981-10-1447-5