3.4 Methods for Solving the Travelling Salesman Problem

3.4.1 Heuristics for the Travelling Salesman Problem

3.4.2 Evolutionary Algorithms for the Travelling Salesman Problem

3.4.3 Other Metaheuristics and Neural Networks for the Travelling Salesman Problem

3.4.4 On the Performance of Solution Approaches

3.5 The Vehicle Routing Problem

3.5.1 The Vehicle Routing Problem with Time Windows

3.5.2 The Vehicle Routing Problem with Multiple Vehicles

3.5.3 The Vehicle Routing Problem with Multiple Depots

3.5.4 More Differentiated Problem Variants

3.6 Solution Approaches for Vehicle Routing Problems

3.7 The Pickup and Delivery Problem

3.8 Network Flow Problems

References

4 Inventory Planning and Lot-Sizing

4.1 The Need for Inventory Planning

4.2 Economic Order Quantities and Safety Stocks

4.3 Capacitated Lot-Sizing Problems

4.4 Solution Approaches for Capacitated Lot-Sizing Problems

4.5 Planning Warehouse Operations

4.6 Storage Locations

4.7 Inventory Routing

References

5 Scheduling

5.1 Introduction

5.2 Simple Rules and Heuristics

5.3 Standard Scheduling Problems

5.3.1 Job Shop Scheduling

5.3.2 Flow Shop Scheduling

5.3.3 Open Shop Scheduling

5.4 Specific Scheduling Problems in Logistics

5.5 Solving Scheduling Problems with Computational Intelligence Techniques

5.5.1 Encoding Issues

5.5.2 Usage of Metaheuristics in Scheduling

References
Contents

6 Location Planning and Network Design ........................................ 121
   6.1 Location Planning as Multicriteria Decision Problems .............. 121
   6.2 Discrete Location Problems ........................................... 123
      6.2.1 The p-Median Problem ........................................... 124
      6.2.2 The p-Center Problem ............................................ 128
      6.2.3 The Uncapacitated Facility Location Problem (UFLP) .......... 130
      6.2.4 The Capacitated Facility Location Problem (CFLP) .......... 133
   6.3 Continuous Location Problems .......................................... 135
      6.3.1 The Uncapacitated Multi-facility Weber Problem (UMWP) .. 135
      6.3.2 The Capacitated Multi-facility Weber Problem (CMWP) ..... 138
   6.4 Location Routing Problems .............................................. 141
   6.5 Hub Location Problems ................................................ 144
   6.6 Multi-Echelon Network Design .......................................... 145
   6.7 Conclusions .............................................................. 146
   References ........................................................................ 146

7 Intelligent Software for Logistics .............................................. 153
   7.1 General-Purpose Optimization Software ............................... 153
      7.1.1 Setting Up a Suitable Model for the Optimization Software ........ 155
      7.1.2 Integration of Optimization Software with Logistics Applications ........ 156
      7.1.3 Adapting the Method to the Problem Under Consideration .... 157
   7.2 Software Providing Specific Optimization Algorithms or Supporting Particular Optimization Problems .............. 157
   7.3 General-Purpose Business Software .................................... 160
   7.4 Logistics Software .......................................................... 163
      7.4.1 Warehouse Management Systems .................................. 163
      7.4.2 Software for Transportation Planning ............................. 165
      7.4.3 Packing and Loading Software .................................... 166
   7.5 Conclusions ................................................................. 167
   References ........................................................................ 168

Authors Brief Biographies ......................................................... 171

Index .................................................................................... 173
Computational Intelligence in Logistics and Supply Chain Management
Hanne, Th.; Dornberger, R.
2017, XX, 176 p. 20 illus., 14 illus. in color., Hardcover
ISBN: 978-3-319-40720-3