



# Contents

<b>Prologue</b> .....	XIII
<b>Authors</b> .....	XIX

## **Chapter 1. Operations in the Current Environment 1**

1. The company in a global environment.....	4
2. Evolution in the organisation of operations.....	6
3. The learning curve.....	11
4. Competitive advantages .....	14
5. Business digitisation.....	17
6. Glossary.....	26
Recommended manuals .....	27
Bibliography.....	28
Accessed online resources.....	29
Recommended media.....	30

## **Chapter 2. Managing Operations 31**

1. The supply chain .....	34
2. The cost of inventory management.....	43
3. The Just-in-Time system.....	44
4. Aggregate planning .....	46
5. Material Requirements Planning (MRP).....	48
6. Project management .....	51
7. Glossary.....	52
Recommended manuals and articles.....	52
Accessed online resources .....	53

**Chapter 3. Tools to Support Decision-Making in Operations Management** **55**

---

- 1. Company capacity and tactical resource planning ..... 58
- 2. Tools for decision-making ..... 62
  - 2.1. Quantitative methods ..... 63
    - 2.1.1. Decision trees ..... 63
    - 2.1.2. Linear programming and sensitivity analysis ..... 65
    - 2.1.3. Transportation modelling ..... 69
    - 2.1.4. Queueing or waiting line theory ..... 71
    - 2.1.5. Learning curves ..... 72
    - 2.1.6. Simulation ..... 75
    - 2.1.7. Demand forecasting ..... 76
  - 2.2. Qualitative methods ..... 85
    - 2.2.1. Value judgments based on experience ..... 85
    - 2.2.2. Customer surveys ..... 86
    - 2.2.3. Delphi method ..... 86
- 3. Glossary ..... 87
- Recommended bibliography and manuals ..... 88
- Accessed online resources ..... 89
- Recommended media ..... 89

**Chapter 4. Aggregate Planning** **91**

---

- 1. Introduction ..... 94
- 2. Aggregate planning ..... 95
  - 2.1. Aggregate production plan ..... 97
  - 2.2. How to develop an aggregate production plan ..... 97
    - 2.2.1. Aggregate production plan with zero inventory ..... 98
    - 2.2.2. Aggregate production plan with constant labour ..... 101
    - 2.2.3. Aggregate production plan with minimal workforce and outsourcing ..... 104
    - 2.2.4. Aggregate production plan with constant workforce and overtime ..... 107
    - 2.2.5. Combined aggregate production plan ..... 111
- 3. Glossary ..... 113



Recommended manuals .....	114
Recommended media.....	114

## **Chapter 5. Inventory Management: Independent Demand** **115**

---

1. Introduction to inventory management .....	118
2. Types of inventories .....	121
3. Functions of inventories.....	122
4. Inventory management.....	123
4.1. Inventory costs .....	124
4.2. Inventory management models for products with independent demands.....	128
4.2.1. Economic Order Quantity (EOQ) model.....	129
4.2.2. Quantity discount model.....	135
4.2.3. Graduate quantity discount model.....	138
4.2.4. Inventory management model with unknown demand....	141
4.2.4.1. Marginal analysis.....	141
5. Glossary.....	144
Recommended manuals .....	145
Recommended media sources.....	145

## **Chapter 6. Inventory Management: Dependent Demand** **147**

---

1. Introduction to inventory management with dependent demand .....	152
2. Inventory management models with dependent demand .....	153
2.1. MRP (Material Requirements Planning) .....	153
2.1.1. Elements of MRP .....	154
2.1.1.1. Master Production Schedule (MPS) .....	154
2.1.1.2. Bill of Materials (BOM).....	155
2.1.1.3. Available inventory.....	156
2.1.1.4. Purchase orders .....	157
2.1.1.5. Delivery time (lead time) .....	157
2.1.2. General operation of the MRP system .....	157

2.1.3. Lot-sizing methods .....	164
2.1.3.1. Lot-for-lot orders .....	164
2.1.3.2. Constant period .....	166
2.1.3.3. Least total cost method .....	167
2.1.3.4. Minimum unit cost.....	169
2.1.3.5. Silver Meal method.....	172
2.1.3.6. Wagner-Whitin algorithm.....	175
2.2. Just-in-Time (JIT) production system .....	180
2.1.2. Kanban system .....	184
2.3. Lean Manufacturing.....	185
3. Inventory management in service businesses .....	189
4. Glossary.....	193
Recommended manuals .....	194
Recommended media.....	194

## **Chapter 7. Operational Programming 195**

---

1. Introduction .....	198
2. Short-term programming.....	200
2.1. Assignment of workload to each work centre .....	201
2.1.1. Hungarian method .....	201
2.2. Sequencing.....	205
2.2.1. Sequencing on a single machine.....	206
2.2.1.1. Sequencing rules .....	208
2.2.2. Sequencing on two machines: Johnson's rule.....	217
2.2.3. Sequencing on three machines .....	222
2.2.4. Sequencing on "m" machines.....	225
3. Glossary.....	228
Recommended manuals .....	229
Recommended media sources.....	229
Annex: Gantt charts .....	229



## **Chapter 8. Quality in the Era of Planned Obsolescence**

---

**233**

1. The evolution of quality: from artisanal production to global quality.	236
2. The current concept of quality in operations management.....	237
3. Maintenance and reliability.....	246
4. Planned obsolescence.....	252
5. Glossary.....	255
Recommended manuals .....	256
Recommended media.....	256
<b>Bibliography .....</b>	<b>257</b>