

THE HANDBOOK OF **LOGISTICS & DISTRIBUTION MANAGEMENT**

5TH EDITION

ALAN RUSHTON, PHIL CROUCHER,
PETER BAKER

The Chartered Institute of
Logistics and Transport (UK)



LONDON PHILADELPHIA NEW DELHI

CONTENTS

| | | |
|-----------|--|-------------|
| | <i>List of figures</i> | <i>viii</i> |
| | <i>List of tables</i> | <i>xv</i> |
| | <i>Preface</i> | <i>xvi</i> |
| | <i>Abbreviations</i> | <i>xxi</i> |
| | Part 1 Concepts of logistics and distribution | 1 |
| 01 | Introduction to logistics and distribution | 3 |
| | Introduction 3; Scope and definition 4; Historical perspective 7; Importance of logistics and distribution 9; Logistics and supply chain structure 14; Summary 15 | |
| 02 | Integrated logistics and the supply chain | 16 |
| | Introduction 16; The total logistics concept 16; Planning for logistics 19; The financial impact of logistics 22; Globalization and integration 24; Integrated systems 25; Competitive advantage through logistics 27; Logistics and supply chain management 28; Summary 30 | |
| 03 | Customer service and logistics | 32 |
| | Introduction 32; The importance of customer service 32; The components of customer service 34; Two conceptual models of service quality 37; Developing a customer service policy 39; Levels of customer service 46; Measuring customer service 47; The customer service explosion 50; Summary 51 | |
| 04 | Channels of distribution | 52 |
| | Introduction 52; Physical distribution channel types and structures 53; Channel selection 57; Outsourcing channels 61; Summary 65 | |
| 05 | Key issues and challenges for logistics and the supply chain | 66 |
| | Introduction 66; The external environment 68; Manufacturing and supply 71; Logistics and distribution 74; Retailing 81; The consumer 83; Summary 86 | |

| | | |
|-----------|---|------------|
| | Part 2 Planning for logistics | 87 |
| 6 | Planning framework for logistics Introduction 89; Pressures for change 89; Strategic planning overview 91; Logistics design strategy 94; Product characteristics 96; The product life cycle 99; Packaging 100; Unit loads 101; Summary 101 | 89 |
| 7 | Logistics processes Introduction 103; The importance of logistics processes 103; Logistics process types and categories 105; Approach 108; Tools and techniques 110; Summary 116 | 103 |
| 8 | Supply chain segmentation Introduction 117; Product segmentation 117; Demand and supply segmentation 119; Marketing segmentation 121; Combined segmentation frameworks 122; Implementation 123; Summary 124 | 117 |
| 9 | Logistics network planning Introduction 125; The role of distribution centres and warehouses 126; Cost relationships 128; A planned approach or methodology 136; Initial analysis and option definition 138; Logistics modelling: logistics option analysis 143; Evaluate results: matching logistics strategy to business strategy 147; Practical considerations for site search 148; Summary 150 | 125 |
| 10 | Logistics management and organization Introduction 151; Relationships with other corporate functions 151; Logistics organizational structures 153; Organizational integration 155; The role of the logistics or distribution manager 158; Payment schemes 160; The selection of temporary staff and assets 164; Summary 167 | 151 |
| 11 | Multichannel fulfilment Introduction 168; Issues 169; Food retailing 170; Non-food retailing 172; Summary 175 | 168 |
| 12 | Manufacturing logistics Introduction 176; Typology of operations 177; Just-in-time 180; Manufacturing resource planning (MRPII) 183; Material requirements planning (MRP) 183; The MRP system 184; Flexible fulfilment (postponement) 187; The effects of distribution activities 188; Future developments 189; Summary 190 | 176 |
| | Part 3 Procurement and inventory decisions | 191 |
| 13 | Basic inventory planning and management Introduction 193; The need to hold stocks 194; Types of stockholding/ inventory 195; Stockholding policy implications for other logistics functions 197; Inventory costs 199; Reasons for rising inventory costs 200; Inventory replenishment systems 201; The reorder point and safety stock 203; The bullwhip effect 205; The economic order quantity 206; Demand forecasting 210; Summary 216 | 193 |

| | | |
|-----------|--|------------|
| 14 | Inventory and the supply chain | 217 |
| | Introduction 217; Problems with traditional approaches to inventory planning 217; Different inventory requirements and the 'decoupling point' 218; The lead-time gap 220; Inventory and time 221; Analysing time and inventory 223; Inventory planning for manufacturing 224; Inventory planning for retailing 227; Summary 233 | |
| 15 | Procurement and supply | 234 |
| | Introduction 234; The procurement cycle 235; The scope of procurement 236; Setting the procurement objectives 236; Managing the suppliers 243; Expediting 246; Procurement performance measures 247; Collaborative planning, forecasting and replenishment 247; Factory gate pricing 248; E-procurement 248; Corruption 250; Summary 251 | |
| | Part 4 Warehousing and storage | 253 |
| 16 | Principles of warehousing | 255 |
| | Introduction 255; The role of warehouses 256; Strategic issues affecting warehousing 258; Warehouse operations 259; Costs 263; Packaging and unit loads 263; Summary 265 | |
| 17 | Storage and handling systems (palletized) | 266 |
| | Introduction 266; Pallet movement 266; Pallet stacking 268; Palletized storage 272; Palletized storage – comparison of systems 286; Summary 288 | |
| 18 | Storage and handling systems (non-palletized) | 290 |
| | Introduction 290; Small item storage systems 291; Truck attachments 295; Long loads 296; Cranes 299; Conveyors 299; Automated guided vehicles 300; Hanging garment systems 301; Summary 302 | |
| 19 | Order picking and packing | 303 |
| | Introduction 303; Order picking concepts 303; Order picking equipment 305; Sortation 313; Picking area layout 315; Slotting 316; Pick routes 316; Information in order picking 317; E-fulfilment 320; Picking productivity 320; Replenishment 321; Packing 322; Summary 324 | |
| 20 | Receiving and dispatch | 325 |
| | Introduction 325; Receiving processes 325; Dispatch processes 326; Cross-docking 327; Returned goods 329; Receiving and dispatch equipment 329; Layouts 332; Summary 335 | |
| 21 | Warehouse design | 336 |
| | Introduction 336; Design procedure 336; Summary 352 | |
| 22 | Warehouse management and information | 353 |
| | Introduction 353; Operational management 353; Performance monitoring 355; Information technology 358; Data capture and transmission 360; Radio data communication 362; Truck management 363; Summary 363 | |

| | | |
|----|---|------------|
| | Part 5 Freight transport | 365 |
| 23 | International logistics: modal choice Introduction 367; Relative importance of the main modes of freight transport 368; Method of selection 370; Operational factors 371; Transport mode characteristics 375; Consignment factors 379; Cost and service requirements 380; Aspects of international trade 381; Summary 387 | 367 |
| 24 | Maritime transport Introduction 389; Structure of the industry 389; Common shipping terms 391; Surcharges 393; Documentation 395; Vessel classification 396; Common ship types and their cargoes 398; Ports and cargo handling 401; Other factors 402; Summary 404 | 389 |
| 25 | Air transport Introduction 405; Structure of the industry 405; Air cargo handling 407; Types of air freighter 409; Documentation 410; Air hubs and spokes 411; Air freight pricing 411; Air cargo security 414; Summary 416 | 405 |
| 26 | Rail and intermodal transport Introduction 417; Intermodal equipment 418; Intermodal vehicles 426; Intermodal infrastructure 428; Mode shift grant schemes 429; Rail transport 429; Summary 432 | 417 |
| 27 | Road freight transport: vehicle selection Introduction 433; Main vehicle types 434; Types of operation 435; Load types and characteristics 443; Main types of vehicle body 446; The wider implications of vehicle selection 452; Vehicle acquisition 453; Summary 455 | 433 |
| 28 | Road freight transport: vehicle costing Introduction 456; Reasons for road freight transport vehicle costing 456; Key aspects of road transport costing 458; Vehicle standing costs 460; Vehicle running costs 464; Overhead costs 466; Costing the total transport operation 467; Whole life costing 468; Vehicle cost comparisons 471; Zero-based budgets 472; Summary 473 | 456 |
| 29 | Road freight transport: planning and resourcing Introduction 474; Need for planning 475; Fleet management 476; Main types of road freight transport 478; Transport resources: requirements and optimization 480; Vehicle routing and scheduling issues 482; Manual methods of vehicle routing and scheduling 488; Computer routing and scheduling 495; Other road-freight transport information systems applications 500; Summary 501 | 474 |

| | | |
|-----------|---|------------|
| | Part 6 Operational management | 503 |
| 30 | Cost and performance monitoring | 505 |
| | Introduction 505; Why monitor? 506; Different approaches to cost and performance monitoring 508; What to measure against? 513; A logistics operational planning and control system 516; Good practice 517; Influencing factors 521; Detailed metrics and KPIs 522; The presentation of metrics 525; Summary 527 | |
| 31 | Benchmarking | 529 |
| | Introduction 529; Why should an organization engage in benchmarking? 530; How to conduct a benchmarking exercise 530; Formal benchmarking systems 536; Benchmarking distribution operations 538; Summary 547 | |
| 32 | Information and communication technology in the supply chain | 548 |
| | Introduction 548; Basic communication 548; Supply chain planning 551; Warehousing 553; Inventory 553; Transport 554; Other applications 556; Trading using the internet – e-commerce 557; Summary 559 | |
| 33 | Outsourcing: services and decision criteria | 560 |
| | Introduction 560; Outsourcing operations 560; Different service types 571; Value added services 577; Drivers and drawbacks of outsourcing 580; What are the critical factors of choice? 586; Summary 588 | |
| 34 | Outsourcing: the selection process | 589 |
| | Introduction 589; Approach 589; Detailed steps 591; Summary 610 | |
| 35 | Outsourcing management | 611 |
| | Introduction 611; The need for management 612; Managing the relationship 612; Implementation planning 616; Monitoring an outsourced logistics operation 618; Summary 622 | |
| 36 | Security and safety in distribution | 624 |
| | Introduction 624; International security measures 625; Strategic security measures 626; Tactical security measures 627; Safety in the distribution centre and warehouse 634; Summary 637 | |
| 37 | Logistics and the environment | 638 |
| | Introduction 638; The European Union and environmental legislation 639; Logistics and environmental best practice 644; Alternative fuels 654; Summary 658 | |
| 38 | Humanitarian logistics | 659 |
| | Introduction 659; Key differences 660; Performance measurement 663; Key terms 665; Pre-positioning of resources 666; Assessment and planning 667; The cluster approach 668; Distribution 669; Summary 670; Further reading 671 | |
| | <i>References</i> 672 | |
| | <i>Index</i> 675 | |