Contents

Preface xv

Chapter 1 Success or Failure with Best Practices 1
  Types of Best Practices 1
  Most Fertile Ground for Best Practices 2
  Planning for Best Practices 3
  Timing of Best Practices 5
  Implementing Best Practices 6
  How to Use Best Practices: Best Practice Duplication 9
  Why Best Practices Fail 10
  Summary 14

Chapter 2 Inventory Purchasing 15
  2.1 Include Suppliers in the New Product Design Process 17
  2.2 Use Supplier-Concurrent Engineering 18
  2.3 Avoid Designing Risky-Procurement Items into Products 18
  2.4 Match Product and Part Life Cycles 19
  2.5 Reduce Safety Stocks by Shrinking Supplier Lead Times 20
  2.6 Purchase Supplier Capacity 20
  2.7 Reduce Safety Stocks by Accelerating the Flow of Internal Information 21
  2.8 Buy from Suppliers Located Close to the Company 22
  2.9 Relocate Suppliers On-Site 23
  2.10 Use Local Suppliers for Rapid Replenishment 24
  2.11 Consider Foreign Sourcing 24
  2.12 Use Auctions for Selective Purchases 25
  2.13 Compare Suppliers Based on Total Landed Cost 26
  2.14 Eliminate Approvals of Routine Purchases 27
  2.15 Purchase Based on Material Requirements Planning 27
  2.16 Compare Open Purchase Orders to Current Requirements 28
2.17 Freeze the Short-Term Production Schedule 29
2.18 Share Production Plan with Suppliers 30
2.19 Obtain Direct Links into Customer Inventory Planning Systems 30
2.20 Require Frequent Deliveries of Small Quantities 31
2.21 Arrange for Inbound Split Deliveries 33
2.22 Arrange for Phased Deliveries 33
2.23 Adopt Rolling Schedules 34
2.24 Adopt Just-in-Time Purchasing 35
2.25 Implement Stockless Purchasing 36
2.26 Centralize Purchasing 37
2.27 Designate Major Suppliers as Lead Suppliers 37
2.28 Single-Source Products 38
2.29 Install a Supplier Rating System 40
2.30 Use Long-Term Supplier Relationships for Strategic Purchases 41
2.31 Shift Raw Materials Ownership to Suppliers 42
2.32 Flag Changes Impacting Advance Material Requests 44

Chapter 3  Inventory Receiving and Shipping 45
3.1 Reject Unplanned Receipts 45
3.2 Obtain Advance Shipping Notices for Inbound Deliveries 47
3.3 Directly Enter Receipts into Computer 48
3.4 Automatically Collect Inbound and Outbound Cube and Weight Information 49
3.5 Repackage Incoming Items into Increments Ordered by Customers 50
3.6 Put Away Items Immediately after Receipt 51
3.7 Stage Received Goods for Zone Putaways 52
3.8 Eliminate the Receiving Function 53
3.9 Combine the Shipping and Receiving Functions in One Area 54
3.10 Assign Docks Based on Minimum Warehouse Travel Time 55
3.11 Require Supplier Deliveries with Open-Sided Trucks Directly to Production 55
3.12 Ship Using Returnable Wheeled Containers 56
3.13 Use Dunnage Bags to Cushion Outbound Shipments 57
3.14 Use Shippers with the Most Consistent Delivery Performance 58
3.15 Have Delivery Person Deliver the Invoice 59
3.16 Pay Suppliers Based Only on Receiving Approval 60
3.17 Provide Pending Shipment Information to the Collections Staff 63

Chapter 4 Inventory Storage 65
4.1 Drop Ship Inventory 67
4.2 Cross-Dock Inventory 67
4.3 Move Inventory to Floor Stock 68
4.4 Use Temporary Storage for Peak Inventory Requirements 70
4.5 Assign Unique Location Codes to All Inventory Storage Locations 71
4.6 Reduce the Number of Inventory Bin Locations Assigned to the Same Product 72
4.7 Assign Fixed Inventory Locations to High-Volume Items 72
4.8 Segregate Customer-Owned Inventory 73
4.9 Allocate Warehouse Areas to Specific Customers 74
4.10 Segregate Inventory by ABC Classification 75
4.11 Store High-Pick Items in Order Fulfillment Zones 76
4.12 Adjust Case Height to Match Cubic Storage Capabilities 76
4.13 Adjust Case Stacking or Width to Avoid Pallet Overhang 77
4.14 Combine Out-and-Back Inventory Moves 78
4.15 Use Different Storage Systems Based on Cubic Transactional Volume 78
4.16 Use Modular Storage Cabinets for Low-Storage-Volume Items 79
4.17 Use Carousels to Increase Picking Efficiency 80
4.18 Use Movable Racking Systems 81
4.19 Use Multistory Manual Picking Systems 81
4.20 Use Gravity-Flow Racking for FIFO Picking 82
4.21 Use Pallet-Flow Racks for Pallet FIFO Picking 83
4.22 Create Double-Deep Racking or Stacking Lanes for Large SKU Pallet Volumes 83
Chapter 5  Inventory Picking

5.1  Group Single-Line Orders and Pick in Order by Location  88
5.2  Use Single-Order Picks for Emergency Orders  89
5.3  For Manual Systems, Pick from the Source Document  90
5.4  Implement Forward Picking  90
5.5  Use Wave Picking by Grouping to Consolidate Transactions  91
5.6  Use Zone Picking to Consolidate Total Transactions  92
5.7  Use Zone Picking with Order Forwarding  93
5.8  Use Voice Picking to Record Low-Volume Picking Transactions  94
5.9  Use Pick-to-Light to Record High-Volume Picking Transactions  95
5.10  Use Portable Scales to Pick Small Items  97
5.11  Pick into Multibin Carts  97
5.12  Store Kitted Inventory in an Accumulation Bin  98
5.13  Use Standard Containers to Move, Store, and Count Inventory  99
5.14  Issue Parts in Full-Bin Increments  100
5.15  Have Suppliers Sequence Their Parts Deliveries  101
5.16  Avoid Restocking during a Picking Shift  101
5.17  Optimize Inventory Storage through Periodic Location Changes  102

Chapter 6  Production Issues Impacting Inventory

6.1  Eliminate Incentive Pay Systems Causing Excessive Production  105
6.2  Standardize the Number of Shifts Worked throughout a Factory  106
6.3  Allow Production Workers to Call Suppliers about Faulty Materials  107
6.4 Invest in Smaller, Low-Capacity Machines Rather than High-Capacity Ones 107
6.5 Purchase Machines from a Single Supplier 108
6.6 Produce the Same Parts on the Same Machine Every Time 109
6.7 Perform Inspections at the Next Downstream Workstation 110
6.8 Improve Periodic Equipment Maintenance Every Time 110
6.9 Shift Some Equipment Maintenance to the Production Staff 111
6.10 Preplan Major Equipment Maintenance 112
6.11 Replace Aisles with Conveyors 113
6.12 Schedule Smaller Production Batches 114
6.13 Produce to Order Rather than to Stock 115
6.14 Reduce Container Sizes 115
6.15 Reduce Setup Times 116
6.16 Shorten Cycle Times 117
6.17 Replace Straight Assembly Lines with Serpentine Lines 118
6.18 Reduce the Length of the Assembly Line 118
6.19 Divide the Assembly Line into Segments 119
6.20 Use Cellular Manufacturing 120
6.21 Group Machine Cells Near Common Inventory Storage Areas 121
6.22 Position Local Cell Storage between Workstations and Aisles 122

Chapter 7 Inventory Transactions 123
7.1 Reduce the Number of Stored Data Elements 125
7.2 Record Inventory Transactions with Barcodes 126
7.3 Record Inventory Transactions with Radio Frequency Communications 127
7.4 Track Inventory with Radio Frequency Identification (RFID) 128
7.5 Eliminate All Paper from Inventory Transactions 130
7.6 Use the Kanban System to Pull Transactions through the Facility 131
7.7 Eliminate All Transaction Backlogs 132
7.8 Verify That Receipts Are Entered in the Computer System at Once 133
7.9 Have Customers Order by Part Number 134
7.10 Audit All Inventory Transactions 135
Chapter 8  Inventory Planning and Management  147

8.1 Include Materials Managers in the New Product Design Process  150
8.2 Reduce the Number of Product Options  151
8.3 Increase Prices for Nonstandard Options  152
8.4 Increase Prices for Small-Unit Orders  152
8.5 Convert Information Products to Electronic Versions  153
8.6 Reduce the Number of Products  153
8.7 Reduce the Number of Customers  154
8.8 Avoid Promotions  155
8.9 Design Products with Lower Tolerances  155
8.10 Require Formal Review and Approval of Engineering Change Orders  156
8.11 Assign Inventory Items to Classifications  157
8.12 Forecast Demand by Product Families  158
8.13 Segment Forecasted Demand into Stable and Unstable Products  159
8.14 Centralize Responsibility for Inventory Planning  160
8.15 Delay the Order Penetration Point as Long as Possible  160
8.16 Use a Material Requirements Planning System to Model Alternative Lot Sizes, Safety Stocks, and Lead Times  161
8.17 Reduce Job Releases to Production  162
8.18 Prioritize Production Based on Delivery Region  163
8.19 Use Variable Safety Stocks for Fluctuating Demand  163
8.20 Convert Safety Stock to Just-in-Case Stock  164
8.21 Eliminate Expediting 165
8.22 Develop a Product Substitution System 166
8.23 Question the Level of Customer Service Provided 166
8.24 Focus Inventory Reduction Efforts on High-Usage Items 167
8.25 Create a Visual Review System for Noninventoried Parts 168
8.26 Eliminate Departmental Stocks 169
8.27 Install a Distribution Requirements Planning System 170
8.28 Distribute Slow-Moving Items from Regional Warehouses 170
8.29 Install a Hold and Flow System 171
8.30 Use Overnight Delivery from a Single Location for Selected Items 172
8.31 Use Fair Shares Analysis to Allocate Inventory to Warehouses 173
8.32 Periodically Rationalize the Warehouse Network 173
8.33 Plan for Product Shutdowns 175
8.34 Create a Materials Review Board 175
8.35 Identify Obsolete Inventory via Physical Inventory Tags 176
8.36 Plan for Service Parts Inventory Levels 177
8.37 Inspect Returned Merchandise for Usability 178
8.38 Reserve Otherwise Obsolete Inventory with “Service/Repair” Designation 178
8.39 Avoid Product Obsolescence with Shelf-Life Control 179
8.40 Create an Obsolete Inventory Budget for Disposals 180
8.41 Batch Excess Inventory for Sale to Salvage Contractors 181
8.42 Sell Excess Items through the Service Department 181
8.43 Set Up a Reverse Logistics System 182
8.44 Outsource Selected Warehousing Functions 183

Chapter 9 Warehouse Layout 185
9.1 Include Other Issues than Cost in a Warehouse Acquisition Decision 186
9.2 Generally Organize the Warehouse in a U-Shaped Process Flow 187
9.3 Organize the Warehouse by Storage Zones 188
9.4 Maximize Vertical Storage Space 189
9.5 Tailor Vertical Storage Space to Manual Picking Needs 190
9.6 Enclose Building Supports in Racks 190
9.7 Use Narrow Aisles in Manual Putaway and Picking Zones 191
9.8 Avoid Aisles Adjacent to Outside Walls 192
9.9 Use Automated Storage and Retrieval Systems 192
9.10 Use Automated Guided Vehicle Systems 193
9.11 Use Conveyors to Reduce Employee Travel 194
9.12 Avoid an Excessive Level of Warehouse Automation 195
9.13 Eliminate the Quality Review Area 197
9.14 Enlarge the Receiving Area 197
9.15 Design Just-in-Time Docks for the Largest Anticipated Trucks 198
9.16 Lock Down the Warehouse Area 199
9.17 Plan for Maximized Warehouse Space Utilization 200
9.18 Eliminate the Warehouse 200

Chapter 10 Cost Accounting 203
10.1 Eliminate Purchase Price Variance Tracking 203
10.2 Eliminate Tracking of Work-in-Process Inventory 205
10.3 Eliminate Scrap Reporting in the Production Area 206
10.4 Charge the Entire Inventory to Expense 206
10.5 Use Specific Identification Costing with RFID Tags 207
10.6 Have the Cost System Separate Value-Added and Nonvalue-Added Activities 208
10.7 Assign Overhead Based on Square Footage Used 209
10.8 Do Not Credit Internal Departments with Sales When Production Is Completed 210
10.9 Report on Landed Cost Instead of Supplier Price 211
10.10 Report on the Total Cost of Product Ownership 211
Chapter 11  Bills of Materials  
11.1 Audit Bills of Materials  
11.2 Conduct a Configuration Audit  
11.3 Modify the Bills of Materials Based on Actual Scrap Levels  
11.4 Modify the Bills of Materials for Temporary Substitutions  
11.5 Eliminate Redundant Part Numbers  
11.6 Standardize Parts  
11.7 Review Inventory Returned to the Warehouse  
11.8 Use Bills of Materials to Find Inventory Made Obsolete by Product Withdrawals  
11.9 Identify Inactive Inventory in the Product Master File  

Chapter 12  Impact of Constraints on Inventory  
Overview of the Theory of Constraints  
Overview of the Constraint Buffer  
Alternatives to the Constraint Buffer  
Expedite Zone  
Buffer Manager  
Buffer Hole  
Buffers for Labor Operations  
Assembly Area Buffer  
Inventory Releases  
Batch Sizes  
Summary  

Chapter 13  Inventory Policies and Procedures  
13.1 Create a Policies and Procedures Manual  
13.2 Train the Warehouse and Accounting Staffs in Inventory Procedures
13.3 Cross-Train for Mission-Critical Activities 251
13.4 Train Using Training Teams 252

Chapter 14 Inventory Measurements 271
14.1 Percentage of New Parts Used in New Products 271
14.2 Percentage of Existing Parts Reused in New Products 273
14.3 Raw Material Content 274
14.4 Bill of Materials Accuracy 275
14.5 Item Master File Accuracy 276
14.6 Economic Order Quantity 276
14.7 Distribution Turnover 277
14.8 On-Time Parts Delivery Percentage 278
14.9 Incoming Components Correct Quantity Percentage 279
14.10 Purchased Component Defect Rate 280
14.11 Percentage of Receipts Authorized by Purchase Orders 281
14.12 Percentage of Purchase Orders Released with Full Lead Time 282
14.13 Putaway Accuracy 282
14.14 Putaway Cycle Time 283
14.15 Scrap Percentage 284
14.16 Average Picking Time 285
14.17 Picking Accuracy for Assembled Products 286
14.18 Average Picking Cost 287
14.19 Order Lines Shipped per Labor Hour 288
14.20 Shipping Accuracy 289
14.21 Percentage of Products Damaged in Transit 290
14.22 Warehouse Order Cycle Time 290
14.23 Inventory Availability 291
14.24 Delivery Promise Slippage 292
14.25 Average Back-Order Length 293
14.26 Dock Door Utilization 294
14.27 Inventory Accuracy 294
14.28 Inventory Turnover 295
14.29 Percentage of Warehouse Stock Locations Utilized 297
14.30 Square Footage of Warehouse Storage Space 298
14.31 Storage Density Percentage 299
14.32 Inventory per Square Foot of Storage Space 299
14.33 Storage Cost per Item 300
14.34 Average Pallet Inventory per SKU 301
14.35 Rate of Change in Inactive, Obsolete, and Surplus Inventory 302
14.36 Obsolete Inventory Percentage 303
14.37 Percentage of Inventory > X Days Old 304
14.38 Percentage of Returnable Inventory 305

Appendix Summary of Inventory Best Practices 307

Glossary 319
About the Author 331
Index 333