

Contents at a Glance

1	Introduction	15
2	Tasks in Industrial Operations	19
3	Production Planning and Control in SAP ERP	59
4	Organizational Structures	79
5	Master Data	91
6	Sales and Operations Planning	147
7	Demand Management	205
8	Material Requirements Planning	225
9	Special Forms of Procurement	295
10	Long-Term Planning	323
11	Production Order Creation	337
12	Capacity Planning	389
13	Production Execution	433
14	Supply Chain Management and Integration with SAP APO	459
A	Glossary	471
B	List of Abbreviations	501
C	Literature	503
D	List of Transactions	507
E	The Authors	517

Contents

Foreword	13
----------------	----

1 Introduction 15

1.1 Goal of This Book	15
1.2 Target Audience	16
1.3 Structure and Content	16
1.4 Restrictions	17

2 Tasks in Industrial Operations 19

2.1 Technical Tasks	19
2.1.1 Development and Design	19
2.1.2 Work Scheduling	23
2.1.3 Programming	26
2.1.4 Quality Management	30
2.1.5 Production Execution	33
2.2 Business Tasks	35
2.2.1 Sales and Distribution	35
2.2.2 Product Cost Planning	38
2.2.3 Materials Management	40
2.2.4 Purchasing	42
2.2.5 Production Planning	43
2.3 The Production Area in Industrial Operations	45
2.3.1 Production in Computer Integrated Manufacturing	45
2.3.2 Production as Part of Logistics	48
2.4 Characteristics of Production Type Creation	52
2.4.1 Product Standardization	52
2.4.2 Product Structure	53
2.4.3 Production Type	55
2.4.4 Production Organization	56

3 Production Planning and Control in SAP ERP 59

3.1 PP in the Context of SAP ERP	59
3.2 Processes in Production Planning and Control	62

3.3	Production Types	64
3.3.1	Discrete Manufacturing	65
3.3.2	Repetitive Manufacturing	65
3.3.3	Process Manufacturing	70
3.3.4	Kanban	72
3.3.5	Engineer-to-Order Production	76

4 Organizational Structures 79

4.1	Meaning of Organizational Structures	79
4.2	Organizational Structure Overview in SAP ERP	81
4.3	Planners in Design and Work Scheduling	86
4.4	MRP Controller, Capacity Planner, and Production Scheduler	87

5 Master Data 91

5.1	Master Data Overview	91
5.2	Material	92
5.3	BOM	100
5.3.1	Areas of Use and Types of BOMs	100
5.3.2	Material BOM	103
5.4	Work Center	112
5.4.1	Role of the Work Center	112
5.4.2	Basic Data for the Work Center	113
5.4.3	Capacity	115
5.4.4	Formulas for Capacity Load and Scheduling	121
5.4.5	Costing	125
5.4.6	Work Center Hierarchy	126
5.5	Routing	129
5.5.1	Purpose and Structure of the Routing	129
5.5.2	Routing	136

6 Sales and Operations Planning 147

6.1	Process Overview	147
6.2	Basic Technical Principles in Sales Planning	154
6.2.1	Information Structures	154
6.2.2	Planning Methods	158
6.2.3	Product Group	161
6.2.4	Planning Hierarchy	163
6.2.5	Proportional Factors and Disaggregation	167

6.2.6	Versioning	169
6.3	Planning Table	170
6.3.1	Planning Type	170
6.3.2	Macros	174
6.3.3	Planning in the Planning Table	176
6.4	Forecast	185
6.5	Event	191
6.6	Resource Leveling Using a Rough-Cut Planning Profile ...	194
6.7	Transferring Planning Data to Demand Management	198
6.8	Mass Processing	200

7 Demand Management 205

7.1	Process Overview	205
7.2	Time-Based Disaggregation	209
7.3	Planning Strategy	211
7.3.1	Selected Planning Strategies	211
7.3.2	Consumption	215
7.3.3	Planning Segments	216
7.3.4	Planning Strategy and Requirements Class	217
7.4	Editing Planned Independent Requirements	221
7.4.1	Reducing the Planned Independent Requirements	223
7.4.2	Reorganization of Planned Independent Requirements	224

8 Material Requirements Planning 225

8.1	Process Overview	225
8.2	Influencing Factors in Material Requirements Planning	230
8.2.1	Lot Size	230
8.2.2	Scrap	240
8.2.3	Safety stock	244
8.2.4	Master Data Selection	245
8.3	MRP Procedures	246
8.3.1	Material Requirements Planning	249
8.3.2	Consumption-Based Planning	251
8.3.3	Consumption Forecast	259
8.4	Executing Material Requirements Planning	262
8.4.1	Net Requirements Calculation Logic	262

8.4.2	Parameters for Material Requirements Planning	267
8.4.3	Planning Scope	271
8.5	Scheduling	272
8.5.1	Forward and Backward Scheduling	272
8.5.2	Scheduling In-House Production (Basic Date Determination)	273
8.5.3	Scheduling External Procurement	276
8.5.4	Planning Time Fence	278
8.6	Procurement Proposals	280
8.6.1	Planned Order and Purchase Requisition	280
8.6.2	Interactive Planning	283
8.7	Analysis	285
8.7.1	Stock/Requirements List and MRP List	285
8.7.2	Exception Messages	288
8.8	Plant Parameters and MRP Group	290

9 Special Forms of Procurement 295

9.1	Process Overview	295
9.2	Phantom Assemblies	297
9.3	Direct Production and Direct Procurement	300
9.4	Stock Transfer	309
9.5	Withdrawal from Alternative Plant	313
9.6	Production in Alternative Plant	314
9.7	Subcontracting	317
9.8	Consignment	322

10 Long-Term Planning 323

10.1	Process Overview	323
10.2	Planning Scenario	325
10.3	Executing Long-Term Planning	331
10.3.1	Release and Planning File Entries	331
10.3.2	Material Requirements Planning in the Planning Scenario	331
10.3.3	Evaluating the Planning Scenario	332
10.3.4	Transferring the Planning Scenario	334

11 Production Order Creation 337

11.1	Process Overview	337
------	------------------------	-----

11.2	Production Order	339
11.2.1	Order Type	346
11.2.2	Master Data Selection	348
11.2.3	Status and Trigger Point	352
11.3	Conversion from the Planned Order	357
11.4	Interactive Production Order Creation	359
11.5	Scheduling	361
11.5.1	Dates of the Production Order	361
11.5.2	Finite Scheduling	363
11.5.3	Transition Times	369
11.5.4	Splitting and Overlapping	371
11.5.5	Float Before Production and Safety Time	375
11.5.6	Reduction	377
11.6	Availability Check	379
11.6.1	Material Availability Check	380
11.6.2	Parameters for the Material Availability Check ...	383

12 Capacity Planning 389

12.1	Process Overview	389
12.2	Capacity Requirements and Capacity Evaluation	390
12.2.1	Capacity Requirements	390
12.2.2	Standard Evaluations of Capacity Utilization	392
12.2.3	Variable Evaluations of Capacity Utilization	394
12.2.4	Cumulating the Capacity Requirements	398
12.3	Checking Capacity Availability	400
12.4	Finite Scheduling	406
12.5	Dispatching	408
12.5.1	Profiles for Dispatching	410
12.5.2	Dispatching Sequence	417
12.5.3	Sequence-Dependent Setup	418
12.5.4	Midpoint Scheduling	423
12.5.5	Mass Processing	425
12.6	Capacity Planning Table	426

13 Production Execution 433

13.1	Process Overview	433
13.2	Releasing the Production Order	434
13.3	Material Withdrawal	438
13.3.1	Goods Issue Posting	438
13.3.2	Picking	440

13.3.3 Backflush	444
13.4 Confirmation	446
13.5 Goods Receipt	452
13.6 Settlement	456
13.7 Completion	457

14 Supply Chain Management and Integration with SAP APO 459

14.1 Supply Chain Management with SAP APO	459
14.2 Integration Scenarios	462
14.3 Technical Integration	464

Appendices 469

A Glossary	471
B List of Abbreviations	501
C Literature	503
D List of Transactions	507
D.1 Organizational Structure and Master Data	507
D.2 Sales and Operations Planning	508
D.3 Demand Management	509
D.4 Material Requirements Planning	510
D.5 Special Forms of Procurement	511
D.6 Long-Term Planning	511
D.7 Production Order Creation	512
D.8 Capacity Planning	513
D.9 Production Execution	515
D.10 Integration with SAP APO	515
E The Authors	517
Index	519