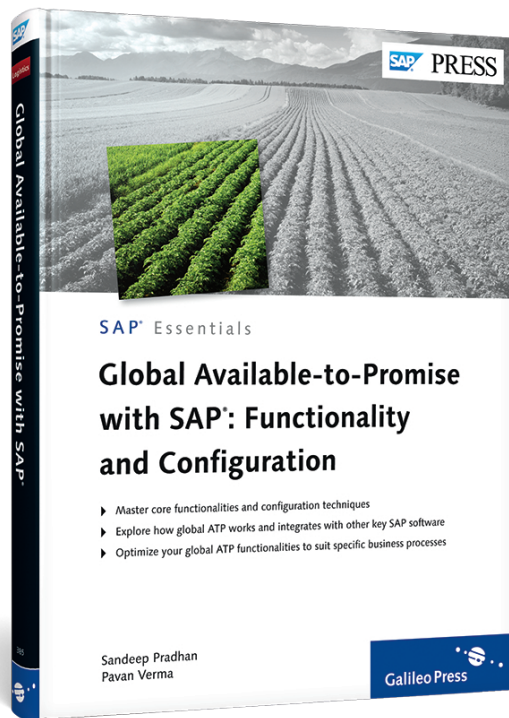


Sandeep Pradhan and Pavan Verma

Global Available-to-Promise with SAP®

Functionality and Configuration



Galileo Press 

Bonn • Boston

Contents at a Glance

1	Order-to-Cash Business Process	19
2	Introduction to Global Available-to-Promise	43
3	How SAP APO Global ATP Technology Works	69
4	Basic Configuration and Master Data Required for Global ATP	83
5	Integrating Transportation Shipment and Scheduling with Global ATP	95
6	Designing Your Supply Chain ATP with Rules-Based ATP	119
7	Managing Your Supply Chain ATP with Product Allocation ...	147
8	Keeping Your Order Confirmation Firm with Global ATP Backorder Processing	177
9	Streamlining Your Manufacturing Planning with Capable-to-Promise	203
10	Confirming Customer Orders with Multilevel ATP Component-Level Check	231
11	Integrating Global ATP with Supply Planning	257
12	Integrating the SAP Customer Relationship Management System with Global ATP	273
13	Accelerate Your Global ATP Implementation with Service-Oriented Architecture (SOA) Packages	289
14	Maintenance and Monitoring Procedure for Global ATP	303

Contents

Preface	15
1 Order-to-Cash Business Process	19
1.1 Order-to-Cash Overview	19
1.2 Supply Chain Operation Reference Model	23
1.2.1 SCOR Order-to-Cash Model for Stocked Product	25
1.2.2 SCOR Order-to-Cash Model for Make-to-Order Product	31
1.2.3 SCOR Order-to-Cash Model for Engineer-to-Order	33
1.2.4 SCOR Order-to-Cash Model for Retail	36
1.3 Key Performance Indicators for Order-to-Cash	38
1.4 Available-to-Promise in Order-to-Cash	39
1.5 Summary	42
2 Introduction to Global Available-to-Promise	43
2.1 Global Available-to-Promise Overview	43
2.2 Global ATP Capabilities	45
2.3 ATP in SAP ERP versus Global ATP	47
2.4 Global ATP Basic Methods	49
2.4.1 Product Availability Check	50
2.4.2 Product Allocation	53
2.4.3 Forecast	55
2.5 Global ATP Advanced Methods	55
2.5.1 Rules-Based ATP Check	56
2.5.2 Multi-Item Single Delivery	59
2.5.3 Production Capable-to-Promise	59
2.5.4 Production Multilevel ATP Check	60
2.6 Global ATP Extended Functions	62
2.6.1 Backorder Processing	63
2.6.2 Time and Scheduling Functions	64
2.6.3 Global ATP Exception Management Alerts	65
2.6.4 Global ATP Implementation Approach	66
2.7 Summary	68

3 How SAP APO Global ATP Technology Works 69

3.1	Global ATP Time Series	69
3.2	Global ATP Technical Landscape	71
3.3	Core Interface (CIF)	72
3.3.1	Core Interface Configuration Steps	73
3.3.2	Core Interface Enhancements	76
3.4	Building Integration Models for Global ATP in SAP ERP	77
3.5	Monitoring Core Interface Processing in Global ATP (SAP APO) ...	79
3.6	Summary	81

4 Basic Configuration and Master Data Required for Global ATP 83

4.1	Basic Global ATP Configuration	83
4.1.1	Business Event	85
4.1.2	Check Mode	85
4.1.3	Check Instructions	86
4.1.4	ATP Group	88
4.1.5	Check Control (Check Horizon, Categories, Scope of Check)	89
4.2	Master Data Requirement for Global ATP	90
4.2.1	Check Mode Determination	90
4.2.2	Checking Horizon	91
4.2.3	ATP Group	93
4.3	Summary	93

5 Integrating Transportation Shipment and Scheduling with Global ATP 95

5.1	Transportation and Shipment Scheduling Overview	95
5.1.1	Transportation and Shipment Scheduling using the Condition Technique	98
5.1.2	Condition Technique Configuration	100
5.1.3	Condition Technique Scenario Testing	104
5.2	Transportation and Shipment Scheduling using the Configurable Process Scheduling (CPS) Method	105
5.2.1	Configurable Process Scheduling (CPS) Configuration	106

5.2.2	Additional Configuration Steps	112
5.2.3	Configurable Process Scheduling (CPS) Scenario Testing	114
5.3	Summary	117

6 Designing Your Supply Chain ATP with Rules-Based ATP 119

6.1	Overview of Rules-Based ATP	119
6.2	Business Case Study I: Product and/or Location Substitution	120
6.3	Basic Configuration	121
6.3.1	Condition Technique	123
6.3.2	Define the Condition Table	124
6.3.3	Define the Access Sequence	124
6.3.4	Define the Condition Type	125
6.3.5	Define the Rule Strategy and Assign the Condition Type	125
6.3.6	Define the New Rule Strategy Sequence	126
6.4	Basic Master Data: Rule Maintenance	128
6.4.1	Rule Control	130
6.4.2	Calculation Profile	131
6.4.3	Activity Type	131
6.4.4	Maintaining Condition Records	132
6.5	Scenario Testing for Location Substitution	133
6.6	Business Case Study II: Consolidation Location	136
6.7	Business Case Study III: Stock Transport Orders	140
6.7.1	Configuration in SAP ERP	140
6.7.2	Configuration in SAP APO	141
6.8	Business Case Study IV: Sales Scheduling Agreement	143
6.9	Enhancements	144
6.9.1	Enhancements in the SAP ERP Field Catalog for Rules-Based ATP	144
6.9.2	Enhancement in SAP APO for Global ATP	145
6.10	Summary	146

7 Managing Your Supply Chain ATP with Product Allocation 147

7.1	Overview of Product Allocation in Global ATP	147
7.2	Business Case Study: Product Allocation	149

7.3	Basic Configuration of Product Allocation in SAP APO	151
7.3.1	Creating a New Planning Object Structure	152
7.3.2	Creating a New Planning Area	152
7.3.3	Define a New Planning Book	153
7.3.4	Maintain Field Catalog for Characteristics	154
7.3.5	Maintain the Product Allocation Object	155
7.3.6	Maintain the Product Allocation Group	155
7.3.7	Maintain the Product Allocation Procedure	159
7.3.8	Maintain the Sequence of the Product Allocation Procedure	161
7.3.9	Maintain the Connection to the Planning Area	161
7.3.10	Check the Product Allocation Settings	163
7.4	Basic Master Data for Product Allocation	163
7.4.1	Characteristics Combination for Demand Planning	163
7.4.2	Characteristics Combination for the Product Allocation Group	166
7.5	Key Steps in Scenario Testing	169
7.6	Enhancement for Product Allocation	173
7.6.1	Enhancements in the SAP ERP Field Catalog for SAP APO Product Allocation	173
7.6.2	Enhancements in SAP APO for Product Allocation	175
7.7	Summary	175

8 Keeping Your Order Confirmation Firm with Global ATP Backorder Processing 177

8.1	Overview of Backorder Processing (BOP) in Global ATP	177
8.1.1	Backorder Processing Comparison in SAP ERP and Global ATP	179
8.1.2	Business Case Study Example	180
8.2	Basic Configuration for Backorder Processing	181
8.2.1	Filter Type	182
8.2.2	Sort Profile	183
8.3	Basic Master Data for Backorder Processing	184
8.4	Key Steps in Scenario Testing	187
8.5	Overview of Event-Driven Quantity Assignment (EDQA)	192
8.6	Enhancements in Backorder Processing	200
8.7	Summary	201

9	Streamlining Your Manufacturing Planning with Capable-to-Promise	203
9.1	Overview of the Capable-to-Promise Process	203
9.2	Business Case Study Example	206
9.3	Capable-to-Promise: Basic Configuration	209
9.3.1	Global ATP: Check Mode	209
9.3.2	Global ATP: Check Instruction	210
9.3.3	Global ATP: Rules-Based CTP	211
9.3.4	Production Planning and Detailed Scheduling: Production Planning Procedure	212
9.4	Basic Master Data Requirements	217
9.4.1	Product Location (SAP APO Transaction /SAPAPO/MAT1)	218
9.4.2	Work Center (SAP ERP Transaction CS03)	219
9.4.3	Bill of Materials (SAP ERP Transaction CR03)	219
9.4.4	Routing (SAP ERP Transaction CA23)	220
9.4.5	Production Version (SAP ERP Transaction C223)	220
9.4.6	Resource (SAP APO Transaction /SAPAPO/RES01)	220
9.4.7	Production Process Model (Transaction /SAPAPO/SCC03)	222
9.5	Key Steps in Scenario Testing	224
9.5.1	Case 1: Block Planning Resource	225
9.5.2	Case 2: Location Determination Activity	227
9.6	Summary	229
10	Confirming Customer Orders with Multilevel ATP Component-Level Check	231
10.1	Overview of the Multilevel ATP Process	231
10.2	Business Case Study Example	234
10.2.1	Fulfilling Business Logic and Rules	235
10.2.2	Variant Configuration	236
10.3	Basic Configuration of Multilevel ATP	236
10.3.1	Global ATP: Check Mode	237
10.3.2	Global ATP: Check Instruction	237
10.3.3	Global ATP: Rules-Based Multilevel ATP	239

10.3.4	Production Planning and Detailed Scheduling: Global Settings	240
10.3.5	Demand Planning (SAP APO DP): Planning Area and Planning Book	242
10.4	Basic Master Data Rule Requirements	244
10.4.1	SAP ERP Variant Configuration	245
10.4.2	SAP APO Demand Planning: Characteristics-Based Forecasting	247
10.4.3	SAP APO Product Location Master	249
10.4.4	SAP APO Production Data Structure	250
10.4.5	Rules-Based Condition Record	251
10.5	Key Steps in Scenario Testing	251
10.5.1	Scenario 1: Multilevel ATP	251
10.5.2	Scenario 2: Multilevel ATP with a Rules-Based Check	253
10.6	Summary	256

11 Integrating Global ATP with Supply Planning 257

11.1	Integration between Supply Planning and Order Fulfillment	257
11.2	Integrating Rules of Global ATP in the Capable-to-Match Planning Run	259
11.2.1	Configuration for Rules-Based ATP Integration with CTM	260
11.2.2	Master Data for Rules-Based ATP Integration with Capable-to-Match	262
11.3	Integrating Global ATP in Transportation Planning and Vehicle Scheduling	265
11.3.1	Dynamic Route Determination (DRD) Profile	267
11.3.2	Activation of Dynamic Route Determination	270
11.4	Summary	270

12 Integrating the SAP Customer Relationship Management System with Global ATP 273

12.1	Overview of SAP CRM with Rules-Based ATP	273
12.2	Basic Configuration in the SAP CRM System	274
12.2.1	ATP Profile	275
12.2.2	Item Category	276
12.2.3	Item Category Determination	276

12.2.4	Business Partner Assignment	277
12.3	Basic Configuration in Global ATP for CRM Integration	278
12.3.1	Requirements Profile	278
12.3.2	Rules-Based ATP	280
12.4	Master Data Maintenance	280
12.5	SAP CRM Business Scenario Testing	282
12.6	Enhancements in CRM for Global ATP	284
12.7	Integration Scenarios with CRM	284
12.7.1	Kit-to-Order	285
12.7.2	Special Dynamic Safety Stock	285
12.7.3	Third-Party Order Processing	285
12.8	Summary	287

13 Accelerate Your Global ATP Implementation with Service-Oriented Architecture (SOA) Packages 289

13.1	Introduction to Service-Oriented Architecture	289
13.1.1	Configuration Templates	290
13.1.2	Ease of Integration	290
13.1.3	Business Process Library	291
13.2	Modeling and Designing the Order Management Process in SOA—Case 1: ATP Check Enterprise Services Bundle	292
13.3	Modeling and Designing Order-Management Process in SOA— Case 2: Availability Issue Resolution and Backorder Processing ES Bundle	295
13.4	Understanding SOA by Design	298
13.5	Enterprise Service Repository	300
13.6	Summary	302

14 Maintenance and Monitoring Procedure for Global ATP 303

14.1	Monitoring and Maintenance	303
14.1.1	Backorder Processing (BOP)	303
14.1.2	Temporary Quantity Assignment (TQA)	304
14.1.3	Persistent Quantity Assignment	304
14.1.4	SAP ERP Database and SAP APO liveCache	305
14.1.5	Reorganization	308
14.1.6	SAP APO Planning Area	310

14.1.7	Product Allocation	311
14.2	Regular Transactions and Batch Jobs	313
14.3	Disaster Recovery Plan	315
14.3.1	Switching the ATP Check from SAP APO to SAP ERP	315
14.3.2	Performing an ATP Check in SAP ERP for the Interim ...	316
14.3.3	Switching the ATP Check Back from SAP ERP to SAP APO	316
14.3.4	Postprocessing Sales Orders in Global ATP	317
14.4	Performance	317
14.5	Application Log	319
14.6	Sizing	319
14.7	Summary	320

Appendices	323
-------------------------	------------

A	Enhancements in Global ATP	325
A.1	Minor Enhancement Scenarios in Global ATP.....	325
A.2	Major Enhancement Scenarios in Global ATP.....	329
A.3	Enhancements in SAP ERP Field Catalog for SAP APO Global ATP and Product Allocation.....	330
A.4	Enhancements in SAP APO Field Catalog for SAP APO Global ATP and Product Allocation.....	331
B	SAP Notes for Global ATP	333
B.1	General	333
B.2	Rules-Based ATP.....	333
B.3	CTP and Multilevel ATP.....	334
B.4	Scheduling Function	334
B.5	Backorder Processing.....	335
B.6	Product Allocation.....	335
B.7	Transportation Integration	336
B.8	CRM Integration.....	336
B.9	Enhancements.....	336
C	The Authors	339
	Index	341

Preface

Companies face constant challenges in their order-fulfillment cycle to meet customer order delivery dates. The goal of any company is to increase the reliability of delivery and also ensure the correct product availability to an exclusive customer base. With the introduction of the global available-to-promise (which we will refer to as global ATP) functionality in SAP, companies are moving forward from a traditional manufacturing push-based supply chain to a market demand pull-based principle. Global ATP introduces many innovative concepts for order-management processes to fulfill market demand on time, increase delivery reliability, and keep inventory levels low at the warehouse.

The objective of this book is to explain how the global ATP functionality within the SAP Supply Chain Management (SAP SCM) suite can be configured and implemented to meet a company's order-fulfillment cycle. This book serves as a functional and technical guide in explaining how global ATP from SAP can be integrated into supply chain business process improvement initiatives.

Target Audience

The target audience for this book is the supply chain practitioners who are considering or are already involved in the implementation of global ATP—whether as a project manager, a project member, or a consultant. The book assumes that the reader has a basic knowledge of the order-to-cash (OTC) business process and an understanding of the logistics process in supply chain management.

What Will I Learn?

The book provides comprehensive guidelines not only for implementing the ATP solution within the order fulfillment business process, but also to maintain the production environment. The book is based on functionalities available in SAP ERP (ECC 6.0) and SAP SCM 7.0 versions. Each chapter explains global ATP functionality, configuration, master data, and testing steps to fulfill customer business

requirements while integrating a specific business case. Most of the business examples you will see are based on the authors' project experiences.

The book starts with an introduction to the order-to-cash (OTC) business process and explains how available-to-promise (ATP) fits in the overall process (**Chapter 1**). Then the global ATP functionality and its core features are introduced in **Chapter 2**. The next couple of chapters focus on global ATP technology (**Chapter 3**) and basic configuration, along with master data requirements for global ATP (**Chapter 4**).

After this preliminary introduction, the book dives into the core capabilities functionality within global ATP. Starting with transportation shipment and scheduling to derive a correct availability date, based on logistics lead time (**Chapter 5**), the book next introduces the rule-based mechanism for the ATP check. The rule-based functionality (**Chapter 6**) allows a company to formulate its business rules to be based on product and/or location substitution during the ATP check. Setting up business priorities during order processing and proper product allocation (**Chapter 7**) is critical for a company to make a profit from sales. Due to constant changes in the supply chain situation, the backorder processing (BOP) (**Chapter 8**) provides the latest ATP corrections.

For some of the manufacturing scenario (make-to-order) variants, global ATP directly integrates with production (**Chapters 9 and 10**) to calculate the capacity and critical component checks necessary to derive the material availability check, against which the ATP check needs to be performed. The integration with supply chain planning (**Chapter 11**) and SAP Customer Relationship Management (SAP CRM) (**Chapter 12**) provides a foundation for global ATP to improve the current business processes in OTC and planning function areas.

The closing section of the book provides an overview for how the global ATP business process can be mapped in the service-oriented architecture (SOA) environment (**Chapter 13**). Last, we explain in **Chapter 14** how a good housekeeping of the global ATP system is imperative for monitoring and maintenance in the production environment.

The Appendix section contains some valuable information about the minor and major technical enhancement possibilities in global ATP, and also lists some of important SAP OSS developer notes.

Acknowledgements

I would like to offer very special thanks to my wife Imelda Linggawidjaja, daughter Jessica Anna, and my parents for giving me the time and encouragement to write this book.

Sandeep Pradhan

I would like to thank my parents for my existence and blessings; my wife Monika Verma, and sons Aditya and Akshat for giving me the time and encouragement to write this book.

Pavan Verma

Finally, we would like to thank Laura Korslund and Meg Dunkerley from Galileo Press, as well as the production team, for helping us in all phases of the project and providing encouragement. Also, a special thanks to Susanti Chandra for becoming our technical reviewer and providing valuable corrections and comments on the book.

The global available-to-promise functions are used with order promising and fulfillment checking across the entire supply chain. This chapter explains the SAP SCM global available-to-promise capabilities for use with order fulfillment and checking methods in the order-commitment process.

2 Introduction to Global Available-to-Promise

The need to provide commitment back to customers is called the available-to-promise (ATP) capability, which is offered by a supply chain operations team to a sales team. A strong ATP functionality is important to any manufacturing or distribution company's credibility with its customers. The truth is that often manufacturing and distribution companies make promises to customers without knowing if they can actually meet the demand.

This chapter introduces the global available-to-promise (global ATP) functionality and its core capabilities that you can use to solve the complexities that arise during the order-promising process. Besides explaining the basic differences of performing ATP in SAP ERP versus that of global ATP, the chapter highlights the basic and advanced ATP check methods. We also outline a recommendation for a global ATP implementation approach.

2.1 Global Available-to-Promise Overview

The aim of available-to-promise (ATP) is to determine if an incoming order can be promised for a specified customer request date. ATP enhances the response time for order promising and reliability of order fulfillment. It directly links the available resources, including both material and capacity, to customer orders and enhances the supply chain performance. The process helps by improving on-time delivery performance, allocating sufficient inventory to buffer inventories, and planning system integration.

With SAP global available-to-promise (global ATP), an application within the SAP Supply Chain Management (SAP SCM) suite, global ATP not only provides basic ATP checks, but also enhanced and extended flexible user decision-support features to model different supply chain order-fulfillment business scenarios.

Global ATP, one of the core functionalities within SAP Advance Planning & Optimization (SAP APO), provides an integrated planning and execution system. Figure 2.1 illustrates the five different functionalities within the SAP APO suite. The first three functionalities in the figure (Demand Planning, Supply Network Planning, and Production Planning/Detailed Scheduling) focus on aligning demand and supply planning, whereas the other two (global ATP and Transportation Planning/Vehicle Scheduling) are involved with order execution and fulfillment.

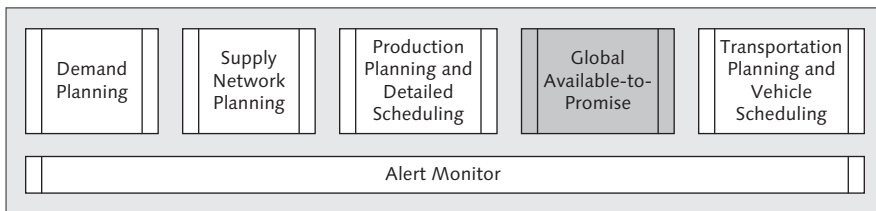


Figure 2.1 SAP Advanced Planning & Optimization Suite

Global ATP leverages an SAP APO technology of SAP liveCache, which is a robust tool that processes a large volume of transactional data and enables data sharing across several applications. The technology offers fast planning, simulation, and what-if analysis. The SAP APO objective is to synchronize supply with demand in the global supply chain by balancing demand and supply with management of demand, distribution, and manufacturing planning. The SAP APO modules shown in the figure are described here:

- ▶ **Demand planning (DP):** Improves the forecast quality and planning accuracy.
- ▶ **Supply Network Planning (SNP):** Improves visibility across the supply chain and lowers inventory.
- ▶ **Production planning and detailed scheduling (PP/DS):** Supports the creation of optimized production plans.
- ▶ **Global ATP:** Offers capabilities that support responding to customer order requests.

- ▶ **Transportation planning and vehicle scheduling (TP/VS):** Optimizes transportation loads and minimizes transportation costs.
- ▶ **Alert Monitor:** Powerful exception management tool integrated with all SAP APO functionalities.

A company's ability to provide an accurate delivery commitment on a customer order is important for maintaining a strong relationship with its customer. Giving reliable and accurate information concerning when customer orders will be delivered increases customer satisfaction and creates repeat business. SAP SCM provides technology in the form of global ATP to meet the challenge of providing product availability information across a company's local and global supply chain.

2.2 Global ATP Capabilities

Global ATP provides a set of capabilities that support a company's ability to respond to customer order requests on a real-time basis. Global ATP offers the following key features in its portfolio:

- ▶ **Seamless integration with other SAP ERP applications and components**
Global ATP can be integrated with SAP ERP 6.0 or SAP CRM where the order-processing business process takes place. It can also be integrated with other SAP APO functionalities (DP, SNP, PP/DS) for providing inputs to supply planning. This offers seamless integration of business processes.
- ▶ **Availability checks on various SAP ERP documents with defined scope**
Global ATP can be used for various documents (sales order, delivery, stock transfers, component check for production order, goods issue check). However, the main use of global ATP lies more in the sales and distribution area than in the manufacturing process. The ATP check can also be performed for replenishment stock transport orders.
- ▶ **Rule-based ATP for product or location substitution strategies**
In a branched supply chain network, rules-based ATP allows manufacturing and distribution companies to take advantage of shipping goods from alternative sites. It also offers the flexibility of shipping substituted products as required to successfully satisfy customer demands.
- ▶ **Product allocation to control commitment to key customers**
This feature allows distribution companies to distribute and sell their products

that are in short supply. Allocations for distribution can be defined on various criteria such as distribution channels, geographic region, customer groups, or key customers.

▶ **Backorder processing (BOP) to manage the order portfolio**

As a critical step in order confirmation to customer orders, this feature allows distribution companies to prioritize their order fulfillment to align with business goals. BOP also helps in performing re-ATP checks on customer orders, based on current inventory situation.

▶ **Multilevel ATP to trigger bill of materials (BOM) explosion and perform component checks**

This feature is helpful for business scenarios that require products to be configured for individual customers. It is commonly used in the make-to-order business scenario.

▶ **Capable-to-promise (CTP)**

Enables the business to call SAP APO production planning to produce the remaining quantity from an ATP check or procure the item externally. This is commonly used in the make-to-order scenario where the sales orders is pegged with the production order for order fulfillment.

▶ **Transportation and shipment scheduling**

Involves backward scheduling to determine the requested material availability date based on the customer-requested delivery date and then forward scheduling to determine the committed delivery date based on the committed material availability date. This feature helps business determine reliable loading and delivery dates for the customer orders.

All of these global ATP functionalities offer the following key benefits to customers:

- ▶ Less time to give reliable availability check results on the current supply chain situation
- ▶ Prevention of over-commitment to customer orders
- ▶ Ability to search supply in multiple locations to reduce overall supply chain costs
- ▶ Effective management of backlog to process all the sales orders
- ▶ Opportunity to prioritize customers and realign order commitments during constraint supply chain situations

Now that we have seen the capabilities of global ATP, let's see how it compares with the ATP functionality available in SAP ERP.

2.3 ATP in SAP ERP versus Global ATP

The concept of ATP is not new in SAP ERP because the functionality is available in Sales & Distribution (SD) and Production Planning (PP). The ATP check capabilities in SAP ERP deliver great results for basic business scenarios, but they have some functionality limitations in complex business scenarios when compared to global ATP. The main functionality comparisons between the standard ATP in SAP ERP and global ATP are highlighted in Table 2.1.

Business Process Requirement	ATP in SAP ERP	Global ATP
Availability check across supply chain network locations.	The ATP check is done on a single plant/product combination.	With rules-based ATP, global ATP offers the functionality to perform availability checks across multiple locations to minimize supply chain cost and maintain customer-service levels. Global ATP can also create stock transfer orders between the two locations during the substitution process.
Product substitution in case of product shortage situations.	Only manual product substitution is possible.	With rules-based ATP, the requirement can be modeled for a defined list of product substitutions during the online availability checks.
During production capacity constraint or product launch, the business needs to allocate supply based on various criteria.	The feature is available in SAP ERP with the use of a standard or self-defined info structure in the flexible planning module.	With product allocation, different characteristics combinations can be defined for the allocation of constraint supply.

Table 2.1 ATP Functionality Comparison between SAP ERP and Global ATP

Business Process Requirement	ATP in SAP ERP	Global ATP
Reallocation of supply and sales orders are required to better align with current inventory situations.	SAP ERP offers BOP on fixed criteria.	Global ATP offers more flexibility when filtering, sorting, and scheduling the sales document using the BOP feature.
Integrate production and ATP check functionality.	Not available.	Available in capable-to-promise (CTP) functionality.
Check the availability of lower-level components during the ATP check.	Not available.	Available in multilevel ATP functionality.
Consideration of reverse logistics in the availability check.	Not available.	Global ATP supports reverse logistics by considering customer returns as planned receipts, increasing the ATP quantity.
Continuous flow output consideration in process industries where the products are available in different stages with long-running manufacturing process orders.	Not available.	Global ATP offers the feature to consider material availability by taking account of the continuous flow of production output with proportional distribution of ATP quantity in different time buckets.
Product availability simulation.	SAP ERP offers a simple simulation feature.	Global ATP simulation extends to both product availability checks based on the method designed and also on the back-order processing.

Table 2.1 ATP Functionality Comparison between SAP ERP and Global ATP (Cont.)

Business Process Requirement	ATP in SAP ERP	Global ATP
Integration with transportation during the product availability check.	SAP ERP offers delivery and transportation scheduling feature.	Global ATP can be integrated with the transportation planning and vehicle scheduling (TP/VS) module to consider the transportation constraints so that the system checks on product availability and delivery route simultaneously.
Scope of check (receipts, requirements, stocks) elements during the ATP check.	Available for defined material requirements planning (MRP) elements.	More granular than SAP ERP and allows the business to choose more firm and reliable ATP categories.

Table 2.1 ATP Functionality Comparison between SAP ERP and Global ATP (Cont.)

SAP ERP does offer basic business requirements in performing ATP checks, but lacks the ability to model complex business variants and rules. If the company has a simple distribution network, the ATP functionality should suffice. The next section explains the basic method in global ATP, which offers more flexibility than standard ATP features in SAP ERP.

2.4 Global ATP Basic Methods

The basic methods for ATP generate good results if the ATP quantity is available on the requested date. If the ATP quantity is not available, global ATP will propose a new delayed delivery date. As shown in Figure 2.2, after the sales orders are created, the ATP check is performed for product availability, which proposes partial or full delivery proposals based on the receipt element's availability. If the quantity cannot be confirmed fully in the same date, separate partial confirmations will be proposed on different dates. The communication between SAP ERP and global ATP is managed by the Core Interface (CIF) (you can find a detailed explanation of this in Chapter 3).

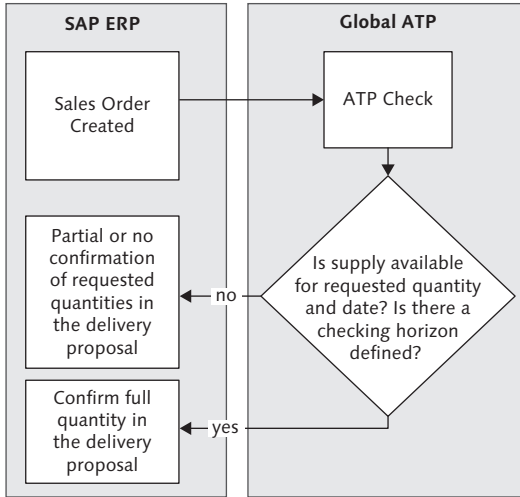


Figure 2.2 Flow Between Order Processing in SAP ERP and ATP Check in Global ATP

The ATP check performed on customer orders can be using basic and/or advanced ATP methods. We will look at the basic ATP method in this section. The following three different basic ATP methods are explained in the following sections:

- ▶ Product availability check
- ▶ Product allocation
- ▶ Forecast

2.4.1 Product Availability Check

This availability check is one of the time-phased simplest checks in global ATP and partially behaves in a similar manner to the SAP ERP availability check. This method can be used in any industry using the make-to-order (MTO) scenario. The ATP result is a simple calculation of the following:

$$\text{Stock} + \text{Total receipts} - \text{Confirmed requirements elements}$$

The scope of check can be defined for the business event and ATP group combination (explained later in Chapter 3) by following the menu path IMG • ADVANCED PLANNING AND OPTIMIZATION • GLOBAL AVAILABLE-TO-PROMISE • GENERAL SETTINGS • PRODUCT AVAILABILITY CHECK • MAINTAIN CHECK CONTROL, or by using Transaction /SAPAPO/AC03 (see Figure 2.3). The scope of check not only defines which elements or categories are considered in the availability check, but also a company's

degree of risk conservativeness toward the customer order confirmation. The scope of check defines the requirements, receipts, and stock categories to be used in ATP quantity determination.

Cat	Sort	Rel.SL	R/3 O..	Cat. Text	Category Description
AA	25	<input type="checkbox"/>	6	PrOrd (C)	Process Order (Created)
AB	25	<input type="checkbox"/>	6	PrOrd (R)	Process Order (Released)
AC	25	<input type="checkbox"/>	6	PrdOrd (C)	Production Order (Created)
AD	25	<input type="checkbox"/>	6	PrdOrd (R)	Production order (released)
AE	25	<input type="checkbox"/>	6	PrjOrd (C)	Project Order (Created)
AF	25	<input type="checkbox"/>	6	PrjOrd (R)	Project Order (Released)
AG	20	<input type="checkbox"/>	1	PurRqs	Purchase Requisition
AH	20	<input type="checkbox"/>	2	PO memo	Advanced Shipping Notification
AJ	23	<input type="checkbox"/>	5	PlOrd. (F)	Planned order (firmed, unconfirmed)
AL	23	<input type="checkbox"/>	5	PlOrd.(CF)	Planned order (confirmed, firmed)

Figure 2.3 Scope of Check

The ATP result in SAP ERP can be adapted to customers' different business requirements with the help of enhancement (user exits), which are called before or after the ATP functionality to better reflect the results. Similarly, global ATP uses SAP liveCache and time series to give better results. SAP APO time series enables you to combine characteristics during the availability check. A good example is in the steel or pharmaceutical industries, where the products are configured with characteristics-based planning. For these products, the product properties are stored at the batch level where the ATP check can be performed.

Global ATP also supports transportation and shipment scheduling to determine material availability date (backward and forward, see Figure 2.4) based on which ATP check is performed for the customer orders. This functionality allows for proper

determination of the requested material availability date (MAD) using transportation and loading lead times. The ATP check is then performed on this MAD to commit a confirmed delivery date to customer orders.

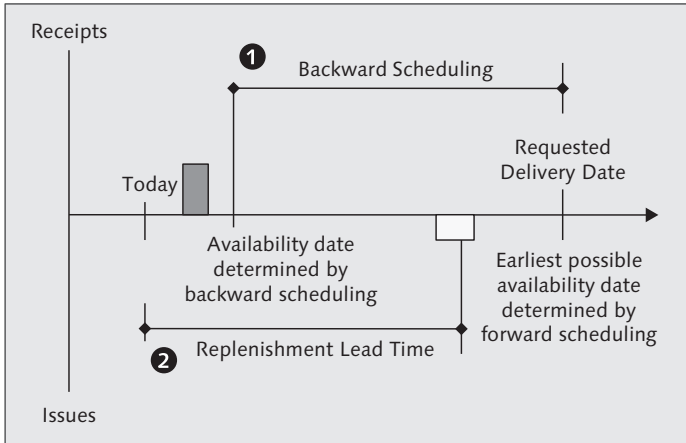


Figure 2.4 Date Scheduling Logic in Global ATP

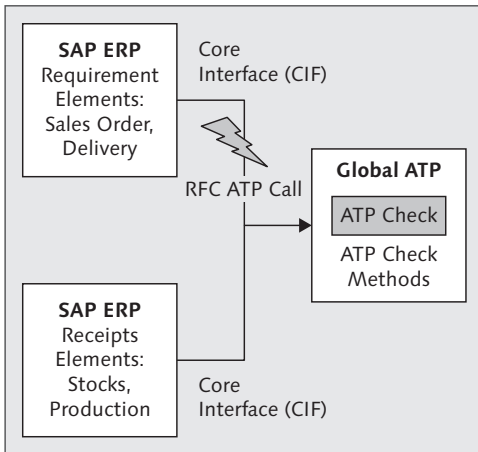


Figure 2.5 Technical Architecture for Global Consolidation of SAP ERP and Global ATP Systems

On the technical architecture capability side, it's possible to have one global ATP communicating with consolidation of multiple SAP ERP environments. An example of technical architecture is shown in Figure 2.5, where two SAP ERP systems are connected with a single instance of global ATP. While the requirement and receipts

elements reside in a different SAP ERP system, these elements can be consolidated in the global ATP environment for performing the availability check. This form of technical architecture is commonly adapted for global consolidation and minimizes the cost implication on hardware and maintenance.

2.4.2 Product Allocation

Product allocation is the second basic method, which is widely used by firms to make decisions on how to distribute and sell products that are in supply shortage. Distribution decisions are made based on distribution channels, geographic regions, customer groups, or strategic customers. This method is widely used in high-tech, steel manufacturing, chemical, automotive, oil and gas, and pharmaceutical sectors. The strategy has gained business acceptance in environments where high-volume items, high-value items, or products with long manufacturing lead times need to be distributed on a consistent basis.

When a product is in short supply, distribution companies want to make sure that each customer receives a proportional allocation of inventory and that the ATP check isn't reserving the entire inventory for one customer with a large order. This situation is usually encountered during material or capacity constraint, seasonal sales, good promotions, price changes, or new product launches where the supply chain may encounter supply shortages. Product allocation planning addresses these business situations by restricting the first in, first out (FIFO) method of order confirmation in SD. Allocation planning addresses the problem by restricting the allocation to specific customers or other criteria such as customer groups or regions. The restriction criteria are flexible to your company's needs.

Global ATP integrates with SAP DP to deliver the allocation capabilities based on characteristics combinations replicating marketing hierarchies for allocating the supply. The availability check with product allocations primarily follows two steps:

1. Perform the availability check.
2. Perform the product allocation check.

The lesser of the ATP and available allocation will be confirmed in the sales order item. Table 2.2 provides an example of how the confirmed quantity is placed for this business scenario.

Order Quantity	ATP Quantity	Allocation Quantity	Confirmed Quantity	Comments
100	150	120	100	Totally confirmed
100	60	120	60	Partially confirmed (due to ATP quantity)
100	150	80	80	Partially confirmed (due to allocation quantity)
100	80	60	60	Partially confirmed (due to ATP + allocation quantity)
100	60	80	60	Partially confirmed (due to ATP + allocation quantity)

Table 2.2 Combination of Product Availability with Product Allocation

The allocation quantity for the preceding table is derived from the allocation object (see Figure 2.6) in global ATP, which defines the quota allocation per the hierarchy. The characteristic combinations are populated to define the hierarchy allocations and serve as master data for the quota allocation maintenance. The sales order is checked against the characteristic combination criteria for an existing product allocation quantity. The quota allocation is entered in the SAP APO DP book (Transaction /SAPAPOAPO/SDP94) based on the characteristics combination master data.

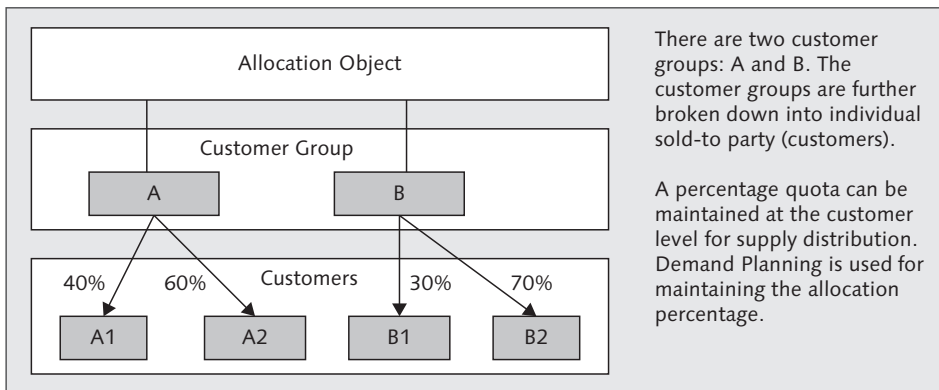


Figure 2.6 Allocation Object in the Global ATP Product Allocation Functionality

Another important feature is the allocation sequence that allows the system to check for alternate allocation procedures when the first one cannot fully confirm the quantity. This feature is part of the product allocation in the global ATP.

2.4.3 Forecast

The third check method is important for the MTO industries (e.g., a computer manufacturer) where no physical inventory is available to confirm the customers' orders. For a typical industry such as a PC manufacturing company, which is market-pull driven, the primary production commences after the sales order is received from the customer. During the initial ATP check, the quantity confirmation is performed against the forecast or planned independent requirements. Similar to product allocation, this check method can be integrated with SAP DP for getting the consensus forecast, or SAP Demand Management for getting the planned independent requirements.

2.5 Global ATP Advanced Methods

The global ATP basic methods form the baseline for the product availability check. Building on these basic methods, we can introduce additional advanced ATP checks to model supply chain constraints. For example, you can perform ATP checks across multiple locations for fulfilling customer orders. The advanced availability check methods include the following:

- ▶ **Combination of basic methods**

To distribute its products proportionately in the market, the company wants to perform product allocation first, and then an availability check on its products. The check sequence of either method is done via the check instruction configuration. The product allocation first determines the resulting confirmed quantity, which is checked against the relevant ATP quantity from the product availability check, or vice versa.

- ▶ **Rules-based ATP check**

Establish rules to determine what, where, and when to deliver products using location substitutions, product substitution, production process model (PPM) substitution, and characteristics substitution.

- ▶ **Production capable-to-promise (CTP)**

Integrates manufacturing and ATP check functionality. During sales order

processing, CTP triggers product planning at the manufacturing plant and determines the delivery date based on the schedule of production capacity.

▶ **Production multilevel ATP**

Checks the availability of components and proposes substitutions. It is based on the BOM explosion at the end item level to check ATP for each component.

▶ **Availability check for kits**

Kits are BOMs that are always shipped in complete and assembled form (e.g., palletized products). This process corresponds to the production process but without any production resource to combine the components as a complete kit.

▶ **Third-party order processing**

This method is helpful when the goods are shipped directly from the supplier to the customer. The company takes the sales order and ships the products directly from the external partner or supplier to the customer warehouse. Using the source determination and product allocation method, this check enables the company to ensure the requirements can be confirmed without having to take into account backorders or cancellations.

In the following subsections, we will discuss three of the commonly used advanced check methods in depth: rules-based ATP, CTP, and multilevel ATP checks.

2.5.1 Rules-Based ATP Check

The rules-based ATP check method was primarily designed for the consumer goods industry and distributors, which have a complex distribution supply chain. The business scenario supported by this feature allows the goods to be shipped to a customer from different sources or with alternative product options. The rule maintenance master data drives the predetermined sequence for alternative locations and alternative products. The substitution rules are the iterative availability check process based on business rules. The check can be processed in several business dimensions: product, location, batch characteristics, or production process model for manufacturing.

A typical example for location substitution (see Figure 2.7) is the replenishment of inventory for satellite warehouses from a regional hub warehouse based on market demand. The business process steps include a sales order coming into distribution center A, whereby the global ATP check confirms the order based on available stock at warehouse A and balance ATP replenishment from warehouse B. Global

ATP also creates a stock transport order for shipping the products between the two locations. You can also use location substitution to always replenish a customer from a specific warehouse.

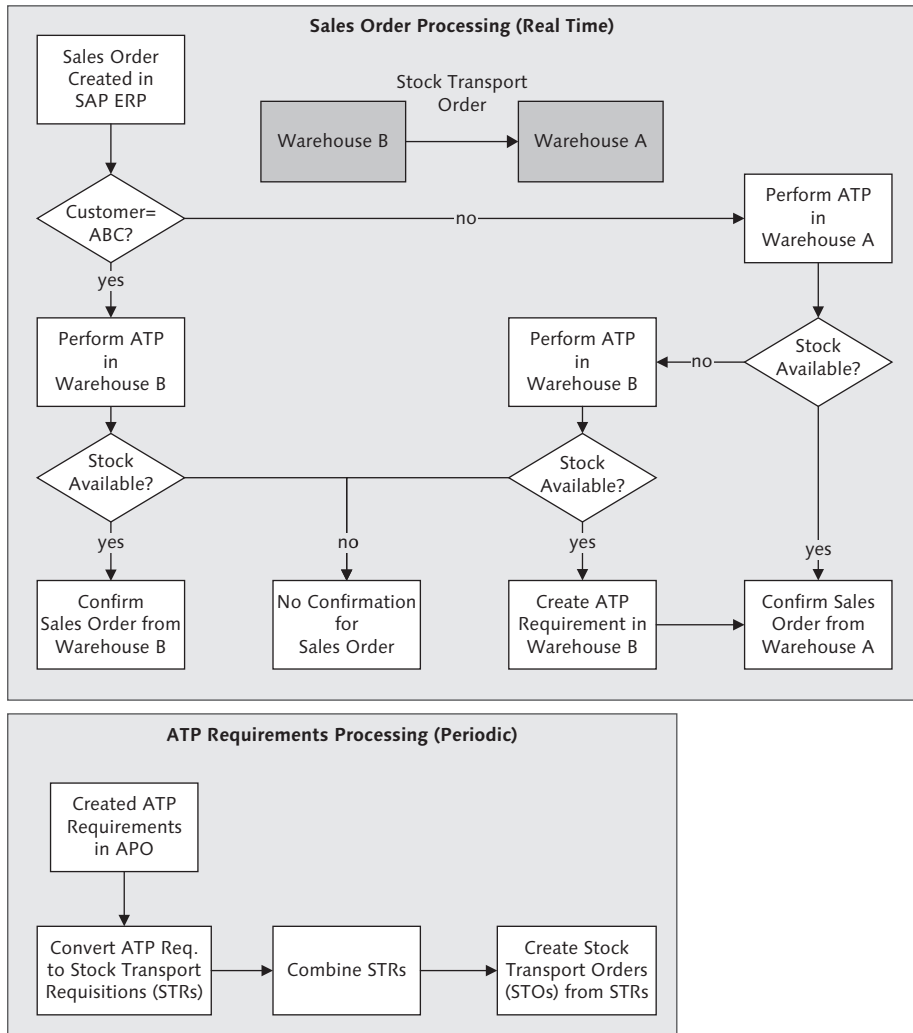


Figure 2.7 Location Substitution Scenario Modeled in Global ATP Rules-Based ATP

The basis of the rules-based ATP check is formed by multiple rules that are executed sequentially. The condition technique, which is commonly used in SD in pricing determination, can be used to define business rules. A typical use of the condition

technique in a business scenario is to define different order fulfillment locations for different customers. A rule maintenance is a master data created in global ATP that primarily consists of below four elements:

- ▶ **Product Substitution List/procedure:** Defines the sequential list of substitution products and the validity period.
- ▶ **Location Substitution List/procedure:** Defines the sequential list of substitution locations and the validity period.
- ▶ **Product/Location rule control parameter:** Defines whether to use location or product or a combination of both procedures.
- ▶ **Calculation profile:** User setting to define how the system should confirm the order when the desired delivery date is not met. Defines allowed delay or early confirmation days.

Figure 2.8 shows a Rule Maintenance screen (accessed via Transaction /SAPAPO/RBA04), where we define the business rule for the sequence of the product locations where the ATP check needs to be performed. The figure shows that the same product is checked across multiple locations first and then substituted by a different product if the ATP check is still not successful.

The screenshot displays the SAP Rule Maintenance interface. On the left, a list of rules is shown with columns for Rule and Description. The main area is divided into 'Overview' and 'Details'. The 'Details' section is active, showing configuration for rule P-103. It includes fields for 'Requested location product' (2400), 'Standard values' (2400_P103), and 'Rule control' (No Restriction). A 'Results table' at the bottom provides an 'Ordered list of all substitute location products' with columns for Seq., Product, Location, Start Production, Productio..., Sub., From Date, Time Frm, To Date, Time to, and Rea... The table contains 9 rows of data, showing a sequence of products and locations for evaluation.

Seq...	Product	Location	Start Production	Productio...	Sub.	From Date	Time Frm	To Date	Time to	Rea...
1	P-103	2400	0	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	
2	P-103	2500	0	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	
3	P-103	2300	1	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	
4	P-104	2400	0	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	0000
5	P-104	2500	0	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	0000
6	P-104	2300	1	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	0000
7	P-102	2400	0	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	0000
8	P-102	2500	0	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	0000
9	P-102	2300	1	0	0	31.12.1999	22:00:00	30.12.2010	22:00:00	0000

Figure 2.8 Rule Maintenance for Location and Product Substitution

2.5.2 Multi-Item Single Delivery

Multi-Item Single Delivery (MISL), also known as complete delivery, provides the functionality of shipping all the items in sales orders from a single location. This is useful when a company wants to consolidate its products for to reduce costs (e.g., transportation costs). During the sales order processing, global ATP uses the MISL functionality (built via rules-based ATP) to determine whether all the items requested in the sales orders are available in a single location. If the single location is not found, the items remain partially confirmed or unconfirmed. During the global ATP MISL process as seen in Figure 2.9 (accessed via Transaction /SAPAPO/AC04), the multiple items are not confirmed in the primary location, but are confirmed in a secondary location. The system automatically updates the location in the sales order by creating an additional item that shows where the order is confirmed.

APO Availability Check - Result Overview											
Alert monitor											
Product/Location	Material Availability...	Rqmt ...	Confirm...	Cum...	U...	P...	D...	Rule	Co...	M...	
▼ PROD1_A_CL@QV5002 / PL0001@QV5002 / Item : 00									001	0...	
▼ Schedule Line: 0001	10.06.2009	150 ◊	0	0	ST						
▼ Product/Location Substitution											
· PROD1_A_CL@QV5002 / PL0001@QV5002	10.06.2009	150 ✖	0	0	ST	△	🔍				
· PROD1_B_CL@QV5002 / PL0001@QV5002	10.06.2009	100 ✖	0	0	ST	△	🔍				
· PROD1_C_CL@QV5002 / PL0001@QV5002	10.06.2009	40 ✖	0	0	ST	△	🔍				
▼ Product/Location Substitution											
· PROD1_A_CL@QV5002 / PL0002@QV5002	10.06.2009	150 △	70	70	ST	△	🔍		✓		
· PROD1_B_CL@QV5002 / PL0002@QV5002	10.06.2009	80 □	80	80	ST	□	🔍		✓		
▼ PROD2_A_CL@QV5002 / PL0001@QV5002 / Item : 00									001	0...	
▼ Schedule Line: 0001	10.06.2009	150 ◊	0	0	ST						
▼ Product/Location Substitution											
· PROD2_A_CL@QV5002 / PL0002@QV5002	10.06.2009	150 △	100	100	ST	△	🔍		✓		
· PROD2_B_CL@QV5002 / PL0002@QV5002	10.06.2009	50 □	50	50	ST	□	🔍		✓		

Figure 2.9 Multi-Item Single Delivery Using Rules-Based ATP

2.5.3 Production Capable-to-Promise

Working in conjunction with the SAP APO PP/DS functionality, this check method integrates the ATP check and production functionality. This global ATP solution is ideal for industries with configured products (steel, paper) or companies with constrained production due to bottlenecks (chemical).

During the sales order processing, if the existing supply cannot cover the demand, the PP/DS functionality is called in real time as a part of the ATP check to determine the manufacturing plant capacity (see Figure 2.10). It then creates a simulation production plan to find the best possible date for delivering the goods while considering the capacity of the manufacturing resources. If the plan is accepted, global ATP generates supply elements that can stock the transport order for nonmanufacturing sites or the production plan for manufacturing sites.

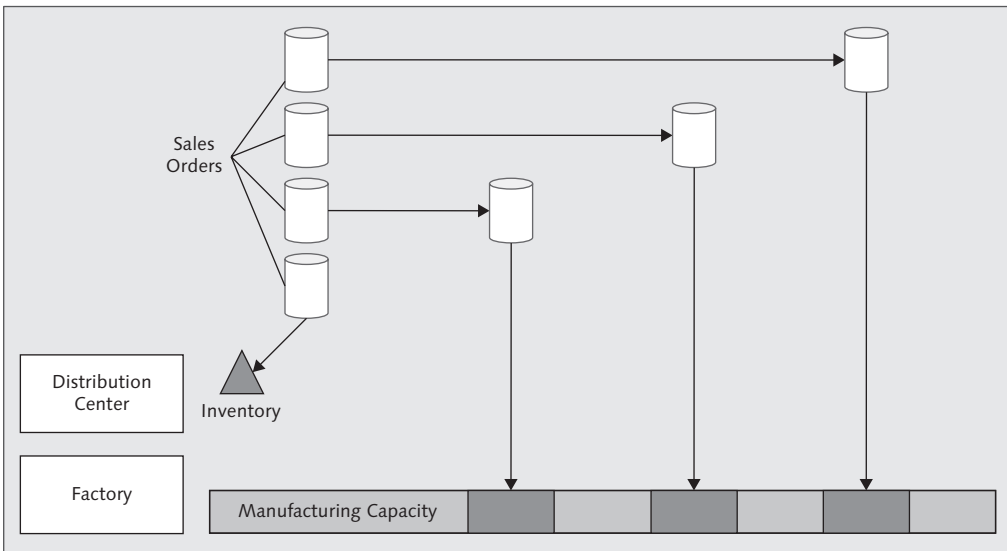


Figure 2.10 Manufacturing Capacity-Based Order Fulfillment

2.5.4 Production Multilevel ATP Check

The multilevel ATP check method is designed for discrete industries that engage in multilevel assembly for configured products (e.g., PCs). This method is useful in industries where the assembly items are stocked and only when a customer sales order is received, the assembly items are assembled for the final product. The method checks the availability of the components (via BOM explosion of the primary product) before committing to the delivery date of the order. The differences between CTP and multilevel ATP are shown in Table 2.3.

Business Process Requirement	Multilevel ATP	CTP
Availability check on component level	Checks on component product availability as defined in the scope of check; supports rules-based ATP	Uses the PP/DS pegging functionality and primarily checks the end item product availability
Characteristics-dependent planning	Does not support	Supports characteristics planning
Scheduling of finished goods	Cumulated in daily bucket	Plans until lowest level of time (seconds)
Result	ATP tree structure	PP/DS planned orders
Display of check results	ATP result overview	Provides planning log
Performance	Better	Needs close monitoring
Capacity restrictions	Daily production rate	Finite scheduling on resource
Scheduling of components	Lead-time scheduling	Detailed scheduling as the production order
Lot size	Lot-for-lot	Fixed/min/max
Block planning	Does not support	Supports

Table 2.3 Differences between Multilevel ATP and CTP

One major difference between CTP and Multilevel ATP is the use of the ATP tree. The ATP tree structure is a new object created during multilevel ATP, which prevents the online creation of the receipt generated by global ATP for system-performance reasons. The conversion to receipt elements for the confirmed orders can be done later as a background job.

An example of multilevel ATP is shown in Figure 2.11 and Figure 2.12, where the order confirmation is done in two dates. The first date is based on the stock availability, while the balance quantity is based on the planned orders availability date, taking into account component lead time and resource capacity.

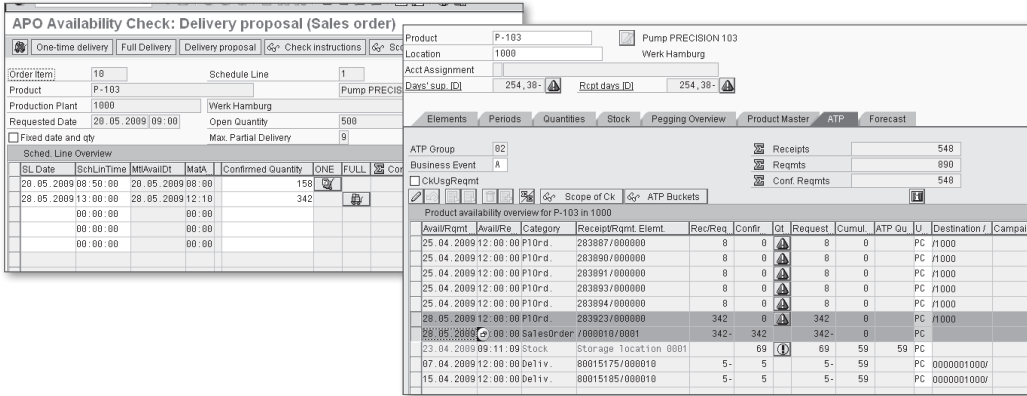


Figure 2.11 Order Confirmation Based on the Production Availability Date

Figure 2.12 shows how the BOM is exploded for the parent item, and the component's availability is checked before the final confirmation of the order.

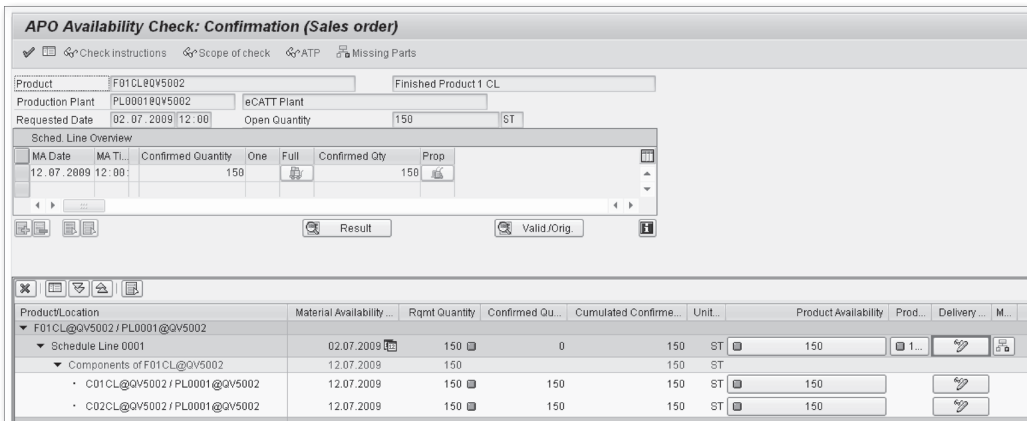


Figure 2.12 Bill of Materials Explosion in a Multilevel ATP Check

2.6 Global ATP Extended Functions

Besides the basic and advanced methods, there are two extended features that are invariably implemented with any global ATP check methods and across all industries. The first method is backorder processing (BOP), which is used primarily for resolving backorder conflicts and re-ATP of the sales orders to reconfirm the delivery dates based on the latest inventory after the MRP run. The second method is the

scheduling function, which is used for determining the correct material availability date (MAD) for shipping the goods.

2.6.1 Backorder Processing

BOP is a critical step in sales order confirmations. It aligns the confirmation process with business goals by prioritizing the sales orders to determine which orders to ship first. BOP is also critical when the supply is constrained and you must decide which sales orders to prioritize for shipping. As a reallocation process, BOP aligns the supply plan and the open sales orders.

The BOP process consists of defining the order processing scope through master data, and executing the BOP in the following four steps:

1. Identify the business criteria important for prioritization. For example, this could be the document creation date or material availability date.
2. Filter the scope of BOP by selecting the orders that will be included in the processing.
3. The user defines the sort profile for defining the sequence to allocate the available stocks to the customer orders.
4. Execute the BOP either interactively (manually reconfirming the sales documents) or as a background job. The *BOP monitor* provides the tool to analyze the changes and result of BOP.

In a business scenario, BOP is essential in the following situations:

- ▶ Unexpected goods receipts (creates more ATP quantity as a result). This will help a business confirm customer orders that were not confirmed when orders were first received.
- ▶ Unexpected goods issues (creates less [negative] ATP quantity as a result). This helps businesses prioritize orders during supply shortage.
- ▶ High-priority order (to fulfill the demand, the confirmation of some low-priority orders must be cancelled). This will help businesses increase the profit margin by serving important customer sales orders.

The functionality of BOP is enhanced with the event-driven quantity assignment (EDQA) feature (see Figure 2.13) where BOP occurs automatically if sales orders/stock inventory is changed. As you can see, when a goods receipt is performed in the warehouse, global ATP automatically confirms the orders from the order due list.

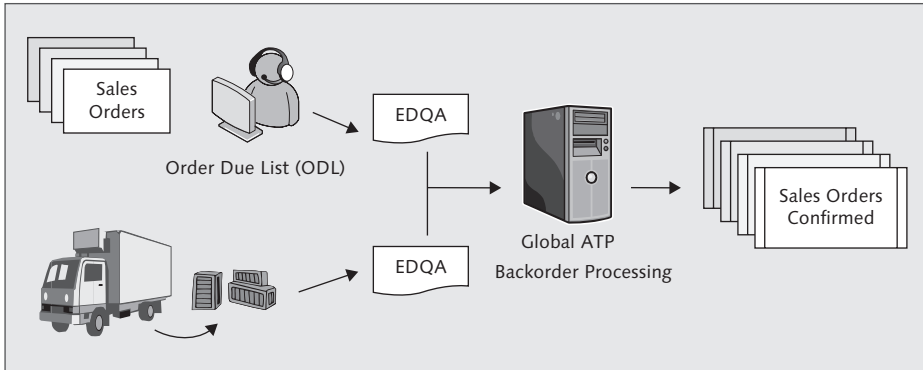


Figure 2.13 Event-Driven Quantity Assignment in Backorder Processing

2.6.2 Time and Scheduling Functions

Transportation and shipment scheduling is an integral part of global ATP and serves as a scheduling tool for proposing a material availability date, loading date, and delivery date during the sales order processing. The scheduling (see Figure 2.14) works backward from the requested date to arrive at the MAD. MAD is the date for checking product availability. Master data will be required in SAP APO in the form of lead times between plants/vendors and transportation zones (ship-to party, state).

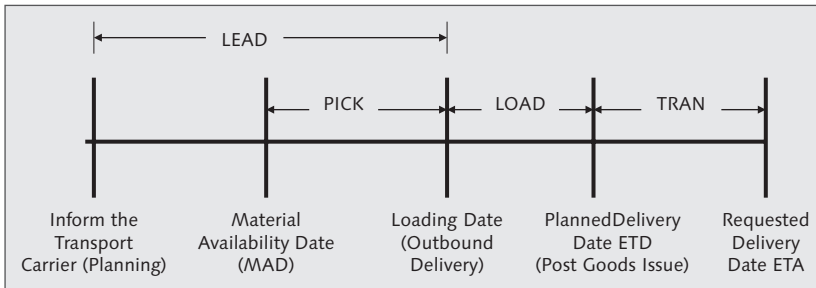


Figure 2.14 Transportation and Shipment Scheduling Lead Time in Global ATP

The feature helps customers with the following functions:

- ▶ Schedule the correct ETA for supply availability
- ▶ Properly calculate the lead time between supplier and customer points
- ▶ Increase the customer-service level and sales based on supply availability at the committed date

Global ATP also provides configurable process scheduling (CPS) as an enhanced scheduling feature to map the logistics function of the company. CPS uses business processes that have activities, and these activities have a start date and end date. CPS should be used in scenarios where transportation and shipment scheduling cannot be achieved using the condition technique. The only difference is that CPS is a lot more flexible where instead of fixed activities for shipment scheduling (e.g., pick, tran), you can add more activities (hold). In addition to duration determination, CPS can also do calendar determination, time zone determination, and location determination using the condition technique.

2.6.3 Global ATP Exception Management Alerts

The exception management process identifies issues (*exceptions*) that will lead to changes/adjustments in the operational demand and supply plans and improvements in the order-fulfillment process in general. Global ATP provides the SAP APO Alert Monitor alert management tool (shown in Figure 2.15), which can be used to model ATP alerts. Custom alerts can also be defined per business requirements (e.g., product allocation alerts can be triggered via custom macros defined in SAP APO DP).

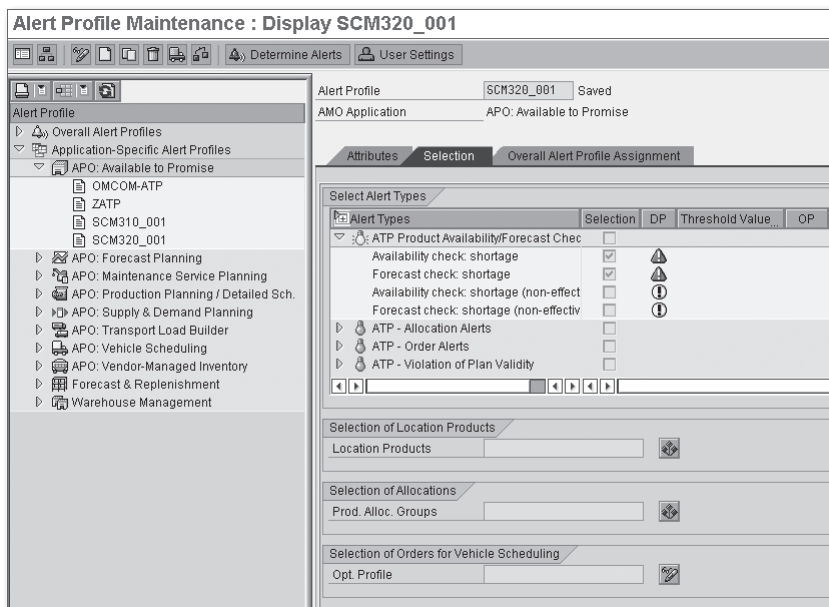


Figure 2.15 Global ATP Alert Profile for Configuring Alerts

2.6.4 Global ATP Implementation Approach

A clear implementation methodology is recommended for successful deployment of the global ATP functionality. The methodology can be divided into five areas, leading toward the production of global ATP functionality.

1. Implementation scenarios

The implementation of global ATP can be combined either with other modules of SAP APO or implemented as a standalone with SAP ERP integration. The viable combinations are listed here:

- ▶ *DP + global ATP*: Combining the forecasting process and allocation process with ATP.
- ▶ *DP + SNP + global ATP*: Integrating demand and supply planning with order fulfillment.
- ▶ *PP/DS + global ATP*: Integrating manufacturing directly with the order-fulfillment process.
- ▶ *Global ATP*: Leveraging on advanced check methods capabilities for complex business scenarios.

2. Big-bang versus phased approach

The majority of global ATP implementations primarily start with a proof of concept (POC) and develop into a project following business acceptance. The project implementation times are usually short—spanning three to five months—and the phased approach is best suited to minimize any business risk and better understand the global ATP behavior in the productive environment. To mitigate the business impact of the ATP check running in two environments—legacy and global ATP—it is recommended to roll out the global ATP solution by customer and distribution center. This also requires activating the CIF model by distribution centers.

3. Global ATP check methods selection

It is imperative to map global ATP functionalities according to business-specific needs to solve order-fulfillment issues. The advantage of global ATP is that you do not need a single global approach, and each global ATP functionality can be implemented separately to solve the business problem. The basic and advanced methods can also be combined to deliver two-step ATP checks on customer orders.

4. Business value versus implementation effort

A matrix (see Figure 2.16) that shows the global ATP functionality ease of implementation versus business value can accelerate the change management and business readiness process.

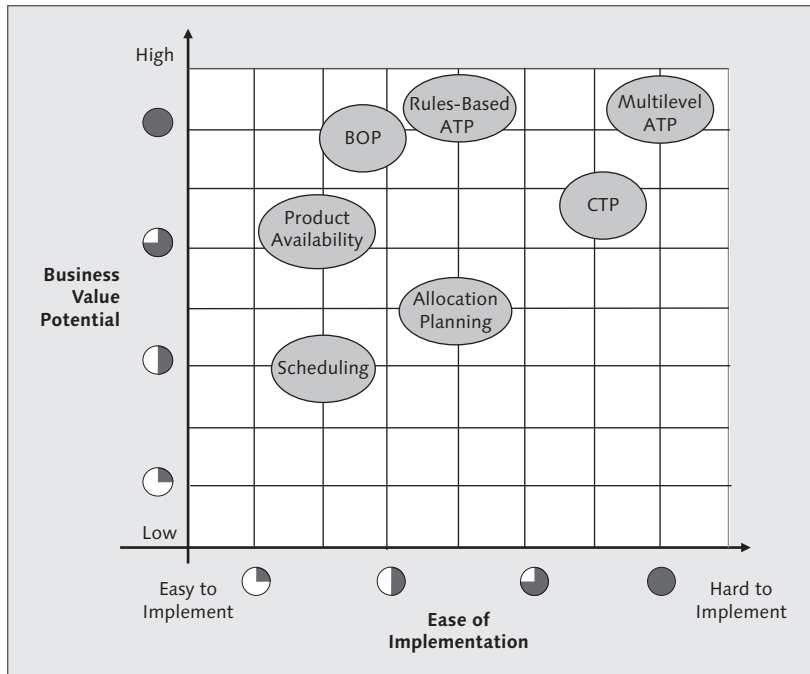


Figure 2.16 Business Value Potential versus Ease of Implementation

5. Performance testing

Global ATP can be technically challenging due to the volume of transaction processing. It is always advisable to perform scalability/stress testing before going to production up to a scale of 120% sales-order volume. The stress testing should focus on the Remote Function Call (RFC) communication between SAP ERP and global ATP to fine-tune SAP Basis settings with parallel processing, and also look at options for a disaster recovery plan if the global ATP system is down.

2.7 Summary

This chapter provided an overview of the global ATP capabilities and how different check methods can solve complex business scenarios related to order promising. A comparison between the traditional ATP in SAP ERP and global ATP shows the advantages a company can harvest by implementing the advanced feature to model its supply chain constraints during the ATP check. Global ATP offers seamless integration with other SAP ERP modules to support the order-to-cash (OTC) end-to-end business process. We also discussed the key global ATP functionalities.

The next chapter introduces the global ATP technical architecture, the integration between the execution system (SAP ERP) and the ATP system (global ATP) using the Core Interface, and the basic configurations to make it work.

Index

A

Access sequence, 109, 260
Activity type, 131
Advance Planning and Optimization (APO),
44
 Technology, 44
 Time series, 51
Allocation group, 151
Allocation object, 54
Allocation sequence, 55
APO liveCache, 305
Application Link Enabling (ALE), 73
Application log, 228
Application programming interface (API), 290
ATP check ES bundle, 292
 Business process steps, 293
 Group, 84, 88, 93
 Tree structure, 61, 137, 232, 236, 238,
 253
Availability check for kits, 56
Availability issue resolution, 295
Available-to-promise (ATP), 39, 43
 Alerts, 318

B

Backorder processing (BOP), 46, 62, 63, 177,
178, 303, 317, 329
 *Business events recorded on transactional
 data*, 181
 Business priority during supply shortage,
 180
 *Changes to product availability dates/
 quantity*, 180
 comparison, 179, 199
 Enhancements, 200
 Product allocation changes, 181
Backorder processing ES bundle, 295
 Business process steps, 297
 External source, 297

Internal source, 297
 Reassignment of order confirmation, 297
Backward consumption, 158
BAdI
 /SAPAPO/RBA_RBAS, 145
 CRM_AV_CHECK_APO_01, 284
 CRM_CONFIRM_01, 284
 CRM_ORDERADM_SCENARI, 284
BADI enhancement, 329
BAPI, 72, 325, 328
 BAPI_APOATP_CHECK, 274
 BAPI_LOCSRVAPS_SAVEMULTI_30A, 328
 BAPI_RULESRVAPS_SAVEMULTI, 330
Basic global ATP configuration, 83
Batch BOP, 191
Big-bang versus phased approach, 66
Bill of materials (BOM), 232, 235
Block basis definition, 216
Block planning, 204, 206
Block reference cycle, 216
Block resource capacity, 207
BOP, 178
 Basic configuration, 181
 Batch simulation, 192
 Benefits, 178
 Business scenarios, 180
 Customer priority, 188
 Different modes, 191
 Direct update, 191
 Field criteria (characteristics), 182
 Filter type, 182
 Filter variant, 185
 Interactive, 192
 Key transactions, 190
 Master data, 184
 Order categories, 182
 Prioritization order, 183
 Scenario testing, 187
 Sequence, 183
 Sort profile, 183
 Worklist, 184
Business context, 289

Business continuity plan, 315
 Business event, 84, 85, 279
 Business object, 300
 Business process execution language (BPEL),
 301
 Business process library, 291
 Business system group (BSG), 73
 Business value versus implementation effort,
 67

C

Calculation profile, 58, 131
 Capable-to-match (CTM), 259
 Capable-to-promise (CTP), 46, 59, 203
 Carrier allocation, 265
 CBF profile, 248
 CBF table, 248
 Characteristic-dependent forecasting, 204
 Characteristics, 216, 246
 Concept, 231
 Characteristics-based ATP, 210
 Characteristics-based forecasting, 232, 242,
 247
 Characteristics combination, 163
 Allocation group, 166
 Characteristics value combination (CVC), 160,
 249
 Characteristic value assignments, 210
 Check control, 84, 89
 Checking group, 88
 Checking group MTVFP, 328
 Checking horizon, 84, 89, 91, 92
 Check instruction, 84, 86
 Check mode, 84, 85
 Determination, 90
 CIF, 71
 CIF delta report, 307
 CIF enhancements, 76
 EXIT_/SAPAPO/SAPLCIF_PROD_001, 76
 EXIT_SAPLCMAT_001, 76
 CIF integration models
 ATP check, 78
 ATP customizing, 78

Master data, 79
 Transactional data, 79
 CIF transactions, 74
 BD54, 74
 CFC1, 74
 CFC2, 74
 CFC3, 74
 CFC5, 77
 CFG1, 77
 CFGD, 77
 CFM1, 77
 CFM2, 77
 CFM5, 77
 CFP1, 77
 CFP3, 77
 NDV2, 74
 SALE, 74
 /SAPAPO/C1, 75
 /SAPAPO/C2, 75
 /SAPAPO/C3, 80
 /SAPAPO/C4, 75
 /SAPAPO/C6, 81
 /SAPAPO/CC, 80
 /SAPAPO/CCR, 80
 /SAPAPO/CP1, 75
 /SAPAPO/CP2, 75
 /SAPAPO/CP3, 75
 /SAPAPO/CQ, 80
 /SAPAPO/CW, 80
 /SAPAPO/OM17, 80
 SCC4, 74
 SLG1, 77
 SM59, 74
 SMQR, 74
 SMQS, 74
 CIF user enhancements, 73
 Collective product allocations, 160
 Compatibility, 269
 Component availability check, 232, 233
 Component constrained, 234
 Composite application, 300
 Condition record, 108 , 132, 280
 Condition technique, 97, 142
 Condition table, 101
 Condition type, 102

- Configuration*, 100
- Configuration objects*, 100
- Field catalog*, 100
- Rule determination*, 102
- Rule strategy/procedure*, 102
- Scenario testing*, 104
- Summary*, 105
- Condition type, 261
- Configurable material, 236
- Configurable process scheduling (CPS), 65, 97, 105
 - Access sequence*, 109
 - Assignment of item category to process alias*, 113
 - Condition maintenance group*, 111
 - Condition table*, 109
 - Condition type*, 110
 - Configuration*, 106
 - Determination procedures*, 111
 - Process alias*, 108
 - Scenario testing*, 114
 - Summary*, 117
 - User exits*, 114
- Configuration in CRM, 274
 - ATP profile*, 275
 - Business partner assignment*, 277
 - Item category*, 276
 - Item category determination*, 276
- Configuration in global ATP for CRM, 278
 - Requirements profile*, 278
- Configuration profile, 246
- Configuration templates, 290
- Configure-to-order policy, 234
- Conservative logic, 70
- Consistency check report, 306
- Consolidation location, 119
 - Case study*, 136
- Core Interface (CIF), 72, 83, 318, 325
 - Configuration steps*, 73
 - Enhancement*, 325
- Correction report for product allocation, 307
- Correction report for sales orders requirements, 307
- Corrective tool, 259
- Correlation groups, 179
- Cost profile, 268
- CPS, 65
 - Business activities*, 106
 - Determination procedure*, 109
 - Determining class*, 108
 - Enhancements user exits*, 114
 - Scheduling log*, 115
 - Scheduling schema*, 105, 107
- CRM, 273
 - Enhancements*, 284
 - Location substitution*, 277
 - Rule procedure type*, 281
 - Scenario testing*, 282
- CTM, 260
 - Planning run*, 259
 - Profile*, 264
- CTP, 203, 204
 - Basic configuration*, 209
 - Basic master data requirements*, 217
 - Rules-based ATP check*, 211
 - Technical backend steps*, 205
- CTP basic master data, 217
 - Bill of materials*, 219
 - Block reference cycle*, 221
 - Characteristic propagation*, 224
 - Production process model*, 222
 - Production version*, 220
 - Product location*, 218
 - Resource*, 220
 - Routing*, 220
 - Work center*, 219
- CTP business case study example, 206
- CTP configuration
 - Global ATP check instruction*, 210
 - Global ATP rules-based CTP*, 211
 - PP/DS block planning*, 216
 - PP/DS production planning procedure*, 212
- CTP configuration
 - Global ATP check mode*, 209
- CTP location determination activity, 227
- CTP mill industry, 205
- CTP paper industry, 206
- CTP scenario testing, 224
- Cumulated check, 160
- Cumulative ATP check, 88
- Customer service level, 258

D

Deleting ATP alerts, 309
 Deleting backorder processing runs, 309
 Delivery commitment, 45, 321
 Delivery performance, 43, 257
 Delivery proposal, 96
 Demand planning, 232, 242
 Demand-to-support process, 41
 Deployment unit, 299
 Difference CTP and multilevel ATP, 60
 Disaster recovery plan, 315
 Postprocessing sales orders in global ATP,
 317
 Switching back ATP check from SAP ERP to
 SAP APO, 316
 Switching the ATP check from SAP APO to
 SAP ERP, 315
 Down binning, 259
 Drop shipment, 285
 Dynamic route determination
 profile, 266, 269
 Dynamic route determination (DRD), 265

E

E-commerce, 289
 EDQA, 178, 192
 Activities, 193
 Backorder processing, 193
 Basic configuration, 194
 Event linkage, 197
 Process category, 196
 Push deployment, 193
 Quantity assignment, 193
 Reassignment, 193
 Testing steps, 199
 Workflow Management, 197
 Engineer-to-order, 33
 Enhancement
 ES_SAPLATPC, 328
 Enhancements for product allocation, 173
 Enhancement spot of ATP, 328
 Enterprise services, 289
 Bundles (ES bundles), 291

Enterprise Services Repository, 291, 300
 End-to-end modeling, 301
 Event-driven quantity assignment, 178, 192
 External procurement, 92

F

Filter type, 179
 SAP_ALERT, 304
 SAP_NETCHANGE, 304
 Fixed configuration, 234
 Forecast, 55
 Forward consumption, 158
 Functionality comparisons, 47

G

Global ATP, 43
 Advanced methods, 55
 Basic methods, 49
 Batch jobs, 313
 Capabilities, 45
 Check methods selection, 66
 Exception management alerts, 65
 Extended functions, 62
 Implementation approach, 66
 Regular transactions, 313
 Technical landscape, 71
 Global data type, 300
 Globally distributed supply chain, 266
 Goods issue date, 105

H

Hard and soft constraints, 269
 Heuristics algorithms, 213

I

Implementation scenarios, 66
 InfoPackage, 167
 InfoSource, 167

In-house production, 92
 Integrated rule maintenance, 280
 Integrating global ATP with TP/VS, 265
 Integration, 257
 Features, 258
 Global ATP and CRM, 273
 Model for global ATP, 77
 Scenarios with CRM, 284
 With business-to-business (B2B) portal, 72
 With non-SAP ERP, 72
 With SAP CRM, 72
 With SAP ERP, 71
 Internet sales, 274

K

Key figures, 152
 Key performance indicator, 38
 Cash-to-Cash Cycle time, 38
 Delivery performance, 39
 Order fulfillment costs, 39
 Order Management cycle time, 38
 Perfect order fulfillment, 38
 Shipping accuracy, 39
 Kit-to-order, 285

L

Legacy categories, 89
 Location substitution, 58, 119
 Case study, 120
 Testing, 133
 Logical system, 73

M

Made-to-order policies, 234
 Main functionality comparison, 47
 Maintenance and monitoring procedure, 303
 Major enhancement, 329
 Make-to-order, 31
 Make-to-stock, 25
 Invoicing, 30

Order Management, 26
 Transportation and logistics planning, 28
 Transportation & Logistics Execution, 28
 Masking character, 160
 Master data for CRM integration, 280
 Master data for product allocation, 163
 Master data product allocation, 163
 Master data requirement , 90
 Material availability date (MAD), 64, 96, 258
 Material requirement planning (MRP), 208
 Material type KMAT, 236
 Minor enhancement, 325
 MISL, 184
 Monitoring CIF processing in global ATP, 79
 MRP, 208
 Multi-item single delivery (MISL), 59, 119, 179
 Multilevel ATP, 46, 231, 233, 235
 Access sequence, 239
 APO product location master, 249
 ATP tab, 249
 Basic configuration, 236
 Basic master data rule requirements, 244
 Business case study example, 234
 Check, 60
 Component substitution, 255
 Condition table, 239
 Condition type, 239
 Demand tab, 249
 GATP - check instruction, 237
 GATP - check mode, 237
 GATP - rules-based multilevel, 239
 Key functionalities, 231
 Key steps in scenario testing, 251
 PP/DS - Global settings, 240
 PP/DS horizon, 250
 PP/DS tab, 250
 Production data structure, 250
 Rules-based ATP, 239
 Rules-based condition record, 251
 Rule strategy, 240
 Rule strategy sequence, 240
 Rules-based check, 253
 Scheduling Horizon in Days, 241
 Technical scenarios, 240

O

Object dependencies, 246
 Object-oriented programming, 329
 Online remote function call (RFC), 96
 Open configuration, 234
 Optimization, 206
 Order due list, 178
 Order fulfillment, 43, 257
 Order selection, 179
 Order-to-cash (OTC), 19
 Business challenges, 22
 Business models, 19
 Priorities, 21
 Visibility and automation, 23
 Order-to-confirm process, 41
 Order-to-ship process, 42

P

Paper industry optimization, 208
 PASS, 285
 Perfect order, 21
 Performance, 317
 Performance testing, 67
 Persistent quantity assignment, 304
 Planning area, 152
 Planning book, 153, 166, 243
 Wizard, 154
 Planning horizon, 268
 Planning object structure, 152
 Planning procedure, 218
 Planning strategy, 90
 Post goods issue (PGI), 113
 PP/DS
 Block planning, 206
 Horizon, 233
 Strategy profile, 215
 PP/DS heuristics, 213, 214
 SAP_CDPBP_01, 214
 SAP_CDPBP_02, 215
 SAP_CDPBP_03, 215
 SAP_CTP_DLG, 214
 SAP_LEN_001, 214
 SAP_PP_002, 214

SAP_PP_CTP, 214
 Pragmatic application, 289
 Preselection functionality, 296
 Priorities, 177
 Process alias, 105
 Process component, 299
 Product allocation, 45, 53, 147, 311
 Basic configuration, 151
 Business case study, 149
 Business scenarios, 147
 Demand planning, 151
 Enhancements in SAP APO, 175
 Enhancements in SAP ERP, 173
 Procedure, 171
 Scenario testing, 169
 Technical steps, 148
 Product allocation configuration
 Connection to planning area, 161
 Consumption period, 158
 Field catalog, 154
 Product allocation group, 155
 Product allocation object, 155
 Product allocation procedure, 159
 Product allocation settings, 163
 Sequence of product allocation procedure, 161
 Product availability check, 50
 product availability overview, 93
 Production capacity, 232
 Production data structure (PDS), 218, 233
 Production planning and detailed scheduling (PP/DS), 203, 232
 Production process model (PPM), 218, 233
 Product substitution, 58, 260
 Profitable, 177
 Progressive logic, 70

R

Re-ATP check, 178
 Redistribution flags, 180
 Re-initialize product allocation, 310
 Remote function call (RFC), 67
 Reorganization, 308
 Reorganization of ATP characteristic matrices, 309

Replenishment lead time, 328

Report

ATP_BASIC_SETTING, 270
/SAPAPO/AMON_REORG, 309
/SAPAPO/ATPLOG_DISPLAY, 319
/SAPAPO/BOP_DELETE, 309
/SAPAPO/CIF_DELTAREPORT3, 307, 327
/SAPAPO/OM_REORG_DAILY, 309
/SAPAPO/RMQUOT_USAGE_ORDER, 173
/SAPAPO/SDORDER_DEL, 308
/SAPAPO/SDRQCR21, 307
/SAPAPO/TS_LCM_CONS_CHECK, 310
/SAPAPO/TS_PAREA_INITIALIZE, 310
/SAPAPO/TS_PLOB_MAINTAIN, 164
SDRQCR21, 306

Requirement class, 85, 90

Requirement profile, 141

Requirement situation correction, 306

Resource assignment, 268

Results comparison, 179

Retail, 36

Routes, 266

Rule condition table, 263

Rule control, 130

Rule maintenance, 128, 263

Rules-based ATP, 45, 119, 260

Access sequence, 124

Basic configuration, 121

Check, 56

Check instruction, 122

Condition table, 124

Condition technique, 123

Condition type, 125

Rule strategy, 125

Rule strategy sequence, 126

Rules-based ATP enhancements, 144

in SAP ERP, 144

in APO, 145

Rules-based ATP for CRM, 280

Rules-based ATP integration with CTM, 262

Rules-based business scenarios, 119

Rule strategy, 261

Rule type, 128

S

SaaS, 290

Sales and operation planning, 258

Sales scheduling agreement case study, 143

SAP APO, 95

Field catalog, 331

Macro, 166

Planning area, 310

Supply Network Planning (SNP), 104

Technology, 69

Time series, 69

SAP Business Information Warehouse (SAP BW) Administrator Workbench, 167

SAP CRM with rules-based ATP, 273

SAP Customer Relationship Management (CRM), 273

SAP enhancement package, 291

SAP ERP and global ATP CIF enhancement list, 326, 327

SAP ERP ATP check, 120

SAP ERP ATP vs. global ATP, 47

Functionality comparisons, 47

SAP ERP backorder processing, 179

SAP ERP field catalog, 330

SAP ERP variant configuration, 245

SAP liveCache, 44, 69

Consistency check, 310

SAP .NET, 72

SAP Quick Sizer, 319

SCHEDL_SDD, 105

Scheduling and sequencing, 213

Scheduling determination types, 107

Scheduling function, 97

Scheduling horizon, 137

Scheduling lead times, 99

Scheduling simulation, 103

Scheduling strategy, 215

Scope of check, 84, 89

SCOR, 23

Process detail, 24

SCOR order-to-cash model, 25, 31

Engineer-to-order, 33

Make-to-order, 31

Make-to-stock, 25

Retail, 36

Semiconductor industry, 259

Index

Service interface, 299
Service operation, 299
Service-oriented architecture (SOA), 289
 Characteristics, 290
Services registry, 300
Shipping points, 99, 101
Simple correlation, 139
Sizing, 319
SOA by design, 298
Sold-to party, 174
Sort profile, 179
Special dynamic safety stock, 285
Statistical forecasting, 242
Stock transport order (STO), 107
 Case study, 140
Structure /SAPAPO/KOMGU, 101, 153
Super BOM, 236, 245
Super routing, 236, 246
Supply chain architecture, 41
Supply Chain Council, 23
Supply Chain Operations Reference, 23

T

Table

ARFC, 318
ARFCSDATA, 318
ARFCSSTATE, 318
/SAPAPO/BOPHEAD, 201
/SAPAPO/BOPRESLT, 201
/SAPAPO/BOPQTVB, 175
/SAPAPO/OBREF, 175
SAPAPO/POSMAPN, 308
/SAPAPO/POSMAPN, 201
/SAPAPO/SDFIELD, 308, 317
/SAPAPO/SDQTVB, 175
Technical architecture, 53
Technical scenario, 280
Telesales, 277
Temporary quantity assignment (TQA), 304, 305
Third-party order processing (TPOP), 285
Time and scheduling functions, 64
Time stream calendars, 112
Touchless order, 273

TQA, 304
Transaction
 CO09, 314
 CRMD_ORDER, 282
 CU43, 246
 MB51, 314
 MD04, 314
 MMBE, 314
 PFTC, 197
 RSA1, 167
 RSKC, 166
 /SAPAPO/SDP94, 54
 /SAPAPO/AC03, 50
 /SAPAPO/AC04, 86, 294
 /SAPAPO/AC42, 169
 /SAPAPO/ADVM, 166
 /SAPAPO/AMON1, 167
 /SAPAPO/ATP2PPDS, 241, 254
 /SAPAPO/ATPC06, 237
 /SAPAPO/ATPC07, 237
 /SAPAPO/ATPCQ_GENER, 163
 /SAPAPO/ATPLOG_DSP, 319
 /SAPAPO/ATPQ_CHKCUST, 171
 /SAPAPO/ATPQ_CHKUSG, 311
 /SAPAPO/ATPQ_COLLECT, 166
 /SAPAPO/ATPQ_KCGRP_U, 312
 /SAPAPO/ATPQ_PAREA_K, 166
 /SAPAPO/ATPQ_PAREA_R, 169
 /SAPAPO/ATPQ_PAREA_W, 173
 /SAPAPO/ATREE_DSP, 253
 /SAPAPO/BOP, 190, 314
 /SAPAPO/BOP_COMPARE, 190
 /SAPAPO/BOP_DELETE, 191
 /SAPAPO/BOPI, 190
 /SAPAPO/BOP_MONITOR, 190
 /SAPAPO/BOP_RESULT, 190, 199
 /SAPAPO/BOP_RUNTIME, 190
 /SAPAPO/BOP_UPDATE, 191
 /SAPAPO/BOP_WORKLIST, 190
 /SAPAPO/CALENDAR, 113
 /SAPAPO/CDPS0, 225
 /SAPAPO/CTM, 264
 /SAPAPO/CURTO_SIMU, 250
 /SAPAPO/EDQA, 199
 /SAPAPO/EDQA_EC, 197
 /SAPAPO/EDQA_PD, 196

/SAPAPO/MC62, 163, 164
 /SAPAPO/MSDP_ADMIN, 152, 153
 /SAPAPO/ODL, 199
 /SAPAPO/OM17, 306
 /SAPAPO/RBA04, 212, 263
 /SAPAPO/RRP3, 188, 253
 /SAPAPO/RRP_ATP2PPDS, 241
 /SAPAPO/RRPCUST1, 241
 /SAPAPO/RRPLOG1, 228
 /SAPAPO/SCHED_TEST, 103
 /SAPAPO/SDP8B, 153
 /SAPAPO/SDP94, 166, 244
 SAPAPO/VS18, 269
 /SAPCND/AO11, 263
 /SAPCND/AU01, 100
 /SAPCND/AU03, 101
 /SAPCND/AU06, 102
 /SAPCND/AU07, 101
 /SAPCND/AU08, 102
 /SAPCND/AU11, 102
 /SCMB/SCHED_DEL, 115
 SE18, 328, 329
 SMQ1, 313
 SMQ2, 313
 SOAMANAGER, 302
 SPAU_ENH, 328
 SU01, 278
 SWDA, 197
 SWETYPV, 197
 tRFC/qRFC, 318
 VA03, 188
 Transportation and logistics execution, 28
 Transportation and shipment scheduling, 46,
 64, 95
 Trim optimization, 208

U

User exit, 76
 EXIT_/SAPAPO/SAPLATPR_001, 145
 EXIT_/SAPAPO/SAPLATPR_002, 146, 330
 EXIT_/SAPAPO/SAPLBOP_000, 201
 EXIT_/SAPAPO/SAPLBOP_040, 201
 EXIT_/SAPAPO/SAPLBOP_051, 201
 EXIT_/SAPAPO/SAPLBOP_052, 201
 EXIT_/SAPAPO/SAPLBOP_060, 201
 EXIT_/SAPAPO/SAPLBOP_069, 201
 EXIT_/SAPAPO/SAPLBOP_100, 329
 EXIT_/SAPAPO/SAPLBOP_FILT_010, 201,
 329
 EXIT_/SAPAPO/SAPLBOP_SORT_020, 201,
 329
 EXIT_/SAPAPO/SAPLCIF_QUOT_001, 175
 EXIT_/SAPAPO/SAPLCIF_QUOT_002, 175
 EXIT_/SAPAPO/SAPLVCRM_001, 114, 330
 FV45VFZY_USEREXIT_CATALOG_VALU,
 144, 155, 173
 User interface (UI), 294

V

Variant class, 246
 Variant configuration, 233, 236
 Visual Composer, 294

W

Wild card, 160, 166, 173
 Workflow Builder, 197
 Workflow concept, 178