

A pair of silver metal scales of justice is shown against a light blue background. The scales are slightly out of focus, with the pans hanging from a central point. The image is used as a metaphor for balance and pricing.

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Effective Pricing with SAP ERP

- ▶ Understand the complete pricing solution from SAP
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Galileo Press 

Effective Pricing

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Effective Pricing with SAP® ERP

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Suresh Veeraraghavan

Preface

Pricing is a complicated subject and is used in several functionalities, including Sales and Distribution (SD) and Materials Management (MM). Currently no book in the market specifically focuses on pricing. We decided to write a book that addresses pricing not only in SD but also in MM to enable you to learn pricing applications for both functionalities in one book. The book has been written with step-by-step instructions so that you can understand the concepts easily. The concepts are also illustrated through numerous business examples throughout the book.

The concept of pricing has been around since SAP SD was introduced. It has been used across other functions, so the challenge was to explain the concept and how it moves through different functionalities and business cases. This book is a complete reference guide for SAP ERP pricing users, consultants, and analysts, both from the technical and functional point of view.

Chapter 1 starts by discussing pricing as a general business process and what that means in the SAP ERP environment. You'll get a clear picture of the scope of the book, and what skills you'll walk away with after reading it. We detail the pricing overview, condition technique, and its strong concept application across many areas.

Chapter 2 discusses where pricing is used in SD documents. Specifically, it covers how pricing procedures work in SD documents such as sales orders, contracts, and schedule agreements. It also explains how customer hierarchies work. The pricing procedure overview, application in SD documents, customs pricing procedures, and customer hierarchies as applicable to your business are also covered.

Chapter 3 addresses condition techniques in SD, which is the mechanism SAP ERP uses to calculate SD pricing. You'll learn how the condition technique needs to be set up and what its most important aspects are. This chapter also covers key topics related to pricing, such as formulas and condition-based values.

Chapter 4 covers the special pricing topics within SD, such as promotions and deals, EDI pricing, and rebate agreements. You'll learn how conditions can be grouped

together cumulatively to arrive at a price. This chapter also explains how pricing works if free goods are offered (e.g., buy one, get one free).

Chapter 5 addresses a very important aspect of pricing design: how performance can be improved by optimized access, minimizing tables per access, and other tips. You'll also learn the technical aspects of pricing such as commonly used user exits, pricing tables, and structures. This chapter covers pricing by optimizing pricing performance in SD and MM documents. The chapter also explores the SD pricing tables, SD pricing user exits, MM pricing technical considerations, and examples of a pricing interface to external systems using user exits.

Chapter 6 shows how pricing data is migrated from legacy applications to SAP ERP. You'll also learn about the key takeaways from a cutover perspective, including the data migration steps, pricing data migration and cutover, and customer planning key points.

Chapter 7 covers pricing with MM documents. You'll learn about the MM pricing document overview, the pricing procedure calculation schema as applicable to MM, and pricing in purchasing documents.

Chapter 8 covers the condition technique in MM, which is the mechanism SAP ERP uses to calculate MM pricing. You'll learn how the condition technique needs to be set up and what the important aspects are. It also covers key topics related to pricing, such as formulas and condition-based values.

Chapter 9 covers special pricing topics, such as delivery costs and foreign currency. Similar to the SD special pricing procedure covered in Chapter 4, we provide examples of planned delivery costs, foreign currency, weight-dependent/volume-dependent pricing, and other pricing applications.

Chapter 10 is about variant configuration: if the product being sold has various options (i.e., an automobile), you'll learn how pricing can be calculated by taking the different configurations into account.

Chapter 11 discusses the Financial Accounting (FI) aspects, such as how the General Ledger (GL) accounts are determined. You'll learn how to segregate the list price, the discount offered, and the taxes from a financial perspective. This chapter focuses on how the revenue and discount accounts are set up in conjunction with the pricing procedure.

Chapter 12 covers the FI aspects with MM. You'll learn how the GL accounts are determined for different pricing elements. In other words, you'll understand how to segregate list price, discounts offered, and taxes. You'll also learn how the revenue and discounts accounts are set up in conjunction with the pricing procedure. The chapter starts with the account determination overview and then moves to the FI postings for MM and its application.

Chapter 13 explains some of the key reports used in pricing, and it discusses how business users can set up and lay out their own pricing reports in SD and MM. Having gone over the key application of pricing from SD, MM, and interface to FI, this chapter addresses the reporting aspect of pricing with pricing reports and lists, custom SD pricing reports, standard MM pricing reports, and custom MM pricing reports.

Chapter 14 discusses Internet pricing, and shows how pricing through the web can be used and set up. The chapter starts with the introduction to the topic and goes into the architecture, Internet sales master data, and the pricing and configuration associated with it.

Chapter 15 concludes the book with a review of the key elements of pricing and takes the opportunity to explain the pricing as it applies to different industries. Because pricing can vary depending on the industry, this chapter explains some of the important aspects of pricing for industry-specific scenarios. This chapter reviews the purchasing and sales pricing conditions and uses examples from AFS, high-tech, and retail pricing.

So, let's jump right in and discuss pricing as a process and what it means in the SAP environment.

This chapter discusses pricing as a general business process and what that means in the SAP ERP environment. You'll learn about the organizational elements of pricing and the condition techniques, as well as why they're used.

1 Pricing Overview

Price, in general, refers to something's monetary value or worth. It is the amount you pay or receive in exchange for goods, which can be defined as materials or services. *Pricing* in SAP ERP broadly refers to the calculation of prices in the Sales and Distribution (SD) and Materials Management (MM) functionalities in SAP ERP.

Pricing is often a complex process, and it can be a challenge for companies to arrive at a specific price for a customer or vendor because many factors need to be considered. For example, taxes on goods are determined based on where the product is shipped to and from. Some of your customers may have favorable discounts because they purchase goods in larger quantities or volumes or during busy times of the year (i.e., the holiday season). You might also offer a bonus gift when the customer buys a certain product. These different promotions, discounts, and taxes make the price determination complex. It's very important to make price determination as automated and effective as possible to prevent manual overrides and price maintenance within your SAP ERP system.

This book provides the details on how the pricing function works within SAP ERP, and we discuss the concepts of various pricing determinations, such as discounts, freights, taxes, and so on. This book addresses the main aspects of the pricing configuration in your SAP ERP system and supports the maintenance and effective use of price determination. The features described in this book may not all be applicable to your specific system because many times it is dependent on the applicable release, but we address the common features across SAP ERP. Throughout the book, we also go over leading practices, tips and tricks, and shortcuts to pricing configuration and maintenance. Before we get into the intricacies of pricing, first you need to understand some of the basics.

1.1 Overview of Pricing

As stated previously, pricing in the SAP ERP system refers to the method by which we can determine the prices of goods or services. When a customer receives an invoice, he pays for the goods or services purchased. Similarly, when a vendor sends an invoice to the buyer, the buyer pays for the goods or services purchased.

SAP ERP is made up of individual, integrated software functionalities and components that perform various organizational system tasks. In SAP ERP, pricing can originate in the following functionalities:

- ▶ Sales and Distribution (SD)
- ▶ Materials Management (MM)

Pricing within SD is used in various sales documents, such as sales orders, quotations, contracts, schedule agreements, inquiries, deliveries, credit memos, and debit memos. Similarly in MM, pricing is used in contracts, quotations, purchase orders (POs), purchase information records, and credit memos.

To grasp pricing as a business process, it's important for you to understand the organizational structure of the SAP ERP system and where your pricing processes fit into the organizational structure.

SAP ERP uses the organizational structure (also called as enterprise structure) to represent various entities such as companies, distribution plants, manufacturing plants, business units selling the products, sales channels, and purchasing organizations.

1.1.1 Sales Organizational Structure

Organizational structures represent the key entity within your organization that performs a certain function or role. For example, your company within the SAP ERP enterprise structure can be represented by a company code and the corresponding sales functions by sales organization, division, and so on. The key elements of an organizational structure from an SD perspective (commonly referred to as the *sales area*) are as follows:

- ▶ **Sales organization**

This represents the selling unit and is responsible for product/service liability and returns. For example, a company can organize its products in North Sales Organization, South Sales Organization, West Sales Organization, or any other

way. These sales organizations are responsible for selling within their respective regions.

► **Distribution channel**

This is the channel through which the product or service is sold. Examples of distribution channels include retail, wholesale, and online.

► **Division**

This represents the business unit to which the products/services belong. It establishes responsibility for profits from materials or services. Within each of the sales organizations, you can have various product divisions that are responsible for certain groups of products. For example, the plastics division is responsible for plastics, while the computer division is responsible for laptops and desktops.

By having a separate sales organization for North, South, West, and East sections, the company has better flexibility in setting up pricing by region. Multiple distribution channels and divisions enable pricing to be controlled by product divisions and the channel through which it is sold. For example, if the product is sold through the Web, the company can offer a better price to the customers because they are purchasing the product directly instead of going through a retail or wholesale distribution channel.

The sales organization and distribution channels are used as organizational elements for pricing. Figure 1.1 illustrates the sales organization structure within SD in SAP ERP.

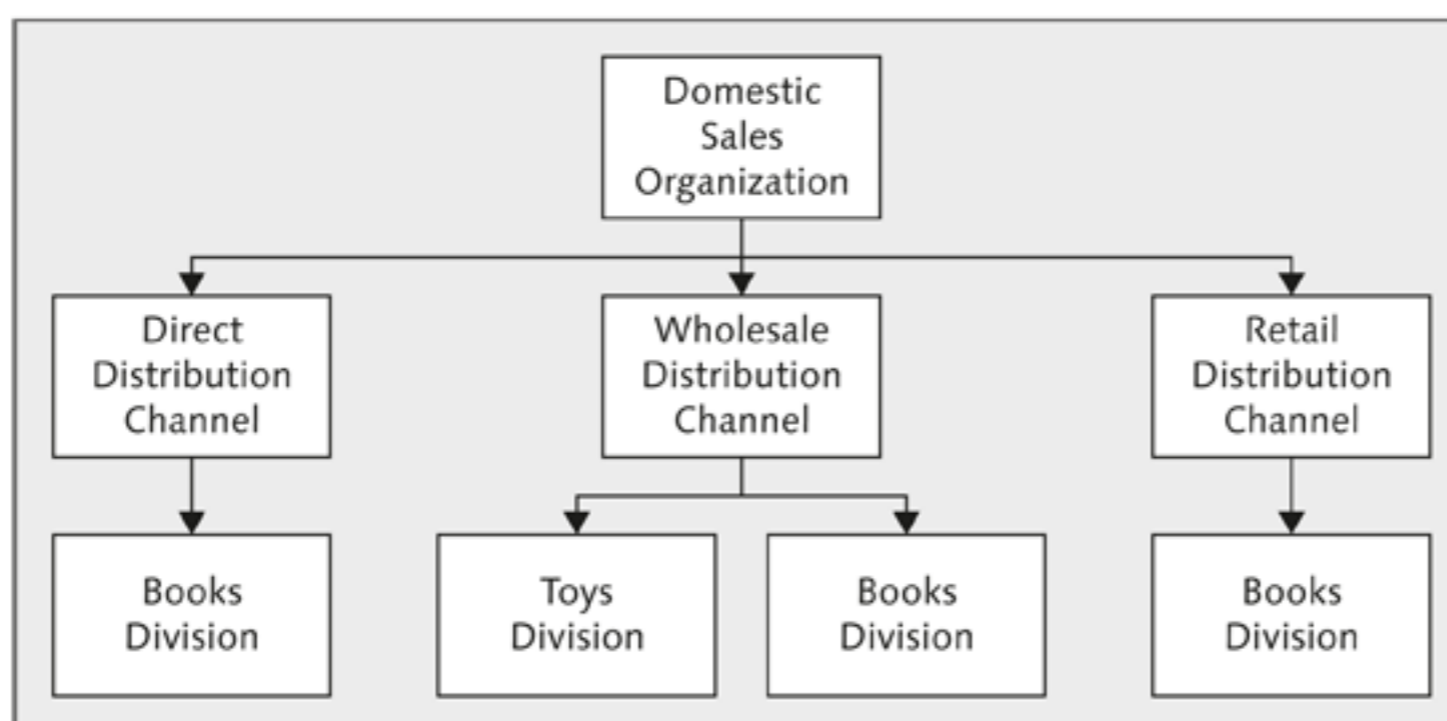


Figure 1.1 Sales Organizational Structure

Let's review the purchase organization structure in the next section.

1.1.2 Purchasing Organizational Structure

A *purchasing organization* is the organizational unit within purchasing in MM. A purchasing organization procures materials and services, negotiates conditions of purchase with vendors, and is responsible for the related transactions.

A *plant* is the organizational unit that is typically responsible for manufacturing or distribution. The purchasing organization and plants can be used as organizational elements for pricing in MM. Figure 1.2 illustrates the purchasing organizational structure.

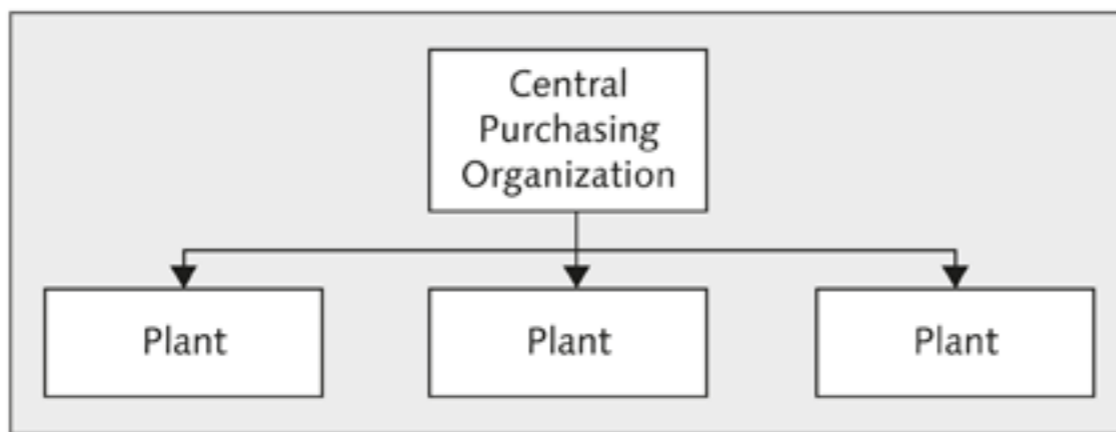


Figure 1.2 Purchasing Organizational Structure

Let's consider an example of a conglomerate that makes computers with businesses in Germany, the United States, and India. To have a competitive edge, the company procures raw materials globally. To enable global procurement, a global purchasing organization can be set up for this company. All the contracts, agreements, and POs are raised with this global purchasing organization to give the company better visibility into the purchasing spend. The company can then leverage these spends for negotiating better prices with suppliers and getting better prices for the products purchased and impacting product costing, which increases company profitability.

Several nonorganizational elements are also part of pricing. Pricing can be based on customers, vendors, materials, and material groups to name a few. We will cover these topics in more detail throughout the coming chapters. Now that we understand the organizational elements, the next paragraph explains how pricing is maintained in organizations.

1.1.3 Pricing Maintenance

Pricing maintenance from a standard business process perspective refers to sales and pricing managers maintaining sales pricing. Because pricing is sensitive data pricing

is only maintained by authorized business users. Because pricing can vary based on different business rules, it is important that this information is kept confidential for competitive reasons or for other business deals. For example, with a specific customer, you may choose to provide a higher discount because it is a strategic account that might help you get more business later or even penetrate a specific market. In another example, the price for intercompany transactions are meant for customs reporting and not for sharing with your customer because it might expose your actual cost and the profit margins you are making on a product or services.

Pricing can be maintained in the SAP ERP system by various methods such as contracts, schedule agreements, pricing condition records, and so on. Access to these transactions is controlled through security, so not every end user or manager has access to them.

Similarly, in procurement, pricing is maintained by contract and purchasing managers, and access to these transactions is also restricted because of the sensitive nature of the data.

Now that we understand who maintains prices, let's look at the different types of pricing available.

1.1.4 Pricing Types Overview

Pricing type is a key aspect of the pricing procedure. As you can see in Figure 1.3, pricing conditions in SD can be broadly categorized into the following sections:

- ▶ **Pricing**
Includes price list, customer or material price, and custom pricing conditions.
- ▶ **Discounts/Surcharges**
Includes customer-specific or material-specific discounts and price group discounts.
- ▶ **Freight**
Includes Incoterms-specific pricing. Incoterms (International Commercial terms) are a series of international sales terms published by the International Chamber of Commerce. For example, a commonly used Incoterm is FOB Destination or freight on board Destination. This implies that the ownership of the goods is transferred to the buying company when the goods reach the destination.

► **Taxes**

Includes levies or fees based on sales or purchases. Taxes can also be tariff-based on the export/import of goods determined by the departure country or the destination country.

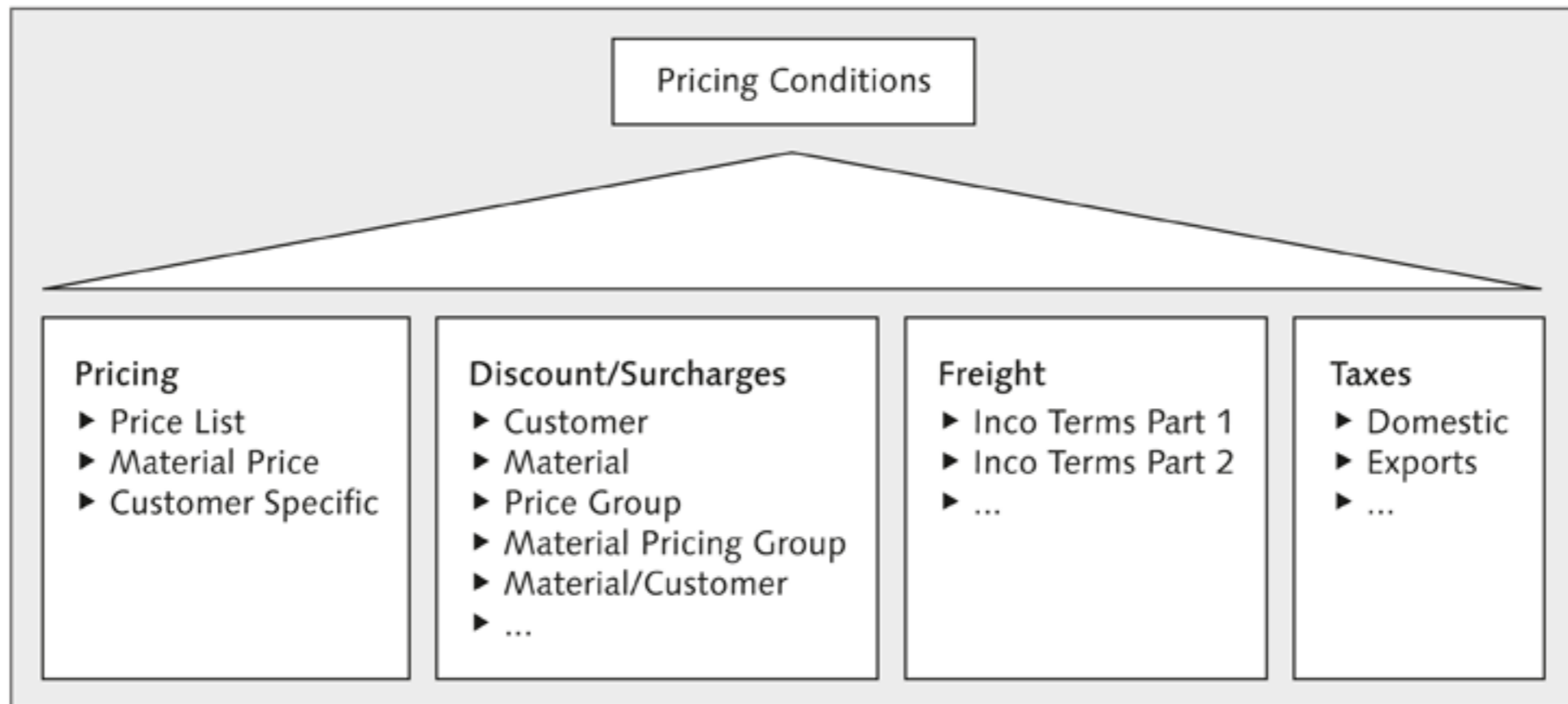


Figure 1.3 Sales and Distribution Pricing Conditions Overview

Similarly, on the procurement side, we can categorize the pricing under the same categories, as shown in Figure 1.4. Specifically, Figure 1.4 displays the MM pricing condition overview. The difference is that instead of customers, the focus is on vendors.

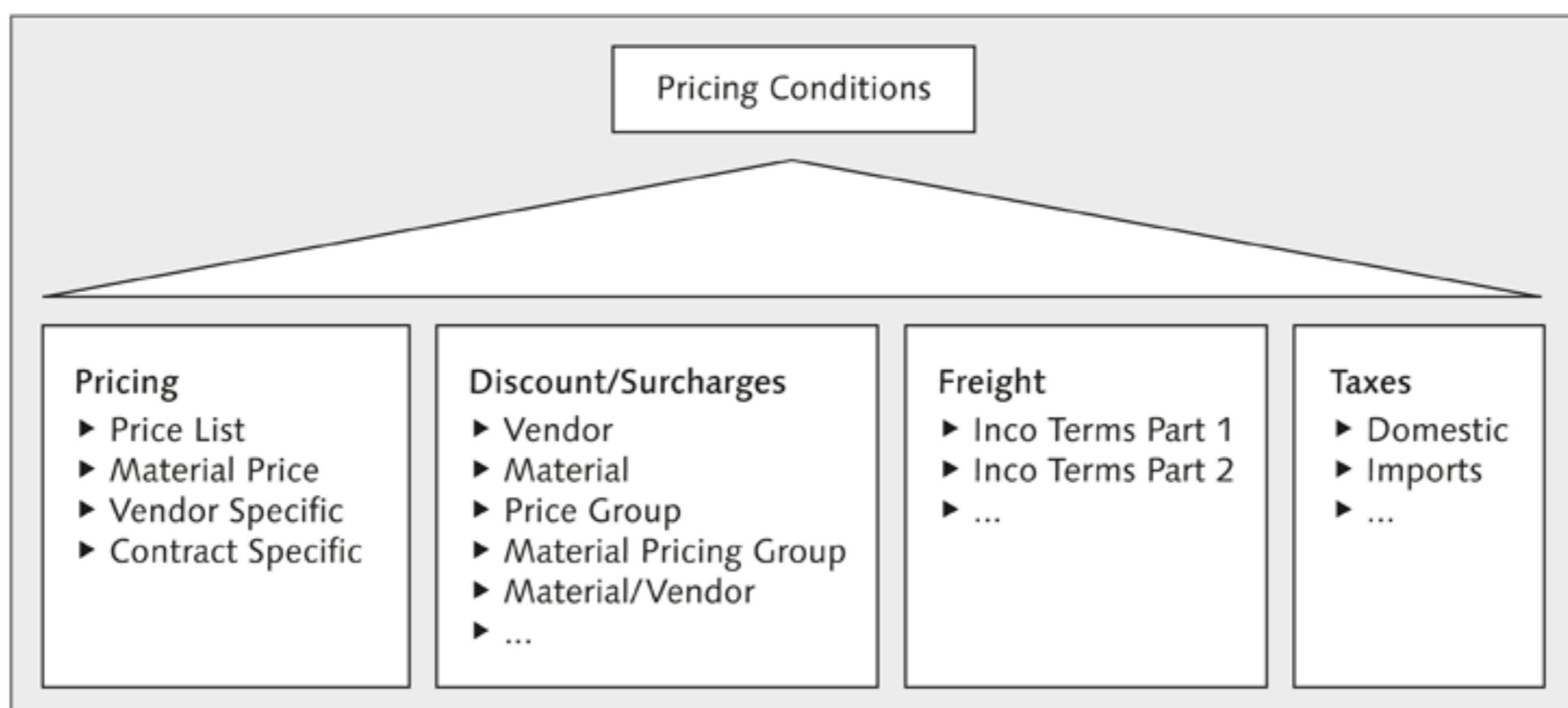


Figure 1.4 Materials Management Pricing Conditions Overview

In the next section, let's review the condition technique overview.

1.2 Condition Technique Overview

The SAP ERP system uses a special mechanism called a *condition technique* to enable pricing. To understand the condition technique, it is important to understand the elements of pricing.

The following are some basic definitions you need to understand before moving on:

- ▶ **Condition technique**

The mechanism SAP ERP uses to calculate the prices for a given product or service.

- ▶ **Condition types**

The way SAP ERP identifies the various pricing elements such as discounts, costs, list price, taxes, and so on.

- ▶ **Condition table**

The combination of fields that identifies an individual condition record.

- ▶ **Condition record**

The way SAP ERP retrieves pricing data from the system. Condition records can be created for all condition types such as discounts, list price, and so on.

- ▶ **Pricing procedure**

The way SAP ERP groups the various condition types, such as prices, discounts, taxes, and so on, to arrive at a final price for the customer.

To help illustrate the elements of pricing, let's look at a customer buying a book at a bookstore, illustrated in Table 1.1. If the book is priced at \$15.00 USD, the customer will pay \$15.00 USD. (Taxes weren't included to show an easier example.)

Price Element Description	Value	Currency
List Price	15.00	USD
Gross Price	15.00	USD
Net Price	15.00	USD

Table 1.1 Pricing Elements

As you can see in this simple example, there is only one pricing element, the list price (including value and currency). The gross price and net price are also calculated. *Gross price* refers to the price before any deductions are taken, such as discounts, while *net price* refers to the price after all the deductions are taken into account.

So, let's look at a more complex example, where the same book is offered at a discount of 10%, as shown in Table 1.2. In this case, the following pricing elements are considered: list price, discount, taxes, gross price, and net price.

Price Element Description	Value	Currency
List Price	15.00	USD
Gross Price	15.00	USD
Discount @ 10%	1.50	USD
Taxes @ 10%	1.35	USD
Net Price	14.85	USD

Table 1.2 Pricing Elements with Discounts

The pricing elements that make up the price are influenced by various factors. For example, in SD, the pricing elements are influenced by sales regions, distribution channel, and product division.

The previous examples represent simple business scenarios. But there are several business scenarios where pricing can be considerably more complex:

- ▶ Discounts can be offered based on volume of purchase, sales, or other criteria (strategic account, etc).
- ▶ A free product is offered for every product purchased.
- ▶ Certain groups of customers receive a discount of 10% while others receive 15%.
- ▶ Pricing is cumulative, meaning that the customer is eligible only if the value of the sales order exceeds \$100.00.
- ▶ Rebates are offered to customers at a later time, rather than at the time of purchase.
- ▶ Customers can purchase products where numerous permutations and combinations of the products are possible (i.e., cars and computers).

Condition techniques are permutations, and combinations require a mechanism to calculate the prices. To manage the various pricing elements (list price, discounts, surcharges, taxes, etc.), SAP ERP uses the condition technique to calculate these prices. We will discuss this in detail in later chapters.

The condition technique helps determine the various pricing elements in SD and MM documents. All the pricing elements are then brought together in a *pricing procedure*.

At a very high level, Figure 1.5 illustrates how all these elements fit together.

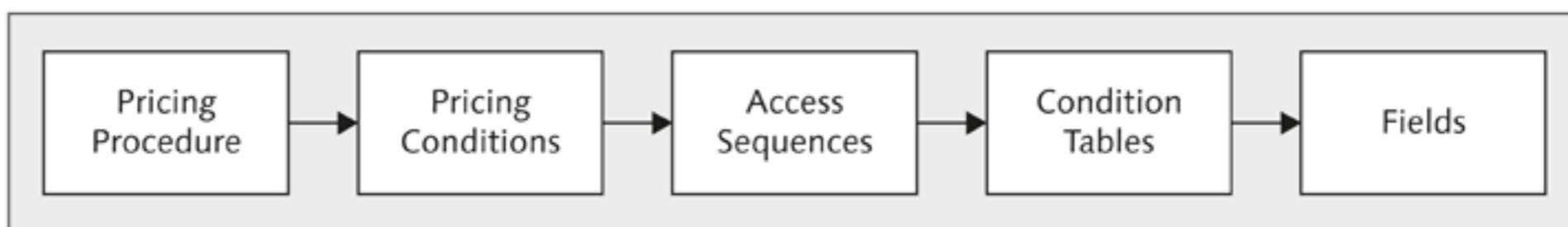


Figure 1.5 Pricing Condition Relationship

Whether it is SD pricing or MM pricing, the technique is the same. For SD documents or MM documents, the pricing procedures are determined. The pricing procedures provide the various pricing conditions (i.e., pricing, taxes, freight, discounts, etc.).

Here's a quick breakdown of pricing:

► **Pricing procedure**

This is usually represented by a six-digit alphanumeric code. Figure 1.6 shows some examples of pricing procedures. Custom pricing procedures usually have a Y or Z starting prefix, for example, ZVAXUS or YVAXUS. Like other custom-defined objects, the pricing object is defined or copied over from the standard start with Y or Z, so that during an upgrade, they are recognized as your own defined objects, and the SAP ERP system doesn't overwrite them.

► **Pricing conditions**

This is a four-digit alphanumeric code. Figure 1.6 shows examples of pricing conditions. Custom pricing conditions usually are preceded by a Y or Z, for example, ZR00 or YR00. As explained earlier, Y or Z prefix not only helps you identify the condition type that is being custom defined but also helps you manage them during upgrades.

AS	Description	Ty.	Description
PR00	Price		Access sequence relevant for pricing
PR01	Price (item price list)		Access sequence relevant for pricing
PR02	Price with Release Status		Access sequence relevant for pricing
PREF	Preference Price		Access sequence relevant for pricing
PREK	Preference price - config.mat		Access sequence relevant for pricing
PREW	Preference price - cross plnt		Access sequence relevant for pricing

Figure 1.6 Pricing Conditions

► **Access sequences**

This is a four-digit alphanumeric code. Figure 1.7 shows some examples of pricing access sequences. Custom pricing conditions usually are preceded by a Y or Z, for example, ZR00 or YR00.

AS	Description	Ty.	Description
PR00	Price		Access sequence relevant for pricing
PR01	Price (item price list)		Access sequence relevant for pricing
PR02	Price with Release Status		Access sequence relevant for pricing
PREF	Preference Price		Access sequence relevant for pricing
PREK	Preference price - config.mat		Access sequence relevant for pricing
PREW	Preference price - cross plnt		Access sequence relevant for pricing

Figure 1.7 Access Sequences

► **Condition tables**

This is a three-digit numeric code. Figure 1.8 shows examples of pricing condition tables. Custom pricing conditions usually are preceded by a 5 (i.e., 501,502, etc.).

► **Table fields**

This is a 30-digit alpha numeric code. Figure 1.9 shows some examples of allowed fields. Custom fields can be added with a preceding Z or Y (ZEKGRP or YEKGRP).

As illustrated by Figure 1.6 through Figure 1.9, the pricing conditions have access sequences that store the condition records in condition tables. The condition tables have condition fields that help provide the fields used to determine pricing. In Chapter 3, we'll discuss condition records, tables, and techniques in more detail.

Tab	Short Description
002	Domestic Taxes
004	Material
005	Customer/Material
006	Price List Type/Currency/Material
007	Division/Customer
011	Export Taxes
020	Division/Price Group
029	Material Pricing Group
030	Customer/Material Pricing Group
031	Price Group/Material Pricing Group
032	Price group/Material
033	Incoterms
034	Incoterms (Parts 1+2)
040	Country/State/Customer Classif.1/Material Classification 1
041	Country/State/County/Customer Classif.2/Material Classif.2
042	Country/State/City/Customer Classif.3/Material Classif.3
055	Sales Org./Order/Plant/Material

Figure 1.8 Condition Tables

Field	Description
ALAND	Country
ANZSN	No. serial numbers
AUART	Order Type
AUART_SD	Sales Document Type
AUBEL	Sales Document
AUGRU	Order reason
AUPOS	Sales Document Item
BELNR	Sales Document

Figure 1.9 Table Fields

Throughout the rest of this book, we'll discuss how the pricing procedures are determined, how the pricing conditions are activated, and which tables are accessed by the access sequences.

1.3 Summary

Pricing elements such as list price, discounts, surcharges, taxes, and so on, are used to determine the final price that is charged to the customer.

For you to arrive at the final price and to keep track of all these different pricing elements, you can use a condition technique in SAP ERP. By using this technique, when a sales order document or PO document is created, the various pricing elements are determined in the system.

Organizational elements that are relevant to sales pricing include the sales organization, distribution channel, and sales division. Organizational elements that are relevant to purchase pricing are the purchasing organization and plants. Pricing is maintained by sales or purchasing managers, and access to these transactions is restricted because of sensitive data.

A condition technique is the mechanism in the SAP ERP system that determines the various pricing elements such as list price, discounts, surcharges, and taxes. All these pricing elements are brought together in a pricing procedure. You can use the definitions and examples of organizational structures we show in this chapter as a guideline to set up an organizational model for your company, including your company's sales organizations, distribution channels, product divisions, and purchasing organizations. This chapter also helps you identify the various pricing elements for a product.

Now that you understand what pricing is, the next chapter discusses how pricing works in SD documents.

This chapter shows you where pricing is used in Sales and Distribution documents. You'll learn about how pricing procedures work in SD documents such as sales orders, contracts, schedule agreements, returns, credit memos, and debit memos.

2 Pricing in Sales and Distribution Documents

The Sales and Distribution (SD) functionality in SAP ERP allows you to model different business scenarios based on sales documents that have been defined in the system. The SAP ERP system uses order types to make a distinction between these different documents. To further differentiate pricing between these various order types, document pricing procedures and customer pricing procedures are used as parameters to have various pricing procedures by companies. To understand this better, let's consider an example of KRYAA Computers Inc.

KRYAA Computers is one of the largest manufacturers and distributors of computers around the world. Within the United States, KRYAA has geographically divided the regions into North, South, East, and West. The company has two product divisions that sell desktops and laptops. The company also distributes products to wholesale customers, retail customers, and Internet customers both domestic and international. The laptops and desktops the company sells and distributes are manufactured in Taiwan and Boise, Idaho.

When customers order computers, they raise a sales order. Most of the orders are regular sales orders, which have a delivery lead time of three weeks, for example. Some customers request expedited delivery, and these rush orders are delivered in less than a week. KRYAA Computers also allows customers to return their purchases within three weeks if they find the product unsatisfactory for any reason.

The regular sales orders have gross price and discounts as pricing elements. The rush orders have expedited shipping charges (e.g., UPS or FedEx next day) in addition to the gross price and discounts. For returns, KRYAA Computers charges a restocking fee, so a restocking charge is required as a pricing element.

As already mentioned, KRYAA Computers not only has domestic customers but also international customers. International customers require special pricing that need to be taken into consideration. These customers are located in Germany, Spain, and so on. If a customer is an international customer, then duties are applicable as pricing elements.

KRYAA Computers also has requests for quotations from schools and government institutions. For these requests, KRYAA Computers responds by providing competitive quotations. These quotations are sometimes converted into contracts if the schools or government institutions request deliveries over an extended period of time.

The process of determining the prices of various SD documents, such as contracts, quotes, sales orders, and returns, is called SD pricing procedure determination. We will use KRYAA Computers as an example to illustrate how the SD pricing procedures are determined for quotes, contracts, sales orders, and more.

2.1 Pricing Procedure Overview

Let's say KRYAA Computers has quotations, regular sales orders, rush sales orders, and contracts. Because these items are at different stages of the sales cycle and the pricing might differ based on the sales document type, we use a separate pricing procedure to represent these sales communications with the customer that can be defined and assigned to these different document types. But it's important to analyze and see if the pricing elements are very similar or different for quotations, sales order, contracts, and returns orders. KRYAA Computers realizes that the pricing elements could be similar for sales orders, contracts, and quotations but different for returns. So KRYAA Computers decides to have one pricing procedure for contracts, quotations, and sales orders, and one pricing procedure for returns. Let's see how these pricing procedures are defined through configurations.

As we discussed in Chapter 1, the various pricing elements are brought together in a pricing procedure. Figure 2.1 shows how a pricing procedure is set up.

To define a sales order type, you can use Transaction V/08 or the menu IMG • SALES AND DISTRIBUTION • BASIC FUNCTIONS • PRICING • DEFINE AND ASSIGN PRICING PROCEDURES • MAINTAIN PRICING PROCEDURE.

Procedures			
Proce...	Descript.	TS...	Pricing Type
0011	Pricing Procedure 0011	<input type="checkbox"/>	
1000	rebate - 1000	<input type="checkbox"/>	
COPA10	Pricing CO-PA	<input type="checkbox"/>	
EVP000	Retail Price	<input type="checkbox"/>	
ICAA01	Intercompany Billing	<input checked="" type="checkbox"/>	
JBS001	JBS Standard PP	<input type="checkbox"/>	
JBS002	JBS Special PP	<input type="checkbox"/>	
K00700	Condition Supplements for K007	<input type="checkbox"/>	
KA0000	Condition Supplements for KA00	<input type="checkbox"/>	
PABR01	Header Price Agreement	<input type="checkbox"/>	
PABR02	Item Price Agreement	<input type="checkbox"/>	
POS000	POS Interface	<input type="checkbox"/>	
POS100	POS Interface incl. BV	<input type="checkbox"/>	
POSDEJ	POS-Interface USA	<input type="checkbox"/>	
POSUSJ	POS-Interface USA	<input type="checkbox"/>	
POSUSN	POS-Interface USA	<input type="checkbox"/>	
PR0000	Condition Supplements for PR00	<input type="checkbox"/>	
PREF00	Pricing Procedure - Preference	<input type="checkbox"/>	
PREP01	Repairs	<input type="checkbox"/>	
PSER01	Periodic Billing	<input type="checkbox"/>	

Figure 2.1 Pricing Procedure

The pricing procedure has multiple key settings, including control data and pricing type. In the following sections, we will go over the settings individually. Let's review the pricing procedures that are available in a standard SAP ERP system as shown in Figure 2.2. Pricing procedure RVAA01 is a standard pricing procedure, which we will use as an example.

Change View "Procedures": Overview																																															
New Entries BC Set: Change Field Values																																															
Dialog Structure - Procedures - Control	Usage <input type="text" value="A"/> Application <input type="text" value="V"/>	<table border="1"> <thead> <tr> <th>Pro...</th> <th>Descript.</th> <th>T...</th> <th>Pricing Type</th> </tr> </thead> <tbody> <tr> <td>PREF00</td> <td>Pricing Procedure - Preference</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>PREP01</td> <td>Repairs</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>PSER01</td> <td>Periodic Billing</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>PSER02</td> <td>LV/WV Resource Related Billing</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>PSVA90</td> <td>Resource Related Billing</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>RVA2U3</td> <td>Standard - US Cost Plus</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>RVAA01</td> <td>Standard</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>RVAA02</td> <td>Standard with Price Book</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>RVAAAR</td> <td>Standard - Argentina</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>RVAAAU</td> <td>Standard Australia</td> <td><input type="checkbox"/></td> <td></td> </tr> </tbody> </table>		Pro...	Descript.	T...	Pricing Type	PREF00	Pricing Procedure - Preference	<input type="checkbox"/>		PREP01	Repairs	<input type="checkbox"/>		PSER01	Periodic Billing	<input type="checkbox"/>		PSER02	LV/WV Resource Related Billing	<input type="checkbox"/>		PSVA90	Resource Related Billing	<input type="checkbox"/>		RVA2U3	Standard - US Cost Plus	<input type="checkbox"/>		RVAA01	Standard	<input type="checkbox"/>		RVAA02	Standard with Price Book	<input type="checkbox"/>		RVAAAR	Standard - Argentina	<input type="checkbox"/>		RVAAAU	Standard Australia	<input type="checkbox"/>	
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PSER01	Periodic Billing	<input type="checkbox"/>																																													
PSER02	LV/WV Resource Related Billing	<input type="checkbox"/>																																													
PSVA90	Resource Related Billing	<input type="checkbox"/>																																													
RVA2U3	Standard - US Cost Plus	<input type="checkbox"/>																																													
RVAA01	Standard	<input type="checkbox"/>																																													
RVAA02	Standard with Price Book	<input type="checkbox"/>																																													
RVAAAR	Standard - Argentina	<input type="checkbox"/>																																													
RVAAAU	Standard Australia	<input type="checkbox"/>																																													

Figure 2.2 Standard Pricing Procedures

2.1.1 Control Data

Control data is specific to each pricing procedure. To access control data, select the pricing procedure (e.g., RVAA01) and choose CONTROL. If you click the CONTROL folder shown in Figure 2.2, it will bring you to Figure 2.3.

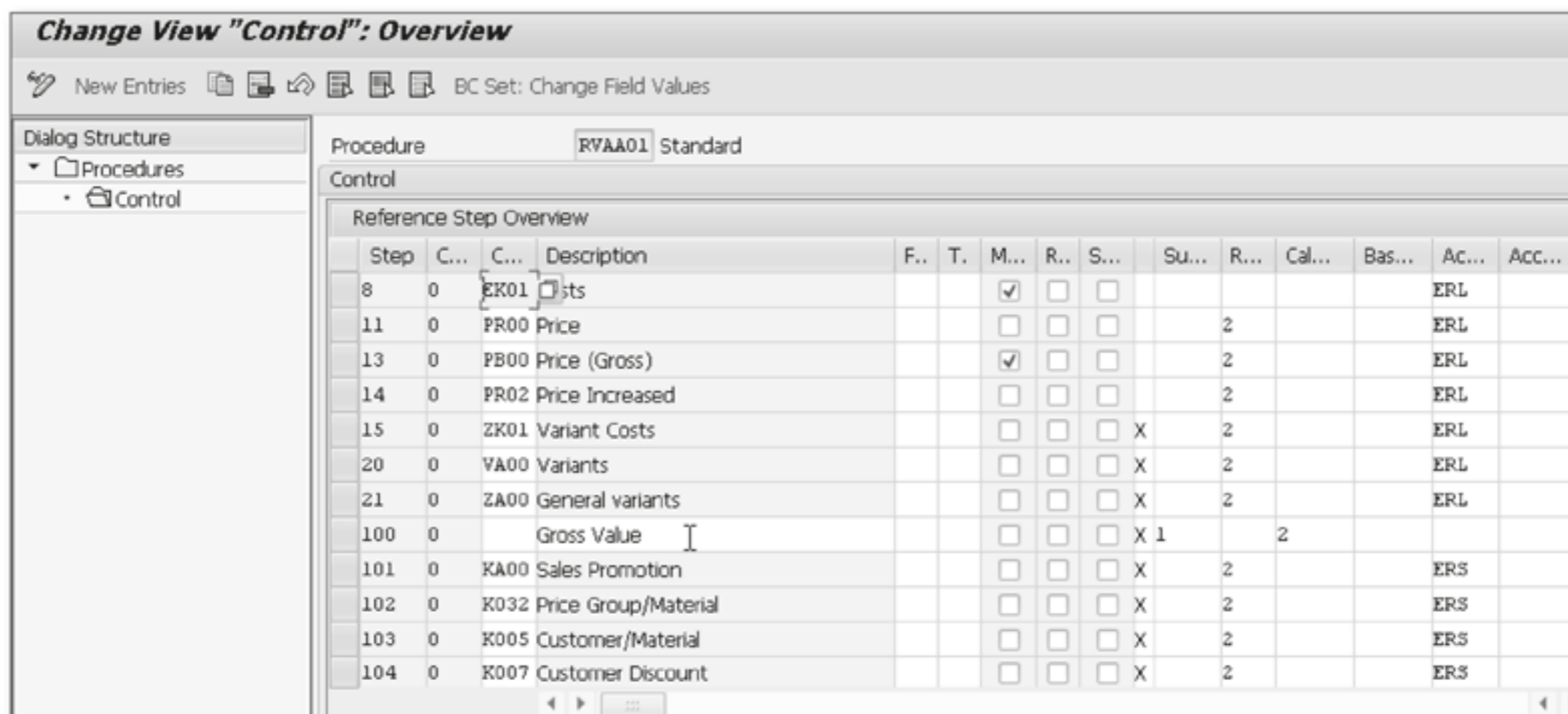


Figure 2.3 Details Control with the Pricing Procedure

Control data contains all of the pricing elements, such as gross price, discounts, taxes, and surcharges. These pricing elements are referred to as *condition types*. Control data also define the sequence in which these pricing elements need to be added up, which is accomplished by using the steps listed in Table 2.1. These steps are organized and defined logically and have to be read from the left for each step, and then top to bottom.

Step	Condition Type	Description	From	To
10	PR00			
100		Gross	10	10
101	KA00	Discount		
102	RA01	% Discount from Gross		
300		Discount Amount	101	102
800		Net Value for Item		

Table 2.1 Pricing Procedure Steps

For example, the list price identified by condition type PR00 is determined in step 10. This can be determined manually or automatically by the system. The other steps are described here:

- ▶ Step 100 is a subtotal step that calculates the gross as a sum of all the steps from 10.
- ▶ Step 101 calculates the KA00 condition type as a discount.
- ▶ Step 102 calculates the RA01 condition type as a discount.
- ▶ Step 300 now calculates the total discount amount as a subtotal.
- ▶ Step 800 calculates the net price as the gross price net of deductions.

In summary, the gross is calculated first, then the discounts are applied, and finally the net is calculated. The pricing elements gross price, discounts, and net price are determined by the condition technique.

As an example to illustrate Table 2.1, KRYAA Computers sells laptops at \$1200 USD. A \$100 USD discount is offered during the holiday season. In this example, the list price is \$1200 USD. The gross price is also \$1200 USD. The discount of \$100 USD applied to the gross price gives a net price of \$1100 USD.

The condition types provide the pricing elements such as discounts (KA00), list price (PR00), and so on. The totals such as gross, discount amount, or net value are calculated in the *pricing procedure*. The "From" and "To" columns in the table are used to indicate from which steps the totals are calculated. For example, the discount amount is calculated by adding discounts in steps 101 and 102.

It's good practice to define the totals in increments of at least 100, so that when a new pricing element (e.g., discount) is added, it can be inserted at the right level. When pricing procedures are complex, the increments may be larger because there will be more pricing conditions and subtotals. For example, if we define another discount condition in Table 2.1, it would be step 103. The total discount amount automatically includes this new discount because it starts at 300. Also the "From" and "To" columns don't always have to be maintained if the total is immediately after the pricing elements. In Table 2.1, the discounts total amount is automatically totaled from steps 101 and 102.

2.1.2 General Pricing Configurations

The pricing configurations are set at the pricing procedure level. In Figure 2.2, we saw two settings, PRICING TYPE and TSPP (transaction special pricing procedure) indicator. Let's review them individually.

Pricing Type

The *pricing type* is another parameter that controls how pricing elements are treated when copying one document to another. For example, when we copy sales to another sales document, this setting determines whether all the pricing elements in the source sales document are copied without any changes, whether taxes are redetermined or manual prices are redetermined, and so on.

Transaction Special Pricing Procedure

The transaction special pricing procedure (TSPP) indicator on the pricing procedure is used for special pricing procedures, such as intercompany transactions, credit and debit memos, and condition supplements. Figure 2.4 shows the various values possible for pricing types.



Figure 2.4 Pricing Condition Type

As an example, let's look at the indicator for ICAA01 (Intercompany Billing). Intercompany billing is used when a customer belonging to a company code is shipped a product from a manufacturing plant belonging to another company code. As an example, KRYAA Computers has manufacturing facilities in Boise, Idaho, and sells to customers located in Germany, Spain, and so on. In addition, this indicator is checked to redetermine the condition class and the statistical condition indicator when copying from a reference document. For example, when you're copying from a shipment document to a customer invoice, the condition types must match, and the TSPP indicator must be checked. Now, let's move on to the pricing procedure as it is applicable to SD documents.

2.2 Pricing Procedure Applicable to SD Documents

You can use document types to organize the various SD documents, such as inquiries, quotations, sales orders, and so on. These different sales documents are grouped

by document categories. The document type is one of the key parameters SAP ERP uses to differentiate the pricing procedures in SD.

Example

KRYAA Computers is setting up quotations, contracts, returns, sales orders, and rush sales order types. Sales document types can be customized; we can define our own sales document types when standard SAP ERP document types do not meet business requirements. Document categories on the other hand, cannot be customized. In other words, you should only use the document category values defined by SAP ERP. Each time a sales order is chosen, it is associated with a document category.

The menu path to define sales order types is IMG • SALES AND DISTRIBUTION • SALES • SALES DOCUMENT HEADER • DEFINE SALES DOCUMENTS TYPES. The Sales Document Type setup is shown in Figure 2.5.

Change View "Maintain Sales Order Types": Details			
New Entries			
Sales Document Type	OR	Standard Order	
SD document categ.	C	Sales document block	<input type="checkbox"/>
Indicator			
Number systems			
No.range int.assgt.	01	Item no.increment	10
No. range ext. assg.	02	Sub-item increment	1
General control			
Reference mandatory	<input type="checkbox"/>	Material entry type	<input type="checkbox"/>
Check division	<input type="checkbox"/>	<input checked="" type="checkbox"/> Item division	
Probability	100	<input checked="" type="checkbox"/> Read info record	
Check credit limit	D	Check purch.order no	<input type="checkbox"/>
Credit group	01	<input type="checkbox"/> Enter PO number	
Output application	V1	Commitment date	<input type="checkbox"/>
Transaction flow			
Screen sequence grp.	AU	Sales Order	Display Range
Incomp1 . proced .	11	Sales Order	UALL
Transaction group	0	Sales order	FCode for overv.scr.
Doc. pric. procedure	A		UER1
Status profile			Quotation messages
Alt.sales doc. type1			B
Alt.sales doc. type2			Outline agrmt mess.
Variant			B
			Message: Mast.contr.
			<input type="checkbox"/>
			ProdAttr.messages
			<input type="checkbox"/>
			<input type="checkbox"/> Incomplet.messages
Scheduling Agreement			
Corr.delivery type	<input type="checkbox"/>	Delivery block	<input type="checkbox"/>
Usage	<input type="checkbox"/>		
MRP for DivSchType	<input type="checkbox"/>		

Figure 2.5 Define the Sales Document Type

Figure 2.5 displays the key definitions within the sales order type. If the document pricing procedure is applied, the appropriate value (e.g., A) is assigned under the TRANSACTION FLOW section in the DOC PRIC PROCEDURE field. Let's go over the document pricing procedure next.

2.2.1 SD Document Pricing Procedure

Each document type can have a separate pricing procedure by associating the document type with a document pricing procedure. A document pricing procedure must be defined first. In our example, KRYAA Computers can use the same document pricing procedure for sales orders, quotations, and contracts. However, for returns, a different sales document type can be used because the pricing procedure is different. The menu path to define the sales order types is IMG • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • DEFINE AND ASSIGN PRICING PROCEDURES • DEFINE DOCUMENT PRICING PROCEDURE, as shown in Figure 2.6.

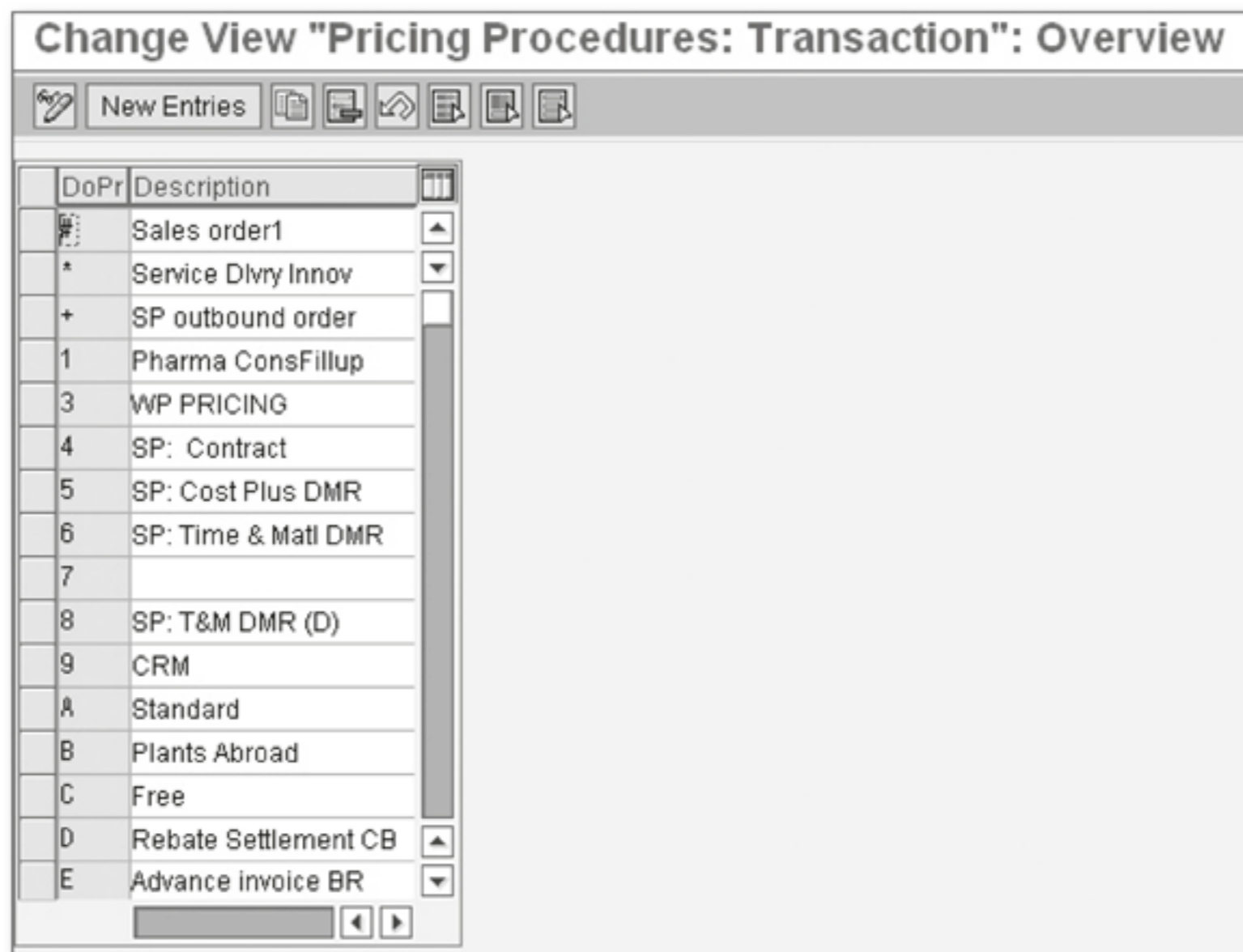


Figure 2.6 Define the Document Pricing Procedure

The document pricing procedure represents different pricing procedures or business processes; for example, you might want to have a different pricing procedure for regular customer orders and for your contact or service orders, and so on. After

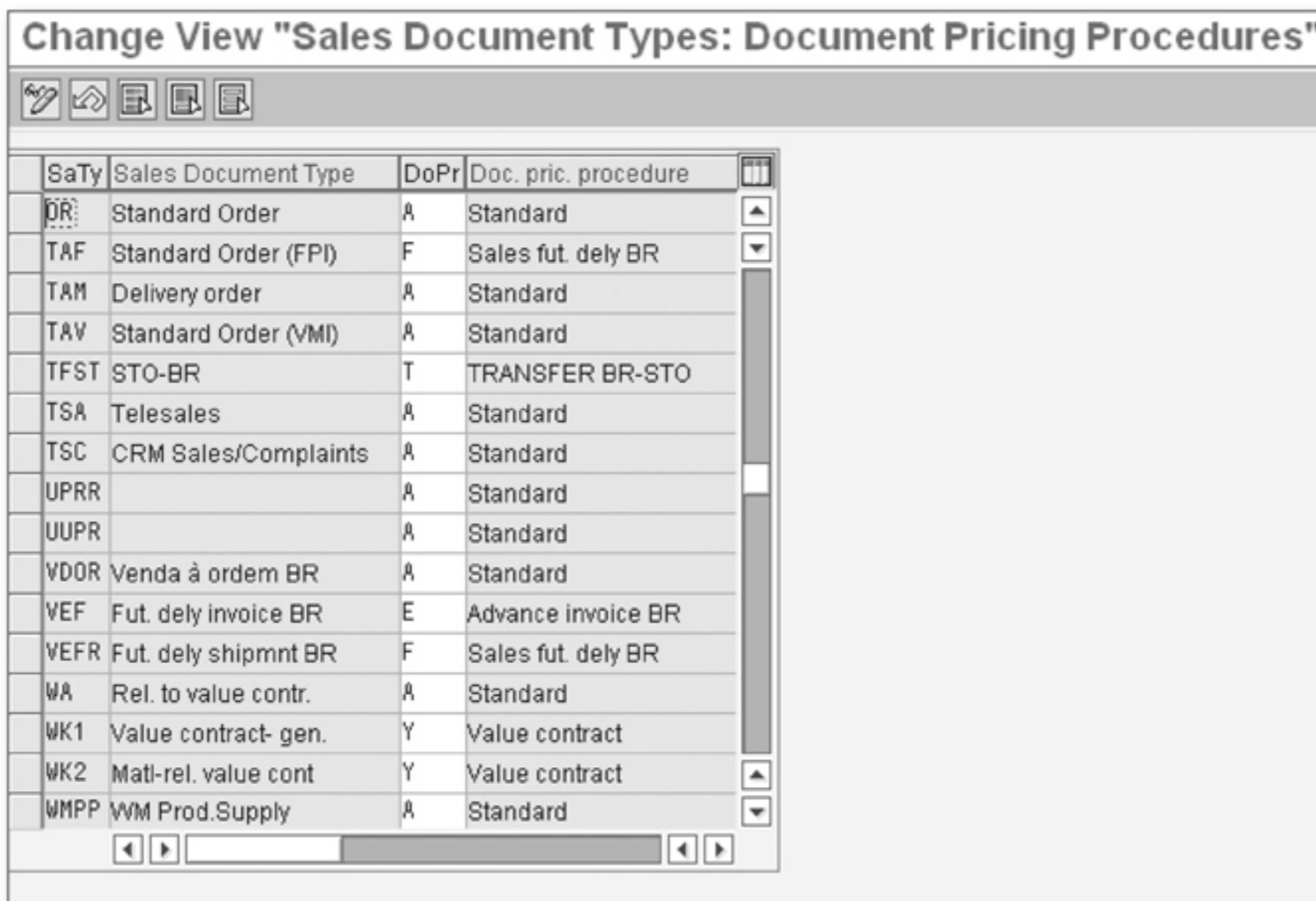
the sales document type is defined, these procedures are assigned to the document types.

2.2.2 Assign SD Document Pricing Procedures to a Document Type

After a document pricing procedure has been defined, you need to associate it with a document type. Because KRYAA Computers uses quotations, contracts, sales orders, rush sales orders, and returns, these sales orders are associated with the SD document pricing procedure. As explained before, KRYAA uses the same document type for sales orders, rush orders, quotations, and contracts. However, a different sales document type is used for returns because the pricing procedure is different.

You can assign the different pricing procedure by going to IMG • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • DEFINE AND ASSIGN PRICING PROCEDURES • ASSIGN DOCUMENT PRICING PROCEDURE TO ORDER TYPES, as shown in Figure 2.7.

Change View "Sales Document Types: Document Pricing Procedures"



SaTy	Sales Document Type	DoPr	Doc. pric. procedure
OR	Standard Order	A	Standard
TAF	Standard Order (FPI)	F	Sales fut. dely BR
TAM	Delivery order	A	Standard
TAV	Standard Order (VMI)	A	Standard
TFST	STO-BR	T	TRANSFER BR-STO
TSA	Telesales	A	Standard
TSC	CRM Sales/Complaints	A	Standard
UPRR		A	Standard
UUPR		A	Standard
VDOR	Venda à ordem BR	A	Standard
VEF	Fut. dely invoice BR	E	Advance invoice BR
VEFR	Fut. dely shipmnt BR	F	Sales fut. dely BR
WA	Rel. to value contr.	A	Standard
WK1	Value contract- gen.	Y	Value contract
WK2	Matl-rel. value cont	Y	Value contract
WMPP	WM Prod.Supply	A	Standard

Figure 2.7 Assign Document Pricing Procedure to Order Type

To further differentiate pricing by customer, you can use a customer pricing procedure. In other words, for the same document type (e.g., standard order), your

customers can have different pricing procedures. Because KRYAA Computers has special requirements such as export duties for international customers, the company defines different customer pricing procedures for domestic and international customers. To accomplish this, you need to define a customer pricing procedure (see Figure 2.8) by going to IMG • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • DEFINE AND ASSIGN PRICING PROCEDURES • DEFINE CUSTOMER PRICING PROCEDURE.

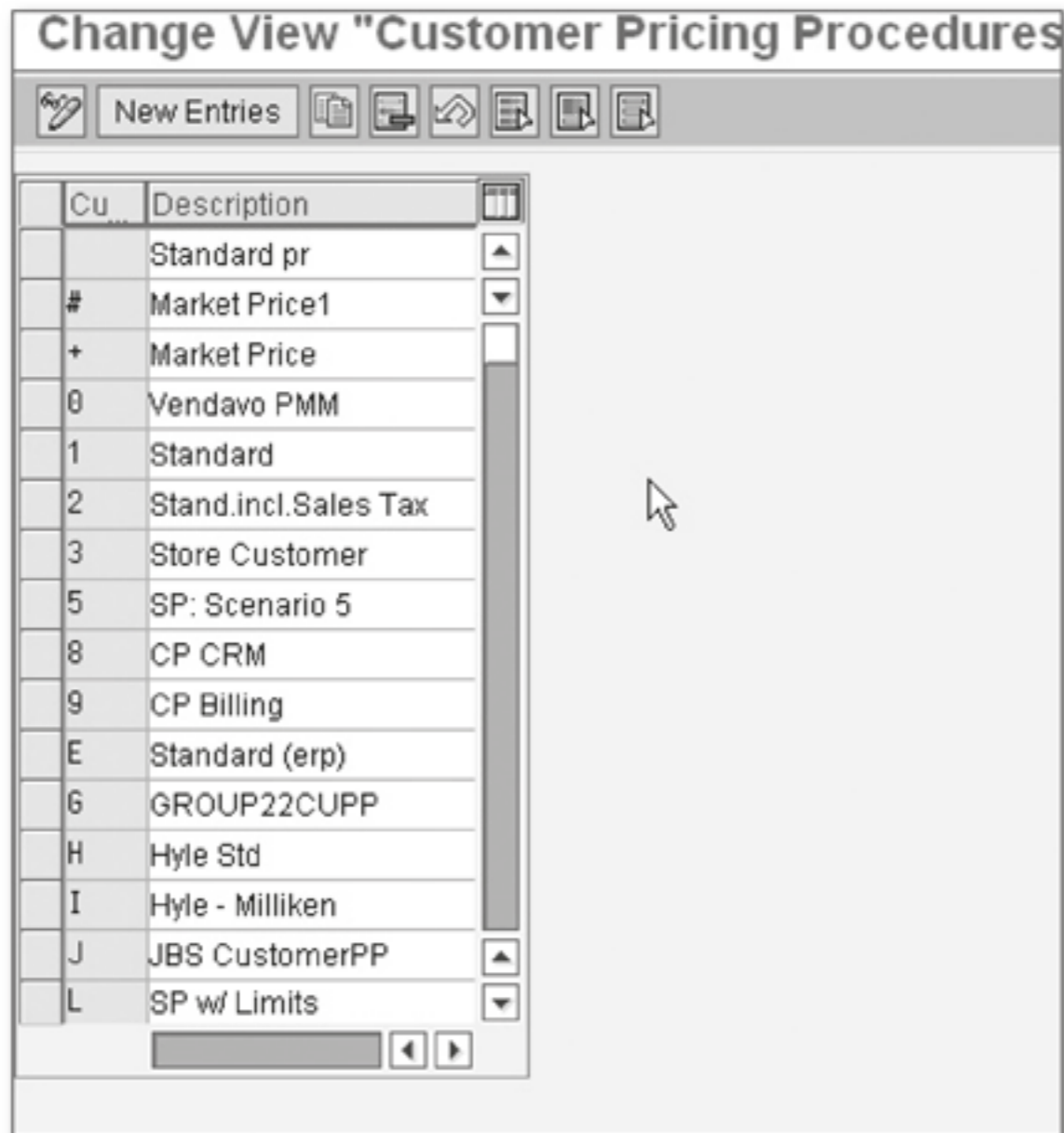


Figure 2.8 Define Customer Pricing Procedure

The customer pricing procedure allows you to manage different pricing procedures for customers; for example, you might want to have a separate procedure for your strategic customer, retail customer, and standard customer.

Now that we have assigned a document to the order type, we are ready to define the pricing procedure.

2.2.3 Define Pricing Procedure Determination

By defining the pricing procedure determination, you'll be able to define the different pricing procedures by sales area (i.e., sales organization, distribution channel, division, etc.), customer pricing procedure, and document pricing procedure.

Though KRYAA Computers has geographically divided its sales organizations as North, South, West, and East, the sales managers decide to use the same pricing procedure across all of the regions. The sales managers realized that they can control the various discounts for different regions and product divisions by using the same pricing procedure without using separate pricing procedures for each region. The only differentiation in pricing procedures is by customers (domestic versus international) and sales documents (quotations, contracts, sales orders, rush orders, and returns).

The menu path to define the pricing procedure (as shown in Figure 2.9) is IMG • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • DEFINE AND ASSIGN PRICING PROCEDURES • DEFINE PRICING PROCEDURE DETERMINATION.

Change View "Pricing Procedures: Determination in Sales Docs"

New Entries

SOrg.	DChl	Dv	DoPr	Cu	PriPr.	Pricing procedure	CTyp	Condition type
						⊕		
0001	01	01	A	2	RVAB01	Tax Included in Price	PR01	Price incl.Sales Tax
0001	01	01	A	Y	ZPKT00	Point Program Procedur	PR00	Price
0001	01	01	C	1	RVCA01	Standard - Free with F		
0001	01	01	C	2	RVCA02	Standard - Free w/out		
0001	01	01	P	1	RVPS01	PS: Order, billing doc		
0001	01	01	P	2	RVPS01	PS: Order, billing doc		
0001	01	01	V	1	PSER01	Periodic Billing	PPSV	Service Price Item
0001	01	01	V	2	PSER01	Periodic Billing	PPSV	Service Price Item
0001	01	01	W	1	PSER02	LVWV Resource Related		
0001	01	01	W	2	PSER02	LVWV Resource Related		
0001	01	01	Z	Y	ZPKT01	Point Program Credit M		
0001	01	22	A	1	RVAA01	Standard	PR00	Price
0001	01	22	A	2	RVAB01	Tax Included in Price	PR01	Price incl.Sales Tax
0001	01	22	A	Y	ZPKT00	Point Program Procedur	PR00	Price
0001	01	22	C	1	RVCA01	Standard - Free with F		

Figure 2.9 Pricing Procedure Determination

Now that we understand how the pricing procedure works, let's see how pricing procedures are determined in various standard SD documents.

2.2.4 Standard Pricing Procedures

As we have explained, pricing procedures bring together the various pricing elements such as list price, discounts taxes, and so on. SAP ERP has defined several standard pricing procedures out of the box that can be used in sales orders, contracts, quotations, returns, rush orders, and more.

The following subsections explain how these pricing procedures are determined for various sales orders, such as inquiries, quotations, and sales orders.

Pricing Procedure in Inquiries

An *inquiry* in the SD functionality stores a customer's request for a product by capturing the customer, material information, and the requested price of a product in the system. To determine the appropriate pricing procedure for an inquiry, the system checks the following elements:

- ▶ Document pricing procedure associated with the document type IN (Inquiry)
- ▶ Customer pricing procedure specified in the sold-to-party record in the sales view
- ▶ Sales area, which consists of the sales organization, distribution channel, and division used when creating the sales order
- ▶ Standard pricing procedures, including RVAAUS and RVAAJUS, which are normally used in the United States for inquiries

Pricing Procedure in Quotations

A *quotation* in SD represents the possible price you want to quote your customer. This captures the customer and material information. To determine the appropriate pricing procedure for a quotation, the system checks the following elements:

- ▶ Document pricing procedure associated with the document type QT (Quotation)
- ▶ Customer pricing procedure specified in the sold-to-party record in the sales view
- ▶ Sales area, which consists of the sales organization, distribution channel, and division used when creating the sales order
- ▶ Standard pricing procedures, including RVAAUS and RVAAJUS, which are normally used in the United States for inquiries

Pricing Procedure in Contracts

A *contract* is a legally binding agreement with a customer in SD. The contract stores the customer's contract price for a product. This captures the customer, material information, and price. To determine the appropriate pricing procedure for a contract, the system checks the following:

- ▶ Document pricing procedure associated with the document types CQ (Quantity Contract) and WK1 (Value Contract)
- ▶ Customer pricing procedure specified in the sold-to-party record in the sales view
- ▶ Sales area, which consists of the sales organization, distribution channel, and division used when creating the sales order
- ▶ Standard pricing procedures, including RVAAUS and RVAAJUS, which are normally used in the United States for inquiries

Pricing Procedure in Schedule Agreements

A *schedule agreement* is also a legally binding agreement with a customer in SD in which the delivery schedules are created. To determine the appropriate pricing procedure for a schedule agreement, the system checks the following:

- ▶ Document pricing procedure associated with the document type LP (Schedule Agreement)
- ▶ Customer pricing procedure specified in the sold-to-party record in the sales view
- ▶ Sales area, which consists of the sales organization, distribution channel, and division used when creating the sales order
- ▶ Standard pricing procedures, including RVAAUS and RVAAJUS, which are normally used in the United States for inquiries

Pricing Procedure in Sales Orders

A *sales order* represents a firm requirement from the customer to buy a product in SD. The sales order captures customer, material, price, and several other attributes. To determine the appropriate pricing procedure in a sales order, the system checks the following:

- ▶ Document pricing procedure associated with the document type OR (Standard Order)
- ▶ Customer pricing procedure specified in the sold-to-party record in the sales view
- ▶ Sales area, which consists of the sales organization, distribution channel, and division used when creating the sales order
- ▶ Standard pricing procedures, including RVAAUS and RVAAJUS, which are normally used in the United States for orders

Note

Document type OR is the standard order applicable in sales order processing. Although there are several variations of sales orders, such as rush orders and cash orders, the mechanism for determining pricing remains the same.

Pricing Procedure in Returns

A *return order* represents the customer's intent to return a product and captures the return authorization number.

Let's consider KRYAA Computers as an example where the customer is returning a defective laptop. First, the customer must give a reference number, which is the original sales order number. After this number is provided, KRYAA's customer service representative can quickly search for the sales order in the SAP ERP System. The original sales order number becomes the return authorization number.

To determine the appropriate pricing procedure for a return, the system checks the following elements:

- ▶ Document pricing procedure associated with the document type RE (Returns)
- ▶ Customer pricing procedure specified in the sold-to-party record in the sales view
- ▶ Sales area, which consists of the sales organization, distribution channel, and division used when creating the sales order
- ▶ Standard pricing procedures, including RVAAUS and RVAAJUS, which are normally used in the United States for returns

Pricing Procedure in Credit/Debit Memos

Credit and debit memo requests are used to represent business scenarios when the customer is charged too much for a product, when the product is defective, or when the customer is charged too little. To determine the appropriate pricing procedure for a credit/debit, the system checks the following elements:

- ▶ Document pricing procedure associated with the document types DR (Debit) or CR (Credit)
- ▶ Customer pricing procedure specified in the sold-to-party record in sales view
- ▶ The sales area, which consists of the sales organization, distribution channel, and division used when creating the sales order

Now that we've discussed how the pricing procedure is determined for various standard sales documents, let's move on to explore why standard pricing procedures may not be sufficient.

2.2.5 Pricing Procedure in Intercompany Sales Orders

Intercompany sales orders are used when the customer's request is received in one sales organization that belongs to one company code, and the product is shipped from a plant that belongs to another company code.

KRYAA Computers perfectly illustrates this because the company manufactures laptops in Boise, Idaho, and sells to international customers (located in Germany, Spain, etc.). The international customers have sales organizations defined for sales in Germany as well as in Spain to reflect how the products will be sold in those countries. These international customers are associated with their own sales organizations, similar to the United States. However, the delivering plant is the manufacturing plant located in Boise, Idaho. In other words, KRYAA is selling products made in the United States to customers residing in another country. These are called as *intercompany orders* to reflect that the manufacturing plants are located in one country, and the customers are located in another country.

To determine the appropriate pricing procedure for intercompany sales orders, the system checks the following elements:

- ▶ Document pricing procedure associated with the document type OR (Standard Order)

- ▶ Customer pricing procedure referencing an intercompany value specified in the sold-to-party record in the sales view
- ▶ Standard pricing procedures, including ICAA001, which are normally used for intercompany sales orders

Having reviewed the standard pricing procedures, let's look at the custom pricing procedures.

2.3 Custom Pricing Procedures

A customized pricing procedure is used when the standard pricing procedures are not sufficient to meet the pricing requirements. Pricing requirements are unique for each company, so almost all companies define at least a few customized pricing procedures.

SAP ERP pricing procedures are sometimes customized for several reasons:

- ▶ The customer requires special pricing elements to be created to capture a restocking fee. For example, when customers return a defective product, such as a laptop, a fee is charged. This is not usually defined as a standard pricing element, so it must be customized.
- ▶ The customer requires a special discount pricing element that is not based on the standard SAP ERP fields provided. For example, customer discounts can be cumulative based on all the line items of a sales order instead of a single line item. A customized discount pricing element has to be defined because this is not available as a standard pricing condition.

It's best to create the new pricing procedures by copying an existing procedure:

1. Identify the standard pricing procedure that you will use as the source for the new customized procedure. The menu path to identify the standard pricing procedure is as follows: IMG • SALES AND DISTRIBUTION • BASIC FUNCTIONS • PRICING • DEFINE AND ASSIGN PRICING PROCEDURES • MAINTAIN PRICING PROCEDURE.
2. Make a copy of the pricing procedure, and rename it as a Z or Y pricing procedure by selecting the standard pricing procedure RVA001, selecting the pricing procedure that you want to copy, and then select the COPY button (**F6**). Name the new pricing procedure "ZVAA01" as shown in Figure 2.10.
3. Remove any unwanted pricing conditions.

Caution

Be careful when deleting unwanted pricing conditions because sometimes condition types such as VPRS (Cost) and DIFF (Rounding Off) are required. The same is true when deleting totals and subtotals because sometimes the subtotals for total discounts and net value are still required.

4. Rename the copied pricing procedure. In this example, as shown in Figure 2.10, we've selected ZVAA01 – COPY OF STANDARD PRICING PROC.

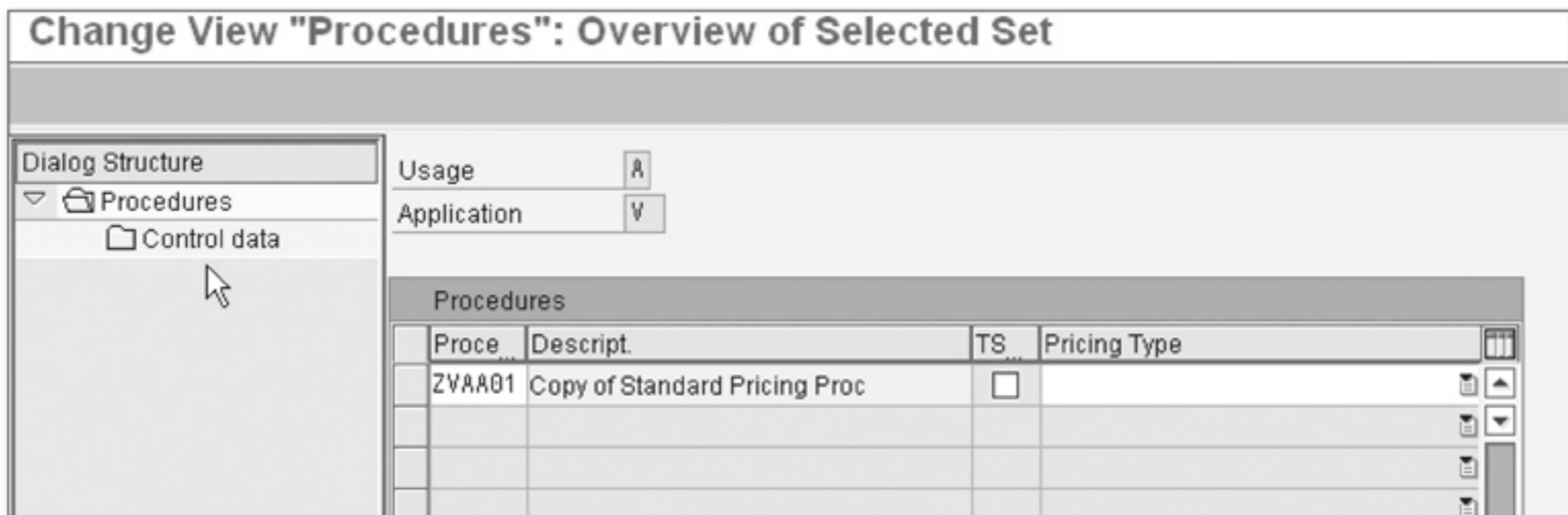


Figure 2.10 New Pricing Procedure Copy from RVAA01 as ZVAA01

If you want to display the pricing procedure on a sales document, use the PRICING CONDITION DISPLAY option. You can use any of the SAP ERP delivered pricing procedures for reference. Just click COPY WITH REFERENCE, and make changes as required.

2.3.1 Defining New Pricing Procedures

Following the copy of the new pricing procedure, you can review the pricing conditions that are applicable and modify or remove the existing pricing procedure. The previous Figure 2.10 shows new pricing procedure ZVAA01 created from a standard pricing procedure.

When pricing procedures are changed, the changes affect only new pricing procedures. The changes do not impact pricing procedures already used in existing documents.

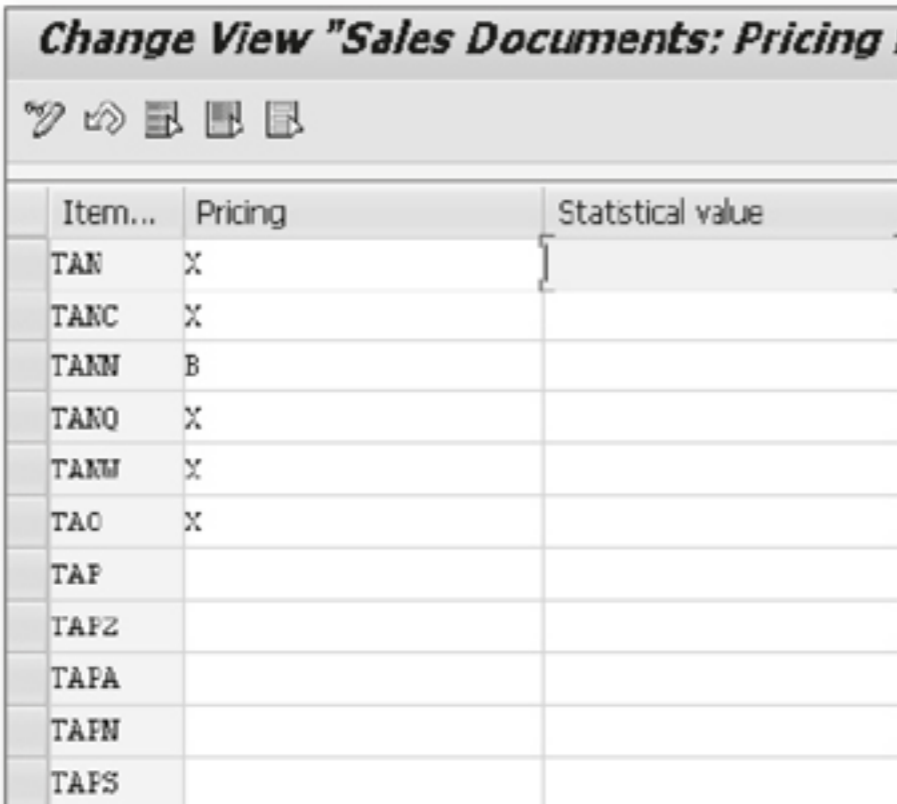
2.3.2 Activating the Pricing Item Category

In addition to defining pricing procedure, you also need to activate pricing at an item category level. This is done using the following menu path: IMG • LOGISTICS • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • DEFINE PRICING BY ITEM CATEGORY. All of the item categories relevant for pricing need to be activated.

Figure 2.11 illustrates that the pricing has been activated for ITEM CATEGORY "TAN". After this indicator has been selected for the item category, the pricing is automatically determined for sales documents that have this item category, and the pricing is added to the cumulative total of the document.

On the other hand, if the STATISTICAL VALUE indicator is chosen, then the pricing is not taken into account for the cumulative value of the document, but the line item shows the price on the sales document.

For example, statistical item category rebates are considered statistical on the sales order because the customer is not given the rebate immediately. Rather the rebate is accrued and paid later, so it is shown as statistical on the sales orders.



Item...	Pricing	Statistical value
TAN	X	
TANC	X	
TANN	B	
TANQ	X	
TANW	X	
TAO	X	
TAF		
TAFZ		
TAPA		
TAFN		
TAFS		

Figure 2.11 Pricing by Item Category

2.4 Customer Hierarchies

Customer hierarchies are defined as logical representations of customer organizations. Large organizations may have customers belonging to different departments that are buying at different negotiated prices.

A customer hierarchy provides the flexibility of defining a customer's organization more effectively. Transaction VDH2N is used to display a customer hierarchy. The menu path for defining customer hierarchies is LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • CUSTOMER HIERARCHY • EDIT.

For example, a customer can have sales organizations or locations on the East Coast and West Coast. The customer may be running a pricing promotion on the East Coast. SAP ERP provides the flexibility to define pricing by using hierarchies. In other words, it is possible to have a different pricing for the East Coast organization versus the West Coast organization even though they belong to the same customer. Figure 2.12 shows how a customer hierarchy is represented.

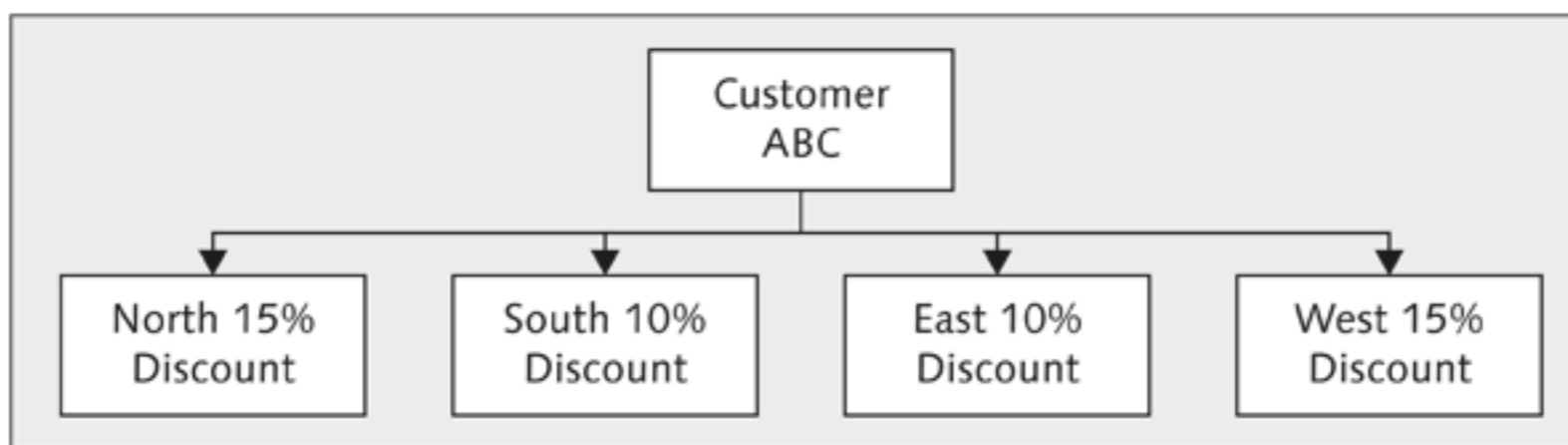


Figure 2.12 Customer Hierarchy Organizational Structure

The customer can be given a different discount based on the region the customer belongs to. To set up customer hierarchies, hierarchy nodes must be created. Hierarchy nodes can be set up using the menu path LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • HIERARCHY NODE • CREATE or Transaction V-12. Figure 2.13 shows how the hierarchy appears in the SAP ERP system.

Maintain Customer Hierarchy, Standard Hierarchy, Dat		
Cust. hierarchy	Customer no.	Loc
Global Customer Hierarchy	100200	US-30000 Atlanta
Global Customer	100100	US-94304 Palo Alto
North Hierarchy Node	100029	US-95054 Atlanta
North Customer	100020	US-30300 Atlanta

Figure 2.13 Maintain Customer Hierarchy

The nodes use a special account group called the Hierarchy account group. The account group is 0012. Hierarchy nodes are useful because they can help model

pricing based on a customer's organizations. Pricing can be defined at hierarchy nodes. All of the customers belonging to a hierarchy node inherit the pricing of the hierarchy node.

Note
 The *account group* is a logical grouping of customers. By using account groups, you can define sold-to-customers, ship-to-customers, and so on.

For example, in the scenario shown earlier in Figure 2.12, Customer ABC can have a 15% discount in the North area and a 10% discount in the South area. If no discount is defined at the lower level, then the discount at the higher level is taken into consideration.

Customer hierarchies are represented by special pricing elements or condition types. HI01 is the pricing condition used to represent discounts by percentage. HI02 is the pricing condition used to represent discounts by amount. To illustrate customer hierarchy pricing elements let's consider an example as shown in Figure 2.14.

Create Standard Order: Item Data

Sales Document Item: 10 Item category: TAN Standard Item
 Material: F126 3H4V Heart rate monitor

Sales A Sales B Shipping Billing Document **Conditions** Account assignment Schedule lines Partners Texts Order Data Status

Qty: 1 EA Net: 82.94 USD Tax: 4.98

N	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr.	Status	NumC	OUn	CCon	Un	Condition value	CdCur	Stat
<input type="checkbox"/>	PR00	Price	9,424.50	USD		100 EA	94.25	USD		1	EA	1	EA	0.00		<input type="checkbox"/>
<input type="checkbox"/>	AZWR	Down Pay/Settlement	0.00	USD			0.00	USD		0		0		0.00		<input type="checkbox"/>
		Gross Value	9,424.50	USD		100 EA	94.25	USD		1	EA	1	EA	0.00		<input type="checkbox"/>
<input type="checkbox"/>	HI01	Hierarchy	12.000	%			11.31	USD		0		0		0.00		<input type="checkbox"/>
		Discount Amount	1,131.00	USD		100 EA	11.31	USD		1	EA	1	EA	0.00		<input type="checkbox"/>
		Rebate Basis	8,294.00	USD		100 EA	82.94	USD		1	EA	1	EA	0.00		<input type="checkbox"/>
		Net Value for Item	8,294.00	USD		100 EA	82.94	USD		1	EA	1	EA	0.00		<input type="checkbox"/>
		Net Value 2	8,294.00	USD		100 EA	82.94	USD		1	EA	1	EA	0.00		<input type="checkbox"/>
		Net Value 3	8,294.00	USD		100 EA	82.94	USD		1	EA	1	EA	0.00		<input type="checkbox"/>
<input type="checkbox"/>	UTXJ	Tax Jurisdct.Code	0.000	%			0.00	USD		0		0		0.00		<input checked="" type="checkbox"/>
<input type="checkbox"/>	JR1	Tax Jur Code Level 1	6.000	%			4.98	USD		0		0		0.00		<input type="checkbox"/>
		Total	8,792.00	USD		100 EA	87.92	USD		1	EA	1	EA	0.00		<input type="checkbox"/>
<input type="checkbox"/>	SKT0	Cash Discount	0.000	%			0.00	USD		0		0		0.00		<input checked="" type="checkbox"/>
<input type="checkbox"/>	VPRS	Internal price	11,514.08	USD		100 EA	115.14	USD		1	EA	1	EA	0.00		<input checked="" type="checkbox"/>
		Profit Margin	3,220.00	USD		100 EA	32.20	USD		1	EA	1	EA	0.00		<input type="checkbox"/>

Condition rec. Analysis Update

Figure 2.14 Customer Hierarchy Condition

In this example, the customer organization is represented by two hierarchy nodes: GLOBAL CUSTOMER HIERARCHY NODE and NORTH HIERARCHY NODE. The GLOBAL CUSTOMER HIERARCHY NODE has one customer assigned to it (Global Customer) and the NORTH HIERARCHY NODE has one customer node assigned (North Customer). North and Global can have different pricing discounts because they belong to different hierarchy nodes.

SAP ERP has provided standard pricing discounts that can be used with customer hierarchies:

- ▶ **HI01:** Customer Hierarchy % Discount
- ▶ **HI02:** Customer Hierarchy Discount Amount

To model percentage discounts, we will use HI01. To use this pricing discount, element HI01 must be defined at hierarchy node 100020 and 100029. The discount defined at hierarchy node 100029 will override the discount defined at 100020.

Customer hierarchy pricing provides the flexibility of defining a pricing discount at the global hierarchy node level (i.e., hierarchy node 100020) and also at the regional level (i.e., hierarchy node 100029). All customers associated with regional hierarchy node receive the regional discount, and all customers who belong to the global hierarchy node receive the discount at that level.

To make this happen, you define different discounts for pricing element HI01 at the regional and global level. The next few sections explain how HI01 is set up and how this pricing condition is displayed on a sales order.

2.4.1 Defining Master Data for Condition Type HI01

HI01 condition will be defined for the customer hierarchy nodes 100020 and 100029, respectively. This is done by using menu path SAP MENU • LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • CONDITIONS • CREATE • CONDITIONS • BY CUSTOMER HIERARCHY or Transaction VK11. Maintain the discount values for customer hierarchies as 12% and 10%, respectively. Figure 2.15 displays the hierarchy condition type, updated in the sales order document.

Create Standard Order: Item Data

Sales Document Item: 10 Item category: TAN Standard Item
 Material: F126 3H4V Heart rate monitor

Sales A Sales B Shipping Billing Document **Conditions** Account assignment Sc

Qty: 1 EA Net: 82.94 USD Tax: 4.98

Pricing Elements									
	N	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr.
<input type="checkbox"/>	PR00		Price	9,424.50	USD	100	EA	94.25	USD
<input type="checkbox"/>	AZWR		Down Pay./Settlement	0.00	USD			0.00	USD
			Gross Value	9,424.50	USD	100	EA	94.25	USD
<input type="checkbox"/>	HI01		Hierarchy	12.000-%				11.31-	USD
			Discount Amount	1,131.00-	USD	100	EA	11.31-	USD
			Rebate Basis	8,294.00	USD	100	EA	82.94	USD
			Net Value for Item	8,294.00	USD	100	EA	82.94	USD

Figure 2.15 Customer Hierarchy Condition Determined in the Sales Document

Now let's review how we activate the hierarchy pricing element within the sales order.

2.4.2 Activating Hierarchy Pricing Elements on the Sales Order

Now that the master data for the hierarchy pricing element has been maintained, it will be activated on the sales order for customers belonging to hierarchy nodes 100020 and 100029.

When a sales order is created for a customer belonging to global hierarchy node 100020, the customer gets a discount of 12% as shown in Figure 2.16.

But when the sales order is created for a customer belonging to both the North Hierarchy Node and the Global Customer Hierarchy Node, a discount of 10% is given, and the global discount of 12% is overridden. This is also shown in Figure 2.16.

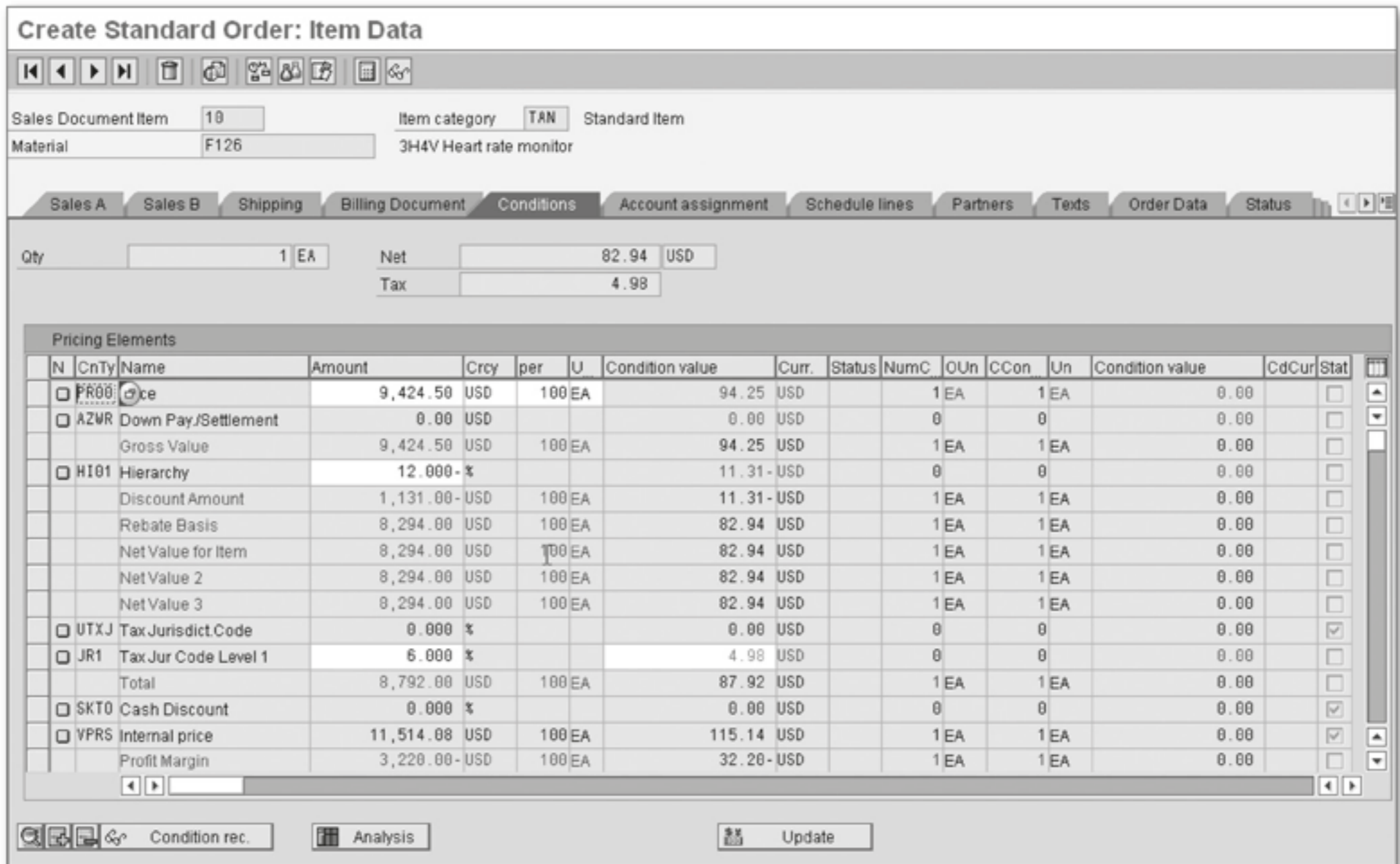


Figure 2.16 Customer Hierarchy Pricing Sales Document: Condition View

The pricing determination indicator on the customer hierarchy must be checked for pricing to be activated. Also it's a good practice to run the update programs on the customer hierarchy nodes whenever the pricing indicator is checked on the customer hierarchy. The update program is available via menu path LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • HIERARCHY NODE • EDIT CUSTOMER HIERARCHY • HIERARCHY • UPDATE PROGRAMS • ALL or via Transaction VDH1N.

2.5 Summary

This chapter explained how pricing procedures are defined by a combination of sales area, customer pricing procedures, and document pricing procedures. This chapter also described how pricing procedures work for standard sales documents such as sales orders, inquiries, quotations, contracts, returns, debit memos, and credit memos.

Customer hierarchies represent the organizational structure of a customer and provide a flexible way to define pricing discounts at the customer node, which allows different discounts for different regions belonging to the same customer.

Finally, the chapter explained some of the reasons why custom pricing procedures are created and how a pricing procedure can be created by copying an existing pricing procedure.

This chapter lays the foundation for Chapter 3, which goes over in detail the different pricing conditions used in the pricing procedure.

A condition technique is a special method used to calculate pricing in documents based on condition records. In this chapter, you'll learn how condition types, access sequences, and condition tables are configured. You'll also learn how to customize formulas and condition-based values.

3 Condition Techniques in Sales and Distribution Documents

In the previous chapter, you explored how pricing is used in Sales and Distribution (SD) documents. You learned that pricing procedures are made up of various pricing elements, which are also known as condition types. Pricing elements are used to represent various prices such as discounts, surcharges, taxes, and so on.

In this chapter, we will delve deeper into the workings of pricing conditions to understand the condition technique. Condition technique is the heart of how pricing is determined in SAP ERP.

First, let's see how pricing works in SD.

3.1 How Pricing Works in Sales and Distribution

Pricing is a term that is broadly used in SD to describe the calculation of prices, but it also includes costs used in cost accounting.

Conditions really represent the factors that are taken into account when pricing is calculated. For example, when a customer buys a product, several factors are at play, including the customer, product, quantity, and date of the product sale when pricing is calculated. These factors are stored as master data.

Pricing works in SD by using condition techniques. A *condition technique* is the systematic way of determining these prices.

Condition techniques combine the following elements to determine pricing:

- ▶ Pricing procedure
- ▶ Condition types
- ▶ Access sequence
- ▶ Condition tables
- ▶ Condition records

As you read this chapter, you'll delve deeper into condition technique concepts, condition types, access sequences with examples, and condition value and tables that store the value, which will help you to better understand how pricing works in SD. This chapter also addresses the maintenance of these condition values.

Finally, we'll explore the application of these configurations and master data to sales document pricing.

Let's review the steps to set up pricing in SD.

3.2 Setting Up Pricing in SD

Each of the elements discussed in Section 3.1 are set up in customizing and have several key parameters that influence how they work. These elements must be set up in a specific sequence in configuration, which are described as follows:

1. Define the pricing condition type that needs to be set up in SD; for example, are we setting up a discount price, gross price, freight, or taxes?
2. Determine which factors influence the pricing condition type. For example, if the pricing condition type is a discount, the discount can be influenced by the customer, or the customer and material. Each condition type has an access sequence that accesses the influencing factors.
3. Determine the priority of the influencing factors. In the example from the prior step, if the pricing is determined by material, or customer and material, then the customer/material is accessed first. If no customer/materials record is found,

then pricing is determined only by material. These different combinations of influencing factors are set up as tables.

4. Put together various condition types, such as discounts, gross price, and freight, logically to create a pricing procedure. A suggested approach is listed here:
 - ▶ First group all of the condition types required to determine gross prices.
 - ▶ Next group discount condition types.
 - ▶ Determine the net price
 - ▶ Group rebates and freights.

Now that you have an overview of the configuration steps involved in pricing setup in SD, let's move on to a detailed understanding of the pricing procedure setup. We introduced pricing procedures in SD in Chapter 2. This topic is included in this chapter again for continuity. Refer to Chapter 2 to get a detailed understanding of the pricing procedure setup.

First, we'll discuss how condition types works.

3.3 How Pricing Condition Types Work

A condition type represents a pricing element. Condition types can be of various kinds, such as net price, discounts, surcharges, costs, taxes, and so on. A condition type has several control elements, such as condition class, condition category, scales, and so on. To set up a pricing condition type, you need to understand these key control elements and how they work.

Let's first see where pricing conditions are set up. You can access condition types by following the menu path **SPRO • LOGISTICS • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL • DEFINE CONDITION TYPES** or via Transaction **V/06**. Figure 3.1 shows the fields for the **CONTROL DATA 1**, **GROUP CONDITION**, **CHANGES WHICH CAN BE MADE**, and **MASTER DATA** sections for condition type **PR00**.

The following sections explain all of the key attributes of a condition type, as you can see from Figure 3.1. Let's review the key sections within the condition type definitions.

Change View "Conditions: Condition Types": Details

New Entries [Icons]

Condit. type PR00 Price Access seq. PR02 Price with Release St
Records for access

Control data 1

Cond. class B Prices Plus/minus positive a
 Calculat.type C Quantity
 Cond.category
 Rounding rule Commercial
 StrucCond.

Group condition

Group cond. GrpCond.routine
 RoundDiffComp

Changes which can be made

Manual entries C Manual entry has priority
 Header condit. Amount/percent Qty relation
 Item condition Delete Value Calculat.type

Master data

valid from Today's date PricingProc PR0000
 Valid to 31.12.9999 delete fr. DB Do not delete (set the deletion 1)
 RefConType Condition index
 RefApplicatio Condit.update

Figure 3.1 Condition Type PR00 Detailed Configurations

3.3.1 Control Data 1

Control Data 1 section explains all the fields that are available to control the pricing condition. These fields include condition class, calculation type, condition category, rounding rule, structure conditions, and the plus/minus indicator.

Condition Class

This field determines how the pricing condition is categorized. The most commonly used condition classes are listed here:

- ▶ **B:** Prices
- ▶ **A:** Discounts
- ▶ **D:** Taxes

For example, when a condition needs to be created as a price, then "B" is used. If a condition needs to be created as a variant (e.g., in variant configuration, quantity discounts, weight discounts, etc.), "A" is used. For tax condition types such as MWST or UT01, use "D". New condition classes cannot be maintained in SAP ERP because they are hardcoded.

Figure 3.1 shows the configuration details within the condition type.

To illustrate this situation, let's consider a computer manufacturer that is selling desktops. The gross price of a desktop is a condition type, and to set this up, we must use condition class "B". If the desktop is sold at a discount during the holidays, the discount is set up as a condition type with condition class "A". In a similar manner, if the desktop is sold in California, the taxes are a condition type with condition class "D". Every condition type can have only one condition class.

Calculation Type

The calculation type determines how the condition type needs to be calculated. The condition can be calculated as a fixed dollar amount, as a percentage, or as a quantity. The commonly used calculation types are listed here:

- ▶ **B:** Fixed amounts
- ▶ **A:** Percentage
- ▶ **C:** Quantity
- ▶ **G:** When a formula has to be defined

If we take the example of the desktop manufacturer further, the gross price is set up as calculation type "C" because it's a quantity-dependent amount (i.e., if there are two desktops, the total gross price is two times the gross price). The discount offered in the preceding example can be set up as a percentage of gross price (i.e., calculation class "A").

We also can define our own procedure for a calculation type by using a formula.

When "G" is assigned to a condition type in the pricing procedures that contains the affected condition type, usually a condition basis formula and a condition value formula must be assigned to this calculation type. But if the condition basis is not important, or if both the condition basis and the condition value are determined within one condition value formula, you don't have to use a condition basis formula. For example, condition type KUMU (cumulative condition type) is defined

with calculation type "G" and uses the formula (condition formula calculation rule) "36" to calculate cumulating conditions in any pricing procedure that uses KUMU. The formula "36" is calculated in Table 3.1.

The cumulative net column calculates the net value of the product by adding all of the component line items and the header line item 0010, 0020, and 0030.

Component	Header	Net Value	Cumulative Net
0010		150	$150 + 25 + 25 = 200$
0020	0010	25	25
0030	0010	25	25

Table 3.1 Pricing Sequence Example

Let's go back to the desktop example for a moment. If the desktop has additional accessories, the keyboard and mouse are represented by line items 0020 and 0030, respectively. The desktop price is represented as the cumulative price of the desktop (Item 0010), keyboard, and the mouse (i.e., $\$150 + \$25 + \$25 = \200).

Condition Category

The condition category is a way to group conditions together. A classification of conditions is essentially a group of conditions that are categorized together and represent a particular application. For example, cost conditions use indicator "G" (transfer prices), and base values use indicator "K" (Base amount excluding tax).

Rounding Rule

This setting helps in either rounding the condition value up or down, or in determining a value according to business standards. For example, if the condition type value is 10.459, it rounds up to 10.46. On the other hand, if the value is 10.454, and the rule is commercial, then the value is rounded down to 10.45.

Rounding rules are driven by specific needs concerning whether the pricing condition value has to be rounded up or rounded off, which can vary by business processes and standards. For example, if the price is set at \$101.7 for 1000 units, and the customer is interested in buying only 10 units, then the price is \$1.017. The rounding rule can be applied to round up the price to \$1.02.

Condition Value (+/- Sign)

The condition value has a prefix of positive or negative, corresponding to the amount. If the condition value is left blank, then it can be either positive or negative.

For example, a condition value for discounts has a “-” sign because the discounts are always subtracted from the gross price. Similarly, freight has a “+” sign. In SAP ERP 6.0, the field is named PLUS/MINUS.

Structural Condition

This setting is used in cumulative pricing conditions and typically for variant configuration or bill of materials (BOM). In our ongoing example, when pricing needs to be carried out for a desktop that has various components, such as RAM, casing, memory, and so on, cumulative condition types such as KUMU are used, and the structural condition value “B” (cumulation condition) must be chosen. By choosing “B”, the condition type KUMU can add the price of the components to determine the total desktop price.

3.3.2 Group Condition

This section describes the group condition, routines, and rounding differences settings. All of these parameters are in the GROUP CONDITION section of Figure 3.1.

Group Condition

Before explaining how a group condition works, it is important to understand the definition of scale.

Scale represents a range at which a particular discount is offered. For example, when a customer buys up to 100 PCs, no discounts are offered. However when the customer buys more than 100 PCs but less than a 1000, a discount of 5 % can be offered for PCs. When customers buy more than 1000 PCs, a discount of 7% is offered. In short, the discount would be defined as follows:

- ▶ 1-100: No discount
- ▶ 100-999: 5% discount
- ▶ 1000+: 7% discount

This setting is used when pricing has to be determined based on the cumulative value of line items. Select the GROUP COND. indicator by a check in the checkbox.

Let's consider an example of a corporate customer buying 200 IBM PCs and 100 DELL PCs. The customer is eligible for a discount of 15% if the cumulative value of the purchase exceeds 250 PCs. This situation is represented in Table 3.2, where we have a sales order with two line items that belong to material group "03" (PCs Material Group).

Material	Quantity	Material Group
IBM PCs	200	03
DELL PCs	100	03

Table 3.2 Grouping of PCs by Material group

To explain how group condition works, let's consider that if a quantity of 10 PCs are purchased, the customer is eligible for a 10% discount. If he purchases up to 250 PCs, a 15% discount is applied. The scales define the quantities eligible for various discounts.

A condition type is set up as a group condition and the pricing condition records must have scales. This is illustrated in Table 3.3. In this example, for PCs purchased up to 250 units, the discount is 10%, while anything over 250 units has a discount of 15%.

Scale Quantity	Discount
From 10 PC	10%
From 250 PC	15%

Table 3.3 Condition Table Scale

Individually, neither the IBM PCs nor the DELL PCs sales order line items qualify for the 15% discount because neither sales order line item exceeds 250 PCs cumulatively. But the cumulative total for the sales order exceeds 250 pieces for the PCs material group and qualifies for a higher discount of 15%.

Rounding Difference Comparison

If the `ROUNDDIFFERENTCOMP` indicator is set, the system compares the condition value at the header level with the total of the condition values at the item level. The difference is then added to the largest item. For example, if the invoicing

header condition pricing is \$100, and the line items total to \$99.95, the difference of \$.05 is added to the largest line item so that there is no rounding difference. This indicator basically determines how the differences between header and line items are settled.

Group Condition Routine

This is a formula that can be used to control the basis for determining the scale value. For example, the basis (e.g., number of pieces) of the group condition can be some or all of the pricing conditions in a document.

3.3.3 Changes Which Can Be Made Section

The CHANGES WHICH CAN BE MADE section, shown in Figure 3.1, controls whether a condition can be changed on the sales order, whether a valid condition record is found, and whether it takes priority over manual entry or whether it can only be processed automatically (i.e., cannot be changed on sales orders). The fields in this section of the screen are described in the following subsections.

Manual Entries

This setting controls whether manual entry takes priority over automatic calculation of the condition type. If you choose "C", then manual entry takes priority. If you choose "B", then automatic entry takes priority.

Header or Item Condition

These settings specify whether the condition type appears as a header or line item.

Delete

This setting controls whether the condition type can be deleted from the sales document.

Value

This setting controls whether the value can be overwritten on the sales document.

Calculation Type

This indicator controls whether you can change the calculation type at the time of processing on the sales document.

3.3.4 Master Data Section

In this MASTER DATA section of Figure 3.1, references can be made to other condition types and pricing procedures for supplements. *Supplements* are additional pricing procedures that can be maintained. In Figure 3.1, the pricing condition PR00 has additional pricing conditions selected by using the pricing procedure PR0000.

Pricing Procedures

A condition can reference a pricing procedure, which in turn can reference a set of conditions called *supplemental conditions*. For example, condition type PR00 can reference conditional supplements KA00, RA00, and other discounts by referencing another procedure PR0000 as shown. This is used, for example, when a list of discounts needs to be applied to the gross price. This is applied when a list of discounts is provided to a customer.

Valid To and Valid From Dates

Valid to and valid from dates are proposed when using rebate agreements. These dates are automatically proposed by the system depending on what values are maintained in the VALID FROM and VALID TO fields. For example, the VALID FROM value can be "1", "2", and so on. These default values can be changed in the rebate agreement, which represents the current date and current month. VALID TO dates can have "1", "2", and so on, which represents the end of the current month and end of the current year, respectively.

For example, if you have a rebate agreement that starts in January 2011 and has an end date of December 2011, then the VALID FROM date will have a value of "1", and the VALID TO date will have a value of "2", which represents the end of the year.

Reference Condition Type

A condition can reference another condition record. The reference condition type is used when the referencing condition is similar to the condition record, but the calculation type, description, or access sequence differs.

For example, when using intercompany pricing, the end customer price PI01 needs to be copied to the intercompany pricing condition IV01, so IV01 references condition type PI01.

In the customer pricing procedure, we want to use PI01 as a statistical condition, and this value will be transferred as an intercompany price on the intercompany pricing procedure.

To use PI01, follow these steps:

1. Check that the pricing condition type IV01 has the reference pricing condition type PI01 in MAINTAIN CONDITION TYPES (Transaction V/06).
2. Create a pricing procedure for the end customer, and include pricing condition type PI01 in the pricing procedure (Transaction V/08). Also include pricing condition type IV01, and mark the condition as statistical by selecting the STATISTICAL checkbox in the pricing procedure.
3. Create another pricing procedure for intercompany pricing and have the pricing condition type IV01 included in this pricing procedure (Transaction V/08).

In another possible instance, if the condition type copied from the existing pricing condition needs a different description, then you can create a new condition type that references the condition type but has a different description. The pricing condition that has a reference condition can have its own access sequence.

Note that the pricing condition and the access sequence share the same condition tables, but they do not need to be in the same sequence. For example, a reference condition has several access sequences, but a new condition that has the reference condition can have only one access sequence. In Figure 3.2, condition type ZRVS has been created with respect to reference PR00. Notice that the ACCESS SEQ. is ZR02. PR00, on the other hand, has access sequence PR00.

While the sales order is being processed, the condition ZRVS references the reference condition PR00, as mapped within the MASTER DATA section.

In terms of the condition value, only PR00 condition values are maintained. On the sales order, the pricing for the reference condition is activated.

Change View "Conditions: Condition Types": Details	
<input type="button" value="New Entries"/> <input type="button" value="Print"/> <input type="button" value="Refresh"/> <input type="button" value="Back"/> <input type="button" value="Forward"/> <input type="button" value="Help"/>	
Condit. type	ZRVS Reference PR00
Access seq.	ZR02 Price with Release St
Records for access	
Control data 1	
Cond. class	B Prices
Plus/minus	<input type="checkbox"/> positive a
Calculat.type	C Quantity
Cond.category	<input type="checkbox"/>
Rounding rule	<input type="checkbox"/> Commercial
StrucCond.	<input type="checkbox"/>
Group condition	
<input type="checkbox"/> Group cond.	GrpCond.routine <input type="checkbox"/>
<input type="checkbox"/> RoundDiffComp	
Changes which can be made	
Manual entries	C Manual entry has priority
<input type="checkbox"/> Header condit.	<input checked="" type="checkbox"/> Amount/percent
<input checked="" type="checkbox"/> Item condition	<input type="checkbox"/> Value
<input type="checkbox"/> Delete	<input type="checkbox"/> Qty relation
	<input type="checkbox"/> Calculat.type
Master data	
valid from	<input type="checkbox"/> Today's date
Valid to	<input type="checkbox"/> 31.12.9999
RefConType	PR00
RefApplicatio	V
PricingProc	PR0000
delete fr. DB	Do not delete (set the deletion 1)
<input checked="" type="checkbox"/> Condition index	
<input type="checkbox"/> Condit.update	

Figure 3.2 ZRVS References PR00 and Has a Different Access Sequence

Figure 3.3 displays the application of the reference condition in a sales document. To get to the screen shown in Figure 3.3, you need to create a sales order using Transaction VA01. Enter a CUSTOMER, MATERIAL, QUANTITY, and DATE.

When a condition has to be copied from a different application, then the REFERENCE APPLICATION field can be used to indicate the application to be copied from, for example, a Materials Management (MM) pricing condition might be copied from a sales pricing condition. The condition types have to be very similar so that there is some advantage in referencing.

Sales Document Item	10	Item category	TAN	Standard Item				
Material	BATMAT	AKT FERT Material Ffor Batch						
<div style="display: flex; justify-content: space-between;"> Sales A Sales B Shipping Billing Document Conditions Account assignment Sch </div>								
Qty	1	EA	Net	3.000,00 EUR				
			Tax	570,00				
Pricing Elements								
N	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr.
△	PR00	Price	100,00	EUR	1	EA	100,00	EUR
□	ZRVS	Reference PR00	3.000,00	EUR	1	EA	3.000,00	EUR
		Gross Value	3.000,00	EUR	1	EA	3.000,00	EUR
		Discount Amount	0,00	EUR	1	EA	0,00	EUR
		Rebate Basis	3.000,00	EUR	1	EA	3.000,00	EUR
		Net Value for Item	3.000,00	EUR	1	EA	3.000,00	EUR

Figure 3.3 Reference Condition on a Sales Order

Delete from Database

This field allows you to set the following values as shown previously in Figure 3. Use the following values to make specific settings:

▶ **[] (blank)**

You can set an indicator so that the condition record is no longer used in pricing. The condition record is then archived in the archiving run. This was typical before release 4.6A. For example, if a condition type is no longer needed or used, then it is archived.

▶ **A (delete with pop-up)**

You can delete the condition records from the database. You then receive a pop-up message, asking whether the condition record should actually be deleted or whether the deletion indicator should simply be set.

▶ **B (delete without pop-up)**

You can delete the condition records from the database and no pop-up message is shown. You only receive a pop-up message if there are condition supplements available.

Condition Index

You can use this checkbox to specify if the condition index is updated or not. Indexes are specified for faster searches.

For example, if all of the condition records need to be accessed for a condition type regardless of materials, then this setting can be activated. If the condition records are to be accessed regardless of materials, then the search will take much longer to get all of the records. So, in this example, the condition index is activated by selecting the checkbox.

Condition Update

This setting controls whether limit values are relevant for pricing, such as making a particular condition record in the document dependent on a specified total value. This total value can be specified in the condition record. For example, an online retail company specifies a discount for the first \$100 that a customer spends. So every order that has a discount is cumulated and checked against this value to see if the total spent by the customer has exceeded \$100. When the value exceeds \$100, then the condition is deactivated in the sales document. The discount is no longer given to the customer after the \$100 amount has been reached.

Figure 3.4 in the next section shows the additional controls that can be used to control the pricing condition type, namely SCALES, CONTROL DATA 2, and TEXT DETERMINATION.

3.3.5 Scales Section

Let's review some of the key elements with the scale function in the SCALES section of Figure 3.4.

Scales			
Scale basis	<input checked="" type="radio"/> Quantity scale	Scale formula	<input type="text"/>
Check value	<input checked="" type="radio"/> Descending	Unit of meas.	<input type="text"/>
Scale type	<input type="checkbox"/> can be maintained in con		
Control data 2			
<input type="checkbox"/> Currency conv.		Exclusion	<input type="checkbox"/>
<input type="checkbox"/> Accruals	<input type="checkbox"/> Variant cond.	Pricing date	<input type="checkbox"/> Standard (KOMK-PRSDT; ta
<input type="checkbox"/> Inv.list cond.	<input type="checkbox"/> Qty conversion	Rel.Acc.Assig	<input type="checkbox"/> Relevant for account ass
<input type="checkbox"/> Int-comBillCond			
<input type="checkbox"/> ServiceChgeSe			
Text determination			
TextDetPrc	<input type="text"/>	Text ID	<input type="text"/>

Figure 3.4 Scales and Control Data 2 of the Pricing Condition Type

Scales Basis

The SCALE BASIS indicator controls the basis for scales. The basis can be quantity, value, weights, and so on.

The SCALES BASIS indicator might be used in the real world at a stationery company, for example, that is selling notepads to a corporate customer. The company offers a scale discount based on the quantity of notepads. If the customer buys fewer than 100 notepads, the price is \$2 per item. If the customer buys fewer than 1000 notepads but more than 100 notepads, then the price is \$1.80 per item. If the customer buys fewer than 5000 notepads but more than 1000 notepads, the price is \$1.60 per item. This can be set up in the SCALES BASIS field as follows:

- ▶ Up to 100 notepads: \$2/item
- ▶ Up to 1000 notepads: \$1.8/item
- ▶ Up to 5000 notepads: \$1.60/item

Check Value

The CHECK VALUE indicator controls whether the scale is entered in ascending order or descending order. Using the example of the stationery company, if the CHECK VALUE is marked DESCENDING, then the scales are displayed as listed here:

- ▶ Up to 100 notepads: \$2/item
- ▶ Up to 1000 notepads: \$1.8/item
- ▶ Up to 5000 notepads: \$1.60/item

Scale Type

The SCALE TYPE controls the validity of the scale, that is, from a certain quantity, up to a certain quantity, or in intervals. The following values are entered in the SCALE TYPE box as shown in Figure 3.4:

- ▶ **A:** Base scale
- ▶ **B:** To scale
- ▶ **C:** Not Used
- ▶ **D:** Graduated scale

An example of graduated scale is defined here:

- ▶ 1 through 10 units: Price = \$15
- ▶ 11 through 20 units: Price = \$12.5
- ▶ 21 through 30 units: Price = \$12

If a sales order comes in for 26 pieces, the first 10 units are valued at \$15 per piece, the next 10 units are at \$12.50, and finally the last 6 units are at \$12. But if the scale type is "B", then the entire 26 units are valued at \$12. The scales are defined here:

- ▶ Up to 10 units = \$15
- ▶ Up to 20 units = \$12.5
- ▶ Up to 30 units = \$12

If the scale type is "A", then the entire 26 units are valued at \$12. The scales are defined here:

- ▶ From 1 unit = \$15
- ▶ From 11 units = \$12.5
- ▶ From 21 units = \$12

Scale Formula

The SCALE FORMULA field can be used to determine alternate forms of scale basis, if the standard scale bases provided by SAP ERP don't meet the company requirement. The scale formulas "1" (Free) or "23" (Partial) are often used.

Unit of Measure

The UNIT OF MEAS. field is used to specify group conditions. The system automatically proposes the unit of measure when you maintain records for group conditions that are either weight-dependent or volume-dependent.

3.3.6 Control Data 2

The CONTROL DATA 2 area of the screen shown previously in Figure 3.4 includes control fields such as CURRENCY CONV., ACCRUALS, and many more. We will go over the key configurations elements in the following subsections.

Currency Conversion

The CURRENCY CONV. field controls when the currency conversion takes place: before the document is saved or after the document is saved.

Accruals

The ACCRUALS indicator controls the accruals amount. For example, rebate pricing conditions are accrued over a period of time prior to settlement. If this field is selected, then the accrual appears as a statistical figure on the sales document.

Variant Condition

Variant condition is used for variant configuration when the pricing conditions have to be set for variants of materials. VA00 and VA01 are examples of this condition type. For more information on variant condition, refer to Chapter 10.

Quantity Conversion

The quantity conversion indicator is used when the calculation rule equals "C" and during condition basis determination. If the sales quantity unit and the condition quantity unit are identical, the quantity of the document item is used, that is, the actual quantity.

Invoice List Condition

Invoicing list is a powerful functionality in which the system generates a list of billing documents at periodic intervals that is then sent to a specific payer.

For example, the head office of a large organization may take responsibility for paying all of the invoices. The group payer takes responsibility for paying the invoice lists and then collecting payment from the individual members. In return for these services, the group payer usually earns a factoring discount.

As a prerequisite to processing this invoice list, condition type RL00 has this indicator set. This condition type is called *factoring discount*.

This indicator makes the condition relevant for internal costing. Internal cost allows you to post the price to the cost accounting along with sales revenue.

Intercompany Condition

Intercompany condition indicates that it is an intercompany condition and is activated on intercompany sales orders such as IV01 and IV02. These conditions are defined as statistical on regular orders.

Service Charge Settlement

Service charge settlement indicates that the trading contract conditions should be calculated using the vendor billing document. Trading contracts integrate multiple legal contracts. This indicator is set only if the condition type is used in a trading contract.

Exclusion Indicator

The EXCLUSION indicator is used when a condition record needs to be excluded. For example, when some customers receive favorable prices, then the discount should be excluded because the customer is already receiving a good price.

Customers can receive favorable prices if a large percentage of the client's business involves this customer or if the customer is a major player in the industry. For instance, when Walmart is a customer of a product producer or distributor, it has a considerable influence on the price of the products it buys.

To configure this pricing condition for the large-scale customer, the system is set with the EXCLUSION indicator. When this indicator is set, all of the discounts are ignored for the customer. Value "A" can be set in the condition type as a configuration parameter for this purpose or it can be set for a specific customer.

Pricing Date

The PRICING DATE indicator controls the date on which a pricing condition type is activated. For example, if ORDER DATE ("E") is used, then the pricing is determined by the price on the order date. On the other hand, if the CREATION DATE ("D") of the sales document (e.g., sales order) is used, then the system finds the available price on the creation date (of the sales order) of the sales document. If is left blank or "B" is chosen, then the pricing date on the sales document is used.

Relevancy for Account Assignment

The relevance for account assignment indicator controls how the account assignment of services is performed in the sales order. But if "B" is chosen, then the accounting

indicator in the system includes the accounting indicator in the account assignment process. The information from the condition record is forwarded to Controlling (CO) with the classification "accounting indicator." The system links the condition record to the underlying billing document item to find the accounting indicator that has been assigned to a particular transaction. "B" is used for service-related transactions, and condition type KBM1 is used for this purpose.

3.3.7 Text Determination

In this section, we'll review the TEXT DETERMINATION area of Figure 3.4 (shown earlier) and the associated configuration steps.

Text Determination Procedure

The text determination procedure identifies the sequence in which the text types appear. Each text procedure can be associated with multiple text IDs in customizing for Text determination in SD (Transaction VTXN). These texts appear on condition records. The text procedure and determination are maintained in text determination procedures under SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • TEXT CONTROL • DEFINE TEXT TYPES • DEFINE ACCESS SEQUENCES for determining texts and assigning text procedures (Transaction VOTXN).

Text Types

In the TEXT TYPE field, you select the text types that can be associated with pricing texts. The text type is a four-digit ID that identifies the text ID DESCRIPTION. See Figure 3.5 for examples of text types and ID descriptions.

Text Object		KONP
Maintain Text ID for Object		
Text	ID Description	
0001	Internal comment	▲
0002	Permits	▼
0003	Concluding comments	
1000	Bonus payments	

Figure 3.5 Text Types

Next, let's review the text types and text procedures.

Text Types and Text Procedures

After the text types have been defined, you must define the sequence in which these text types are called. The text procedure is defined in the same step (define the text procedure and then define the sequence) as shown in Figure 3.6.

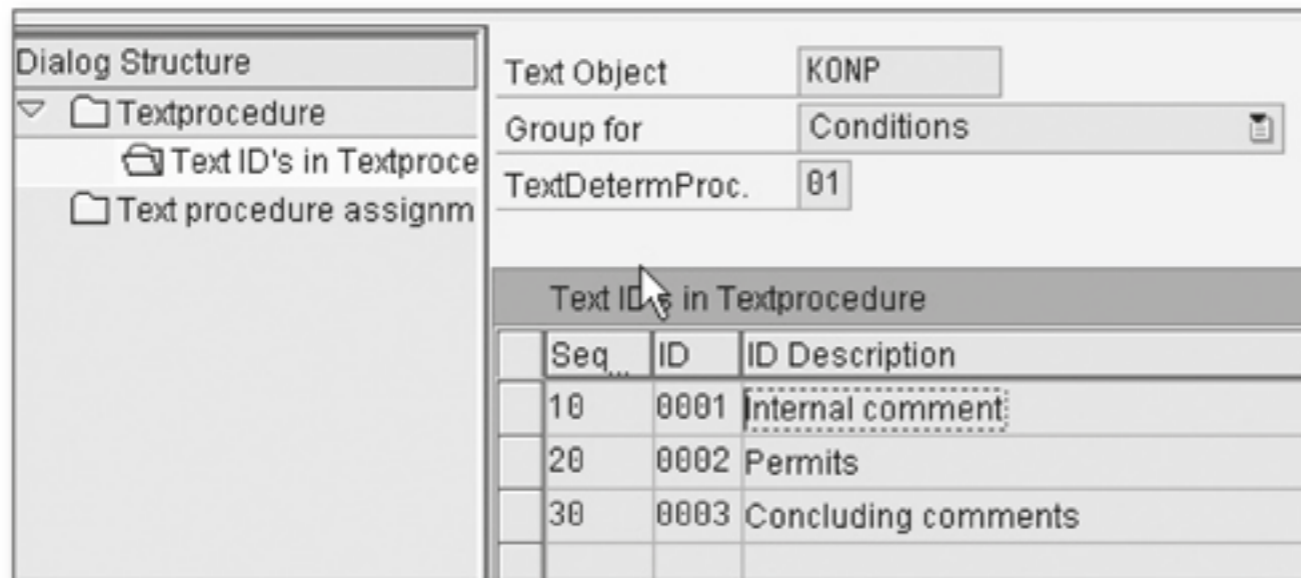


Figure 3.6 Define Text Procedure and Sequence

Now, let's review how we assign the text procedure to the condition type.

Assign Text Procedure to Condition Type

After you have defined the text type, and the access sequence and text procedure have been defined, the next step is to assign the text procedure to the desired condition type selecting TEXT PROCEDURE ASSIGNMENT in the directory tree, as shown in Figure 3.7.

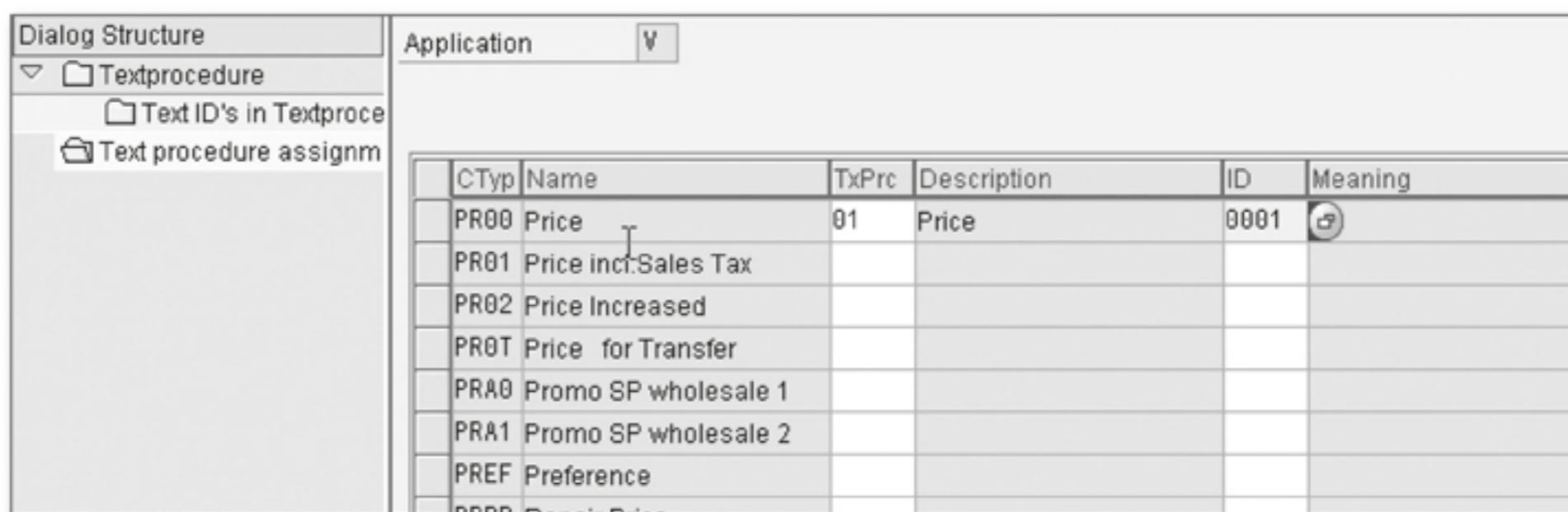


Figure 3.7 Assign the Text Procedure to Condition Types

Now let's move on to discuss the access sequence.

3.4 Access Sequences

A pricing condition can be defined for a customer and material, material, material group and customer, and so on. Various combinations of material, customer groups, and material pricing groups are possible. An access sequence refers to the way a condition type accesses the various possible combinations. To define access sequences, you can use the menu path SPRO • LOGISTICS • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL • DEFINE ACCESS SEQUENCES or use Transaction V/07.

Let's consider a real-world example of a desktop computer manufacturer: Desktops Inc. The manufacturer is offering special prices because of the holiday season. The manufacturer has grouped customers by retailers and end customers, and priced the desktops based on the group the customer belongs to. Not only that, but special customers who have been doing business with Desktops Inc. for a long time are given the best prices.

The list price has two groupings: Product/Special Customers and Product/Customer Groups. The access sequence provides the list price for these two groups. Using condition type PR00 as the list price, the access sequence provides a way to access these two different prices.

SAP ERP offers several standard pricing access sequences, which are used with the existing pricing condition types. For example, pricing condition PR00 uses pricing access sequence PR00.

From a business perspective, this means the gross price (condition type PR00) can be maintained only for a material, a customer and material, or a customer group and material. For example, if Desktop Inc. has to maintain the gross price for the desktop, then the price can be defined as \$1600 for regular customers, \$1500 for special customers, and \$1450 for customers belonging to the public sector, identified by the customer group Public Sector. If the standard pricing conditions provided by SAP ERP are not sufficient, you can define custom access

The access sequence identifies the sequence in which the various combinations of fields can be accessed. For example, Figure 3.8 shows the access sequence PR00 associated with condition type PR00.

No.	Tab	Description	Requirement	Exclusive
10	5	Customer/Material		<input checked="" type="checkbox"/>
20	6	Price List Type/Currency/Material		<input checked="" type="checkbox"/>
30	6	Price List Type/Currency/Material	3	<input checked="" type="checkbox"/>
40	4	Material		<input checked="" type="checkbox"/>

Figure 3.8 Access Sequence for PR00

The No. column represents the sequence in which the various combinations of fields are accessed. Figure 3.8 should be read left to right and then top to bottom. First, look for number "10"; this is the first access. If the pricing condition cannot find a record, it goes to the next number, "20", which is PRICE LIST TYPE/CURRENCY/MATERIAL. In this way, the pricing condition seeks a condition record by the sequence. The search continues until it finds a value or it reaches the end of the sequence.

The TAB column (Table) represents the combination of fields. For example, TAB 5 represents customer and material. The combination of fields is determined based on how pricing needs to be determined.

The REQUIREMNT column represents a condition that needs to be fulfilled to access the condition table. For example, requirement "003" ensures that a particular table is accessed only if the item category is checked for pricing. The coding for requirement "003" is shown in Figure 3.9.

```

1  * Pricing is turned on in item category configuration (TVAP)
2  form kobed_002.
3    sy-subrc = 4.
4    if komp-kposn ne 0.
5      check: komp-prsfd ca 'BX'.
6      check: komp-kznep = space.
7    endif.
8    sy-subrc = 0.
9  endform.
10 * Prestep
11 form kobev_002.
12   sy-subrc = 0.
13 endform.
14

```

Figure 3.9 Example of Requirement to Check Pricing

The next column in Figure 3.8, EXCLUSIVE, ensures that the search for condition records stops as soon as a condition record is found. In our example, the system first checks for sequence 10 to see if there is a valid customer/material record. If it finds a record, then the search for a valid record stops there. The search does not continue to sequence 20.

Now that we have covered access sequences, let's discuss condition tables.

3.5 Condition Tables

As we know, pricing values are represented by condition types, and these values are stored within the system with condition tables. These condition tables consist of fields, which represent the attributes.

Let's use the previous real-world example of Desktops Inc., where the list price varied by Special Customers/Product and Customer Groups/Product. You learned that the access sequence provided a way to access this data (i.e., customer, customer group, products). This data is actually stored in condition tables, and the customer/customer groups/products are represented as condition fields.

In the previous section, we showed how each step of an access sequence has a table associated with it. The condition table defines the fields that can be used for each sequence. The menu path for defining an access sequences is SPRO • LOGISTICS • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL • DEFINE CONDITION TABLES, or you can access the sequence via Transaction V/0. Here you can also find the options to change and display the condition tables and allowed fields. SAP ERP offers several standard pricing condition tables, which are used with the existing access sequences. For example, pricing access sequence PR00 uses condition tables 10, 20, 30, and 40.

If the standard pricing conditions tables provided by SAP ERP are not sufficient, you can define custom tables. Let's return to the real-world example of Desktops Inc., which defines condition tables based on customer groups and product. As explained before, the customer groups represent retailers such as Walmart or Best Buy. The products are the desktops sold by Desktops Inc.

To create a condition table for this example company, follow these steps:

1. Use menu path SPRO • LOGISTICS • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL • DEFINE CONDITION TABLES, and choose CREATE CONDITION TABLE.
2. Enter the custom condition table ID: in this example, enter "996" as shown in Figure 3.10.

Table <input type="text" value="996"/>	
<input checked="" type="checkbox"/> With validity period <input checked="" type="checkbox"/> with release status	
Selected fields	FieldCatlg
Long Key Word	Long Key Word
	Accounting Indicator
	Activity Code GI Tax
	Agreement
	Base Unit of Measure
	Batch
	Bill-to party
	CAP prod. group
	Campaign ID
	Catalog
	City code
	City of deliv.plant
	Commission group
	Company Code
	Condition Contract
	Conditn pricing date

Figure 3.10 Pricing Condition Table

The system displays a list of allowed fields in the FIELDCATLG column, which can be used to create the custom table.

3. Select the desired fields of the custom table by double-clicking the available list of fields.
4. Select the GENERATE button, and assign the "Package". Assigning the package refers to linking the custom table to a 4 digit code (e.g. ZTMP). Upon selecting the GENERATE button the system will request you to input this code.

Note

Related objects in the ABAP Workbench are grouped together in a package. The assignment of an object to a package is entered in the object directory (TADIR). The package determines the transport layer that defines the transport attributes of an object. The transport layer defines how the pricing condition table is moved from the development system to the quality system and finally to the production system.

5. Click the **SAVE** button, and assign a transport request to the generated table. The system generates the table **A996** in the background. This table stores the table contents for the customer group/material combination. The description for the table is automatically assigned as shown in Figure 3.11.

Technical view		Other description	Field attributes...
Table	996	Cust.group/Material	
		<input checked="" type="checkbox"/>	With validity period
		<input checked="" type="checkbox"/>	with release status
Selected fields		FieldCatlg	
Long Key Word		Long Key Word	
Customer group		Hierarchy	
Material		Hierarchy Node	
		Incoterms	
		Incoterms (Part 2)	
		Industry	
		Internal object no.	

Figure 3.11 Custom Table Creation

Next, let's review the condition fields associated with the condition type.

3.6 Condition Fields

In Section 3.6, we choose from a list of allowed fields to create our condition table. But, sometimes the list of allowed fields may not be sufficient; for instance, if there is a requirement to create a freight condition type based on the port of discharge. This is not a standard field that SAP ERP offers, so we need to create a new Z-field for this purpose.

3.6.1 Creating a Custom Field for the Pricing Table

In this example, an “Item” category needs to be included as a pricing field. Because this is not available as a standard field for pricing, we must first create this category as a data element in Transaction SE11 by following these steps:

6. Create the data element ZZITEMCAT in Transaction SE11 as a data type (shown in Figure 3.12).

Note

Note that to create new data types, the user must be registered as a developer.

The screenshot shows the SAP SE11 transaction interface for creating a new data element. At the top, the 'Data element' field contains 'ZZITEMCAT' and the status is 'New(Revised)'. The 'Short Description' field contains 'Item category'. Below this, there are four tabs: 'Attributes', 'Data Type', 'Further Characteristics', and 'Field Label'. The 'Data Type' tab is selected. Under the 'Data Type' section, the 'Elementary Type' radio button is selected. Within 'Elementary Type', the 'Domain' radio button is selected. The 'Domain' field contains 'PSTYV' and the description is 'Sales document item cat'. Below this, the 'Data Type' is 'CHAR', 'Character String', 'Length' is '4', and 'Decimal Places' is '0'. Other options like 'Predefined Type', 'Reference Type', and 'Reference to Predefined Type' are visible but not selected.

Figure 3.12 New Field ZZITEMCAT (Item Category) Available for Use

7. After the pricing data element has been created, it needs to be included in the pricing communication structure, KOMPAZ. The KOMPAZ structure is a subset of the pricing communication structure KOMP. Execute Transaction SE11, and enter the pricing communication structure “KOMPAZ” in the input field as shown in Figure 3.13. Include ZZITEMCAT in this structure by adding it to the structure. A developer access key is required to perform this function. After the key has been assigned, the new field ZZITEMCAT is available in the pricing field catalog.

Component	RTy	Component type	Data Type	Length	Decim	Short Description
ZZPRODH2	<input type="checkbox"/>	ZZPRODH2	CHAR	10	0	Produktgruppe (Produkthierarchie Stelle 1-10)
ZZPS_POSID	<input type="checkbox"/>	ZZPS_POSID	CHAR	24	0	
MVGR1	<input type="checkbox"/>	MVGR1	CHAR	3	0	Materialgruppe 1
ZZPORCIT	<input type="checkbox"/>	ZZPORCIT	CHAR	20	0	
ZZPORLAND	<input type="checkbox"/>	ZZPORLAND	CHAR	20	0	
ZZPODCIT	<input type="checkbox"/>	ZZPODCIT	CHAR	20	0	
ZZPODLAND	<input type="checkbox"/>	ZZPODLAND	CHAR	20	0	
ZZLOADPORT	<input type="checkbox"/>	ZZLOADPORT	CHAR	20	0	
ZZDISCHPORT	<input type="checkbox"/>	ZZDISCHPORT	CHAR	20	0	
KVGR2	<input type="checkbox"/>	KVGR2	CHAR	3	0	Kundengruppe 2
J_3ASIZE	<input type="checkbox"/>	ZZ_3ASIZE	CHAR	8	0	
ZZITEMCAT	<input type="checkbox"/>	ZZITEMCAT	CHAR	4	0	

Figure 3.13 Creating Custom Fields to Table ZAKOMPAZ

8. Navigate to SALES AND DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL and execute DEFINE CONDITION TABLES. Choose CONDITIONS: ALLOWED FIELDS, and include "ZZITEMCAT" as a new entry as shown in Figure 3.14.

Field	Description
ZZDISCHPORT	Port of Discharge
ZZITEMCAT	Item Category
ZZLOADPORT	Port of Loading
ZZPODCIT	Place of Delivery - City
ZZPODLAND	Place of Delivery - Country
ZZPORCIT	Place of Receipt - City
ZZPORLAND	Place of Receipt - Country
ZZTESTBS	

Figure 3.14 Assigning the Field Element to the KOMPAZ Structure

When ZZITEMCAT is included in the pricing catalog, the field is ready to be included in the allowed condition fields in a custom condition table. To include the ZZITEMCAT field in the allowed condition fields, follow these steps:

1. Navigate to the following menu path: SPRO • LOGISTICS • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL • DEFINE CONDITION TABLES • CONDITIONS: ALLOWED FIELDS.

2. Double-click ALLOWED FIELDS, and then select a field from the list that is provided. The selected fields are shown in the Figure 3.15.

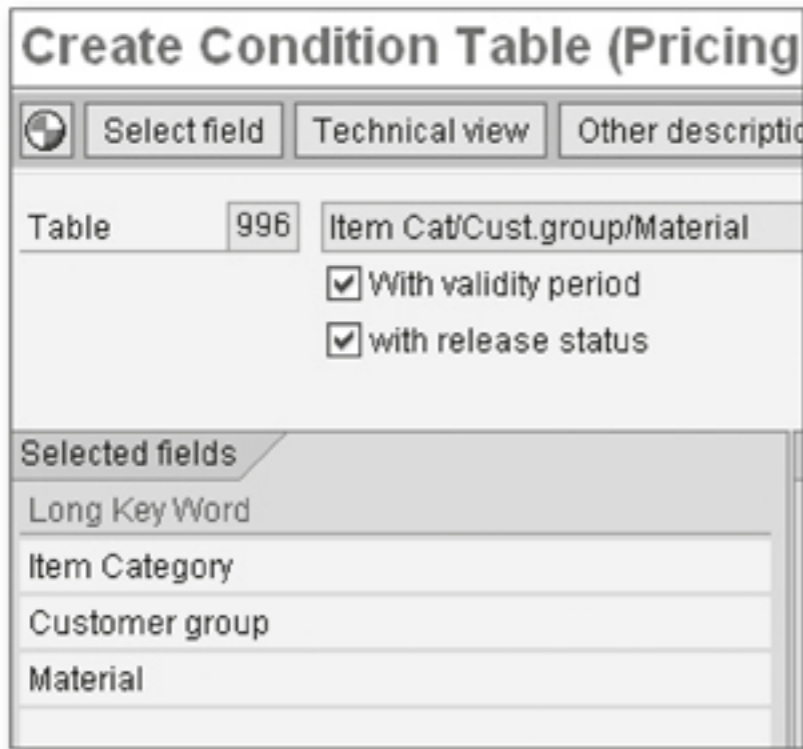


Figure 3.15 Adding ZZITEMCAT (Item Category) to Custom Table 996

3. Next, include field ZZITEMCAT in user exit USEREXIT_PRICING_PREPARE_TKOMP as `MOVE VBAP-PSTYV TO TKOMP-ZZITEMCAT`. By including the ZZITEMCAT in the user exit, condition records can be defined for the custom table. This user exit is available in order processing MV45AFZZ, as shown in Figure 3.16.

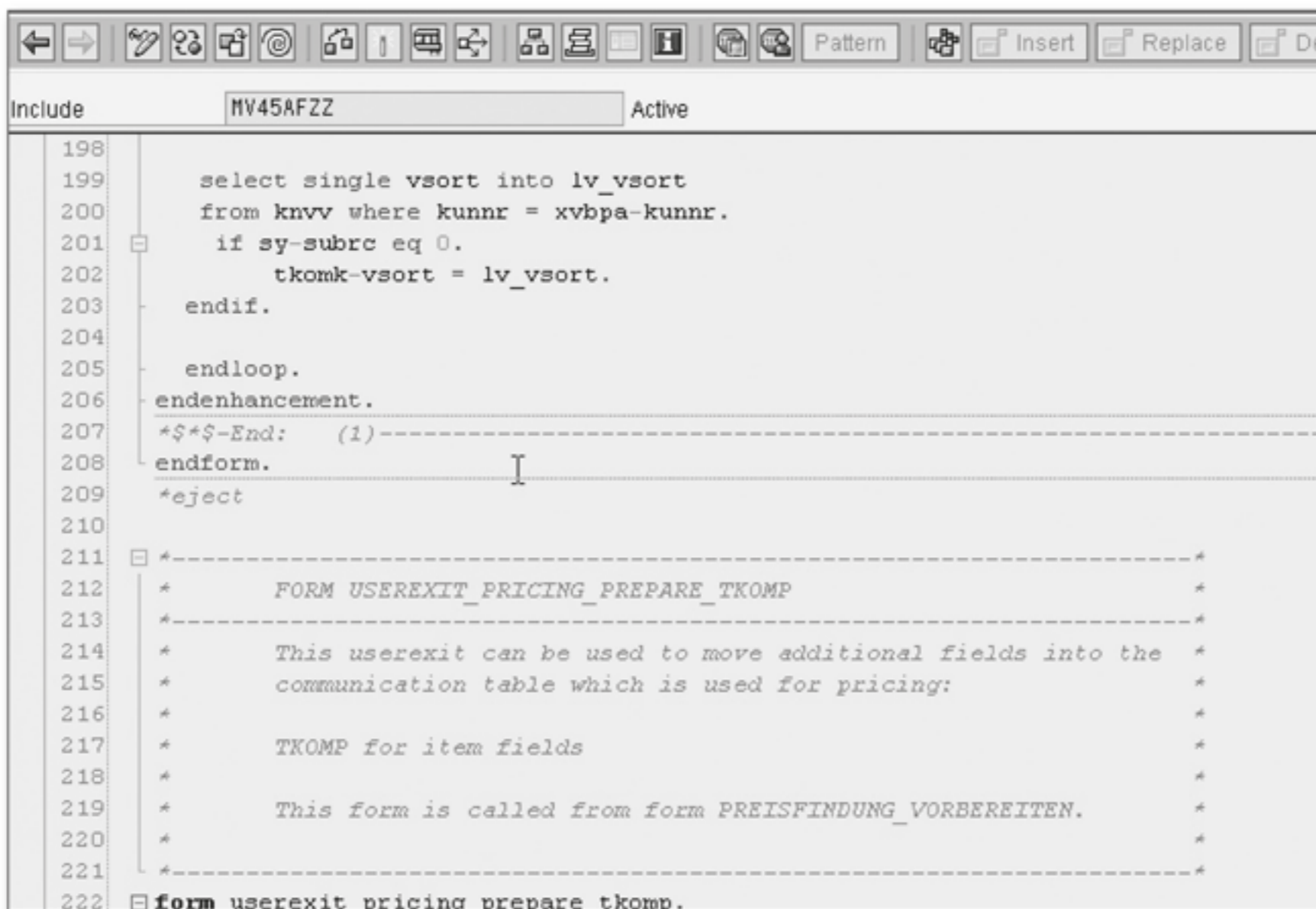


Figure 3.16 User Exit for the Pricing Field

Note

TKOMP is used for line item fields, and the user exit USEREXIT_PRICING_PREPARE_TKOMPK. TKOMK is used for header fields. The corresponding user exit is USEREXIT_PRICING_PREPARE_TKOMPK.

Now that you understand condition types, access sequences, and condition tables and how they work, let's explore how to set up pricing procedure in more detail.

3.7 Requirements, Condition Values, and Condition-Based Formulas

The SAP ERP system provides further flexibility in defining the pricing procedures by using requirements, condition values, and condition-based values. These are essentially ABAP codes that can be plugged into pricing procedures. They are also called VOFM routines, which can be accessed using Transaction VOFM. We'll discuss what each of these mean and how they can be set up in detail. In this section, we'll cover some of the key ABAP routines such as requirements, condition values, and condition-based formulas:

- ▶ Requirements provide a way of checking specific criteria before a pricing condition can be selected.
- ▶ Condition values formulas are used to calculate pricing using a special formula.
- ▶ Condition-based values are formulas that are used to change the basis for calculation that is different from what standard SAP ERP software provides. For example, standard SAP ERP uses quantity as the basis for calculating pricing, but with condition-based values, the pricing can be based on volume.

The following sections explain in more detail how requirements, condition values, and condition-based values are set up.

Figure 3.17 illustrates where requirements, condition values, and condition-based values are defined in a pricing procedure. Requirements are identified by REQT, condition values are identified by CALTYPE, and condition-based values are identified by BASTYPE in the overview screen.

Change View "Control": Overview

New Entries BC Set: Change Field Values

Dialog Structure
 ▾ Procedures
 • Control

Procedure: RYAA01 Standard

Control

Reference Step Overview

Step	C...	C...	Description	F..	T.	M...	R..	S...	Su...	Reqt	CalTy...	BasType
8	0	PK01	Costs			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
11	0	PR00	Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2		
13	0	PB00	Price (Gross)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2		

Figure 3.17 Requirements, Condition Values, and Condition-Based Values in a Pricing Procedure

Requirements provide flexibility and additional functionality within the pricing procedures to check for certain conditions before a condition type is activated. In other words, if the conditions are not met, then the condition type will not be activated. The menu path for requirements is SPRO • SALES AND DISTRIBUTION • SYSTEM MODIFICATIONS • DEFINE REQUIREMENTS. You can also navigate to Transaction VOFM and choose REQUIREMENTS • PRICING.

Here we can maintain our own pricing requirements or use existing pricing requirements. New pricing requirements can be defined starting from number 900 onward. SAP ERP has reserved this number range for defining new pricing requirements.

Note

To define pricing requirements, a developer access key is required.

A leading practice for defining new requirements is to overwrite an existing requirement that is similar to the new requirement you want to create. This copies the existing requirement into a new requirement, which you can modify.

Let's consider a business example for Desktops Inc., who wants to activate a special desktop price for public-sector customers. This special price is identified by pricing condition type ZR00. The customers who belong to the public sector are grouped by the customer pricing group S2.

To do this, a new requirement needs to be created, which will control the activation of condition type ZR00 only when the customer pricing group is equal to S2. Let's create a new requirement (980) and assign it to the condition type for this purpose:


```

1  *****
2  *** Attention: copied routine! ***
3  *** Attention: ***
4  *** Character string 901 is replaced by 980 everywhere ! ***
5  *****
6
7  *****
8  *** This routine checks the customer price group on the ***
9  *** Document to allow the condition to pass the ***
10 *** requirement ***
11 *** ***
12 *** Service Provider -- Morrow 07/2002 ***
13 *****
14
15
16 * Check if Customer Price Group is S2
17
18 form kobed_980.
19   sy-subrc = 4.
20   check: komk-konda eq 'S2'.
21   sy-subrc = 0.
22 endform.
23 * Prestep
24 form kobev_980.
25   sy-subrc = 4.
26   check: komk-konda eq 'S2'.
27   sy-subrc = 0.
28 endform.

```

Figure 3.18 Creating a New Pricing Requirement "980"

1. Navigate to Transaction VOFM. Go to REQUIREMENTS • PRICING.
2. Choose an existing pricing requirement that is similar to the pricing requirement you want to create (e.g., choose available requirement 970 by placing the cursor on 970).
3. Overwrite the existing requirement 970 with a new pricing requirement. In our example, we overwrite 970 with 980.
4. Now 980 has the same ABAP code as the copied requirement. Modify the ABAP code in requirement 970 by changing the customer pricing group to S2, as shown in Figure 3.18. To change the pricing group to S2, place the cursor on the ABAP code, and overwrite the existing code. After the modification is complete, activate the pricing requirement by going to PROGRAM • ACTIVATE on the same screen.
5. Assign the pricing requirement to the pricing condition type by navigating to the pricing procedure using Transaction V/08. Select the pricing procedure, and double-click CONTROL to show all of the pricing conditions.

- Assign the requirement "980" to the step of the pricing procedure containing the pricing condition type by entering "980" in the requirement field of the condition type.

3.7.1 Condition Values

A condition value is another useful way to control the pricing procedures. In some cases, the pricing condition needs to be calculated by a special formula. This can be achieved by inserting a small ABAP code into the condition value. The code can be used as the logic to calculate the formula. The menu path for creating a new condition value is VOFM • FORMULAS • CONDITION VALUES.

The procedure for creating a condition value is the same for creating requirements. An existing condition value formula that is similar to the condition value you want to create can be copied to create a new condition value formula. Just as in requirements, an access key is required to create a new condition value.

Include	RV64A950	Active (Revised)
23	*\ sy-msgv2 = komp-led_curr.	
24	*) DELETE	
25		
26	*) INSERT 4\$4\$4\$4\$ 1	
27	*	
28	form frm_kondi_wert_902.	
29	xkwert = xworke - xworkd.	
30	endform.	
31	*) INSERT	
32	*) DELETE 4\$4\$4\$4\$ 7	
33	*\ CONDENSE sy-msgv1.	
34	*\ CONDENSE sy-msgv2.	
35	*\	
36	*\ sy-msgno = '075'.	
37	*\	
38	*\ call FUNCTION 'MESSAGE_STORE_WITH_DISPLAY'	
39	*\ EXPORTING	
40	*\ arbgb = 'YTELO1'	
41	*\ msgty = 'I'	
42	*\ msgv1 = sy-msgv1	
43	*\ msgv2 = sy-msgv2	
44	*\ txtnr = sy-msgno.	
45	*\ * -----	
46	*) DELETE	
47		
48	ENDFORM.	

Figure 3.19 Alternate Condition Value "950"

In Figure 3.19, a new condition value formula has been created that calculates the difference between subtotal "E" and "D". After the routine has been activated, it

can be assigned to a pricing procedure condition type. This is done by assigning the alternate condition value to the pricing condition type in the pricing procedure in the ALTERNATE CONDITION VALUE field.

3.7.2 Condition-Based Values

Condition-based values are used to define the basis for calculation that is different from what standard SAP ERP software provides. For example, standard SAP ERP software provides quantity or value as the basis of calculating the price. If volume, gross weight, or net weight need to be the basis for calculating the price, condition-based value formulas can be used.

For the sake of our example, let's say we want to define the basis for calculating a condition type as production sales in a new condition-based formula 995. Production sales (ZPRDSALES) is a custom field defined and included as part of the KOMP communication structure. The menu path for condition-based values is VOFM • FORMULAS • CONDITION BASED VALUES. A new routine can be created by copying an existing routine and providing an access key (see Figure 3.20).

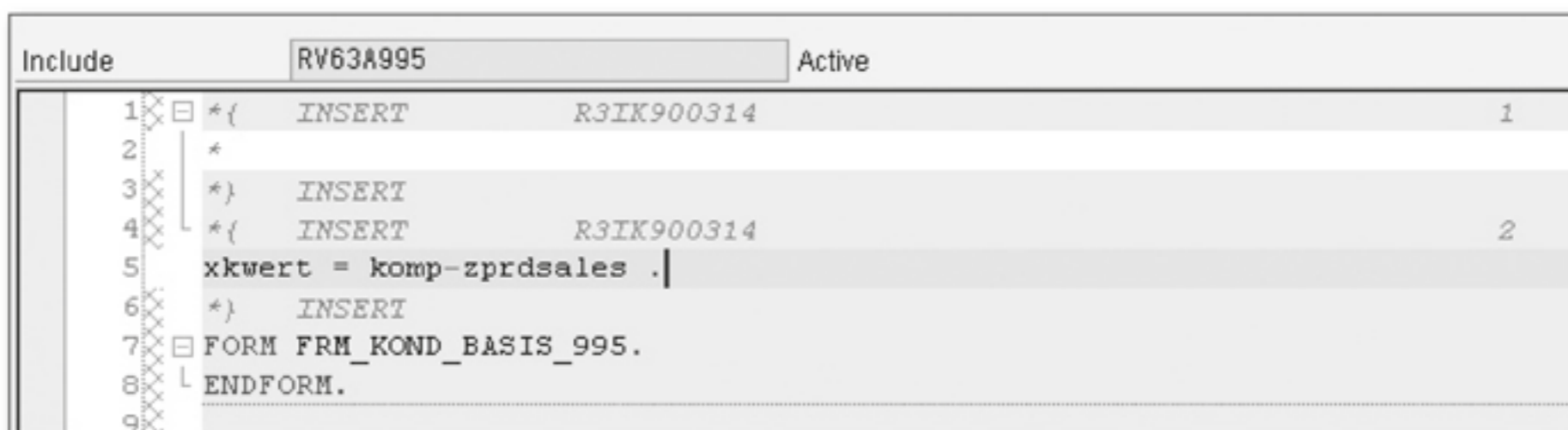


Figure 3.20 Creating a New Condition-Based Value

In the next section, let's review the condition exclusion procedures.

3.8 Condition Exclusions Procedures

In earlier sections, we explored condition exclusions where if a customer has already received a favorable price, then he is not entitled to receive additional discounts. Sometimes in pricing for sales and billing documents, more than one condition record may apply to a particular item at any one time. You can use the condition exclusion process to compare possible conditions to determine such things as the

best price for a customer. To build a condition exclusion procedure, you must follow these steps:

1. Define the exclusion groups.
2. Assign condition types to the exclusion groups.
3. Maintain condition exclusions for the pricing procedure.

The following example will help explain the condition exclusion procedure. A customer can receive discounts in various ways. For example, the discount a customer receives can be based on the product the customer is purchasing or based on the high volume of business the customer has been doing with the company.

The various discounts that can be offered (i.e., discounts based on material, customer/material, and so on) are listed here:

- ▶ **K004:** Material
- ▶ **K005:** Customer/Material
- ▶ **K007:** Customer Discount
- ▶ **K020:** Price Group

Let's come back to our example of Desktops Inc., who sells desktops to various customers, including special customers and retailers. The special customer can receive a discount because they belong to a price group (K020 Condition Type) as well as receive a discount because they are eligible for customer discounts (K007 Condition Type). The condition exclusion procedure ensures that the customer receives the most favorable price from the two discounts. It also ensures that the customer doesn't receive the discount twice.

Note

A condition type can have multiple accesses. If no exclusive access is set in any of these condition types (refer to Section 3.4 to refresh your memory on how exclusion between multiple accesses are set), the system can automatically determine the most favorable price for the customer, so an exclusion group is not necessary.

Condition exclusion groups deal with more than one condition type. The possible variations are described in the following subsections.

3.8.1 Condition Types Belonging to the Same Condition Group

As an example, if K004, K005, K007, and K020 all belong to the same exclusion group Z001, then the most favorable discount is given to the customer from among the condition types. All other condition types are deactivated.

3.8.2 Condition Types Belonging to Multiple Condition Groups

The exclusion groups might be defined so that one group has discounts, and the other group has freight. In this case, the system picks the best discount possible from the exclusion and deactivates the other discounts.

On the other hand, if the other exclusion group includes freights, then the freight condition type that offers the lowest freight possible is offered to the customer. If both the exclusion groups have discounts, then the system sums the discounts for each group and gives the higher discount total to the customer.

Let's illustrate an example of a customer getting the best discount and the lowest freight. Desktops Inc.'s desktops are being shipped to retailers or to end customers, so the customer can have freight charges associated with it. The discounts and freight for the retailer has been set up as follows:

- ▶ Discount Condition Type K004 has 10 EUR
- ▶ Discount Condition Type K005 has 15 EUR
- ▶ Freight Condition Type KF00 has 20 EUR
- ▶ Freight Condition Type ZF00 has 25 EUR

The most favorable price, which takes into account not only the discount but also the freight, gives the customer the highest possible discount and the lowest possible freight. To make sure the retailer receives the best price, follow these steps:

1. Create EXCLUSION GROUPS "Z001" and "Z002", as shown in Figure 3.21. The menu path for defining condition exclusion groups is SPRO • SALES & DISTRIBUTION • PRICING • CONDITION EXCLUSION • CONDITION EXCLUSION FOR GROUPS OF CONDITIONS.
2. Assign condition types to the exclusion group (see Figure 3.22). The menu path for defining condition exclusions is SPRO • SALES & DISTRIBUTION • PRICING • CONDITION EXCLUSION • ASSIGN CONDITION TYPES TO EXCLUSION GROUPS.

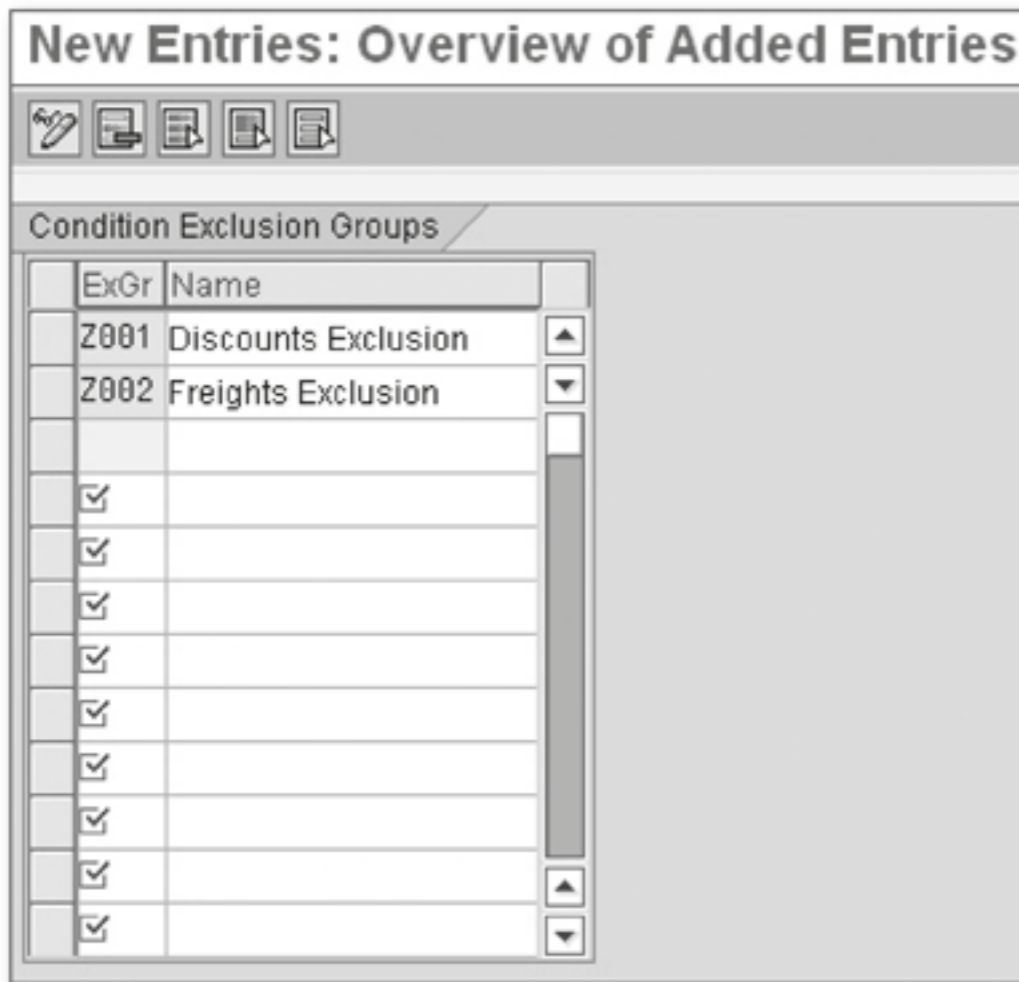


Figure 3.21 New Exclusion Groups Z001 and Z002 Defined



Figure 3.22 Assigning Condition Types K004, K005, KF00, and ZF00 to the Exclusion Groups Z001 and Z002

- Now you can assign exclusion groups to procedures (see Figure 3.23) via the menu path SPRO • SALES & DISTRIBUTION • PRICING • CONDITION EXCLUSION • EXCLUSION GROUPS TO PRICING PROCEDURES. Assign procedure ZVAA01 to condition exclusion groups Z001 and Z002, respectively.

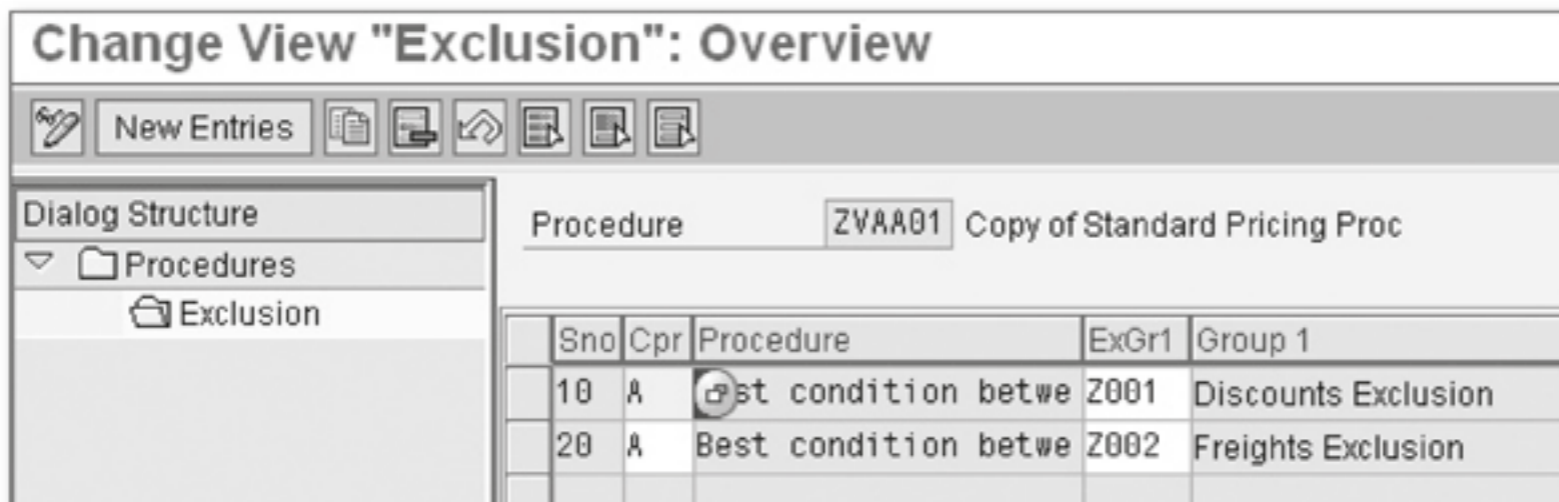


Figure 3.23 Assigning Exclusion Groups to Pricing Procedure

The procedure requires best discount condition type \$15 and lowest freight condition type ZF00 of 20 EUR, so two exclusion groups have been set up with a condition exclusion procedure value of "A" (best condition within an exclusion group).

Note

The pricing procedure will have all of the mentioned condition types defined in customizing. The user maintains the master data for these conditions. The system then uses the exclusion groups defined for the procedure to automatically calculate the best price for the customer.

When the system includes all of these factors, the net price to the customer is 100 EUR (Price) – 15 EUR (Discount) + 20 EUR (Freight) = 105 EUR. This process is illustrated in Figure 3.24 when a sales order is created. The conditions that have been deactivated are indicated by a yellow triangular icon. A deactivated condition is not taken into account in the calculation of the net value of the item. In Figure 3.24, the deactivated conditions are K004 and KF00. Condition types K004 and KF00 are simply not included in the net price calculation.

Sales Document Item		10	Item category		TAN	Standard Item							
Material		BATMAT	AKT FERT Material Ffor Batch										
Sales A		Sales B		Shipping		Billing Document		Conditions		Account assignment		Schedule	
Qty		1		EA		Net		105,00		EUR			
						Tax		19,95					
Pricing Elements													
N	CnTy	Name	Amount	Crcy	per	U...	Condition value	Curr.	Status				
<input type="checkbox"/>	PR00	Price	100,00	EUR	1	EA	100,00	EUR					
		Gross Value	100,00	EUR	1	EA	100,00	EUR					
<input type="checkbox"/>	K005	Customer/Material	15,00-	EUR	1	EA	15,00-	EUR					
<input type="checkbox"/>	K004	Material	10,00-	EUR	1	EA	10,00-	EUR					
		Discount Amount	15,00-	EUR	1	EA	15,00-	EUR					
		Rebate Basis	85,00	EUR	1	EA	85,00	EUR					
		Net Value for Item	85,00	EUR	1	EA	85,00	EUR					
<input type="checkbox"/>	KF00	Freight	25,00	EUR	1	KG	25,00	EUR					
<input type="checkbox"/>	ZF00	Freight	20,00	EUR	1	KG	20,00	EUR					
			105,00	EUR	1	EA	105,00	EUR					

Figure 3.24 Exclusion Group in Sales Order Pricing

Now that we have discussed the various elements of condition techniques such as pricing procedures, condition types, access sequences, condition tables, condition fields, VOFM routines (requirements, condition values, condition-based values), and exclusion procedures, let's now examine how the pricing condition records are set up.

3.9 Master Data and Pricing

Pricing in SD can be defined in multiple ways. Pricing on the sales order can be derived from SD documents such as contracts, quotations, or pricing condition records. The following subsections cover how pricing is derived on the sales orders.

3.9.1 Pricing Condition Records

A pricing condition record is the data maintained for each pricing condition type. If we consider the Desktop Inc. example, the gross price can be maintained for retailers (Walmart, Best Buy) by each desktop:

- ▶ Walmart Customer, Desktop 123 Gross Price 1500 USD is a condition record.
- ▶ Best Buy Customer, Desktop 123 Gross Price 1550 USD is a condition record.

When a sales order is entered for Walmart or Best Buy, the system automatically puts in the gross price on the sales order.

Pricing condition records can be created for condition types that have access sequences. If the condition records do not have access sequences, then they must be manually defined on the sales orders. Conditions defined in the system are available across all sales documents, such as quotations, contracts, sales orders, and so on, if the sales document type is not used to differentiate pricing. If necessary, conditions can also be overwritten on these sales documents if the pricing procedure has been configured so that manual overrides are possible.

As a real-world example, actual freight costs can change after the goods have been shipped to the customer, so the planned freight costs have to be adjusted manually on the sales order.

Figure 3.25 illustrates how pricing can initially be maintained as condition records. These condition records are proposed on the quotations, contracts, and schedule

agreements (and sales orders) and can be overwritten. When a sales order is created with reference to a quotation, contract, or schedule agreement, the pricing on these sales documents takes precedence.

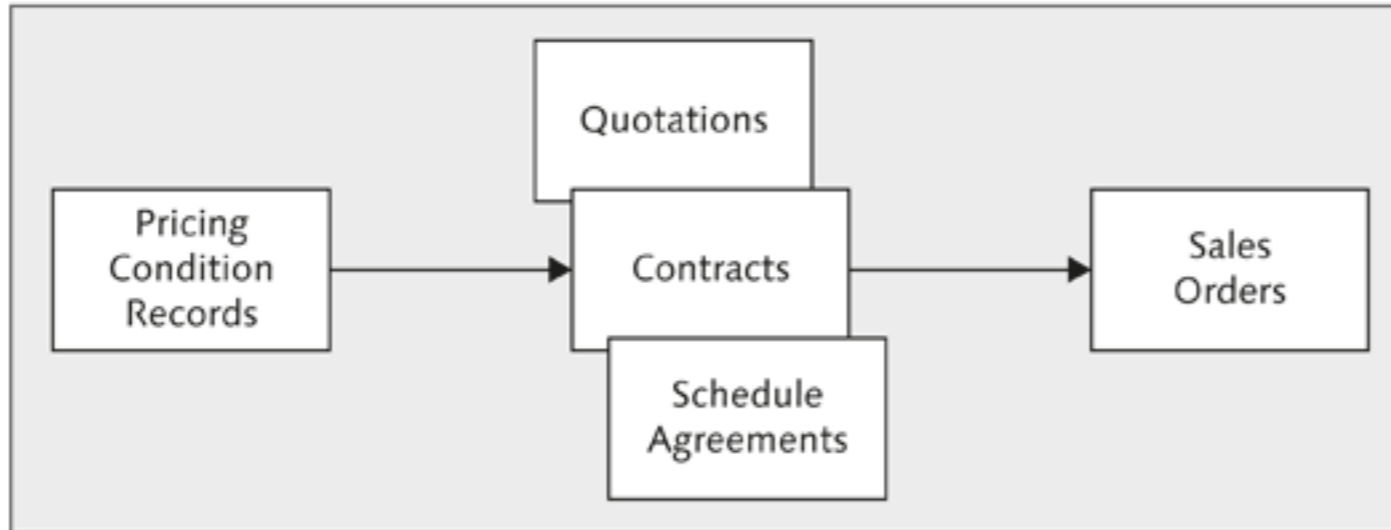


Figure 3.25 Pricing Condition Records Flow into Sales Documents

Now let's see how a pricing condition can be maintained. Figure 3.26 illustrates the maintenance of the pricing condition record.

Figure 3.26 Maintain Pricing Condition PR00

The menu path for defining master pricing condition records is LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • CONDITIONS • SELECT USING CONDITION TYPE • CREATE, or you can access the screen with Transaction VK11.

In the input screen, enter the pricing condition type. The key combination displays the various possible ways (access sequences) the condition can be defined.

In Figure 3.26, we see that the pricing condition can be maintained for CUSTOMER/MATERIAL WITH RELEASE STATUS, MATERIAL WITH RELEASE STATUS, and so on.

Condition Record Maintenance

Pricing condition records are default pricing conditions that the system automatically proposes on the sales documents. By defining pricing condition records, the business user doesn't have to manually determine the various possible combinations of price variations for a material, customer/material, and so on.

After the condition is defined, the pricing condition record can be maintained based on the access sequence that is defined. For example, pricing can be maintained for a sales organization, distribution channel, or material with specific validity periods. Figure 3.27 illustrates that the pricing condition record PR00 is maintained for a customer/material combination.

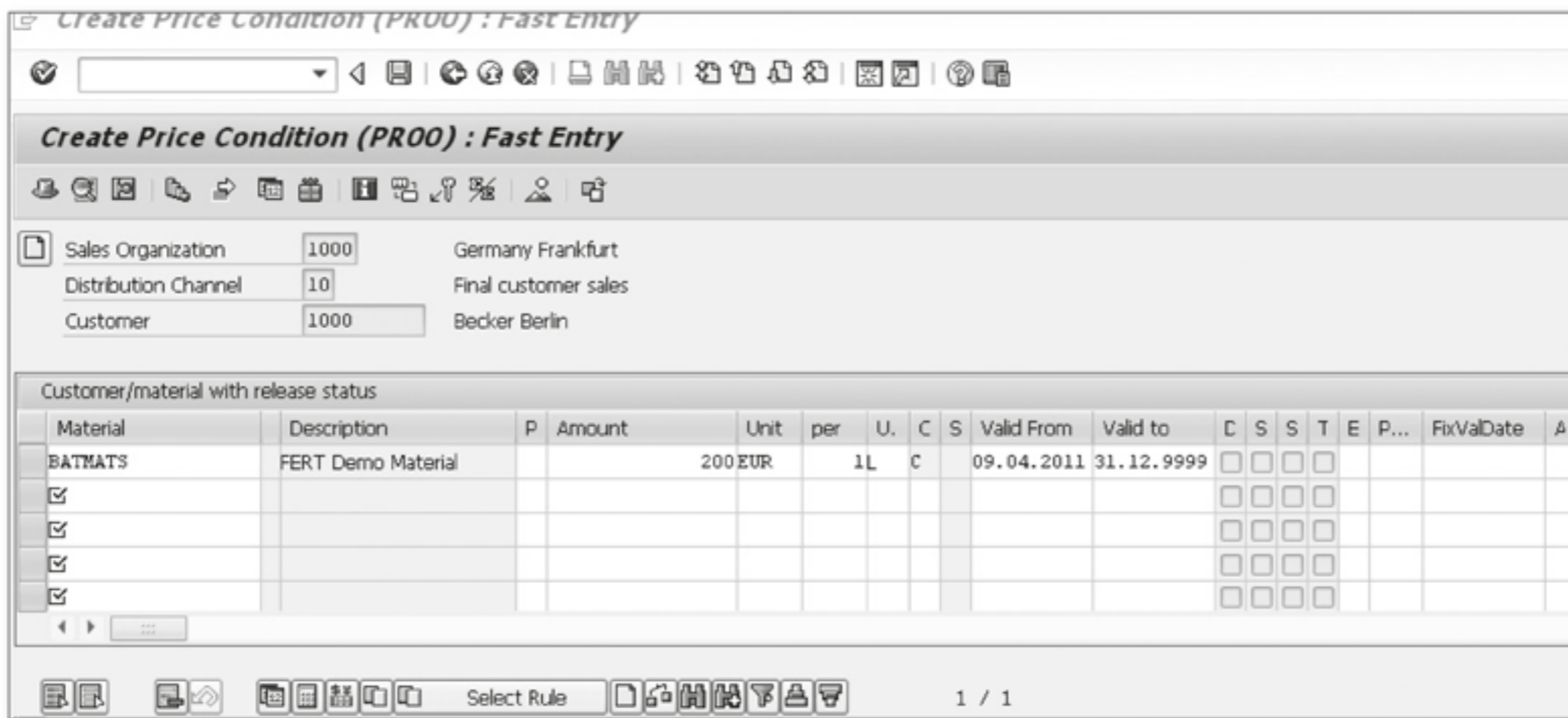


Figure 3.27 PR00 Pricing Condition Record Maintenance for a Customer/Material for a Given Sales Org/Distribution Channel

Key Condition Record Fields

As shown in Figure 3.28, PAYMENT TERMS, FIXVALDATE, and ADDITIONAL VALUE dates are key condition record fields that are typically defaulted from the customer master. But if alternate information is defined on the pricing condition record, then that information takes precedence over the master.




The SELECT RULE icon can be used to copy condition records. For example, if condition record PR00 has to be copied for a range of customers from customer number 2004 through 2007, the following steps must be executed:

Sales Organization		1000													
Distribution Channel		10													
Customer		1000													
Customer/material with release status															
Material	Description	P	Amount	Unit	per	U.	C	S	Valid From	Valid to	C	S	S	T	E
BATMAS				100EUR		1EA			20.05.2011	31.12.9999	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Figure 3.28 Pricing Condition Record Fields

1. Click the SELECT RULE button, as shown earlier in Figure 3.29. The screen that appears contains the CONDITION TYPE PR00, the CUSTOMER NUMBER "2003" input from the previous screen, and SALES ORGANIZATION 1000.







Copying : Customer to Customer

Options   

Characteristics of source conditions

Condition table	305	Customer/material with releas
Condition type	PR00	Price
Customer number	2003	Customer for EDI tra

Select target field

Sales organization	1000 	to	1000	
Sort field		to		
Target customer number	2005	to	2010	
Sales office		to		
Sales group		to		

Characteristics of new conditions

Target condit.type	PR00
Sort string for condition	
Start of new validity period	
End of validity period	

Display list

Figure 3.29 Selection Rule for Copying Customer 2005 to Customer 2010 from Customer 2003

- ▶ Input the range of customers 2005 through 2007 in the input field TARGET CUSTOMER NUMBER as shown in Figure for the range of customers and sales organizations.
2. Select the EXECUTE icon. Upon execution, the system takes you to the COPYING: CUSTOMER TO CUSTOMER screen as shown in Figure 3.30.
 - ▶ Select the customers (i.e., 2005 to 2007) for which the pricing condition record has to be copied. Select CONTINUE.
 - ▶ The pricing condition record PR00 value of Customer 2003 is selected to update the pricing values for customers 2005 through 2007. Select SAVE to update the pricing condition records of customers 2005 through 2007.

Note

If the prices for customers 2005 through 2006 have to be different from the price of customer 2003, manually update the prices for those customers

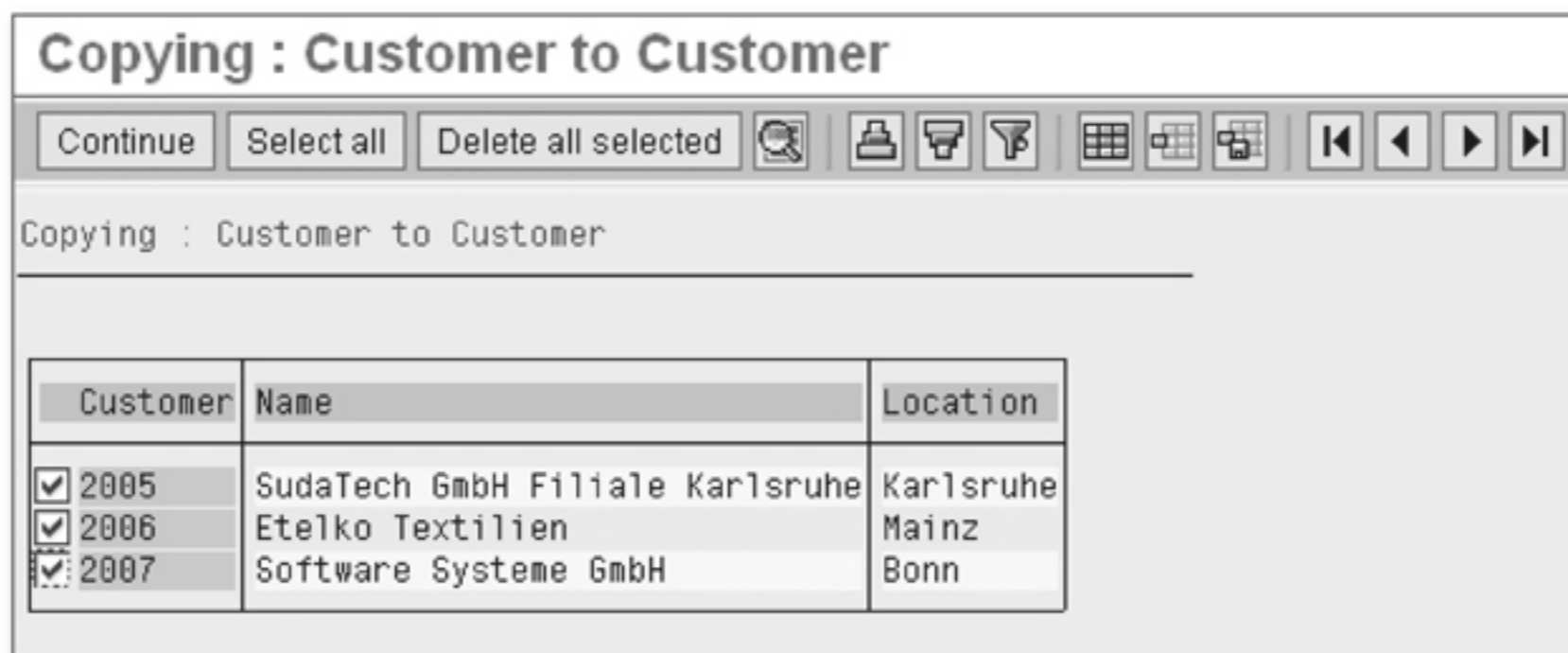


Figure 3.30 Copying Condition Records from Customer 2003 to Customer 2005 through 2007

Now that you understand how to copy condition records, let's move on to additional pricing details, namely pricing upper and lower limit values.

3.9.2 Pricing Upper and Lower Limit Values

To maintain the pricing for upper and lower limit values, use the following menu path: LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • CONDITIONS • SELECT USING CONDITION TYPE • CHANGE • OVERVIEW • GO TO • DETAILS (see Figure 3.31).

The LOWER LIMIT and UPPER LIMIT values are used to set upper and lower thresholds for the pricing condition types. If it exceeds the limit on the sales order, then a warning message is triggered that the upper or lower thresholds are being exceeded when manually changing the prices.

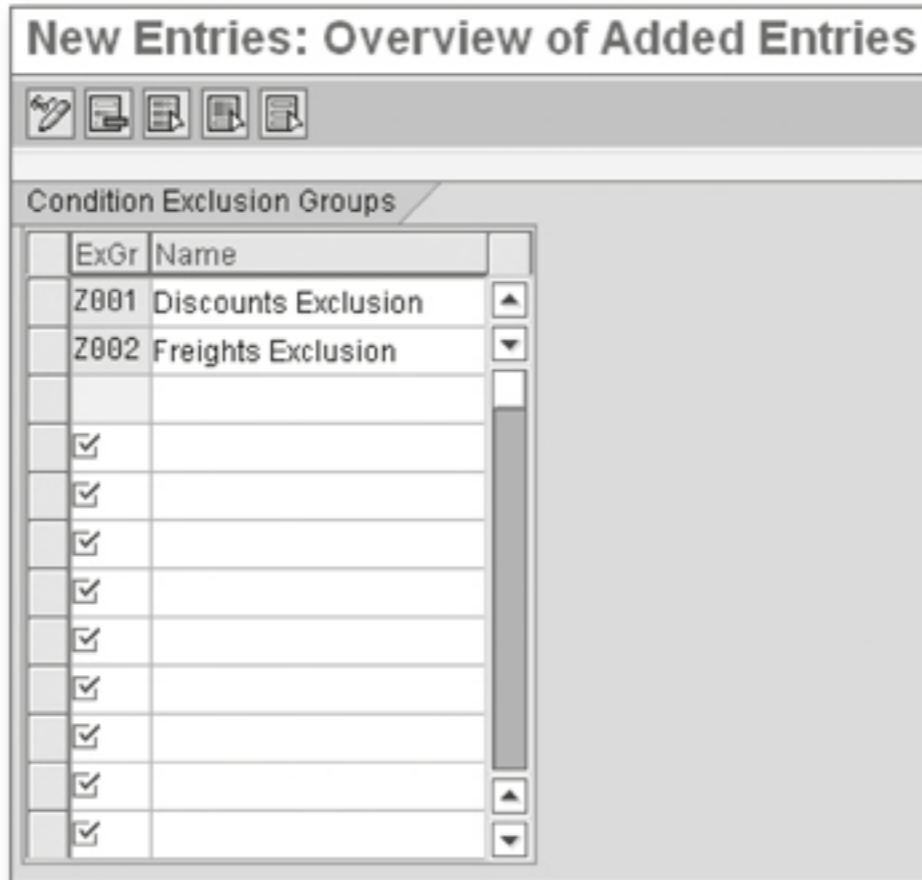


Figure 3.31 Maintaining Lower and Upper Limits

We discussed exclusion indicators earlier: when a customer already has a favorable price, he is ineligible to receive additional discounts. The scales can be used to control up to, from, or base scales, which were covered earlier in Section 3.3.5.

Condition Supplements

Condition supplements can be used to maintain additional conditions for the main condition record. To access the condition supplements screen, select the yellow arrow icon (shown in Figure 3.27) or press **[Shift] + [F7]**. This opens the screen to enter additional pricing conditions such as KA00 and RA00, which are supplements to condition type PR00.

Condition supplements are controlled in configuration by associating a supplement pricing procedure to the condition type. For example, condition type PR00 is assigned to pricing procedure RVA0000 and has discount conditions KA00 and RA00 associated with it.

Now that you understand pricing condition maintenance, we'll discuss how to apply these conditions in the sales document.

3.10 Pricing Applications in Documents

Pricing condition, type, and procedure allow you to determine the appropriate pricing condition values for the sales document. With condition value maintenance, these conditions appear in the document as applicable. The following subsections look at some of the different functionalities and features of pricing applications as they apply to sales documents.

3.10.1 Contract Pricing

A contract is a legally binding agreement. Contracts include various topics such as quantity, value, pricing, and so on. Pricing can be defined in contracts as pricing condition records. The pricing in contracts can be defined manually, or if condition records exist, the pricing conditions are automatically calculated in the contract because pricing condition records have been defined beforehand. The system uses the pricing condition records to calculate the contract pricing.

When a sales order is created with reference to the contract, the sales order copies the pricing defined in the contract.

Figure 3.32 shows how the net pricing value is calculated in a contract with a list price (PR00 condition type), and discounts (K005 and K004 condition types).

These prices have been derived from the pricing condition records that have been maintained for PR00, K005, and K004, respectively, using Transaction VK11.

PR00 (list price) has been maintained for a customer (customer number 2003), material (demo material), sales organization (1000), distribution channel (10), and division (10). Discounts and freight have also been maintained in a similar way.

Change Quantity Contract 40000206: Item Data

Sales Document Item: 10 Item category: KMN Qty Contract Item
Material: BATMAT Demo Material

Sales A Sales B Shipping Billing Document **Conditions** Account assignment Partners

Qty: 100 EA Net: 25.475,00 EUR Tax: 4.840,25

Pricing Elements									
N	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr.	Status
<input type="checkbox"/>	PR00	Price	250,00	EUR	1	EA	25.000,00	EUR	
		Gross Value	250,00	EUR	1	EA	25.000,00	EUR	
<input type="checkbox"/>	K005	Customer/Material	15,00	EUR	1	EA	1.500,00	EUR	
<input checked="" type="checkbox"/>	K004	Material	10,00	EUR	1	EA	1.000,00	EUR	
		Discount Amount	15,00	EUR	1	EA	1.500,00	EUR	
		Rebate Basis	235,00	EUR	1	EA	23.500,00	EUR	
		Net Value for Item	235,00	EUR	1	EA	23.500,00	EUR	
<input type="checkbox"/>	KP01	Incomp.Pallet Surch.	20,00	EUR	1	EA	0,00	EUR	
<input type="checkbox"/>	KP02	Mixed Pallet Disc.	25,00	EUR			25,00	EUR	
<input checked="" type="checkbox"/>	KF00	Freight	25,00	EUR	1	KG	2.500,00	EUR	
<input type="checkbox"/>	ZF00	Freight	20,00	EUR	1	KG	2.000,00	EUR	
			254,75	EUR	1	EA	25.475,00	EUR	
		Net Value 2	254,75	EUR	1	EA	25.475,00	EUR	
		Net Value 3	254,75	EUR	1	EA	25.475,00	EUR	
<input type="checkbox"/>	AZWR	Down Pay/Settlement	0,00	EUR			0,00	EUR	

Figure 3.32 Contract Pricing

The net price is then calculated as the net of list price, subtracting discounts, and adding freight.

Next, let's review quotation pricing.

3.10.2 Quotation Pricing

Pricing on quotations works the same way as with contracts as explained in Section 3.10.1. Pricing can be defined on the quotations, and the sales orders can be created with reference to quotations. The pricing in quotes can be defined manually, or, if condition records already exist, the pricing conditions are automatically calculated in the quote.

When a sales order is created with reference to the quote, the sales order adopts the pricing defined in the quote.

Figure 3.33 shows pricing defined on the contract and illustrates pricing on quotes.

Create Quotation: Item Data

Navigation icons: Home, Back, Forward, Refresh, Print, Copy, Paste, Undo, Redo, Help, Search, etc.

Sales Document Item: 10 Item category: AGN Standard Item
 Material: BATMAT Demo Material

Navigation tabs: Sales A, Sales B, Shipping, Billing Document, **Conditions**, Account assignment, Schedule I

Qty: 100 EA Net: 30.500,00 EUR Tax: 5.795,00

Pricing Elements									
N	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr.	Status
<input type="checkbox"/>	PR00	Price	300,00	EUR	1	EA	30.000,00	EUR	
		Gross Value	300,00	EUR	1	EA	30.000,00	EUR	
<input type="checkbox"/>	K005	Customer/Material	15,00-	EUR	1	EA	1.500,00-	EUR	
<input checked="" type="checkbox"/>	K004	Material	10,00-	EUR	1	EA	1.000,00-	EUR	
		Discount Amount	15,00-	EUR	1	EA	1.500,00-	EUR	
		Rebate Basis	285,00	EUR	1	EA	28.500,00	EUR	
		Net Value for Item	285,00	EUR	1	EA	28.500,00	EUR	
<input type="checkbox"/>	KP01	Incomp.Pallet Surch.	20,00	EUR	1	EA	0,00	EUR	
<input type="checkbox"/>	KP02	Mixed Pallet Disc.	25,00-	EUR			0,00	EUR	
<input checked="" type="checkbox"/>	KF00	Freight	25,00	EUR	1	KG	2.500,00	EUR	
<input type="checkbox"/>	ZF00	Freight	20,00	EUR	1	KG	2.000,00	EUR	
			305,00	EUR	1	EA	30.500,00	EUR	
		Net Value 2	305,00	EUR	1	EA	30.500,00	EUR	
		Net Value 3	305,00	EUR	1	EA	30.500,00	EUR	
<input type="checkbox"/>	AZWR	Down Pay./Settlement	0,00	EUR			0,00	EUR	

Figure 3.33 Pricing on Quotations

So far, we've discussed the pricing condition type, access sequence, and condition value maintenance with applications to different sales document types. In the next section, let's go over the different aspects of these condition techniques as they apply to sales documents.

3.11 Header versus Line Item Pricing

As we go through the pricing determination in the document structure, pricing conditions types are applicable to the document header or line item. Based on the

requirement, you will see the different applications of the header pricing condition and line pricing condition in the following sections.

3.11.1 Header Pricing

A header condition is indicated by selecting the indicator **HEADER CONDITION** in Transaction V/06. A header pricing condition may be applicable for all of the line items of a sales document. For example, freight or insurance are pricing elements that may appear only once as a header pricing condition type for the entire pricing procedure. The header pricing condition can also be distributed to all of the individual line items.

The basis of distribution to the line items is controlled by the indicator **CALCULATION TYPE** in Transaction V/06. So, for example, if header freight has to be distributed to all of the line items based on a percentage basis, then this can be controlled by choosing the calculation type as a percentage.

3.11.2 Line Item Pricing

If the pricing condition shows the header condition indicator as blank, then you can deduce that it's a line item condition type. These condition types are entered at the line item level and are aggregated to the header automatically. The analysis screen also helps determine whether a pricing was a manual condition, as in condition type PR00. Subtotals, such as gross value, are identified by clicking the calculator icon.

3.11.3 Pricing Analysis in Sales and Distribution Documents

When sales documents use the pricing procedure to calculate pricing, you can analyze which pricing procedure was used, which condition types were used, and which access sequences found a condition record. Also, the pricing values can be updated based on recent changes or updates to pricing conditions.

1. To initiate a pricing analysis on a sales document, follow the menu path **SALES DOCUMENT • CHANGE • SELECT THE LINE ITEM • GO TO • ITEM • CONDITIONS**.
2. Select the **ANALYSIS** icon, and the screen shown in Figure 3.34 appears.

Analysis Pricing		
Procedure	Description	
▼ ZVAA01	Copy of Standard Pri...	
EK01	Costs	
▼ PR00	Price	
▼ 10(PR02)	Customer/material ...	
100,00 EU BATMATS		
20(PR02)	Price list category/cu...	
30(PR02)	Price list category/cu...	
40(PR02)	Material with releas...	
▶ ZRVS	Reference PR00	
▶ PB00	Price (Gross)	
▶ PR02	Price Increased	
▶ ZK01	Variant Costs	
▶ VA00	Variants	
▶ ZA00	General variants	
Gross Value		
▶ KA00	Sales Promotion	
▶ K032	Price Group/Material	
▶ K005	Customer/Material	
▶ K007	Customer Discount	
▶ K004	Material	
▶ K020	Price Group	
▶ K029	Mat.Pricing Group	
▶ K030	Customer/Mat.Pr.Grp	

Overview		
Condition type	Message	Description
EK01	001	Manual condition
PR00	208	Condition record has been found
ZRVS	109	Condition record is missing
PB00	001	Manual condition
PR02	109	Condition record is missing
ZK01	102	Access not made (initialized field)
VA00	102	Access not made (initialized field)
ZA00	102	Access not made (initialized field)
Gross Value	200	Subtotal
KA00	109	Condition record is missing
K032	102	Access not made (initialized field)
K005	109	Condition record is missing
K007	002	Access not made (initialized field)
K004	109	Condition record is missing
K020	002	Access not made (initialized field)
K029	102	Access not made (initialized field)
K030	102	Access not made (initialized field)

Figure 3.34 Analysis Pricing

As shown in Figure 3.34, the ANALYSIS PRICING screen shows that pricing procedure ZVAA01 is used for the sales documents.

This screen shows all pricing conditions associated with the pricing procedure. Also, the analysis reveals that PRICING CONDITION "PR00" has four access sequences. Access sequence 10 (Customer/Material) successfully determined a condition record. Also, if a requirement was assigned to a condition type, and the requirement is not fulfilled, then the screen displays the requirement number along with the text requirement that has not been fulfilled.

Debugging of Requirements

Pricing analysis debugging is one of the tools used to analyze pricing from a technical perspective. Breakpoints help in setting up where to debug the code. To test whether a requirement is working correctly, a breakpoint is set on the requirement ABAP code. When the sales document is created, the debugger stops at the breakpoint. Figure 3.35 shows how the debugger sets the breakpoint.

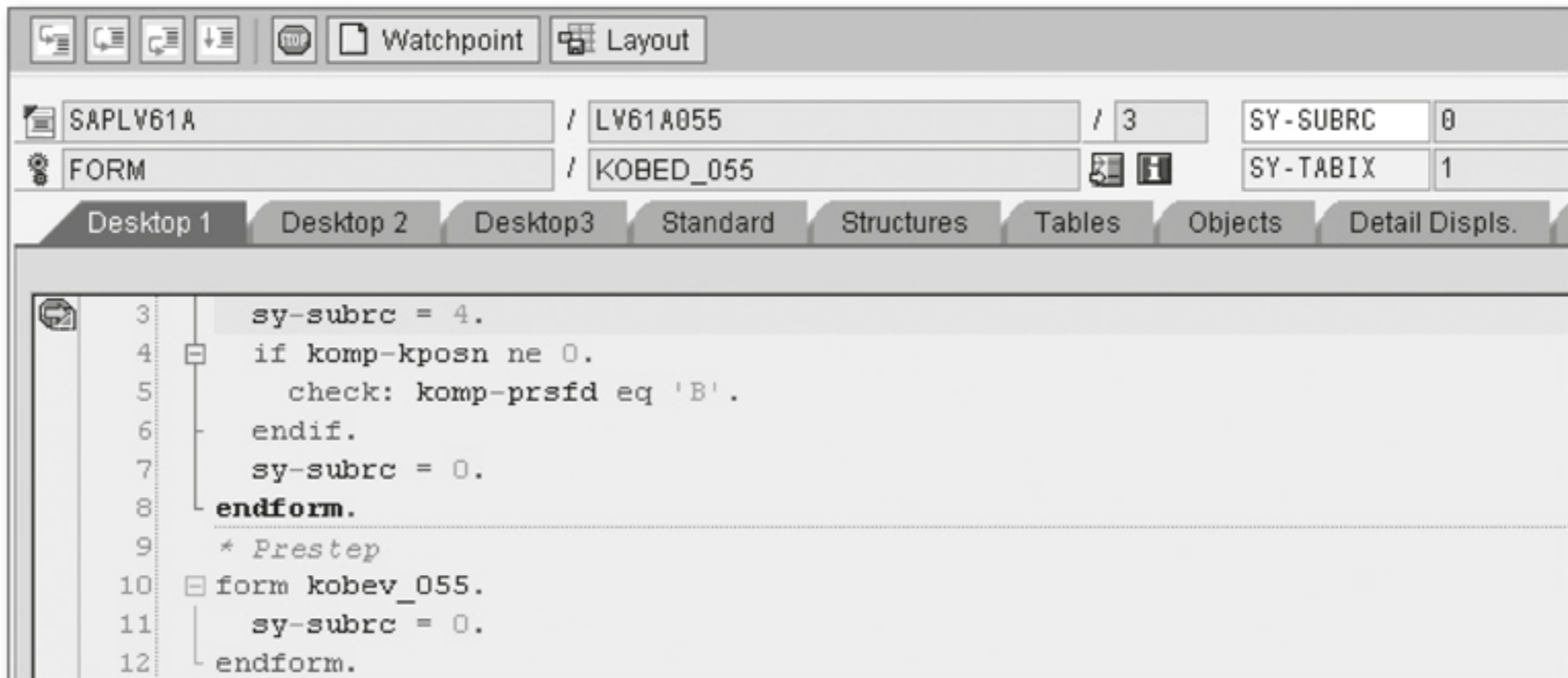


Figure 3.35 Breakpoint Set for Requirement 55

The field values of the requirement are then analyzed, as shown in Figure 3.36. The analysis of the field values reveals whether the requirement is functioning as designed. Going back to the Desktops Inc. example, let's assume that the gross price calculation is enabled only when the desktops are shipped from certain manufacturing plants. By debugging the requirement, you can check if the requirement is activated only for certain manufacturing plants.

St	Variable	Va	Val.	C
	KOMP-KPOSN		000010	
	KOMP-PRSF		X	
	SY-SUBRC		0	

Figure 3.36 Field Values for Requirement 55 during Debugging

Similarly, a condition formula and condition-based formula can also be debugged. These pricing conditions in the document represent the price that is agreed on with your business partner.

In the next section, we'll cover some of the ways you can print these values in the document for communication with your business partner.

3.12 Printing Pricing Conditions

The print ID on the pricing procedure controls how the pricing conditions are printed on sales documents such as sales orders, invoices, and so on. Not all pricing conditions on the pricing procedure have to be printed on the sales orders. For example, cost condition type is not printed on the sales order. Some pricing conditions, such as freight, may be printed at header level. See Figure 3.37 for an example of a pricing condition you could see in a pricing procedure.

Procedure ZVAA01 Copy of Standard Pricing Proc									
Control									
Reference Step Overview									
Step	Co	CType	Description	Fro	To	Ma	R	Stat	Print
8	0	EK01	Costs			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11	0	PR00	Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	0	ZRVS	Reference PR00			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13	0	PB00	Price (Gross)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14	0	PR02	Price Increased			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	0	ZK01	Variant Costs			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
20	0	VA00	Variants			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
21	0	ZA00	General variants			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
100	0		Gross Value			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
101	0	KA00	Sales Promotion			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
102	0	K032	Price Group/Material			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
103	0	K005	Customer/Material			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
104	0	K007	Customer Discount			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
105	0	K004	Material			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Figure 3.37 Display of Pricing Condition in a Pricing Procedure

The print ID has several possible values. Some of the key and most commonly used values are listed here:

- ▶ [] (**blank**): Condition is not printed.
- ▶ **X**: Condition is printed at item level.

- ▶ **S:** Condition is printed at totals level (i.e., if there are multiple line items, then the pricing condition is shown as individual line items as well as at the totals level).
- ▶ **A:** Condition is added to the net value and printed, not shown individually.
- ▶ **B:** Condition is printed as a total if it's a nonzero condition.

Figure 3.38 shows a sample printout, demonstrating that gross price (PR00) and customer material discount (K005) are both at line item level, but the material discount (K004) is at the totals level (Setting "S").

10	Material:	BATMATS	FERT Demo Material					
	Quantity:	1 EA						
	Price:	Type	Rate	RU	per	CUD	Value	
		Gross Value	100.00	EUR	per	1 EA	100.00	
		Net Value for Item	75.00	EUR	per	1 EA	75.00	
	Terms of Delivery:	FOB waldrof						
20	Material:	BATMAT	AKT FERT Material Ffor Batch					
	Quantity:	1 EA						
	Price:	Type	Rate	RU	per	CUD	Value	
		Gross Value	100.00	EUR	per	1 EA	100.00	
		Customer/Materia	-15.00	EUR	per	1 EA	-15.00	
		Net Value for Item	75.00	EUR	per	1 EA	75.00	
Items total							215.00	
	Price Type		Rate	RU	per	CUD	Base	Value
	Material		-10.00	EUR	per	1 EA	1.000	-10.00
	Material		-25.00	EUR	per	1 EA	1.000	-25.00
Final amount							255.85	

Figure 3.38 Sales Document Printout

This section discussed some of the pricing procedure definitions and how the condition types, sequences, and access sequences work together. Some important settings within the pricing procedure influence how the procedure is applied, so let's talk about those next.

3.13 Pricing Procedure Settings

Additional settings on the pricing procedure include manual, statistical, required, subtotals, and accrual settings.

Figure 3.39 displays the settings as applicable to the condition type within the pricing procedure. Some of the key settings are listed here.

Procedure ZVAA01 Copy of Standard Pricing Proc														
Control														
Reference Step Overview														
	Step	Co	CType	Fro	To	Manual	Required	Statistics	SuTot	Reqt	CalTy	BasTy	AccK	Accru
	905	0	B005	400		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		24			ERB	ERU
	906	0	ZB07	400		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		24			ERB	ERU
	908	0				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	910	0	PI01			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	B	22			ERL	
	911	0	AZWR			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2	48		ERL	
	914	0	SKTV			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	D	14		2		
	915	0	MWST			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10		16	MWS	
	919	0	DIFF			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		13	16	4	ERS	
	920	0				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A		4			
	930	0	SKTO			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		9		11		

Figure 3.39 Other Settings

► MANUAL

This setting is used when a pricing condition has to be manually input. In other words, even if the pricing condition is automatically determined, if the MANUAL indicator is set for the pricing condition type, then the automatically determined price can be overwritten.

► REQUIRED

This setting is used when a pricing condition is mandatory on the sales order. The sales order will not be completed until this pricing condition is entered.

► STATISTICS

This setting is used when the pricing condition type value doesn't add to the total value of the customer sales order. When the indicator is selected, you can still set this value manually on the sales order. The other indicators such as REQUIRED and MANDATORY are still applicable if the STATISTICS indicator is chosen. This pricing condition can be transferred to an intercompany sales order where it will no longer be statistical and will add to the total value of the intercompany sales order. The intercompany pricing condition PI01 on the standard pricing procedure RVAA01 is marked as statistical on the customer order but not on the intercompany sales orders.

► SuTOTALS (subtotals)

This indicator provides a flexible way of storing the calculated pricing conditions

value. This indicator's purpose is to allow the pricing conditions values to be stored in a subtotals field for use in further calculations.

The SAP ERP system provides many fields for storing these subtotals, as shown in Figure 3.40.

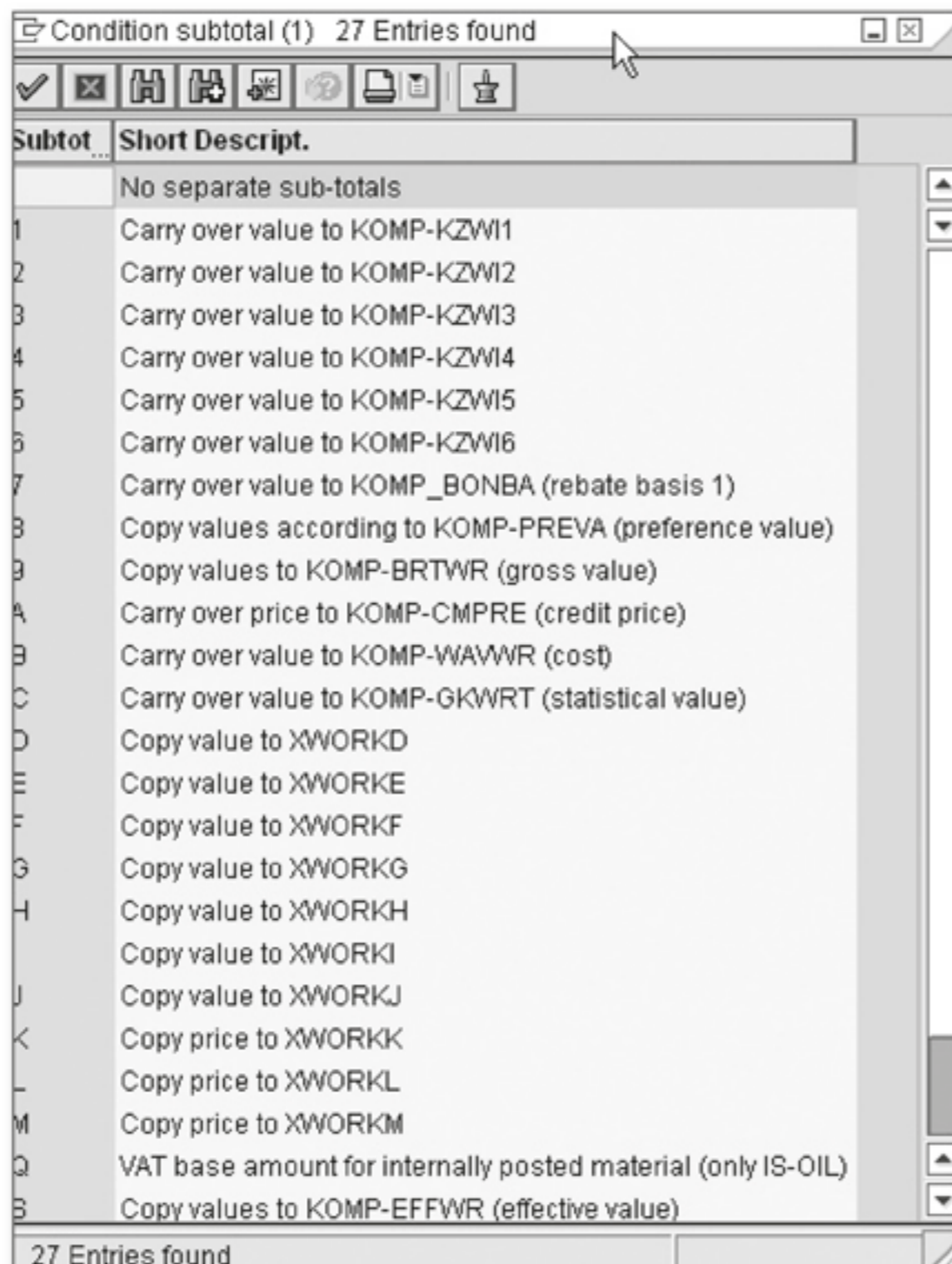


Figure 3.40 Subtotals

For example, the gross value subtotal can be stored in Subtotal 1 and be subtracted from Tax 2, respectively. After these values are stored, a difference of gross value minus tax can be calculated, as shown earlier in Figure . To store the gross value in Subtotal 1, assign the condition type PR00 to Subtotal 1 as shown in Figure 3.41.

```

1 | * Rate without tax (KOMP-KZWI1 minus tax)
2 | form frm_kondi_wert_025.
3 |   xkwert = komp-kzwi1 - komp-mwsbp.
4 | endform.
5 |

```

Figure 3.41 Use of Subtotals

► **ACCKEY**

The account key is the way each pricing condition type is linked to a General Ledger (GL) account. This setting is covered in detail later in Chapter 11.

► **ACCRUALS**

Accruals are maintained for rebate agreements. Some of the condition types, such as BO01 and BO02, are examples of rebates posted to accrual accounts. An account key is associated with the accruals account key, which is linked to a GL account. Account keys and accruals are discussed in more detail in Chapter 11.

3.14 Summary

Now that you have finished reading this chapter, you should have a good understanding of how to design and configure SD pricing procedures for your own company.

By understanding pricing condition types, access sequences, and condition tables, you can now set up list prices, discounts, freights, and taxes for your own company. You also learned that custom pricing conditions can be used if the standard conditions are not sufficient to meet your company requirements.

In addition, you should now understand condition exclusions and how you can use them to provide the best possible price for a customer. You also learned how to print (or omit) various pricing conditions.

A fundamental understanding of basic SD pricing conditions is essential for you to learn about special SD pricing conditions, which is covered in the next chapter.

This chapter discusses how to use special pricing conditions such as promotions and deals, EDI pricing, and rebate agreements, as well as free goods (e.g., buy one, get one free).

4 Special Topics in SD Pricing

Now that you understand pricing condition procedures and application, we will address some of unique applications of pricing. In addition to standard pricing conditions available in SAP ERP software, certain special pricing conditions are also available for your use. This chapter examines the various special pricing conditions and how they are used. These special pricing features can be used by companies in various situations.

For example, retail companies that deal with a large volume of EDI sales orders will find the EDI customer expected pricing feature very useful because it compares the customer expected price with the EDI price and blocks the sales order if the discrepancy exceeds a certain percentage, as defined by the company.

One of the special pricing functionalities that is useful in all industries is promotions and sales deals in which companies can track the various discounts offered during special occasions, such as holiday seasons.

Promotions can be applied to a range of products or to specific products. A promotion can have several sales deals. Promotions are all set up as agreement types in the SAP ERP system. A sales deal targets specific products and provides better focus to selling products. Sales deals can be offered in various ways, such as material discounts or customer discounts.

Rebate agreements refer to a special price granted to the customer depending on the sales volume. Rebate agreements are collections of condition records that contain general information and terms that apply to the condition records. Pricing allows you to manage your business through these functions. Special conditions can include anything from group conditions and minimum order value, to cumulative condition types, which are some of the most commonly used special conditions. After a rebate agreement has been defined, the system keeps track of and accumulates all

of the billing documents that are relevant for the rebate. The accruals can then be posted to the relevant accounts.

Group conditions enable a company to offer discounts based on the cumulative value of the pricing condition. Condition type groups allow you to specify a range of condition types to the agreement. In the following sections, we'll discuss each of these topics in detail.

4.1 Promotional Pricing and Sales Deals

Promotions are short-term plans to increase sales of products and services, usually by targeting wholesalers and retailers. Promotional pricing can include promotions or sales deals.

As the name suggests, promotional pricing is a marketing plan to sell products. For example, a sportswear company wants to get rid of last year's inventory, so they decide to offer a 5% discount in the pricing of all men's leather shoes. This requires setting up a promotional pricing for leather shoes in the SAP ERP system.

For the rest of this section, we will illustrate promotional concepts with a fictional retail company named Luxury Inc. By setting up an overall promotional campaign, Luxury can track all of the sales deals that are part of the promotional campaign. Let's look into how the promotions and sales deals are being set up for this particular company.

4.1.1 Promotions

Promotions can cover a range of products or only specific products. A promotion can have several sales deals. Promotions are all set up as agreement types in the SAP ERP system. SAP ERP uses agreement types to differentiate between promotions and sales deals.

The agreement types are set up in customizing, and each agreement type has control data. Let's consider an example of Luxury setting up a Master Promotional Agreement. This promotion is for a period of 3 months, starting January 01, 2010, and ending on March 31, 2010, as a winter/spring sale targeting all high-end luxury products, such as handbags and sunglasses.

To configure promotions, follow this menu path IMG • SALES AND DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING AGREEMENTS • MAINTAIN PROMOTION TYPES (see Figure 4.1).

Change View "Promotion Types": Details		
New Entries		
Promotion type	0030	Promotion
Assignment		
Application	V	Sales/Distribution
Agreement category	B	Promotion
Default value		
Proposed valid-from	2	First day of month
Proposed valid-to	1	End of the current month
Control		
Overview screen	PI01	Overview screen for a promotion in
TextDetermProc.	<input type="checkbox"/>	
Text ID	<input type="text"/>	

Figure 4.1 Promotion Type definition for Agreements

Figure 4.1 displays the promotion type defined in the configuration. The definition and the details are explained later in this section.

Enter the following values for the key fields in this screen to set up this promotional campaign for Luxury:

- ▶ **PROMOTION TYPE**
Enter "0030".
- ▶ **AGREEMENT CATEGORY**
Enter category "B". ("B" is used for promotions, and "C" is used for sales deals.)
- ▶ **PROPOSED VALID-FROM/PROPOSED VALID-TO**
These settings are used to control the start and end dates of the promotion. Enter "2" for VALID-FROM and "1" for VALID-TO. (Value "2" represents the first day of the month, and value "1" represents the end of the current month.)

► **OVERVIEW SCREEN**

This field controls how the overview screen of the promotion agreement is displayed. Enter "PI01" in this field.

► **TEXTDETERMPROC.**

This field controls the texts that appear on the promotion. These texts can be left blank or can be used to store any information pertaining to the sales deal. For example, you can maintain notes about the sales deals in this field.

The next step is to assign number ranges to the promotional campaign type created for Luxury.

Number Ranges Definition for Promotion

As part of the promotion definition, you need to define the number ranges that are assigned within the promotion. The same number ranges are used for the rebate agreement. The menu path for defining the number ranges is SPRO • SAP REFERENCE IMG • SALES AND DISTRIBUTION • BASIC FUNCTION • PRICING • PRICING AGREEMENTS • DEFINE PROMOTION. When the pop-up window appears, select MAINTAIN NUMBER RANGES FOR AGREEMENTS. You can maintain the number ranges here

The configuration step to maintain number ranges can be reached via the menu path: SPRO • SALES AND DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING AGREEMENTS • MAINTAIN NUMBER RANGES FOR THE REBATE AGREEMENTS. Figure 4.2 displays the number range to assign to the promotional agreement.

Subobject	Group
Element	Text
	Standard number range (volume-based rebate)
0001	Group Rebate
0002	Material Rebate
0003	Customer Rebate
0004	Hierarchy Rebate
0005	Indep. of sales vol.
0020	Sales Deal
0030	Promotion

Figure 4.2 Number Range Assignment for Promotion (0030)

Assign the number range "0030" to PROMOTION by clicking the number 0030 in the ELEMENT column.

To apply the promotional condition to the transaction, you need to set up and maintain the master data. So now that we have the configuration set up, let's go over the master data setup of the promotional agreement.

1. For the promotion set up (master data), follow the menu path LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • AGREEMENTS • PROMOTION • CREATE, or use Transaction VB31. Figure 4.3 shows that a promotion "94" has been set up with agreement type "0030", organizational data "1000 10 10" (Sales Area), and text.

Change Promotion	
Promotion	94
Description	Promotion Demo
External description	EXTERNAL PROMOTION
Default data	
Validity period	01.10.2010
To	31.10.2010
Terms of payment	NT30 Net 30
Fixed value date	Addit.value days
Internal comment	
Master Promotion Agreement	

Figure 4.3 Promotion Example

2. Enter the following information to set up the master data for the promotional campaign for Luxury:
 - ▶ **Promotion Type:** "0030"
 - ▶ **Sales Area:** "1000,10,10"
 - ▶ **Promotion Description:** "Promotion Demo"
 - ▶ **Valid From:** "01.10.2010"
 - ▶ **Valid To:** "01.31.2010"
 - ▶ **Internal Comment:** "Master Promotion Agreement"
3. Click the SAVE button. The promotion number "94" is automatically generated by the system.

4.1.2 Sales Deals

A sales deal targets specific products and provides better focus to selling products. Sales deals can be offered in various ways, such as material discounts or customer discounts. When the sales deal is linked to a promotion, the promotion number is contained in the sales deal.

To continue with our example, Luxury is running a sales deal for its handbag line that doesn't sell as well as the rest of the company's merchandise as part of a promotional campaign.

Set up the sales deal for Luxury as follows:

1. Follow the menu path SPRO • SALES AND DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING AGREEMENTS • SETUP SALES DEALS • DEFINE SALES DEAL TYPES to access the screen that allows you to set up the sales deal. Figure 4.4 shows the screen you will see after you access this menu path.

Change View "Sales Deal Types": Details		
New Entries [Icons]		
Type of sales deal	0020	Sales Deal
Assignment		
Application	V	Sales/Distribution
Agreement category	C	Sales deal
Default value		
Proposed valid-from	2	First day of month
Proposed valid-to	1	End of the current month
Release status	<input type="checkbox"/>	Released
Control		
Cond.type group	0020	
<input checked="" type="checkbox"/> Different val.period		Cond. record validity period may differ
Overview screen	AG01	Overview screen for a sales deal in sales and distrib
Agreement hierarchy	A	A higher-level agreement can be assigned
Text determination		
TextDetermProc.	<input type="checkbox"/>	
Text ID	<input type="text"/>	

Figure 4.4 Sales Deal Type Configuration Settings

2. Enter the following key fields to create a sales deal for Luxury:

- ▶ **TYPE OF SALES DEAL**
Enter "0020" as the sales deal type.
- ▶ **AGREEMENT CATEGORY**
Enter "C" as the category used for sales deals.
- ▶ **PROPOSED VALID-FROM/PROPOSED VALID-TO**
Enter "2" for PROPOSED VALID-FROM and "1" for PROPOSED VALID-TO dates. ("1" represents the start date of the current month, and "2" represents the end of the current month.)
- ▶ **RELEASE STATUS**
The release status can be used for blocking the sales deal usage or price simulation of the sales deal. Because this sales deal is going to be active, use a blank value.
- ▶ **COND.TYPE GROUP**
This setting controls the pricing conditions associated with the sales deals.
- ▶ **OVERVIEW SCREEN**
This field controls the overview screen of the promotion agreement. Enter "AG01". The SAP ERP system delivers the standard screen, based on the business process and data need for different functions; for example, sales order screens or data might be different from the quotation. ("AG01" represents sales promotion.)
- ▶ **AGREEMENT HIERARCHY**
This setting controls whether a higher level agreement can be set or not. For example, a promotion can be assigned to the sales deal if this field is set to "A".
- ▶ **TEXTDETERMPROC.**
This setting controls the texts that appear on the sales deal. Text determination procedures can be used to store any information pertaining to the sales deal. For example, we can maintain notes about the sales deals. In this instance, leave this field blank.

3. Click the **SAVE** button to create a sales deal.

Now that we've created a sales deal, let's talk about condition type grouping, which is used in conjunction with sales deal and promotions.

4.1.3 Condition Type Groups

Condition type groups allow you to specify a range of condition types for the agreement. Continuing with our example of Luxury, let's consider handbag sales. In this scenario, Luxury is setting up discount conditions for handbag sales based on customers, for example, who have a membership or who carry a store credit card.

The discounts can be applied in various ways for the handbag sales. For example, the discounts can be applicable to certain customer groups that are identified by the price groups associated with the customer and can be represented by a special discount condition type.

Alternatively, the same discount can be provided directly to the customer, which can be represented by another special discount type.

Several discounts are applicable to this sales deal, so we can group all of these condition types using a condition group, which will make them easier to keep track of. Condition type groups contain groups of condition types and tables, which can be assigned to an agreement. For example, you might have several pricing conditions that apply to agreements. The condition group helps you group the condition types for the agreements.

The next few subsections explain how to configure the following:

- ▶ Creating a condition type group
- ▶ Assigning condition types to the condition group
- ▶ Assigning this condition group to a sales deal

Create a Condition Type Group

In this setting, condition groups are created and assigned to category "A" because "A" represents pricing agreements. Then we assign condition types to condition groups.

Assign the condition types to the condition group "0020" in this setting, as you can see in Figure 4.5.

0020	Sales Deal	1	K020	Price Group	20	Division/Price Group
0020	Sales Deal	2	K007	Customer Discount	7	Division/Customer
0020	Sales Deal	3	K000	Sales Promotion	5	Customer/Material
0020	Sales Deal	4	PR00	Price	304	Material with release sta
0020	Sales Deal	5	PR00	Price	305	Customer/material with i

Figure 4.5 Condition Types Assigned to Condition Group "0020"

Assign Condition Groups to Sales Deals

Now you can assign the condition groups to SALES DEAL "0020" as shown in Figure 4.6. Condition Group "0020" has been assigned with the condition types "K020" (Price Group Discount) and "K007" (Customer Discounts).

Change View "Allocation of Condition Type"				
	ATyp	Agreement type	CTyGr	Cond.type group
	0020	Sales Deal	0020	Sales Deal

Figure 4.6 Assign Condition Group to Sales Deals

In the previous section, we saw how the promotions are created. Let's now look at how to define sales deals from the master data point of view. Now that we know how to customize a sales deal, the next step is to actually create a sales deal. First, we'll explain how the master data needs to be set up to create a sales deal with reference to a promotion.

1. To create a sales deal, follow the menu path LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • AGREEMENTS • SALES DEALS CREATE, or use Transaction VB21.

In this step, we'll create a sales deal with a promotion, and reference the promotion created in the previous step. Figure 4.7 displays the creation of the sales deal with reference to a promotion.

2. Enter the TYPE OF SALES DEAL as "0020", and select the REFERENCE PROMOTION button.
3. Enter the PROMOTION number (created from earlier step).
4. Select COPY, and confirm the settings on the next screen.

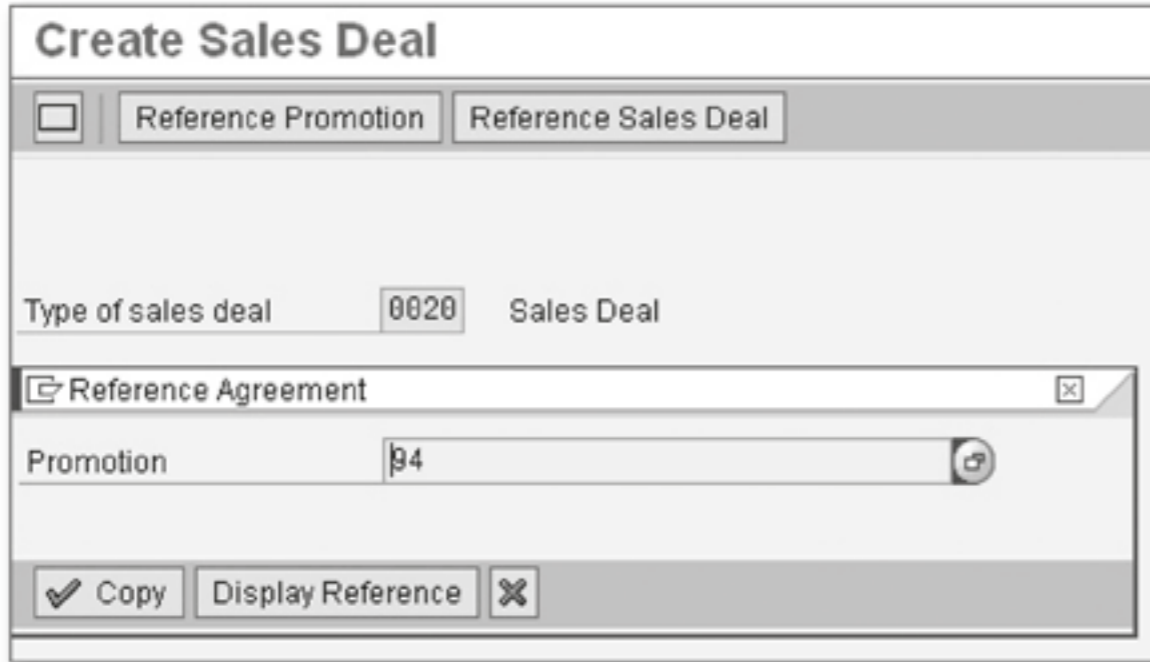


Figure 4.7 Creating Sales Deal with Promotion

5. Select CONDITIONS. The default values on the next screen (see Figure 4.8) are automatically filled in by the system. The figure displays the default values that are proposed based on our configuration set up for the promotion type, as shown earlier in Figure 4.1.

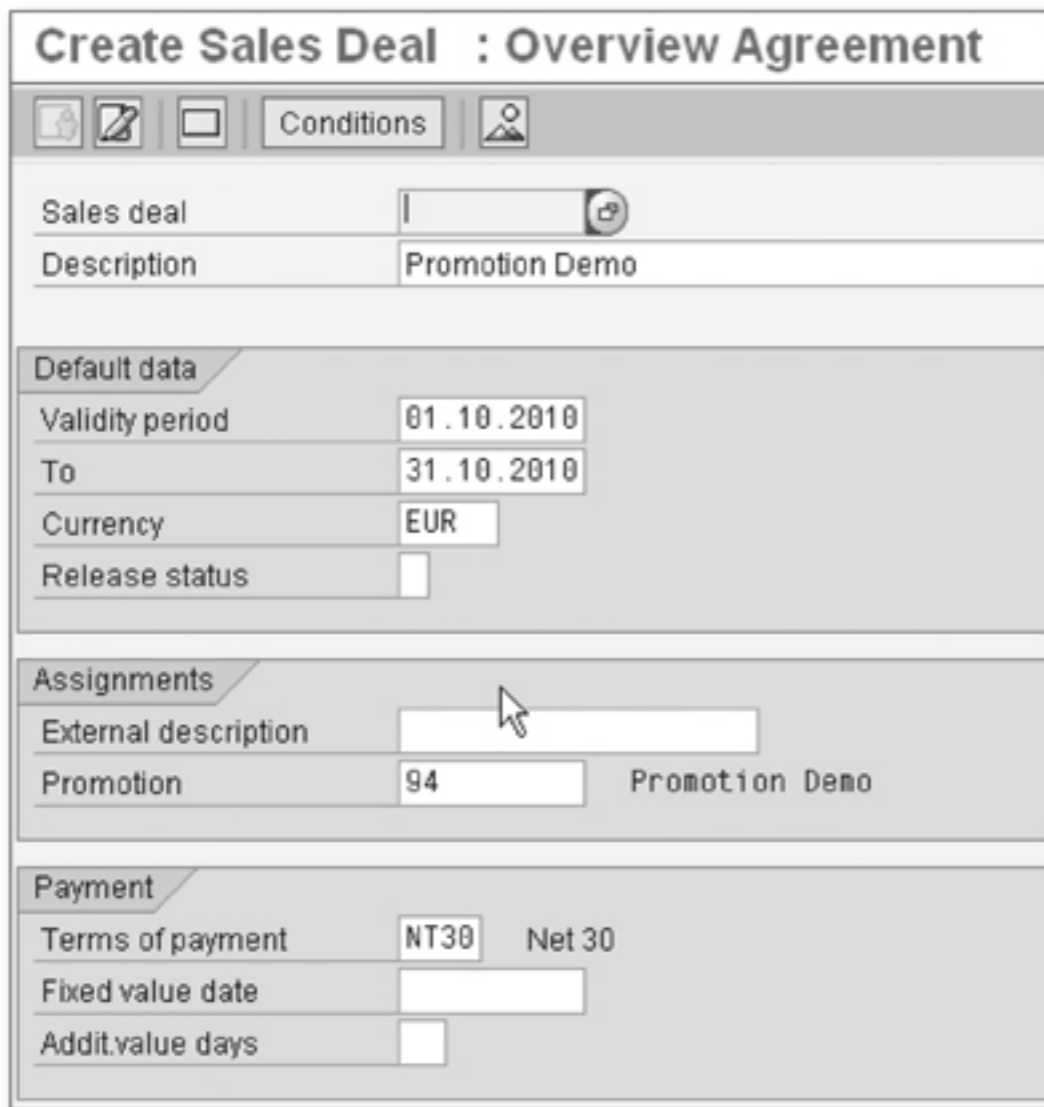


Figure 4.8 Default Values from Sales Deal Setting and Promotion

6. Define a specific condition type for this sales deal. For Luxury, we created a condition group "0020", which had condition types "K020" and "K007" assigned to it in the previous configuration step. The various condition types belonging to condition group "0020" are given as options. For Luxury's sales deal, choose

customer discount "K007" as shown in Figure 4.9. Refer to Figure 4.6, where you saw the creation of the sales deal with reference to a promotion. Here, you will not click the REFERENCE PROMOTION icon.

Create Sales Deal : Overview Customer Discount (K007)

Sales Organization: 1000 Germany Frankfurt
 Distribution Channel: 10 Final customer sales
 Division: 00 Cross-division

Division/Customer										
	Customer	Description	Amount	Unit	per	U...	C	S	Valid From	Valid to
<input checked="" type="checkbox"/>	2003	Customer for EDI training	10,000-%				A		01.10.2010	31.10.2010

Figure 4.9 Sales Deal Condition Type

The condition types are maintained the same way as described earlier in Chapters 1 through 3. The condition records can also be set up for a group of customers by specifying copying rules and providing a dynamic way of maintaining data.

- Click the SAVE button, and a sales deal is now created. As shown in Figure 4.10, a promotion is assigned to the sales deal automatically by the system.

Display Promotion

Promotion: 94
 Description: Promotion Demo
 External description: EXTERNAL PROMOTION

Default data

Validity period: 01.10.2010
 To: 31.10.2010
 Terms of payment: NT30 Net 30
 Fixed value date: Addit.value days: 0

Internal comment

Master Promotion Agreement

Li 1, Co 1 Ln 1 - Ln 1 of 1 lines

Assigned sales deals

Sales deal	Sales deal descript.	Valid From	Valid to
95	Sales Deal Demo	01.10.2010	31.10.2010

Figure 4.10 Sales Deal Assigned Promotion

Now we've set up a sales deal on Luxury's handbags for specific customers. Following the creation of the master data, let's review how this applies to the business transactions.

Consider an example of the sales order processing. When a sales order is created for customer "2003", as shown in Figure 4.10, the discount conditions associated with this sales deal automatically appear, as shown in Figure 4.11.

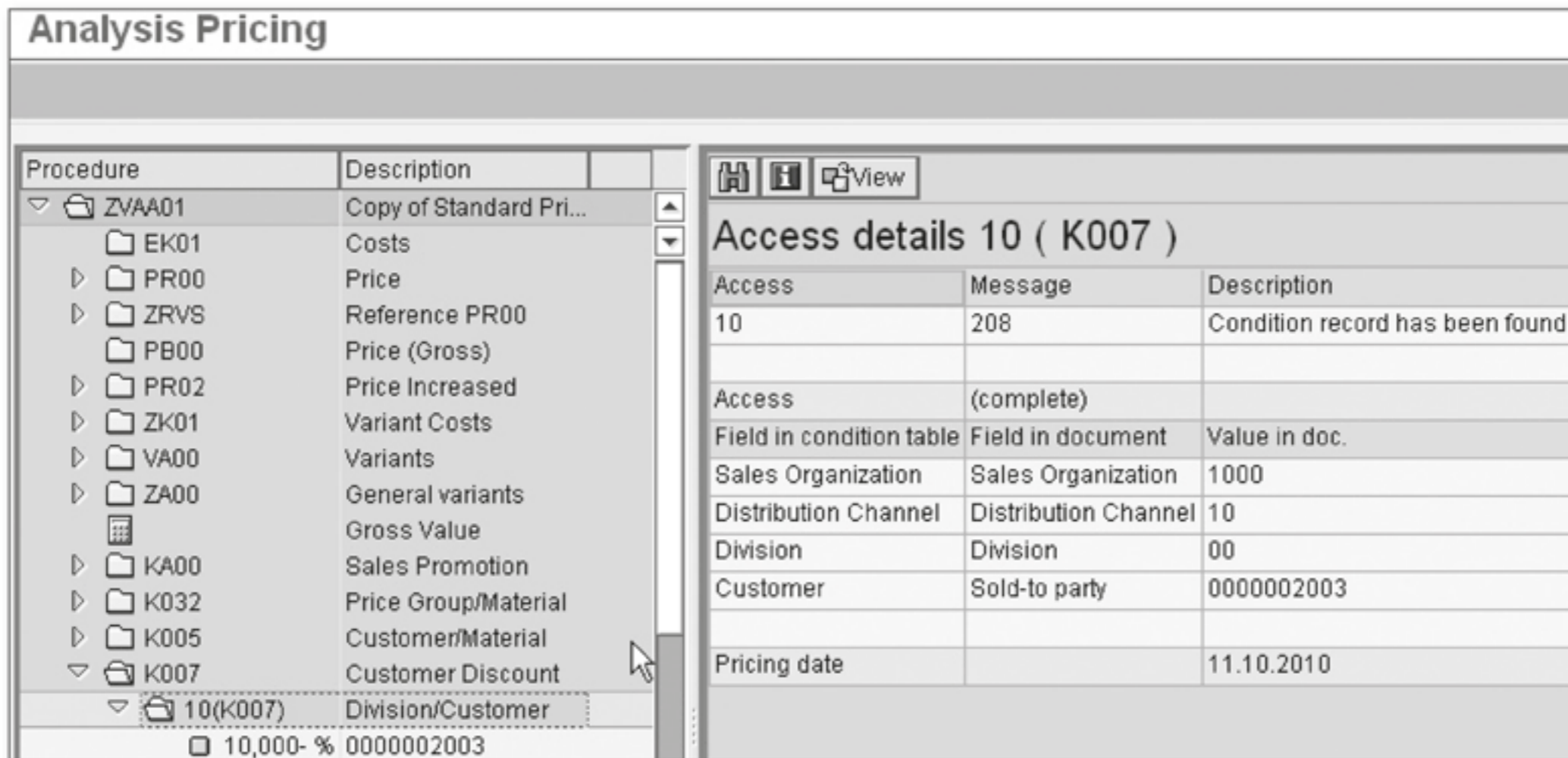


Figure 4.11 Analysis of a Sales Deal Discount on the Sales Order

We just learned about the configuration, data maintenance, and application of sales promotions and deals. Now let's go over another special pricing application that is involved with sales and distribution, which is called a rebate agreement.

4.2 Rebate Agreements

Rebate agreements are a special price granted to the customer depending on the sales volume. Rebate agreements are collections of condition records that contain general information and terms that apply to the condition records. Rebate agreements also involve discounts, which are paid retroactively to a customer. Usually rebates are settled after a periodic time specified in the agreement. The rebate agreements can be based on sales volume tied to a customer and/or material. The rebate

agreements are set up just like other agreements and are settled by issuing a credit to the customer. Rebate agreements can also be based on quantity of purchases.

A real-world example of rebate agreements based on quantity is used by car manufacturers. Manufacturers offer incentives to dealers for hitting sales targets. The car dealers get a rebate based on the quantity of cars sold at the end of the year.

Another example involves grocery retail stores where customers get discounts based on the dollar value of the groceries purchased over a period of time.

The next section covers the rebate agreements in detail.

4.2.1 Rebate Agreement Types

Let's consider an example of Krypt Inc., which is a company that makes audio and video equipment and then sells it to wholesale customers. Krypt has established a rebate agreement with wholesale customer Electronic Data Interchange for a period of one year. At the end of the year, all of the purchases made by Electronic Data Interchange will be added up and offered as a credit against their purchases.

We will use this situation as an example to explain how the rebate agreements are set up in the following sections.

The rebate is specified as an agreement type in customizing. The menu path for the configuration of rebate agreements is as follows (see Figure 4.12): SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • REBATE AGREEMENTS • DEFINE AGREEMENT TYPES (Transaction VB01).

You must set several control settings for rebate agreements on the screen for your agreements to properly work:

- ▶ **AGREEMENT**
Enter the rebate agreement four-digit code and description (e.g., "0003, Customer Rebate Agreement").
- ▶ **PROPOSED VALID-FROM/PROPOSED VALID-TO**
Controls the start and end dates of the rebate promotion.
- ▶ **PAYMENT METHOD**
Specifies how the payments are made (e.g., checks, wire transfers, etc.).








Change View "Rebate Agreement Types": Details	
     	
Agreement	0003 Customer Rebate
Default values	
Proposed valid-from	3  First day of year
Proposed valid-to	2 End of the current year
Payment Method	<input type="checkbox"/> Default status <input type="checkbox"/>
Control	
Cond.type group	0003 Customer
Verification levels	<input type="checkbox"/> Display all documents
<input type="checkbox"/> Different val.period	Rebate agreement and cond.record have same validity
ManAccrIs Order type	<input type="checkbox"/> Manual accruals
Arrangement calendar	<input type="checkbox"/>
Manual payment	
Payment procedure	B Payment allowed up to the value of the pro forma sett
Partial settlement	R3 <input checked="" type="checkbox"/> Reverse accruals
Settlement periods	<input type="checkbox"/>
Settlement	
Final settlement	B1 Correction B2
Minimum status	B Agreement released for settlement
Text determination	
TextDetermProc.	<input type="checkbox"/>
Text ID	<input type="checkbox"/>

Figure 4.12 Rebate Agreement Type Configurations Details

► **DEFAULT STATUS**

Specifies the status of the rebate agreement when it is created. It can be individually released (leave blank) or prereleased (enter "B").

► **COND.TYPE GROUP**

Controls the pricing conditions associated with the sales deals. The rebate condition type group groups together the conditions that can be used for the rebate agreement type. The condition type groups are set up for rebates the same way as promotions and sales, which you learned about in the previous section. For example, condition type group 0002 is associated with condition type BO02. Condition type group 0003 is associated with condition type BO03.

- ▶ **VERIFICATION LEVELS**
Specifies what is printed or displayed for a rebate agreement (e.g., Display totals by Customer, Display all documents, etc.).
- ▶ **DIFFERENT VAL. PERIOD**
The condition record validity period can be the same or different based on this indicator. This indicator controls the start and end date of the rebate agreement and can help manage your promotion for a specific period.
- ▶ **MANUAL ACCRUALS**
Indicates if the accruals are posted manually. The rebates are applied after the transaction, so this indicator provides the function for manually entering the accruals following the completion of the sales transactions.
- ▶ **MANACCRLS ORDER TYPE**
Specifies which sales document to use for manual posting of accruals of rebate agreements.
- ▶ **PAYMENT PROCEDURE**
Defines the procedure for manual postings (e.g., limit the payment based on what has been accrued).
- ▶ **PARTIAL SETTLEMENT**
If partial settlement is allowed, specifies the settlement type. There can be a business case in which the settlement of the rebate is settled partially, let's say, based on the quantity being sold or on accounts receivable. This indicator can help manage those business processes. For example, a seller sells to a distributor, and the distributor gets a rebate based on the end customer sale, based on the placement of the next set of orders, or based on a condition to tie this to the returns.
- ▶ **REVERSE ACCRUALS**
Allows reversals of manual accruals. The reversal accruals can apply when a sales deal has not been completed. For example, if the distributor sells it to the retailer and goods are returned for some reason, the accruals that are paid to the distributor need to be reversed.
- ▶ **SETTLEMENT PERIOD**
Specifies the period of the settlements (e.g., bi-weekly, monthly, etc.).
- ▶ **FINAL SETTLEMENT**
Specifies the credit memo order type for the final settlement.

- ▶ **MINIMUM STATUS**
Specifies when an agreement can be finally settled (e.g., if the agreement or rebate can be settled after release of the rebate agreement).
- ▶ **CORRECTION**
Specifies the sales document type that the system automatically uses to correct the values (e.g., the sales volume) on which the rebate payment is based.
- ▶ **TEXTDETERMPROC.**
Controls the texts that appear on the promotion.

Now that we've discussed the configuration screen for rebate agreements, let's review the rebate agreement maintenance screen.

4.2.2 Rebate Agreement Overview Screens

Our next step is to control the sequence in which the various screens appear when creating a rebate agreement.

1. Follow the menu path **SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • REBATE AGREEMENTS • OVERVIEWS • DEFINE OVERVIEWS**. Each screen number, as shown in Figure 4.13, corresponds to the screens available with the program **SAPMV13A**.

Change View "Conditions: Views": Overview			
New Entries			
View	Description	No.	View screen
0001	Condition rate	3001	Conditions: Overview - Condition Rate
0002	Administrative data	3002	Conditions: Overview - Administrative Data
0003	Sales Promotion	3003	Conditions: Overview - Sales Promotion/Promotion
0004	Terms of payment	3004	Conditions: Overview - Term of Payment
0005	Validity periods	3005	Conditions: Overview - Validity Periods
0008	Planned values	3008	Conditions: Overview - Planned Values

Figure 4.13 Define Overview Screens

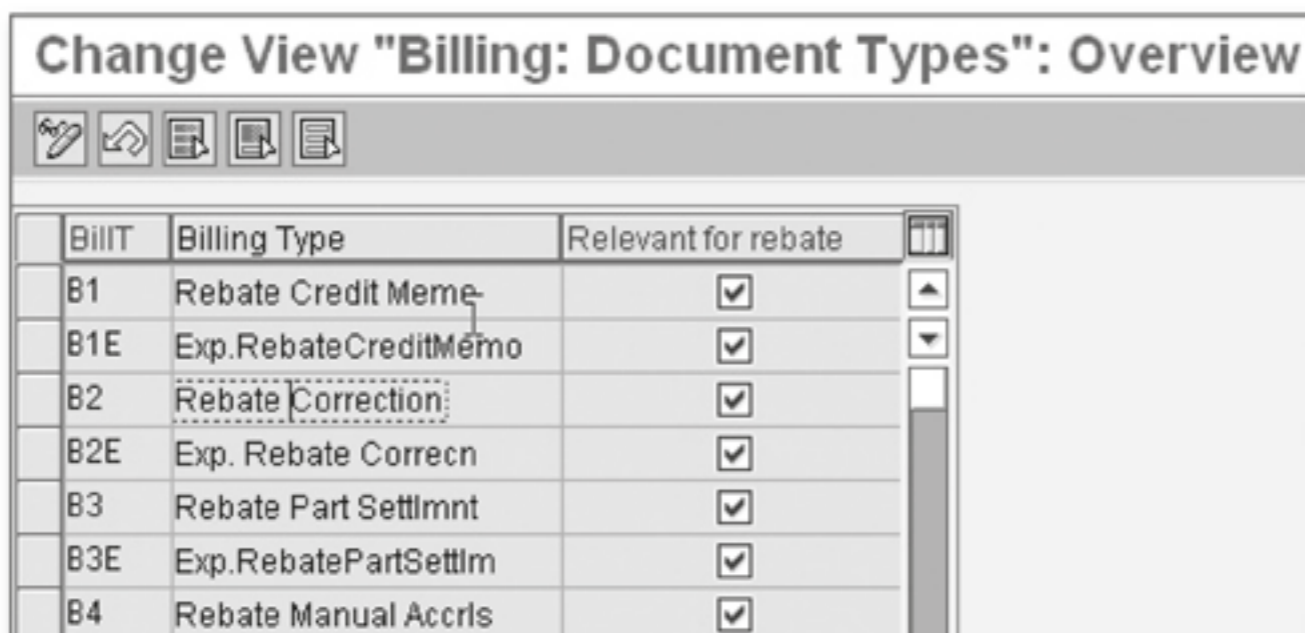
After the overview screens are defined, the sequence in which they must appear is defined in the configuration step. This is part of configuring the rebate agreement; as a first step, you define the screen that appears while creating rebates and assign them.

2. To define the sequence, access the overview screen (see Figure 4.13) through the menu path SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • REBATE AGREEMENTS • OVERVIEWS • ASSIGN OVERVIEWS.

4.2.3 Rebate Agreement Activation

Next, the agreement needs to be activated by following these steps:

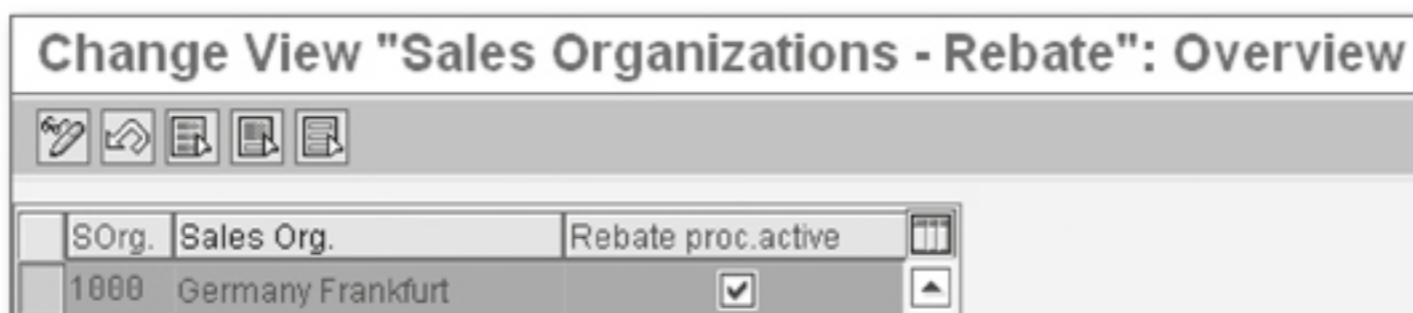
1. To activate the agreements, follow the menu path SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • REBATE AGREEMENTS • ACTIVATE REBATE PROCESSING and select BILLING TYPES FOR REBATE PROCESSING (see Figure 4.14).



BIIT	Billing Type	Relevant for rebate
B1	Rebate Credit Memo	<input checked="" type="checkbox"/>
B1E	Exp.RebateCreditMemo	<input checked="" type="checkbox"/>
B2	Rebate Correction	<input checked="" type="checkbox"/>
B2E	Exp. Rebate Correcln	<input checked="" type="checkbox"/>
B3	Rebate Part Settlmnt	<input checked="" type="checkbox"/>
B3E	Exp.RebatePartSettlm	<input checked="" type="checkbox"/>
B4	Rebate Manual Accrls	<input checked="" type="checkbox"/>

Figure 4.14 Activate Billing Type for Rebate Processing

2. Activate the rebate agreement for the sales organization (see Figure 4.15) by following the menu path SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • REBATE AGREEMENTS • ACTIVATE REBATE PROCESSING • ACTIVATE REBATE PROCESSING FOR SALES ORGANIZATION.



SOrg.	Sales Org.	Rebate proc.active
1000	Germany Frankfurt	<input checked="" type="checkbox"/>

Figure 4.15 Activate Sales Organization for Rebates

3. To group materials for rebate processing, a rebate agreement group can be defined. Maintain the rebate agreement group through the menu path SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • REBATE AGREEMENTS • ACTIVATE REBATE PROCESSING • REBATE MATERIAL GROUPS (see Figure 4.16).

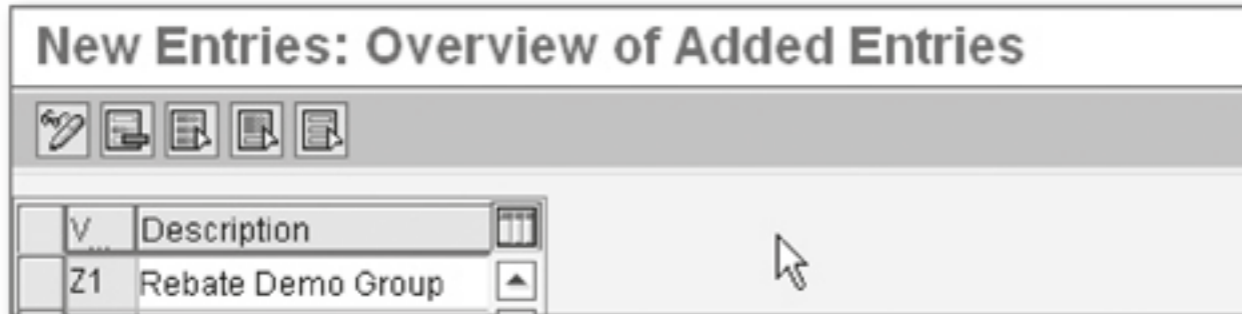


Figure 4.16 Rebate Material Groups

This will help group materials together and can serve as a key field for rebate agreements. For example, Luxury can group together all handbags that have long shoulder straps.

The next section reviews how the rebate agreement has an impact on reorganizing from the billing document when pricing values are altered.

4.2.4 Reorganizing Rebate-Relevant Data from Billing Documents

When a pricing procedure that has rebate pricing conditions is altered, it may affect the subtotals being calculated; that is, the rebate values calculated may be altered. If this happens after the billing documents have been created, you must reorganize the billing documents so that the rebate values are recalculated.

The screen shown earlier in Figure 4.16 shows the reorganizing report that must be run to recalculate the rebates. You can access the report by following the menu path **SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • REBATE AGREEMENTS • ACTIVATE REBATE PROCESSING • RECALCULATE SUBTOTALS FOR REBATE PROCESSING**.

4.2.5 Retroactive Rebate Processing

When the rebate agreements are created retrospectively, the billing index is used internally to include the billing documents that should be in the rebate agreement. To process a rebate retroactively, follow these steps:

1. Access the billing index by following menu path **SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • REBATE AGREEMENTS • ACTIVATE REBATE PROCESSING • CREATE BILLING INDEX**.
2. Enter the billing documents to be included in the rebate agreements in the screen that results from the menu path, as shown in Figure 4.17.

Figure 4.17 Retroactive Rebate Agreements

3. Specify the date and time, maximum runtime, and frequency of the run. In our example, we use "11.10.2010" in the FIRST RUN ON field; the MAX. RUNTIME is "2" and it's run once a day.
4. Use program SDS060RC to simulate statistical data setup for info-structure S060.
5. After simulation is run and reveals errors in statistical updates, you can run reorganization by following the menu path SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • SIMULATE AND EXECUTE 'SETUP OF STATISTICAL DATA'. You will see the screen shown in Figure 4.18.

Figure 4.18 Reorganize Statistical Data

6. Compare the statistics for rebate settlements with the billing document values by following the menu path SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • COMPARE REBATE BASIS AND CORRECT ACCRUALS.

Program RV15B002 enables you to compare the statistics for rebate settlements with the values from the billing documents. This program can be executed through Transaction SE38. You should compare these values because the billing document values can differ if you implement rebate processing retrospectively and want to take into account old billing documents. The report allows you to post a rebate correction request to correct the accruals.

This report updates the old billing documents when there is a change in the rebate structure, and a new pricing procedure is carried out with update pricing type "I". Only rebate processing condition types are updated by running this report.

The menu path to make this rebate correction request and update the old billing documents is SPRO • SALES & DISTRIBUTION • BILLING • REBATE PROCESSING • ACTIVATION OF THE NEW REBATE PROCEDURE.

You have now learned the necessary configuration steps to set up rebate agreements. You are also now familiar with the reports that can be run retroactively to correct rebate agreements.

In the following sections, you'll learn about the master data setup and transactions to calculate rebate processing.

4.2.6 Master Data Settings for Rebate Agreements

Let's consider a sample scenario where a grocery store is setting up a rebate agreement for a customer. The customer is eligible for a rebate of \$5 for every purchase made.

The customer master for the grocery store company has to be set up for receiving rebates. This is set via Transaction XD02 • BILLING (see Figure 4.19) or use SAP EASY ACCESS • SALES AND DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • CUSTOMER • CREATE • XD02 - COMPLETE.

Change Customer: Sales Area Data

Other Customer | General Data | CIN Details | Additional Data, Empties | Additional Data

Customer: 2003 Customer for EDI training: 42000
Sales Org.: 1000 Germany Frankfurt
Distr. Channel: 10 Final customer sales
Division: 00 Cross-division

Sales | Shipping | **Billing Documents** | Partner Functions

Billing document

Subs. invoice processing **Rebate** Price determin.
Invoicing dates:
InvoicingListDates:

Figure 4.19 Activate Rebate Setting for Customer

Now we need to set up the rebate agreement master data by following these steps:

1. Follow the menu path LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • AGREEMENTS • REBATE AGREEMENT • CREATE, or choose Transaction VB01. In our example, we choose rebate agreement type "0002" (see Figure 4.20).

Create Material Rebate : Overview Agreement

Conditions | Pay | Accrue

Agreement: [] Agreement type: 0002 Material Rebate
Description: Material Rebate Demo
Extended Bonus: W/VAKEY Ind. Settlement Periodic Settlement

Rebate Recipient

Rebate recipient: 2003 Customer for EDI training
Currency: EUR
Payment Method: []
External description: []

Validity

Settlement periods:
Validity period: 01.01.2010
To: 31.12.2010

Control Data

Agreement Status: Open
Verification levels: F Display totals by payer/material

Figure 4.20 Material Rebate Agreement

2. Fill in the relevant fields: the DESCRIPTION, REBATE RECIPIENT, CURRENCY, VALIDITY PERIOD, and, if applicable, VERIFICATION LEVELS.
3. Specify the material that qualifies for the rebate as shown in Figure 4.21, and save the rebate agreement. After the rebate agreement is created, when you create a billing document, the rebate condition BO02 appears as a condition. Rebate condition BO02 appears because rebate agreement 0002 is associated with rebate condition BO02, which was set up in configuration.

Create Material Rebate : Overview Material Rebate (BO02)

Sales Organization Germany Frankfurt
 Distribution Channel Final customer sales
 Division Cross-division
 Customer Customer for EDI training
 Validity period
 To

Customer/Material

Material	Description	Amount	Unit	per	U...	Accruals
BATMAT	FERT Material Ffc	5,00-	EUR	1	EA	5,00-

Figure 4.21 Rebate for Material

The rebate agreement can also be displayed as a statistical condition on the sales order if required. This can be done by including the rebate pricing condition on the sales order pricing procedure and also marking it as a statistical condition type in configuration.

Figure 4.22 displays the application of the rebate condition to the billing document, as a condition with the value of \$5 is reduced from the total cost.

We now need to set up the sales volume for the rebate. For example, in a spice retail company, we set a level that indicates what volume of flour the customer must order before they are eligible for a rebate. To update and verify the rebate amount by the sales volume on the rebate agreement, follow these steps:

1. Go to menu path LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • AGREEMENTS • REBATE AGREEMENT • CHANGE (Transaction VBO2) • REBATE PAYMENTS SALES VOLUME. Figure 4.23 displays the accrued rebate agreement with the condition type B002, which is derived from the transaction explained earlier.

Item	10	Created by	IDADMIN
Item category	ZTN1	Created on	11.10.2010 Time 19:55:49
Material	BATMAT	AKT FERT Material Ffor Batch	
Batch	0000000447		

Qty	1,000 EA	Net	86,50 EUR
		Tax	16,44

Pricing Elements									
N	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr.	
		Net Value 2	86,50	EUR	1	EA	86,50	EUR	
<input type="checkbox"/>		B002 Material Rebate	5,00-	EUR	1	EA	5,00-	EUR	

Figure 4.22 Rebate Agreement BO02 on the Billing Document

Sales Volume for Rebate Agreement											
<input type="button" value="Rebate recipient"/> <input type="button" value="Verification level"/> <input type="button" value="Declarations"/> <input type="button" value="Choose"/>											
! There are messages											
Agreement	Reb.recip. Name, loc						Valid from	Valid to	Status		
CType Name	Valid From Valid To										
Condition key											
Condition key											
Total val.	Crcy	Amount	Unit	CondBasVal	CdCur	ScaleBasV1	ScCur	Accruals	Crcy		
<input type="checkbox"/> 96		Material Rebate Demo 2003		Customer for EDI training, 420	01.01.2010	31.12.2010	B				
B002 Material Rebate											
Sales org.	Distr.	Ch1	Division	Customer	Material						
1000	10	00	2003	BATMAT							
5,00	EUR	5,00	EUR	1,000	EA	1,000	EA	5,00-	EUR		
* 96											
5,00											
5,00- EUR											

Figure 4.23 Accrued Rebate for Condition Type BO02

- Execute the report, and enter the rebate agreement number. Note that if the sales volume is not updated correctly or the system comes up with the message "Sales Volume not updated correctly" when changing the rebate agreement, it may be necessary to run report SDBONT06 (see Figure 4.24). This report ensures that the sales volume is correctly updated

Update billing documents			
<input type="checkbox"/> <input type="checkbox"/>			
Doc. selection			
Agreement	96	to	<input type="text"/>
Rebate recipient	2003	to	<input type="text"/>
Validity end date before	11.10.2010		
Organizat. Data			
Sales organization	1000	to	<input type="text"/>
Distribution channel	10	to	<input type="text"/>
Division	00	to	<input type="text"/>
Default data			
Posting date	11.10.2010	FI-Doc.type	<input type="text"/>
Log			
<input checked="" type="checkbox"/> Error			
Processing:			
<input checked="" type="radio"/> Drill-down			
<input type="radio"/> Statement of sums			
<input type="radio"/> No log			
Control			
<input checked="" type="checkbox"/> Test			
<input checked="" type="checkbox"/> Changed agreements			

Figure 4.24 Run Report SDBONT06 to Calculate Sales Volume Correctly

- To execute report SDBONT06 as a separate transaction, follow the menu path LOGISTICS • SALES & DISTRIBUTION • BILLING • REBATE • REBATE SETTLEMENT • UPDATE BILLING DOCUMENTS, or use Transaction VBOF to directly access this screen.
- Input the correct rebate agreement number, sales area, and other fields as required to update the billing documents. After this is done, the sales volume will be reflected accurately in the rebate agreement.
- Settle the rebate agreement (see Figure 4.25). This can be done from the rebate agreement or can be run as a separate transaction. To execute it as a separate transaction, go to LOGISTICS • SALES & DISTRIBUTION • BILLING • REBATE • REBATE SETTLEMENT • REBATE SETTLEMENT, or use Transaction VB(7 to get to rebate settlement.

Settlement of Rebate Agreements

Rebate agreements

Rebate agreement 96 to []

Rebate recipient 2003 to []

Validity end date before 11.10.2010

Organizational data

Sales organization 1000 to []

Distribution channel 10 to []

Division 00 to []

Periodic partial settlement

Accounting settlement period [] to []

Settlement date 30.09.2010

Rebate settlement status

Open

Agreement to be checked Agreement released

Credit memo req.created Final settl.carried out

Actions

Carry out final settlement Issue verification level

Carry out partial settlement

Only issue s/s rev.

Control run

Test control run

Figure 4.25 Settle Rebate Agreement

6. Enter the rebate agreement number, and click the EXECUTE button. When the report is executed, the rebate agreement is settled and a credit memo is generated, as shown in Figure 4.26.



Figure 4.26 Credit Memo Generated

Now that we've covered rebate agreements, let's move on to another special pricing condition: EDI pricing.

4.3 EDI Pricing

The EDI pricing functionality enables a company to compare the price sent by the customer via EDI and the price maintained in the company's SAP ERP system via condition type PR00. The company can see if there is a difference between the two prices; then an incompleteness procedure can be assigned to the sales order. If the difference between the EDI price and the actual price is over a specified amount, then the incompleteness procedure is assigned. The comparison between the prices is controlled by the formula in the pricing procedure. The formula (pricing formula 8 or pricing formula 9) is available standard in SAP ERP and can be copied and modified if the percentage difference between the EDI and actual price has to be changed.

EDI processing is typically used by customers who process a large volume of transactions. EDI transactions not only provide you with established communication with your customer, they also help you avoid manual intervention, which is prone to errors. To illustrate this situation with an example, let's consider the example of KRY Electronics, which sells consumer electronic products such as televisions and stereo amplifiers. At its distribution centers, the company also stocks wholesale customers, such as Thomas Electronics. Thomas Electronics in turn sells to end customers.

Because Thomas Electronics has various department stores in several locations throughout the United States, the processing volume is high so the company must use EDI to place its sales orders. The product pricing is communicated in advance to KRY Electronics and is set up as the master condition record (PR00 condition record). On the sales orders placed by Thomas Electronics, the customer expected price is sent as an EDI1 pricing condition to KRY Electronics. The customer expected price is the price that has been negotiated by Thomas Electronics in advance of placing the sales order.

The EDI1 (customer expected price) and EDI2 (customer expected value) are the prices used to communicate customer expected price. To control the difference in standard pricing formula, "8" (1 unit of currency unit) or "9" (.05 of the currency value) are assigned to the condition type (see Figure 4.27). These formulas are specified in alternative calculation types as shown in Figure 4.27. Both formulas can be used for any currency.

The standard formula 8 is chosen if the difference in price cannot exceed one unit of currency. The standard formula 9 is chosen if the difference in price value cannot exceed .05 units of currency. If this does not meet the requirement, then a new pricing formula can be created by copying formula 8 or 9.

970	0	EDI1	Cust.expected price			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			9
971	0	EDI2	Cust.expected value			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			8

Figure 4.27 Customer Expected Price

Let's consider a small example for Krypt Inc., where the permissible difference between the customer's expected price and the actual price cannot exceed .05 units of currency. To achieve this, the pricing formula 9 is assigned to the alternative calculation type

The net value of an item is \$100.00, and the EDI1 price is \$125.00. Because the difference between the two is greater than the permissible \$5.00 as defined in formula 9, an incompleteness log is assigned to the sales document. After an incompleteness log has been assigned to the sales order, the sales order is blocked from further processing, and the price difference has to be reviewed by the business users.

The price difference can then be reviewed using Transaction V.25 and released (i.e., if the price difference is acceptable, then the sales order is released from the block).

Figure 4.28 illustrates how the sales document 13571, which had a price discrepancy, is reviewed and then released from block. The sales document can be processed upon release. To release a sales order, click the RELEASE button.



Figure 4.28 Release Sales Order

We've now looked at both rebate agreements and EDI special conditions. Next let's go over some of the special conditions that exist in pricing and learn how you can use them to help run your business.

4.4 Special Conditions

Pricing allows you to manage your business innovatively, as you'll see with some examples of different ways to use these special conditions. This section discusses a few of the special conditions that exist in pricing. Special conditions can include anything from group conditions and minimum order values, to cumulative condition types, which are some of the most commonly used special conditions. These are standard SAP ERP conditions, so they are available and ready to use out of the box.

4.4.1 Group Conditions

Group conditions enable a company to offer discounts based on the cumulative value of the pricing condition. To enable group conditions, the condition type must have the group condition indicator checked. Furthermore, the materials must belong to the same material group. Let's consider an example.

Material X and Material Y are assigned to Material Group 2 in the material master. The discounts for the condition type ZDIS are defined with scales as follows:

- ▶ From 10 units through 24, the discount is \$5.00
- ▶ From 25 units and up, the discount is \$10.00

If a sales order has 10 units of Material X for the first line item and 15 units of Material Y for the second line item, there are 25 units in the group. Individually, the line items qualify for the \$5 discount, but because the condition ZDIS has the GROUP COND. box checked (see Figure 4.), the cumulative value of the order is 25 units, which qualifies the order for the higher discount of \$10.00.

Figure 4.29 shows how the group condition "ZDIS" has been set up as a discount condition type: the COND. CLASS is "A", the discount is calculated on gross weight as CALCULAT.TYPE "D", and the discount is based on the MATERIAL GROUP, which is controlled by the ACCESS SEQ. K029.

Change View "Conditions: Condition Types": Details of Selected Set

Condit. type Group Condition Access seq. Material group

Control data 1

Cond. class Discount or surcharge Negative

Calculat.type Gross weight

Cond.category

Rounding rule

StrucCond.

Group condition

Group cond.

RoundDiffComp

Figure 4.29 Group Condition Indicator Turned On

4.4.2 Minimum Order Values

You might also have a certain overhead cost for selling a particular good. So, you can make use of the minimal order quantity functionality to ensure that your customer places the order based on the minimal quantity specified. Let's consider an example where the minimum order value is \$100.

Condition types AMIW (Minimum Order Value) and AMIZ (Minimum Value Proposal) are used to ensure that if the value of the sales order is below a certain limit, then the order is automatically adjusted to the minimum price. For example, if the order value is \$71.00, the minimum order value of \$100.00 can be met by bringing in the difference amount of \$29.00. This is done by adding a surcharge of \$29.00 to the net item value of \$71.00.

As shown in Figure 4.30, because there is a difference of \$29.00 between the sales order price (\$71.00) and the minimum price on the sales order (\$100.00), there is a surcharge of \$29.00 net value calculated in the AMIW condition type.

Now let's look at the cumulative condition type, which allows you to sum or subtotal the condition values.

Sales Document Item	10	Item category	ZTN1	Chnge Item
Material	BATMAT	AKT FERT Material Ffor Batch		
<div style="display: flex; justify-content: space-between;"> Sales A Sales B Shipping Billing Document Conditions Account assignment Sch </div>				
Qty	1,000	EA	Net	120,00 EUR
			Tax	22,80
Pricing Elements				
N	CnTy	Name	Amount	Crcy per U Condition value Curr.
<input type="checkbox"/>	PR00	Price	90,00	EUR 1 EA 90,00 EUR
		Gross Value	90,00	EUR 1 EA 90,00 EUR
<input type="checkbox"/>	K005	Customer/Material	15,00-	EUR 1 EA 0,00 EUR
<input type="checkbox"/>	K007	Customer Discount	10,000-%	9,00- EUR
<input type="checkbox"/>	K004	Material	10,00-	EUR 1 EA 10,00- EUR
		Discount Amount	19,00-	EUR 1 EA 19,00- EUR
		Rebate Basis	71,00	EUR 1 EA 71,00 EUR
		Net Value for Item	71,00	EUR 1 EA 71,00 EUR
<input type="checkbox"/>	KP01	Incomp.Pallet Surch.	20,00	EUR 1 EA 0,00 EUR
<input type="checkbox"/>	KP02	Mixed Pallet Disc.	25,00-	EUR 25,00- EUR
<input type="checkbox"/>	KF00	Freight	25,00	EUR 1 KG 25,00 EUR
<input type="checkbox"/>	AMIW	Minimum SalesOrdVal	100,00	EUR 100,00 EUR
<input type="checkbox"/>	AMIZ	Minimum ValueSurchrg	100,00	EUR 29,00 EUR

Figure 4.30 Minimum Surcharge Added to the Order

4.4.3 Cumulative Condition Types

The cumulative condition type is used to cumulate the net values of an item and all of the subitems belonging to that item. For example, condition type KUMU (Cumulative condition type) is defined with calculation type “G” and uses the formula (condition formula calculation rule) “36” to calculate the accumulation of conditions in any pricing procedure using KUMU. The formula “36” is calculated as shown in Table 4.1. (Refer to Chapter 3, Section 3.1, for details on the condition KUMU.) Formula 36 is a standard pricing formula used with condition type KUMU and is assigned as an alternative calculation type.

Item	Main	Net Value	Cumulative Net
0010		150	150 + 25 + 25 = 200
0020	0010	25	25
0030	0010	25	25

Table 4.1 Calculation for a Formula

In this example, line items 0020 and 0030 are subitems of line item 0010. This is because both line items 0020 and 0030 have main items as 0010.

The pricing formula calculates the sum of line items 0020 and 0030 to arrive at the cumulative net value of line item 0010.

4.4.4 Variant Pricing

Variant pricing is a special pricing condition that is usually used for configurable materials. When a discount has to be duplicated for the components belonging to a BOM, then the DUPL condition type is used. So if the main item has a discount of 12%, then the discount is duplicated to all of its subitems on the sales order. We'll discuss variant pricing further in Chapter 10, Variant Configuration.

4.4.5 Referential Pricing

You can implement referential pricing when a condition type is used with reference to another condition type. An example of a condition type that references another condition type is statistical pricing referencing the list pricing for statistical reporting. A condition can also reference another condition record. This is used when the referencing condition is similar to the condition being copied, but the calculation type, description, or access sequence differs.

When using intercompany pricing, for example, the end customer price condition PI01 needs to be copied to the intercompany pricing condition IV01. To copy PI01 to IV01, condition IV01 references condition type PI01. In the customer pricing procedure, PI01 is used as a statistical condition, and this value is transferred as the intercompany price on the intercompany pricing procedure. This has no impact on the accounting because it's a statistical value.

Similarly, if the condition type (Type A) has a different description, based on the use or application, then a new condition type (Type B) can be created that references Type A. For example, you could copy a base price value to a material price. All you need to do is change the description of Type B.

The pricing condition that has a reference condition can have its own access sequence (i.e., Type B). Although the two conditions share the same condition tables, but they do not need to be in the same sequence. For example, when a reference condition

has several access sequences, a new condition with the reference condition can have only one access sequence, such as for specific customer accounts.

In Figure 4.31, condition type ZR02 has been created with reference to PR00. Notice that the access sequence is ZR02. On the other hand, PR00 has access sequence PR00. ZR02 does not have to necessarily use the same access sequence as PR00.

Change View "Conditions: Condition Types": Details of Selected

Condit. type: ZR02 Price Access seq.: ZR02 Price with Release St
 Records for access

Control data 1

Cond. class: B Prices Plus/minus: positive a
 Calculat.type: C Quantity
 Cond.category:
 Rounding rule: Commercial
 StrucCond.:

Group condition

Group cond. GrpCond.routine:
 RoundDiffComp

Changes which can be made

Manual entries: C Manual entry has priority
 Header condit. Amount/percent Qty relation
 Item condition Delete Value Calculat.type

Master data

valid from: Today's date PricingProc: PR0000
 Valid to: 31.12.9999 delete fr. DB: Do not delete (set the deletion 1)
 RefConType: PR00 Condition index
 RefApplicatio: V Condit.update

Figure 4.31 Condition Type ZR02 Has Access Sequence ZR02

For an example of this scenario, let's consider Krypt Inc., which has maintained a list price condition type (e.g., PR00) based on large access sequences such as customer, customer groups, customer and material, and so on. Another condition (e.g., ZR00) can be defined by referencing PR00 but has an access sequence only for the customer group, which defines an access sequence to only the customer.

So far, we've discussed conditions in which a customer was billed or charged for the goods or services. You might have a different business scenario where you send

goods free of charge along with regular priced or sale. The next section discusses the free goods pricing setup.

4.5 Free Goods

In many industries, it's common to provide goods free of charge to a customer when certain goods, or a certain amount of goods, are purchased. SAP ERP classifies a free goods purchase as either inclusive free goods or exclusive free goods.

In an *inclusive free good agreement*, the customer pays for part of the goods purchased, and the rest is offered free. In an *exclusive free goods agreement*, the customer pays for the entire goods purchased but receives additional goods.

4.5.1 Configuring Free Goods

The setup of free goods follows the same pricing condition technique as regular ones, which we explained in Chapter 3. Follow these steps to set up free goods pricing:

1. Follow menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • FREE GOODS • CONDITION TECHNIQUE FOR FREE GOODS (see Figure 4.32).

The condition type has its own access sequence and access tables.

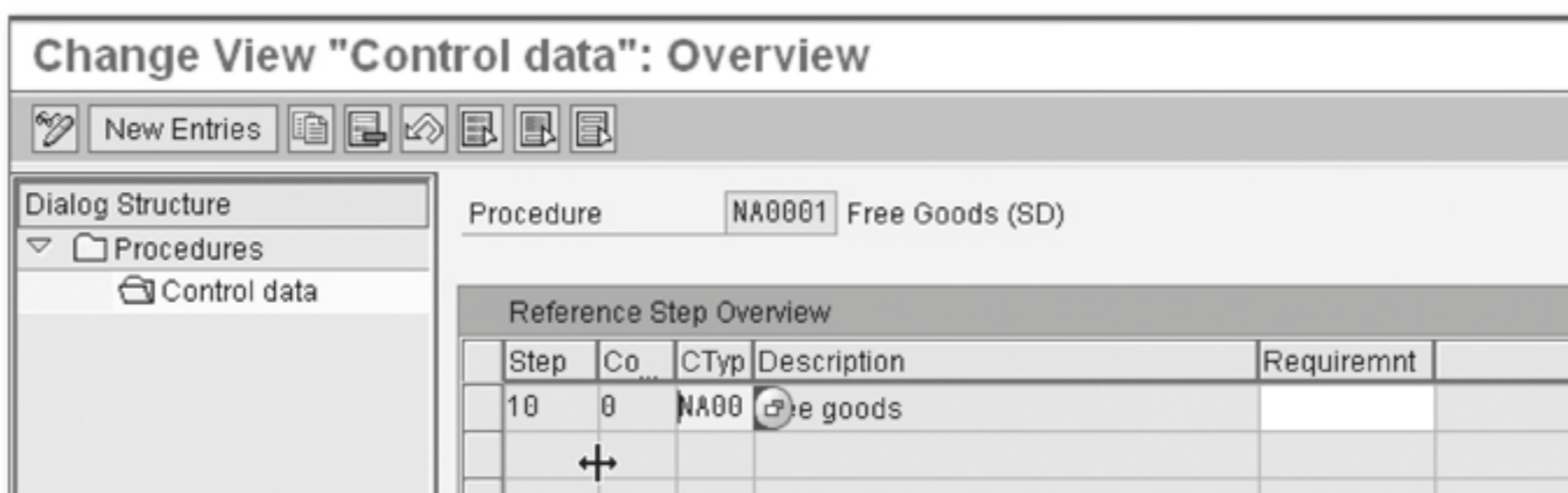


Figure 4.32 Free Goods Determination Procedure and Condition Type

2. Activate the FREE GOODS DETERMINATION by the sales area, customer, and document pricing procedure as shown in Figure 4.33. The menu path for this procedure is SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • FREE GOODS • CONDITION TECHNIQUE FOR FREE GOODS • ACTIVATE FREE GOODS DETERMINATION.



Figure 4.33 Activating Free Goods Determination by Sales Area + Document and Customer Pricing Procedure

Now that the pricing procedure is set up, let's review the master data setup.

4.5.2 Free Goods Master Data

Let's consider an example of free goods master data set up. A shoe retail customer places an order for 1200 units. The customer will receive 10 units free for every 100 units purchased, which means the shoe retailer will receive 120 units free. So the balance quantity of 1080 is charged (we subtract the amount of free goods from the order amount).

You set up the master data for free goods by following menu path SAP EASY ACCESS LOGISTICS • SALES AND DISTRIBUTION • MASTER DATA • CONDITIONS • FREE GOODS • CREATE (VBN1). Figure 4.34 displays the free goods master data setup. This helps pull the condition value but not bill the customer for the freebie.



Figure 4.34 Free Goods Master Data

The key fields of this screen are as follows:

- ▶ **MIN QTY**
Details the minimum quantity that has to be ordered for eligibility. This field indicates that there has to be a specific quantity ordered for the customer to get the free item.
- ▶ **FROM**
Gives the quantity after which the free goods will be given.
- ▶ **ARE FREE GOODS**
Shows the quantity that should be given as free goods to the customer.
- ▶ **CALCULATION RULE**
Explains on what basis the amount of free goods are to be given to the customer. The calculation rule can be any of the following:
 - ▶ Proportional
 - ▶ Unit Reference
 - ▶ Whole Unit

These rules determine if the freebie is calculated based on the units ordered, proportional quantity, or whole order quantity.
- ▶ **FREEGOODS**
Tells whether the free goods are inclusive or exclusive. To display the inclusive free goods without generating a new item in the sales order, select "3" in the FREEGOODS category. In the free goods master data maintenance, this new free goods type is dealt with in the same way as the inclusive free goods procedure, except that in the sales order, no subitem is created. This helps you to review the items being shipped or the free parts of the items ordered by the customer.
- ▶ **FREE GOODS DELIVERY CONTROL**
Controls the delivery of free goods. This explains whether the free goods are delivered in conjunction with the main item or are delivered alone.

Inclusive Free Goods

Figure 4.35 shows the activation of inclusive free goods in the sales order. This is in addition to the preceding setup, where you want the free goods to appear in the sales order; in other words, this setup is in conjunction with the preceding set up of the FREE GOODS category.

Create Standard Order: Overview

Standard Order Net value 140.400,00 EUR

Sold-To Party 2003 Customer for EDI training // D- 42000

Ship-To Party 2003 Customer for EDI training // D- 42000

PO Number Free Goods Demo PO date

Sales | Item overview | Item detail | Ordering party | Procurement | Shipping | Reason for rejection

Req. deliv.date D 20.10.2010 Deliver.Plant

Complete dlv. Total Weight 1.200 KG

Delivery block Volume 0,000

Billing block Pricing date 11.10.2010

Payment card Exp.date

Card Verif.Code

Payment terms 0001 Special Payment Ter Incoterms FOB waldrof

Order reason

All items

Item	Material	Order Quantity	Un	Description	S	Customer Material Numb
10	BATMAT	1.080,000	EA	AKT FERT Material Ffor	<input checked="" type="checkbox"/>	
11	BATMAT	120,000	EA	AKT FERT Material Ffor	<input checked="" type="checkbox"/>	

Figure 4.35 Free Goods on Sales Orders

As already mentioned, only 1,080 units are charged in this order. The remaining 120 items are free of charge (identified by FREE OF CHARGE item category TANN).

Exclusive Free Goods

Note that exclusive free goods work slightly differently than inclusive free goods. The condition records are maintained the same way as before, with the only exception being you need to choose the EXCLUSIVE GOODS tab.

The total quantity is now 1200 units + 120 units = 1320 units. 120 units are offered free, and the total quantity is now 1320 units. On the sales order, the exclusive free goods are displayed as shown in Figure 4.36.

Create Standard Order: Overview

Standard Order Net value 155.400,00 EUR

Sold-To Party 2003 Customer for EDI training // D- 42000

Ship-To Party 2003 Customer for EDI training // D- 42000

PO Number Exclusive Free Goods Demo PO date

Sales Item overview Item detail Ordering party Procurement Shipping Reas

Req. deliv.date D 20.10.2010 Deliver.Plant

Complete div. Total Weight 1.320 KG

Delivery block Volume 0,000

Billing block Pricing date 11.10.2010

Payment card Exp.date

Card Verif.Code

Payment terms 0001 Special Payment Ter Incoterms FOB waldrof

Order reason

All items

Item	Material	Order Quantity	Un	Description	S	ItCa	Plnt	CnTy	Cu
10	BATMAT	1.200,000	EA	AKT FERT Material Ffor	<input checked="" type="checkbox"/>	TAN	1000	PR00	
11	BATMAT	120,000	EA	AKT FERT Material Ffor	<input checked="" type="checkbox"/>	TANN	1000	PR00	

Figure 4.36 Exclusive Free Goods

4.6 Summary

In this chapter, we looked at how special pricing conditions, such as promotions and sales deals, are configured and how they work, and then moved on to explain how the customer expected price can be set up for EDI pricing. We discussed group conditions and what parameters need to be set up for group conditions, as well as how the promotion and sales deal are applicable. We also reviewed the rebate agreement application and different ways to use special conditions. We also showed how referential pricing can be configured. In addition, we showed how free goods need to be set up and how they work on the sales orders.

In the next chapter, we'll review user exits that are commonly used in pricing and show you how to optimize pricing performance.

Pricing performance can be improved by optimizing access and minimizing tables per access. It's important to understand the technical aspects of pricing such as user exits, pricing tables, structures, and integration to external systems.

5 Price Performance and Technical Aspects

The previous chapters discussed how to use pricing conditions, pricing procedures, special pricing conditions, and more. Pricing procedures with a large number of pricing condition types, or pricing condition types with numerous pricing access tables can have a direct impact on performance. To ensure that these pricing procedures and pricing condition types work in a speedy and efficient way, it's important to understand how pricing performance is impacted and how it can be optimized.

In the technical aspects section of pricing, you'll learn about pricing communication structures, which are user exits that can be used to make pricing more flexible.

Pricing is determined in sales orders and billing documents that use pricing procedures. Your pricing performance can be managed through the optimal and personalized configuration of your system, but sometimes configuration alone is not enough. The technical aspect of pricing is critical in providing solutions that the configurations can't match.

Pricing procedures are associated with business transactions and determine the basis for your pricing condition, access sequence, and requirements. We recommend minimizing the number of pricing procedures that are applicable to your business transactions. The more pricing procedures you have, the more maintenance is required, which in turn calls for additional customer pricing procedures and document pricing procedures maintenance.

In this chapter, we'll review the performance impact of different pricing configurations elements. The technical changes that help you to meet certain business needs have specific impacts on the performance of your system, so we'll look at these impacts from a performance management point of view. Let's go over some of the

key configuration elements and the best known methods in pricing procedures for better performance and use of enhancements.

5.1 Optimizing Pricing Access in Sales Documents and Purchasing Documents

Performance is one of the most important aspects of pricing, and optimizing involves looking at several aspects of pricing for improvements. As SAP ERP installations and implementations mature, complex business processes are implemented. It's important to have a set of rules not only during initiation of the project but also during the ongoing implementation and enhancements. This not only ensures better performance but also helps reduce the total cost of ownership. As a general rule, the following considerations will improve pricing performance:

- ▶ Eliminating unwanted pricing conditions types
- ▶ Selecting the EXCLUSIVE indicator on access sequences
- ▶ Preprocessing
- ▶ Increasing the number of condition types and minimizing access to condition tables
- ▶ Minimizing user exits

The following subsections address each of these points in detail.

5.1.1 Pricing Procedures Condition Types

It's a best practice to copy standard pricing procedures to create custom pricing procedures. But often when we copy the standard pricing procedures, we don't pay attention to all of the condition types that are copied over from the standard pricing procedure. It's best to review the copied over pricing scheme from the standard and individually justify the need of retaining the pricing condition types and then validate, if they are not required. Eliminating unwanted pricing condition types ensures that the system only looks for the relevant pricing conditions, which reduces the time it takes to go through all of the pricing conditions that are not required. Also, from a business user perspective, the user is limited to choosing only the pricing conditions that are relevant.

5.1.2 Exclusive Indicator for Access Sequences

When you are defining access sequences for pricing procedures, set the checkbox in the EXCLUSIVE column on the far right of the screen, as shown in Figure 5.1. If this indicator is not set, then even if the first table finds a record, the system continues to look for additional records, which impacts your system performance. We discussed the pricing condition and access sequence in detail in Chapter 3.

No.	Tab	Description	Requirement	Exclusive	
10	5	Customer/Material		<input checked="" type="checkbox"/>	▲
20	6	Price List Type/Currency/Material		<input checked="" type="checkbox"/>	▼
30	6	Price List Type/Currency/Material	3	<input checked="" type="checkbox"/>	
40	4	Material		<input checked="" type="checkbox"/>	

Figure 5.1 Set Exclusive Flag to Improve Performance

5.1.3 Access: Preprocessing

As we reviewed in Chapter 3, accesses are the search mechanism used by SAP ERP. Now let's review some of the options for optimizing accesses.

Preprocessing to Optimize Access

Pricing performance can be improved by using preprocessing for access. The preprocessing determines if the system should first search for the condition records only using the document header data. If the search is not successful, then this access is ignored.

Preprocessing becomes useful when the number of line items increases in a document. For example, if a pricing condition record has customer and material fields, and this discount is defined for only 5% of the customers, then it makes sense to define this condition with a prestep (checking whether the customer is valid). By doing this, the system will not search for the customer and material in the remaining 95% of the records, which improves system performance.

You can get to the screen for optimizing access with the menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL • DEFINE ACCESS SEQUENCES • OPTIMIZE ACCESS. In this configuration screen shown in Figure 5.2, you can maintain the condition types for which we want to optimize the access.

Change View "Proof Read at Header Level - Preliminary Ste

New Entries

CTyp	Condition Type	Access sequence	AcNo	Access
K005	Customer/Material	K005	10	Customer/Material
K007	Customer Discount	K007	20	Division/Customer
KA00	Sales Promotion	K005	10	Customer/Material
MWSI	Output Tax	MWST	10	Domestic Taxes
MWSI	Output Tax	MWST	20	Export Taxes

Figure 5.2 Optimize Access in Sales and Distribution

If you look in the left-hand column CTyp (condition types) K005 and K007 have *customer* as a condition field. Let's say the customer is not part of the preprocessing search. In that case, the condition is ignored, which improves the system performance. As shown here in Sales and Distribution (SD), a similar configuration step is available within the Materials Management (MM) functionality for optimizing access. The menu path for this is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE CONDITION TYPES • OPTIMIZE ACCESS (see Figure 5.3).

New Entries: Overview of Added Entries

New Entries

CTyp	Condition Type	Access sequence	Ac	Access
ZV01	Plant Discount	Z000	10	Outline Agreement Item: Plant-Depe
			<input checked="" type="checkbox"/>	

Figure 5.3 Optimize Access in Materials Management

In Figure 5.3, the condition type ZV01 has access number 10. Access number 10 has *vendor* as one of the condition fields, as shown in Figure 5.4.

Condition	I/O	Docmt Stru...	Doc.field	Long field label	Spec. Val. Source	Init
LIFNR	←	KOMK	LIFNR	Vendor		<input type="checkbox"/>
MATNR	←	KOMP	MATNR	Material		<input type="checkbox"/>
EKORG	←	KOMK	EKORG	Purch. Organization		<input type="checkbox"/>

Figure 5.4 Vendor as a Condition Field

So if the search doesn't have the vendor, then the condition type is ignored, which improves access.

5.1.4 Splitting Access Sequences and Tables

The access sequence is linked to condition tables. The larger the number of tables, the more the access sequence has to search to find a condition record, which impacts performance. A better approach is to split the number of tables per access sequence. For example, let's say you have an access sequence with 10 tables. You can split this sequence into multiple condition types; for example, you can have 2 condition types with 2 associated access sequences and 5 tables associated with each access type (see Table 5.1). With this split, you can both meet the business requirement and improve performance.

Case	Condition Type	Access Sequence	Tables/Access/Table
A	1	1	10
B	2	2	5

Table 5.1 Access Sequence and Table Combination for Condition Types

As illustrated in Figure 5.5, condition type ZR00, which has six condition tables, is now split into two condition types with three condition tables associated with the access sequence.

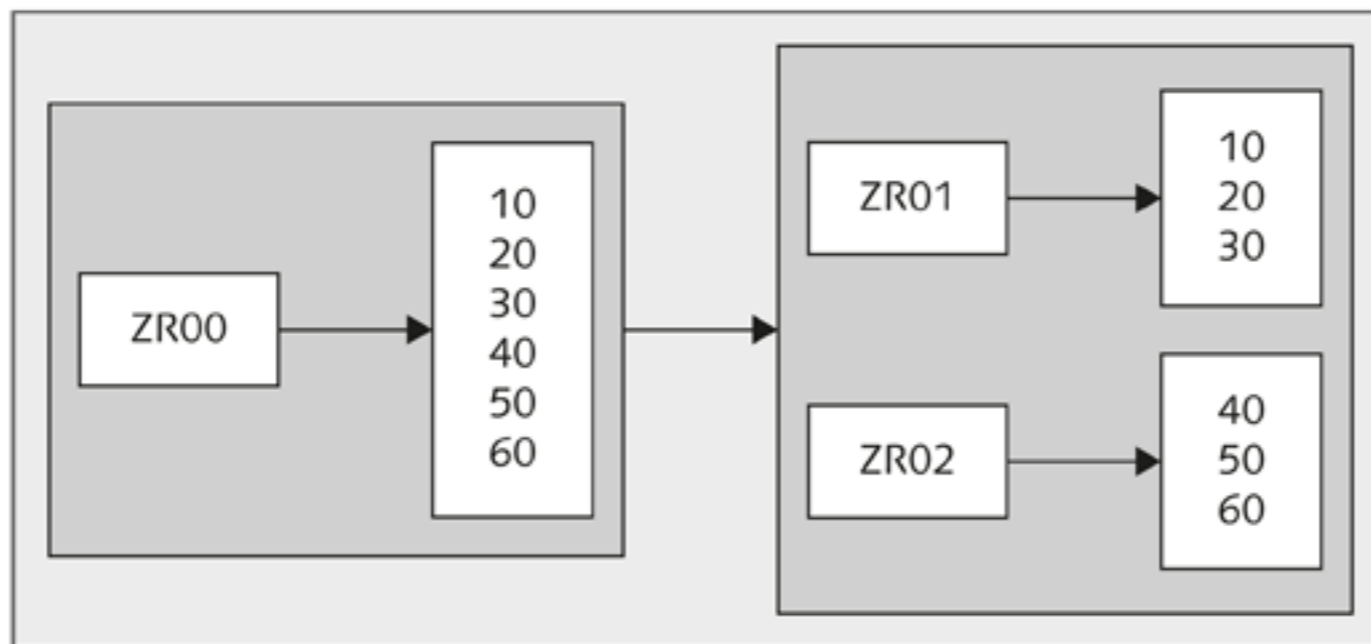


Figure 5.5 Splitting Access Sequences into Multiple Condition Types

Figure 5.5 displays the splitting of access sequence with condition type and managing the table searches associated with it.

In the next section, we'll review some of the technical aspect of the pricing that can help with performance tweaking.

5.2 Technical Aspects of Pricing

Within your business processes, you may be using user exits, which have an impact on pricing. The SAP ERP standard pricing technique comes with condition types, formulas, and possibly user exits so you can meet specific business requirements. For example, if the customer expects a rush delivery, you can check based on the delivery service you chose and add an additional cost to the customer for the expedited service by using a user exit. It's important to consider the user exits as part of the performance considerations.

Condition records store values and the changes to the condition values have an impact on performance as well because these are stored in the table. While creating a report, be sure to consider the performance tips.

5.2.1 User Exits, Alternative Condition Value, and Formulas

User exits concept allows you to add your own functionality to standard business applications in SAP without having to modify the original applications. SAP ERP creates customer exits for specific programs, screens, and menus within standard R/3 applications. These exits do not contain any functionality. Instead, the customer exits act as hooks. You can hang your own add-on functionality onto these hooks

SD provides several user exits in pricing. But the system performance can be affected by the number of user exits; that is, the more user exits, the poorer the performance of the system. The best-known method is to optimize the use of user exits by evaluating the use application and the business value to decide whether to use the user exit. The same minimal custom condition values and formulas rule is applicable for alternative condition basis and formulas as well. The fewer the user exits, alternative conditions, or formulas, the better the application performs. You must evaluate the impact of activating these user exits compared to the business benefit.

5.2.2 Condition Records Changes

Sometimes the update to condition records using Transaction VK11 takes a long time because the CDCLS table (Cluster Structure for Change Documents) needs

performance tuning. One option to explore is to build an index on the table CDCLS to see if this improves the performance.

The next section discusses a technique to help measure the performance of reports.

5.2.3 Optimizing Sales and Distribution Pricing

If the runtimes are long, you can create a custom report to optimize SD pricing. For example, Transaction ST12, the ABAP trace transaction, shows a large number of executions of the SD pricing from SEL_KONDTAB. SEL_KONDTAB is responsible for reading all of the various AXXX (e.g., A005) SD pricing condition record tables. You can also use this report if SM50/SM66 shows AXXX SD pricing condition record tables that are being read.

Tip

Review the OSS Note 1423737 for the necessary steps to create a custom program to analyze the pricing procedures.

Next, let's review another key technical aspect of pricing: the pricing tables and structures.

5.3 SD Pricing Tables and Structures

SD tables and structures are used for storing the configuration values, master data, and condition values. These tables and structure are an important aspect of the pricing function. The following subsections cover some of the important elements of these topics.

5.3.1 Pricing Tables: Application and Usage

As we reviewed in Chapter 3, access sequences are associated with pricing tables. Similar to tables within SAP ERP, pricing tables store the pricing-related data. Table 5.2 explains the commonly used pricing tables and structures.

Table Name	Common Pricing Usage
VBAK	This is the sales document header table that contains the KNUMV field, which provides the link to KONV to obtain condition data.
VBAP	This is the sales order line item table.
KONV	This table contains the pricing condition types and rates pertaining to the sales order. The key KNUMV is obtained from the sales order table (VBAK). The KNUMV and the sales order line item, step number of the pricing procedure, and the counter uniquely identify the condition.
A_ (A001,A002,A003 etc)	This table represents all of the master condition records stored in your SAP ERP system. For example, Tables A003 and A004 are used to store SD pricing condition records for materials, taxes, and so on. The rates and conditions again have to be obtained from the KONP table by using KNUMH as the key.
KONH	This table is the condition header table, which stores the pricing condition types. It provides the key KNUMH.
KONP	This table contains actual rates for condition types. To obtain the conditional rates, the condition number (KNUMH) has to be obtained from header tables.
KONM	This table is used to store quantity scales. The key is KNUMH, which is the sequential number of the condition type.

Table 5.2 Key Pricing Tables

In many of the applications or business transactions, instead of pricing tables, SAP ERP uses the structures listed in the table. The structure helps retrieve the information by combining one or more tables.

5.3.2 Pricing Structures

Pricing communication structures are basically used to transfer data from pricing procedures to the transactions and documents. Pricing condition type processing happens during the creation of a particular document. Data that is required to

process these condition types are sent through communication structures instead of allowing condition types to access table data directly. So SAP ERP basically uses these communication structures for filling data for the condition types before they are processed. Table 5.3 displays the key structures and their application in the brief description.

Pricing Structures	Description
KOMK	Pricing header communication structure
KOMP	Pricing line item communication structure
KOMG	Allowed fields for pricing condition structures. This contains the fields for KOMK and KOMP.
KOMKAZ	Pricing communication header: Customer modifications. This contains additional pricing header fields not available in KOMK.
KOMPAZ	Pricing communication line item: Customer modifications. This contains additional pricing header fields not available in KOMP.

Table 5.3 Pricing Structures and Their Applications

Now that we have a basic concept of commonly used tables and structures, let's see how they are used in some user exits.

5.4 SD Pricing User Exits

If the standard functionality of your system doesn't support your existing business requirements, then some pricing exits can be used to support the needs of your business. This section explores some of the user exits you can use, along with some examples and detailed information on how they are used. All user exits can be reviewed or accessed through Transaction SE37. Let's review some of the user exits and their applications.

5.4.1 USEREXIT_PRICING_PREPARE_TKOMK

This user exit copies additional fields for pricing in the TKOMK communication structure. When new fields are added to the pricing catalog, you can't just add the new fields to the pricing catalog and condition table—you must also add them to

this user exit. This user exit is used for pricing header fields. In sales order processing, this user exit is found in MV45AFZZ.

For example, if a new field has been added to the pricing catalog ZZLAND (Destination Country) and included in a pricing condition table, this user exit should contain the code to populate the communication structure. To display or review the programs, use Transaction SE38.

The sample code could look as follows for populating a destination country for a partner "ZW":

```
loop at xvbpa
  where parvw = 'ZW'.
    tkomp-zzland = xvbpa-land1.
endloop.
```

5.4.2 USEREXIT_PRICING_PREPARE_TKOMP

This user exit is used for copying additional fields for pricing in the TKOMP communication structure. When new fields are added to the pricing catalog and condition table, they must also be added to this user exit.

This user exit is used for pricing line item fields. In sales order processing, this user exit is found in program MV45AFZZ. For example, if a new field has been added to the pricing catalog ZZPRODH2, product hierarchy, and included in a pricing condition table, this user exit should contain the code to populate the communication structure. The following is sample code for populating the product hierarchy where the product is finished products:

```
Loop at xvbap
  where mstart = 'FERT'.
    Tkomp-zzprodh2 = xvbap-zzprodh2
endloop.
```

5.4.3 USEREXIT_FIELD_MODIFICATION

This user exit is used to adjust the display of individual lines in the condition screen by changing the display attributes of the screen fields and does not include the display of subtotals. The user exit is also used in order processing. In other words, you can use the user exit to suppress or enable screen fields on sales orders. The screen fields are allocated to modification groups 1 through 4, and can be edited

together during a modification in ABAP. The modification group is found in program MV61AFZA. The following list details the modification groups:

- ▶ **Modification group 1:** Automatic modification with transaction MFAW.
- ▶ **Modification group 2:** Contains "LOO" for step loop fields.
- ▶ **Modification group 3:** For modifications that depend on check tables or on other fixed information.
- ▶ **Modification group 4:** Not used.

The FORM routine is called up for every field of a screen. If you require changes to be made, you must make them in this user exit. This FORM routine is called up by the module FELDAUSWAHL.

Example

As an example of how user exit USEREXIT_FIELD_MODIFICATION can be used, here we are suppressing Incoterms on the sales order line item by this sample code:

```
Check SCREEN-NAME = VBKD-INCO1
SCREEN-INPUT = 0
```

If the Incoterm (International commerce term) is applied in the sales order, and you want to suppress it for display, use this line of code within the user exit.

5.4.4 USEREXIT_FIELD_MODIFIC_KZWI

This user exit can be used to change the display of subtotals in the condition screen by changing the display attributes of the screen fields. It is also used in order processing. You can find the user exit in program MV61AFZB.

5.4.5 USEREXIT_FIELD_MODIFIC_KOPF

This user exit can be used to change the display of subtotals in the condition screen by changing the display attributes of the screen fields. This user exit is also used in order processing. This is found in program MV61AFZB.

5.4.6 USEREXIT_FIELD_MODIFIC_LEER

This user exit can be used to control the display of blank lines in the condition screen to your requirements by changing the display attributes of the screen fields. This is found in program MV61AFZB.

5.4.7 USEREXIT_PRICING_CHECK

This user exit can be used to install additional pricing checks for maximum/minimum value in pricing conditions, for example. This is found in program MV61AFZA.

5.4.8 USEREXIT_PRICING_RULE

In the standard SAP ERP system, the condition categories and classes that can be copied or recalculated per pricing type are predefined. This exit can be used to change the predefined standard procedure for each pricing type. For example, this user exit influences the pricing type in copying a control from a sales to a billing document.

Figure 5.6 shows where the PRICING TYPE indicator is located. The pricing type specifies how the system treats pricing data when copying from the preceding document to the subsequent document, for example, from the sales order to the billing document. The screen shows that when a billing document is created from a sales document, the copying control elements on this screen control what and how data is being copied from the sales order. The pricing type is a key indicator, which influences whether the pricing is recalculated or not.

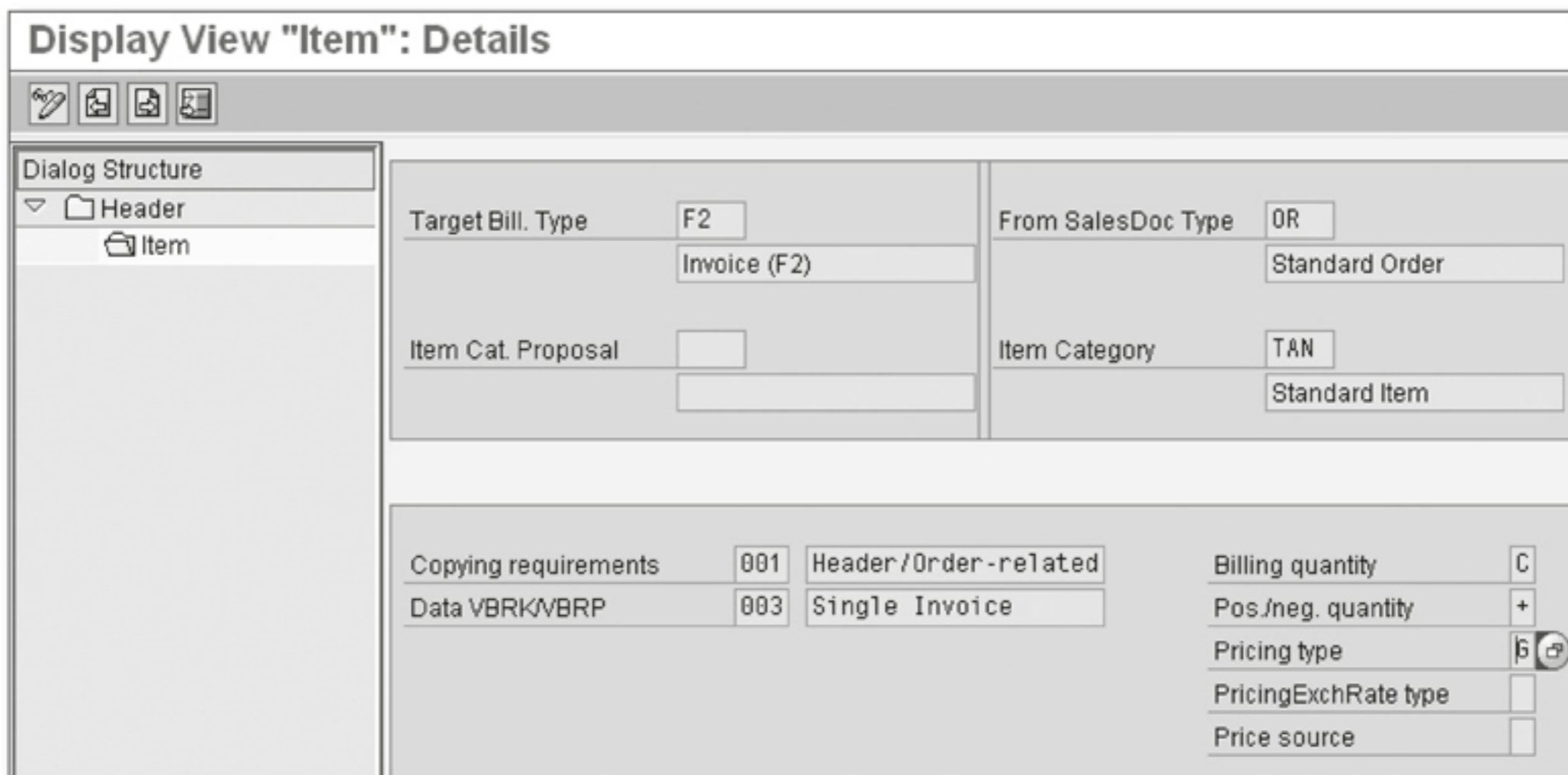


Figure 5.6 Pricing Type Indicator

The user exit can be used to control the behavior of the pricing type. For example, if you want to copy condition type PI01 (price for intercompany billing) from the sales order with intercompany pricing into the billing document, you use pricing type G. Even with the use of G, the system still tries to redetermine the conditions. We recommend that you apply the following code within the user exit, so that the system won't try to reset the previous document pricing conditions:

```
FORM USEREXIT_PRICING_RULE.
  STEU-KNPRS = 'Y'.
  STEU-KNTYP = 'GLRE.....'.
  IF KOMK-KNUMA IS INITIAL.
    STEU-KOAID = 'CD.....'.
  ELSE.
    STEU-KOAID = 'D.....'.
  ENDIF.
  APPEND STEU.
ENDFORM.
```

This scenario can be applied when you have a sales order where the material is sourced from a plant that is from a different company code than the sales organization. Following the customer invoice, the supplying plant might want to invoice the selling company code.

5.4.9 USEREXIT_CHANGE_PRICING_RULE

This user exit can be used to change the pricing type that has been predefined in the copying control table in billing (say that there is a pricing type B that must be changed to C). This is used in program MV61AFZA. This code shows how the pricing type can be overwritten from one pricing category to another:

```
FORM USEREXIT_CHANGE_PRICING_RULE USING PRICING_RULE.
  IF PRICING_RULE = 'B'.
    PRICING_RULE = 'C'.
  ENDIF.
ENDFORM.
```

This scenario might be applicable when you want to redetermine the pricing majority of the scenario with the exception of customers where you have agreed on a price with no change. This user exit helps you influence the pricing type.

5.4.10 USEREXIT_XKOMV_BEWERTEN_INIT

This field is used in the formulas and initialized before the loop for the pricing procedure starts. This is used in program RV61AFZB.

5.4.11 USEREXIT_XKOMV_BEWERTEN_END

Within a loop for the price components during pricing, specific values can be transferred into the communication structures in pricing to be further processed. This is used in program RV61AFZB.

5.4.12 USEREXIT_XKOMV_ERGAENZEN

In change mode, you can change the dynamic part of the condition record (KONVD) that is always redetermined (i.e., it isn't stored in database table KONV). This is used in program RV61AFZB.

5.4.13 USEREXIT_XKOMV_ERGAENZEN_MANU

You can use this user exit to change the ready-for-input fields of the manually entered condition record in add mode in the condition screen. This is used in program RV61AFZB.

5.4.14 USEREXIT_XKOMV_FUELLEN

This user exit is always called up during a redetermination of all or individual price components. You can change the work fields of the condition line, but this only applies to conditions that have been determined via a condition record. This is used in program RV61AFZB.

5.4.15 USEREXIT_XKOMV_FUELLEN_O_KONP

This user exit is always called up during a redetermination of all or individual price components. You can change the work fields of the condition line, but this only applies to conditions that have been determined via a condition record. This

may include subtotals, manually entered conditions, or conditions that have been calculated with a formula. This is used in program RV61AFZB.

5.4.16 USEREXIT_PRICING_COPY

You can change the KONV fields for copied price components. This is used in program RV61AFZB. For example, if the list price PR00 exceeds a certain limit, the freight condition is always 10, no matter what the PR00 value is after this limit.

Here is the sample code for application within this user exit:

```
>>>
If Konv-Kschl = 'PR00' and Konv-Kwmenge > "1000"
If konv-kschl = 'HD00'
  Konv-kmenge = '10'
Endif
Endif
>>>
```

The program LV61AA12 (FORM KONDITIONSVORSTEP) shows the standard behavior of pricing types. SAP OSS Note 24832 provides additional examples of how some of these user exits work.

Now that we've reviewed the user exits and their applications, let's discuss the Materials Management tables and structure.

5.5 Materials Management Pricing Technical Considerations

Similar to SD pricing tables and structure, Materials Management (MM) pricing has tables and structures that are applicable to purchasing and MM processes.

5.5.1 MM Pricing Tables: Usable and Application

MM uses pricing similar to SD within the purchasing function and other MM functions, such as goods receipt material document and invoice verification. Table 5.4 represents the most commonly used pricing tables for any pricing related processing.

Table Name	Application and Usage
EKKO	This is the purchase document header table. Has the KNUMV field, which provides the link to KONV to obtain condition data.
EKPO	This is the purchase order line item table.
KONV	This table contains the pricing condition types and rates pertaining to the sales order. The key KNUMV is obtained from the purchase order table (EKKO). KNUMV, the purchase order line item, step number of the pricing procedure, and the counter uniquely identify this condition.
A_ (A017, A018, etc.)	This represents all of the master condition records, which are stored in your SAP ERP system. For example, A017 is used to store MM pricing info records for vendors. The rates and conditions again have to be obtained from the KONP table by using KNUMH as the key.

Table 5.4 MM Pricing Tables

5.5.2 Materials Management Pricing Structures

The MM pricing structure is similar to the SD pricing structure, which combines tables so that you can effectively view data within business transactions (see Table 5.5).

Table Name	Description
KOMK	Pricing header communication structure
KOMP	Pricing line item communication structure
KOMG	Allowed fields for pricing condition structures. This contains the fields for KOMK and KOMP.
KOMKAZ	Pricing communication header: Customer modifications. Additional pricing header fields not available in KOMK.
KOMPAZ	Pricing communication line item: Customer modifications. Additional pricing header fields not available in KOMP.

Table 5.5 Materials Management Pricing Structures

Pricing communication structures are basically used to transfer data from pricing procedures to pricing fields. Pricing condition type processing happens during the creation of a particular document such as purchase orders and contracts. Data required for processing these condition types are sent through communication structures instead of allowing condition types to access table data directly. So SAP ERP basically uses these communication structures for filling data for the condition types before they are processed.

Now let's review the MM pricing user exits.

5.5.3 Materials Management Pricing User Exits

Similar to SD pricing user exits, the pricing functions within MM utilizes user exits, which we will go over individually to detail the purpose or use.

► **LMEK001**

This enhancement has the exit (EXIT_SAPLMEKO_001), which is basically used to extend communication structures for KOMK.

► **LMEK002**

This enhancement has the exit (EXIT_SAPLMEKO_002), which is used to extend communication structures for KOMP.

These user exits perform the same functionality as the ones within SD: USER-EXIT_PRICING_PREPARE_TKOMP and UEREXIT_PRICING_PREPARE_TKOMK, respectively. For example, if we have to use a new header pricing field to be included in the condition tables (e.g., purchasing group), this field has to be included in the communication structure KOMKAZ as ZZEKGRP. (We explained in Chapter 4 how this can be done.) After the field has been included in the structure, this has to be included in the user exit EXIT_SAPLMEKO_001 because this exit is used for pricing header fields.

Note

An example of a sample code where this condition is populated is when the purchase order type is "NB":

```
If ekko-auart = "NB"  
    tkomk-ZZEKGRP = EKPO-EKGRP.  
endloop.
```

With SAP ERP, the pricing concept originated from SD and was extended to MM. Pricing can be extended beyond the SAP ERP system; we will look at an application that is external to the SAP ERP system and how the pricing interface applies to it.

5.6 Pricing and External Systems Integration Using User Exits

The following sections give an overview of some of the key considerations for external systems integration, such as how the company Vertex[®] employs the use of user exits. Please note that this section is not intended to be a complete configuration guide. This topic covers pricing and integration to an external software system (Vertex), and provides a guideline for using pricing configuration in conjunction with user exits.

5.6.1 Vertex Overview

Vertex is an external, non-SAP system that interfaces with the SAP ERP system in the areas of SD and MM. Pricing can also be plugged in with other external systems for taxes (Vertex, Taxware), rebates, and commissions management (VISTEX). Vertex is an external system that can be integrated with SAP ERP for several purposes. Vertex and SAP ERP integrate from a tax configuration standpoint where the tax procedures (TAXUSX), SD pricing procedure (RVAXUS), and tax codes are set up in your SAP ERP system to talk to Vertex.

After this configuration has been set up, the sales documents, billing documents, and purchases are integrated with tax to determine the taxes on these documents. The tax codes are sent to Vertex so that the taxes can be calculated (Vertex can return the tax amount).

When a sales order from SAP ERP and Vertex integrate, several fields are taken into consideration when determining tax: sold-to/ship-to parties, shipping address, products, net value of the item, and the pricing date. Similarly, on the purchase orders the vendor address, jurisdiction code, item value, product or material groups, and ship-to address are taken into consideration. A/P invoices are taken

into consideration the same way the tax base, date, company code, product or material groups, and net value are taken into consideration.

SAP ERP uses Remote Function Calls (RFC) to pass these sets of data for the tax to be calculated by Vertex. The user exit used is FYTX0002. The function module EXIT_SAPLFYTX_USER_001 in FYTX002 is used to pass this set of data. From a master data perspective, Vertex automatically determines the customer tax jurisdiction codes and maintains the customer tax classifications, material master tax calculations, plant master jurisdiction codes, and cost center jurisdiction codes. Master conditions records are maintained for taxes (UTXJ) for the SD pricing procedure after the tax codes are set up. Similarly, MWST has to be set up for purchasing. At minimum, the following information needs to be passed to Vertex by SAP ERP to calculate tax:

- ▶ Ship-to jurisdiction
- ▶ Extended amount (e.g., unit price × quantity)
- ▶ Tax date
- ▶ Company code
- ▶ Transaction type

The user exit runs the rule against the Vertex system, and Vertex then calculates the tax rates and amounts and returns the value back to the SAP ERP system.

5.7 Summary

In this chapter, we learned about various aspects of fine-tuning pricing to improve performance. We learned to improve the performance of our systems by eliminating unwanted condition types, minimizing pricing procedures, and minimizing user exits.

We also learned about the standard pricing tables and structures SAP ERP uses in Sales and Distribution, as well as in Materials Management. We also discussed some of the commonly used user exits for pricing in SD and MM.

Finally, we discussed an overview of how SAP ERP integrates with Vertex, using user exits and pricing configuration.

This chapter has provided you with tips and tricks for fine-tuning pricing performance. These techniques can be applied to the pricing procedures you develop for your own company needs. The guidelines we provided will also help you set up integration to Vertex or other external tax systems, such as Taxware.

In the next chapter, we'll explore data migration and cutover planning from a pricing perspective.

Data Migration and cutover are important aspects of getting the new SAP ERP system ready for business users. Planning pricing data migration and cutover is a critical step in this business readiness preparation.

6 Data Migration and Cutover Planning

A SAP ERP project has five phases: project preparation, blueprinting, realization, readiness preparation, and go-live and support. Data migration and cutover planning belong to the fourth phase: readiness preparation. Pricing migration and cutover planning need to be addressed as part of readiness preparation because business users must be able to use correct pricing data in the new system. Typical pain points associated with data migration is the quality of data being migrated. Pricing data migration can also be complicated because pricing can have several condition types such as list price, discounts, and so on. Several iterations of data conversion are required before the data quality is good.

In cutover planning, it's also important to understand the dependencies between the various objects that are loaded as well as the sequence in which they must be loaded. For example, if the list price is based on the customer and material, then the pricing conversions can be carried out only after the customers and materials are loaded. Several iterations of cutover are required before the data is loaded into production. These are called mock cutovers or dry runs.

Now that you understand why data migration and cutover are important, let's move on to the steps involved in data migration.

6.1 Data Migration Steps

Data migration is the process of moving or transferring data from legacy systems to your SAP ERP system. Data migration involves different components that contribute to maximize efficiency, minimize risks, and maintain the quality of data delivery. In this process, different teams facilitate a successful data conversion project by executing different tools and procedures, which you'll learn more about in this

chapter. Business processes, security policies, development environments, clear definitions of roles and responsibilities, achievement of milestones, and testing procedures are used in concert to achieve common goals of transferring data with minimum risks and high predictability. Data migration can be divided into five distinct steps listed here and described in upcoming sections:

1. Data discovery and data extraction
2. Data cleansing and validation
3. Data conversion (data transformation)
4. Data consolidation
5. Data migration (data load)

To understand this topic better, let's consider the example of Acme Computers, which sells desktops and laptops. Acme's desktops and laptops have various product numbers, and each product has a unique product ID. They also have different list prices defined in legacy applications that have to be loaded from the legacy system to the SAP ERP system. The desktops are managed in one legacy application, and the laptops are managed in another legacy application

The list price is represented by pricing condition PR00. PR00 pricing condition has the sales organization and distribution channel as data fields in addition to customer, material, and the actual price. The Sales organization's value is "1000", and the distribution channel's value is "10".

6.1.1 Data Discovery and Extraction

The purpose of data discovery and extraction is to determine the various types of data that should be migrated, as well as to establish any data definitions that may be required. The first major step in this phase is to dig deeper into the legacy data for SAP ERP data requirements mapping. Pricing data can come from multiple source systems, so, you must establish the source, the number of records that need to be migrated, and the rules of extraction.

Data extraction is the process of extracting data from legacy systems into flat files, or data staging areas, based on the format specified and the fields listed in the specification document. Several levels of extraction must be done:

▶ **Sample extraction**

Sample extraction must be done for master data prior to the completion of the specification documentation. This process only extracts a few critical fields for each master data conversion object. These fields are defined for each of the objects by the business team leads and functional (consultants) leads.

▶ **Initial extraction for mapping**

Initial extraction is done when you apply the extract rules that you defined after the sample extract. The purpose of this extract is to validate the extract rules and identify any initial cleansing that needs to be done at the legacy level. The initial extract might be done in stages, depending on the number of missing fields that are mandatory for the cleansing process. The remaining fields are extracted in subsequent stages.

▶ **Final extraction**

The final extraction is done after all of the extract rules have been validated and the cleansing has been completed. This extract is then normalized and formatted for the final load into SAP ERP.

▶ **Sample extraction and analysis of data**

The functional teams and business team leads define limited data sets for all master data conversions to extract sample data. The IT teams then use this information to extract the data from the different legacy systems. The functional teams, business owners, and the data cleansing teams then analyze the extracted data. The goals of the sample data extraction phase are listed here:

- ▶ Identify the volume of data for each master data conversion by business entity and in totality.
- ▶ Estimate the effort of data cleansing and preparation.
- ▶ Rate conversions by complexity, and prioritize them accordingly in the work plan.
- ▶ Analyze data and define extract rules to minimize the volume of data by eliminating redundant and unwanted data.
- ▶ Help in developing a cleansing approach and strategy for all of the conversions.
- ▶ Provide input for the functional teams for their blueprint sessions and configuration.
- ▶ Estimate time required for extraction from different locations.

▶ **Extract rules**

After analyzing the sample data, the business users define the extract rules for all of the conversions. These extract rules help reduce the volume of data being migrated by eliminating bad data, duplicates, and redundant information (e.g., drop rebates, pricing, older than *xx/xx/xx*).

▶ **Set up staging area**

The source files can be obtained from various legacy systems, and the files extracted from the legacy systems can be in various layouts. The purpose of the staging area is to ensure that all of these source files are received in one common area and then converted into a common file layout, which is the layout in which SAP ERP expects the data to be loaded. The staging area also provides an area for data manipulation. The staging area allows data cleansing and development to be initiated well in advance of the actual conversion.

Example

For Acme Computers, the existing data for desktops and laptops are extracted from the two legacy systems to get a good understanding of the data. An extract program is written to extract sample data for pricing from both systems.

You should now have a firm understanding of the data discovery and extraction step. Let's move on to the data cleansing and validation step.

6.1.2 Data Cleansing and Validation Stage

Data cleansing and validation refers to the stage where data is cleansed in a legacy system or in a staging area. At this stage, data can have several issues. The key problems are described in the following list:

▶ **Functional**

Discrepancies between similar data entered into separate systems, or noncurrent data in one system.

▶ **Syntactic**

Spelling errors (e.g., Geoffrey instead of Jeffrey) and reference inconsistencies (e.g., 1st instead of First, Walmart instead of Wal*Mart).

▶ **Structural**

Different data values representing the same thing, or entry of numeric data into

a text field (e.g., one legacy system may use 1 for YES, but a separate legacy system uses Y for YES).

► **Semantic**

A customer or vendor has multiple addresses, so the user cannot determine which address is valid.

Data cleansing requires planning and preparation, data owner identification, data project planning, data metric definitions, and quality assessments.

In our example of Acme Computers, when extracting data from both the legacy systems, the pricing decimal value was found to be represented with a comma, so the data are cleansed to represent it as a period.

Following the data cleansing, data conversion is the next step.

6.1.3 Data Conversion Stages

At this stage, the data from the legacy system is converted to meet the project requirements target. Business rules related to data requirements for data conversion are provided by the business core system. This stage involves data transformation, enrichment, and synchronization with legacy systems:

► **Transformation**

The case for data transformation is based on the data format and size in the legacy system; it might need to convert to a certain format and size to fit into the target system. During this transformation step, the legacy data needs to be converted to meet the SAP ERP pricing requirements.

For Acme Computers, the list price is to be loaded from the legacy system to the SAP ERP system. The list price is represented by pricing condition PR00.

Pricing condition PR00 has the sales organization and distribution channel as data fields in addition to customer, material, and the actual price.

► **Enrichment**

Data enrichment is the process of modifying the data extracted from the legacy system by providing additional data content. Data enrichment is an example of data from the legacy system that might not cater to the details the target system is expecting. For example, the target system might capture data specific to the pricing element, the scales, and the percentages, which might be needed

to determine the discounts, and this needs to be enriched prior to performing the conversion.

In our example, the extracted data is added with default values as well. The sales organization has the default value of "1000", and the distribution channel has the default value of "10".

► **Synchronization**

Data synchronization involves aligning the key data elements that are identified as mandatory and optional prior to loading.

In the next step, prior to data loading, we need to work on the consolidation of the data.

6.1.4 Data Consolidation Stage

The purpose of this activity is to collect similar legacy data from each business unit, consolidate it into a single source, and develop common business rules. For example, if there are three business units that are running on multiple legacy systems, this data needs to be consolidated. This consolidated data will drive the new enterprise system because the consolidation step standardizes business information and the new data governance and standardization process. The consolidation is iterative and can consume much of the data preparation time.

In our Acme Computers example, both the desktops and laptop data from two legacy systems are loaded into a single SAP ERP system.

This stage is also called the data mapping process. Following this step leads to the data load and validation stage.

6.1.5 Data Load and Validation Stage

This stage involves loading data into SAP ERP systems. Various methods are available to load data, including manual direct input, CATT, BAdIs, IDOCs, and more. After the loads are completed, the data needs to be validated. The loading involves taking the data from the legacy system in any format and updating the data in the new system. Following the update of the data into the system, it needs to be verified for accuracy. For Acme Computers, the data from two legacy systems are loaded as pricing condition records PR00 for laptops and desktops.

The following sections explain in detail the steps required for pricing data migration using LSMW, and the key points to consider from a cutover perspective.

6.2 Pricing Data Migration and Cutover

Pricing data migrations are similar to other data conversion in terms of the different stages, but they differ in terms of the approach. As a general rule, the type of conversion we undertake for pricing depends on the volume of the data that needs to be converted. For example, if you have only 50 to 100 records, then you will probably be better off manually loading the records, rather than trying to use a program for conversion.

These are the two common methods to manage the data conversion:

- ▶ **LSMW (Legacy Systems Migration Workbench)**

Provides an easy alternative to manually creating pricing records for loading pricing records. LSMW is a tool based on SAP ERP software that supports single or periodic data transfer from non-SAP to SAP ERP systems. Its core functions are to import legacy data from PC spreadsheets or sequential files.

LSMW is easy to use and even functional users can actually write the programs. LSMW can be used for a reasonable volume of data (e.g., 100,000 records).

- ▶ **Custom programs/BAdIs**

Used if the pricing requirements are complex, involve high volumes of processing, and cannot be done using LSMW.

6.2.1 Prerequisites

Prior to loading any pricing data, it's important to ensure that the following activities have already been completed:

- ▶ Pricing extract files are cleansed and ready to be transformed. The file contains the data in the format desired to be loaded by the LSMW program.
- ▶ Mapping rules have been defined for each field to convert legacy fields to SAP ERP fields using a data mapping spreadsheet, which defines the transformation rules for each field that needs to be converted.
- ▶ All configuration activities have been completed for pricing condition types, access sequences, access tables, and fields.

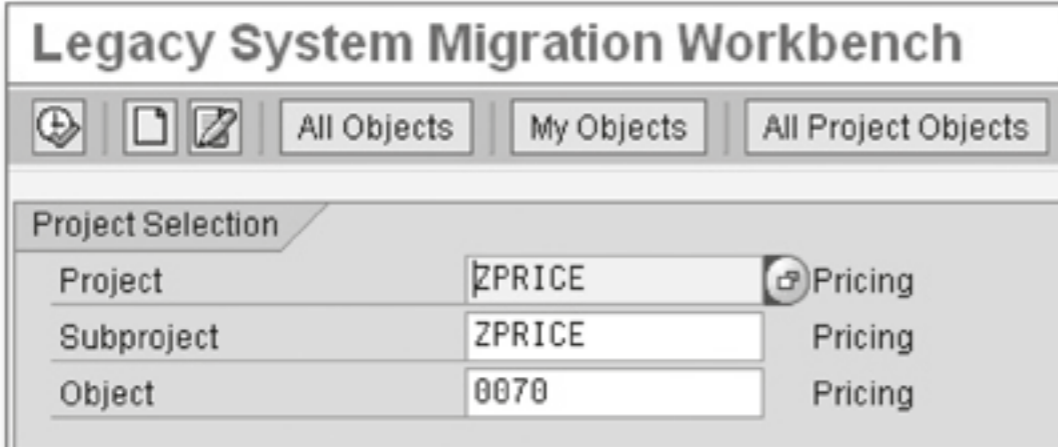
One of the best-known methods to be sure these activities are completed is to confirm that the condition records can be created and saved *manually* prior to using any other loading tools or methods, (BAPI, CATT, etc.). Let's go over the approach with LSMW in the next section.

6.2.2 Steps for LSMW

We will continue to use Acme Computers to illustrate the LSMW steps. Acme Computers is doing a migration of data from its old legacy application to SAP ERP. As part of this migration, the company is converting its legacy data, including pricing. Acme is converting all of its list prices to SAP ERP list prices, which are represented by pricing condition PR00.

Let's consider an example of loading PR00 records. Follow these steps to record the program:

1. Create a LSMW program by using Transaction LSMW to create a project.
2. Enter the PROJECT, SUBPROJECT, and OBJECT, and click CREATE.
3. Enter the PROJECT DESCRIPTION, SUBPROJECT DESCRIPTION, and OBJECT DESCRIPTION. As shown in Figure 6.1, retain the project name, subproject name, and the object ID created in the previous step, and click the EXECUTE button after entering the information.



Legacy System Migration Workbench		
<input type="button" value="All Objects"/> <input type="button" value="My Objects"/> <input type="button" value="All Project Objects"/>		
Project Selection		
Project	ZPRICE	<input checked="" type="radio"/> Pricing
Subproject	ZPRICE	<input type="radio"/> Pricing
Object	0070	<input type="radio"/> Pricing

Figure 6.1 Create New Project

4. Maintain the object attributes by selecting the OBJECT ATTRIBUTES tab, and select the EXECUTE button (see Figure 6.2).
5. Maintain the object attributes by clicking the DISPLAY <--> CHANGE button, and then selecting the BATCH INPUT RECORDING radio button. Select the OVERVIEW icon as shown in Figure 6.2.

LSM Workbench: Change Object Attributes

Display <-> Change | Documentation | Display Interfaces

Attributes

Object: 0070 Pricing

Owner: IDADMIN IDADMIN

Data Transfer: Once-Only Periodic

File Names: System-Dependent

Object Type and Import Method

Standard Batch/Direct Input

Object:

Method:

Program Name:

Program Type:

Batch Input Recording

Recording: ZPRICING Record Pricing PR00

Figure 6.2 Input Batch Input Record Name

6. Create a recording of the pricing by entering the name "ZPRICING" in the RECORDING field under BATCH INPUT RECORDING.
7. Press , and go to the next screen to enter TRANSACTION "VK11" for pricing condition records, as shown in Figure 6.3.
8. Press again, and the system simulates the creation of pricing condition records by stepping you through the various screens of Transaction VK11.

Recordings of Project 'ZPRICE': Overview

Recordings

- ZPRICING
 - Record Pricing PR00
 - Transaction: VK11 Create Condition
 - Owner: IDADMIN IDADMIN

Figure 6.3 Use Transaction VK11 to Record Pricing Creation

9. Enter the appropriate information in the required fields, such as PRICING CONDITION TYPE ("PR00"), SALES ORGANIZATION ("1000"), DISTRIBUTION CHANNEL ("00"), and so on, for recording a pricing transaction successfully. The recorded fields will look as shown in Figure 6.4.

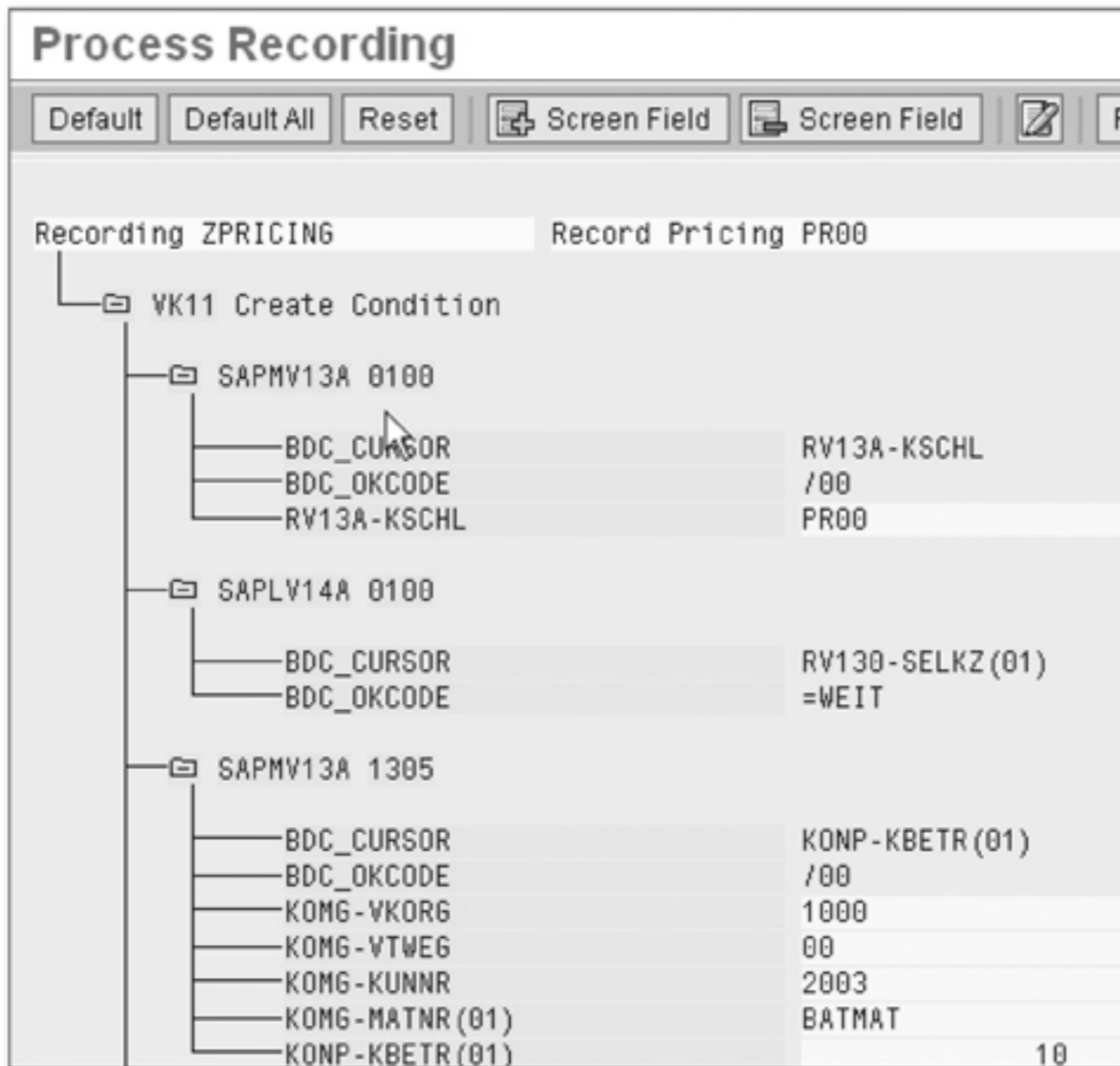


Figure 6.4 Record Fields for Transaction VK11

Note that the fields are populated with default values. The values you entered when you recorded the transaction are set by default.

10. Double-click the field RMMG1-MATNR.
11. To follow our example, enter the NAME as "MATNR" and the description as "Material Number", and then remove the default value "BATMAT", as shown in Figure 6.5.

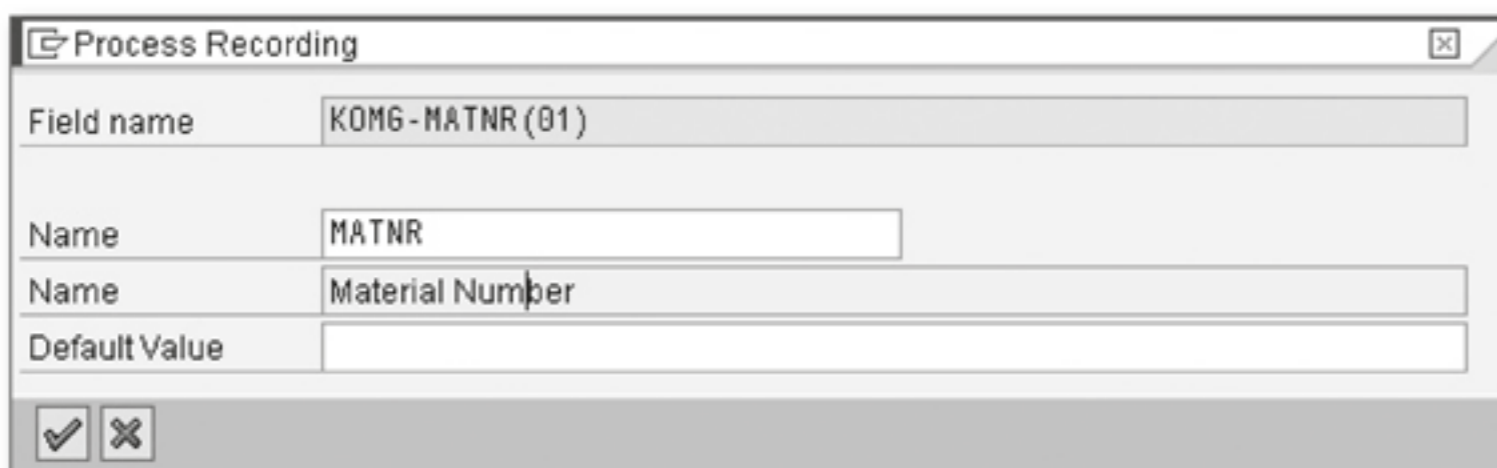


Figure 6.5 Replace Default Values for Fields

12. Click the SAVE button after all of the fields have been updated, and then click the BACK arrow icon until you are at the overview screen.

13. On the overview screen, select the **MAINTAIN SOURCE STRUCTURES** checkbox, and select the **EXECUTE** button to be taken to the screen shown in Figure 6.6.
14. Create the source structure by entering the **SOURCE STRUCTURE** name and **DESCRIPTION**. Click the **SAVE** button.

The screenshot shows a dialog box titled "Create Source Structure". It has two input fields: "Source Structure" with the value "ZSOURCEPRICING" and "Description" with the value "Source Pricing Structure". At the bottom left, there is a checked checkbox and a close button (X).

Figure 6.6 Maintain Source Structure

15. Now go back to the main screen by selecting the **BACK** arrow icon.
16. On the overview screen, select **MAINTAIN SOURCE FIELDS**, and select the **EXECUTE** button. The system takes you to the screen displayed in Figure 6.7.

The screenshot shows the "LSM Workbench: Change Source Fields" screen. The title bar reads "LSM Workbench: Change Source Fields". Below the title bar is a toolbar with various icons. The main area shows "ZPRICING - ZPRICING - 00070 ZPRICING" and a tree view under "Source Fields" with a node "ZPRICING".

Figure 6.7 Change Source Fields

17. Select the **DISPLAY/CHANGE** button. Now maintain the list of fields that are present in the source structure. The easiest way to maintain the list is to click the **TABLE MAINTENANCE** icon (icon with little squares) as shown in Figure 6.7.
18. Enter the **FIELD NAME**, **TYPE**, and **LENGTH** for each field, as shown in Figure 6.8.
19. Select the **SAVE** button after entering the required fields, and go back to the main screen by clicking the **BACK** arrow icon. The legacy file will have material, customer, and price. In our example, the extracted file is the legacy file representing the fields extracted: material, customer, and price.

Source Fields for Source Structure ZSOURCEPRICING			
Field Name	Type	Le	Field description
MATERIAL	C	18	Material
CUSTOMER	C	16	Customer
PRICE	AMT1	12	PRICE

Figure 6.8 Maintain Source Structure

20. On the overview screen, the system positions the cursor on MAINTAIN STRUCTURE RELATIONS. When you see this, click the EXECUTE icon. Because there is only one SOURCE AND TARGET STRUCTURE, the relationship is defaulted automatically. Select the BACK arrow icon to go back to the main screen.
21. The cursor is now positioned on the MAINTAIN FIELD MAPPING and conversion rules. Click the EXECUTE button.
22. Keep your cursor on the MATNR field, and click the CREATE SOURCE field icon. The system shows the ZPRICING-MATNR: ASSIGN SOURCE FIELD pop-up screen shown in Figure 6.9.
23. In the pop-up screen, keep the cursor on source field MATERIAL and press . This selects the source structure ZSOURCEPRICING and source field MATERIAL to assign the source field.

LSM Workbench: Change Field Mapping and Conversion Rules

ZPRICE - ZPRICE - 0070 Pricing

Field Mapping and Rule

- BEGIN_OF_PROCESSING_ Before Data Processing Starts
- BEGIN_OF_TRANSACTION_ Before Transaction Processing Starts
- ZPRICING Record Pricing PR00
 - Fields
 - BEGIN_OF_RECORD_ Before Using Conversion Rules
 - Rule : Default Settings
 - Code: ZPRICING = INIT_ZPRICING.
 - Customer
 - Material Number
 - END_OF_RECORD_ After Using Conversion Rules
 - Rule : Default Settings
 - Code: transfer_record.

ZPRICING-MATNR: Assign Source Field

No.	Source Structure	Source Field	Description
0001	ZSOURCEPRICING	MATERIAL	Material
0002	ZSOURCEPRICING	CUSTOMER	Customer
0003	ZSOURCEPRICING	PRICE	PRICE

Figure 6.9 Assign Source Field

24. Repeat the steps we've outlined for all fields. You can also maintain reusable translations and user-defined routines, which can be used across conversion

tasks. When you are done assigning all of the source fields to the target fields, click the BACK arrow icon to return to the overview screen.

25. Your next step is to create an Excel spreadsheet with your pricing data, and save it as a tab-delimited text file on your local C drive. A sample file ZPRICE_ZPRICE__0070.lsmw.conv is shown in Figure 6.10. This file is an example of the extracted file from the legacy system. You won't need to create a sample pricing file in a real-life scenario because you'll extract the source file from the legacy system. We are only using a sample file with three fields (customer, material, and price) in our example. In a real-world scenario, there could be additional fields as well. This sample file will help show how the source file fields are mapped to the target fields in the SAP ERP system.

LSM Workbench: Convert Data For MAT_REC, MAT_REC, MAT_REC	
02/22/2006 - 01:45:05	
File Read:	D:\usr\MAT_REC_MAT_REC_MAT_REC.lsmw.read
File Written:	D:\usr\MAT_REC_MAT_REC_MAT_REC.lsmw.conv
Transactions Read:	2
Records Read:	2
Transactions Written:	2
Records Written:	2

Figure 6.10 Pricing Sample File

Next, you need to specify the files created in the previous step that will be referred to for data loading:

1. On the overview screen, place the cursor over the SPECIFY FILES checkbox, and click EXECUTE. The system takes you to the LSM WORKBENCH: SPECIFY FILES (CHANGE) overview screen shown in Figure 6.11.
2. Click the CHANGE icon on the screen.

LSM Workbench: Specify Files (Change)	
ZPRICING - ZPRICING - 00070 ZPRICING	
Files	
Legacy Data	On the PC (Frontend)
Legacy Data	On the R/3 server (application server)
Imported Data	File for Imported Data (Application Server)
Converted Data	File for Converted Data (Application Server)
Wildcard Value	Value for Wildcard '*' in File Name

Figure 6.11 Specify Files Overview Screen

This screen shows the line LEGACY DATA - ON THE PC (FRONTEND). This is the option you have to choose so that the file you created in the previous step can be used as a source.

- Place the cursor on LEGACY DATA - ON THE PC (FRONTEND), and select the CREATE ENTRY icon. This takes you to the screen shown in Figure 6.12. Here, you need to specify the input file (i.e., the source file). The source file is the sample Excel file we created in the earlier step: ZPRICE_ZPRICE__0070.lsmw.conv. The source file is a tab-delimited file with the first row as field names. Specify the file ZPRICE_ZPRICE__0070.lsmw.conv, and then click the BACK arrow icon to go back to the overview screen.

	A	B	C	D
1	Customer	Material	Price	
2	2003	BATMAS	10	
3	2004	V1	12	
4				

Figure 6.12 Specify Input Files

- After specifying the files, you need to assign the file to the source structure. On the overview screen, place the cursor on the ASSIGN FILE checkbox, and click EXECUTE.
- Assign the file ZPRICE_ZPRICE__0070.lsmw.conv to the source structure. The source structure was created as shown earlier in Figure 6.6 with the customer, material, and price fields.
- Next, the LSMW needs to read the data from the file assigned. To make this happen, place the cursor on the READ DATA checkbox, and click EXECUTE. The LSMW reads the data from the source file ZPRICE_ZPRICE__0070.lsmw.conv (from your PC's local drive) as shown in Figure 6.13. You have the option to read only selected rows and convert data values to internal format.

LSM Workbench: Convert Data For MAT_REC, MAT_REC, MAT_REC	
02/22/2006 - 01:45:05	
File Read:	D:\usr\MAT_REC_MAT_REC_MAT_REC.lsmw.read
File Written:	D:\usr\MAT_REC_MAT_REC_MAT_REC.lsmw.conv
Transactions Read:	2
Records Read:	2
Transactions Written:	2
Records Written:	2

Figure 6.13 Read Data

7. Display the data by going back to the overview screen, placing the cursor on the DISPLAY DATA checkbox, and then clicking the EXECUTE button.
8. Now you need to convert the data to the target format from the source format. Go back to the overview screen and place the cursor on the CONVERT DATA checkbox. Click the EXECUTE button.
9. Finally, you need to create a batch session to load the data. Place the cursor on the CREATE BATCH INPUT SESSION checkbox in the overview screen, and click EXECUTE. This takes you to the screen shown in Figure 6.14. A batch session is created with the session id "0070" as specified in the input field NAME OF THE BATCH INPUT FOLDER(S) in Figure 6.14.
10. Go back to the overview screen, and select the RUN BATCH SESSION checkbox. The batch session created in the previous section is now executed, which results in loading the pricing records for condition type PR00. In this manner, pricing records can be loaded using LSMW.

File Name (with Path)	ZPRICE_ZPRICE_0070.lsmw.conv
Display Trans. per BI Folder	
Name of Batch Input Folder(s)	0070
User ID	IDADMIN
<input type="checkbox"/> Keep batch input folder(s)?	

Figure 6.14 Create Batch Session to Load Price Records

The batch program you created can be scheduled through Transaction SE37 in the background so that the user can continue to work on other things while the program is loading the data.

Now that we have gone through data conversion, let's look at the preparation work that needs to be carried out.

6.3 Cutover Planning Key Points

Cutover planning is the process of migrating data to the live production system. Prior to cutover, several mock cutovers are done to ensure that data are loaded in a consistent and predictable way with minimal data errors. The quality of the data should be high in mock cutover, prior to executing the actual cutover.

Prior to cutover, be sure the following are completed or in place with regards to pricing:

- ▶ Data migration sequencing has been defined. For example, if we have to load pricing condition type PR00, which has access sequences customer and material, the customers and materials must be loaded prior to starting the pricing condition loads.
- ▶ All pricing configuration elements have been transported and verified in the production environment.
- ▶ All user exits, requirements, condition formulas, and values are activated in the production client.
- ▶ Business users are ready for data validation for verifying the data files prior to load.
- ▶ Conversion programs have been tested multiple times.
- ▶ Business users are ready for data validation for verifying the data loads after it is loaded into the SAP ERP system.
- ▶ Appropriate data verification procedures have been defined to verify the number of records, pricing values, and so on. Typically, migrated data can be verified using standard pricing reports. Chapter 13 explains how to run SAP ERP standard reports.
- ▶ Pricing procedures are simulated, using sales orders, to confirm that the pricing records are determined correctly.

These points are best-known methods and lessons learned from various implementations. Now that you understand how the LSMW can be used for data migration, you should be able to write LSMW programs for loading your own pricing condition records for not only list prices but also other pricing condition types such as discounts, freights and so on.

6.4 Summary

In this chapter, we discussed the steps involved in data migration, including data discovery, data cleansing, data mapping, data extractions, data consolidation, data loading, and validations. We then reviewed a data conversion load using LSMW for pricing condition records.

We discussed cutover planning, and the key steps in cutover planning for pricing data loads.

Now that you understand how pricing data can be migrated as well as understand the key dependencies for pricing cutover, let's move on to pricing in purchasing documents.

Pricing functions apply to Materials Management within processes such as purchasing, and material document and invoice verification. In this chapter, you'll learn how pricing procedures work in common Materials Management documents.

7 Pricing with Materials Management Documents

Now that understand pricing in Sales and Distribution (SD) documents such as sales orders, contracts, and schedule agreements, we'll move on to discuss how pricing works in the same way in the Materials Management (MM) functionality. MM in SAP ERP allows you to model different business scenarios that are based on purchasing documents, which are defined in the system. SAP ERP uses a technique called a *calculation schema* to determine pricing in MM. The following sections explain in detail how this procedure works.

7.1 Materials Management Pricing Documents Overview

This section gives you a brief overview of the purchasing documents that are used to represent pricing in the Purchasing subcomponent. Pricing can be defined in the following documents for Purchasing:

- ▶ Purchase conditions
- ▶ Quotations
- ▶ Purchase info records (PIRs)
- ▶ Schedule agreements
- ▶ Contracts
- ▶ Purchase orders (POs)

7.1.1 Purchasing Organization Structure

It's important to understand some basic definitions for purchasing organizations, plants, and purchasing groups:

► **Purchasing organization**

An organizational unit within the Logistics functionality that represents the procurement unit in a legal sense. The purchasing organization is responsible for procuring materials and services, and negotiating contracts with vendors. Purchasing organizations can be global, company-specific, or plant-specific:

- When one purchase organization is responsible for all procurement and services across all companies, it's called an enterprise-wide purchasing organization or centralized purchasing organization.
- When one purchasing organization buys for one company, it's a company-specific purchasing organization.
- When one purchasing organization buys for one plant, it's a plant-specific purchasing organization.

► **Plants**

An organizational unit within the Logistics functionality that can represent a manufacturing, distribution, or warehousing unit.

► **Purchasing groups**

Buyers or a group of buyers.

We'll briefly discuss what these represent in your SAP ERP system. To explain these documents and areas better, let's consider an example company named Sharp Industries, which is in the business of manufacturing computers, including desktops and laptops. Sharp Industries (applicable to all companies, not just large companies) procures several components from its suppliers, such as PCB, RAM, and others. Sharp Industries has a centralized purchasing organization, which is responsible for overseeing all procurement activities. The centralized purchasing organization is also responsible for negotiating contracts with suppliers and reviewing quotations from suppliers. When determining the final purchase price from the suppliers, Sharp Industries includes discounts, freight charges, and taxes. Let's now see how Sharp Industries uses the various purchasing documents.

Purchasing Conditions

Purchasing conditions are pricing elements that consist of gross price, discounts, freights, and so on. These elements are also called condition types. For Sharp Industries, procurement activities are streamlined through the use of contracts and purchase info records (PIRs). Because contracts and PIRs support all of the pricing requirements for Sharp, no individual pricing conditions are maintained for discounts or freights. The discounts and freights are maintained in the contracts and PIRs, so individual purchasing conditions are not needed. Contracts and PIRs are covered in detail later in this chapter.

Request for Quotations (RFQs)

Quotations are used to respond to the vendor's response to requests for quotations (RFQs). Quotations represent the price quoted by the vendor. Whenever Sharp Industries desires new technical specifications from its supplier, the company solicits responses from existing suppliers as well as new suppliers. Through the request for quotations, Sharp Industries can describe the requirements of the product and solicit responses for the best prices.

Purchase Information Records

A purchase info record (PIR) maintains the relationship between a vendor and a material or material group. Prices can be set at the purchase organization level, or they can be set at the plant level. Further prices can be defined for regular purchase orders (POs), as well as consignment and subcontracting POs.

Sharp Industries maintains PIRs for those suppliers with which there is no long-term agreement. Typically, these are not high-volume purchases.

Schedule Agreements

Schedule agreements are used to represent vendor delivery schedules. When the dates for delivery can be clearly specified for a specific period of time, schedule agreements are the best choice. So schedule agreements are also good to use when the demand can be communicated in advance to the supplier. If not, you should use POs. Sharp Industries uses schedule agreements for certain parts. The schedules are communicated to vendors about three to four months in advance so that the vendors can see the schedule and deliver on the requested delivery date.

Contracts

Value or quantity contracts can be set up with vendors. These contracts basically represent the agreed quantity or value to be purchased over a period of time. Several of the component purchases by Sharp Industries, such as RAM and keyboards, all have long-term quantity contracts, which are an agreement to purchase a certain volume of components in a specified time period.

Purchase Orders

Purchase orders (POs) represent confirmed quantities to be supplied by vendors. Sharp Industries creates POs based on either the quantity contracts, or, in the absence of long-term contracts, the PIR is used as a source for POs. Figure 7.1 illustrates how the pricing conditions are used in various purchasing documents.

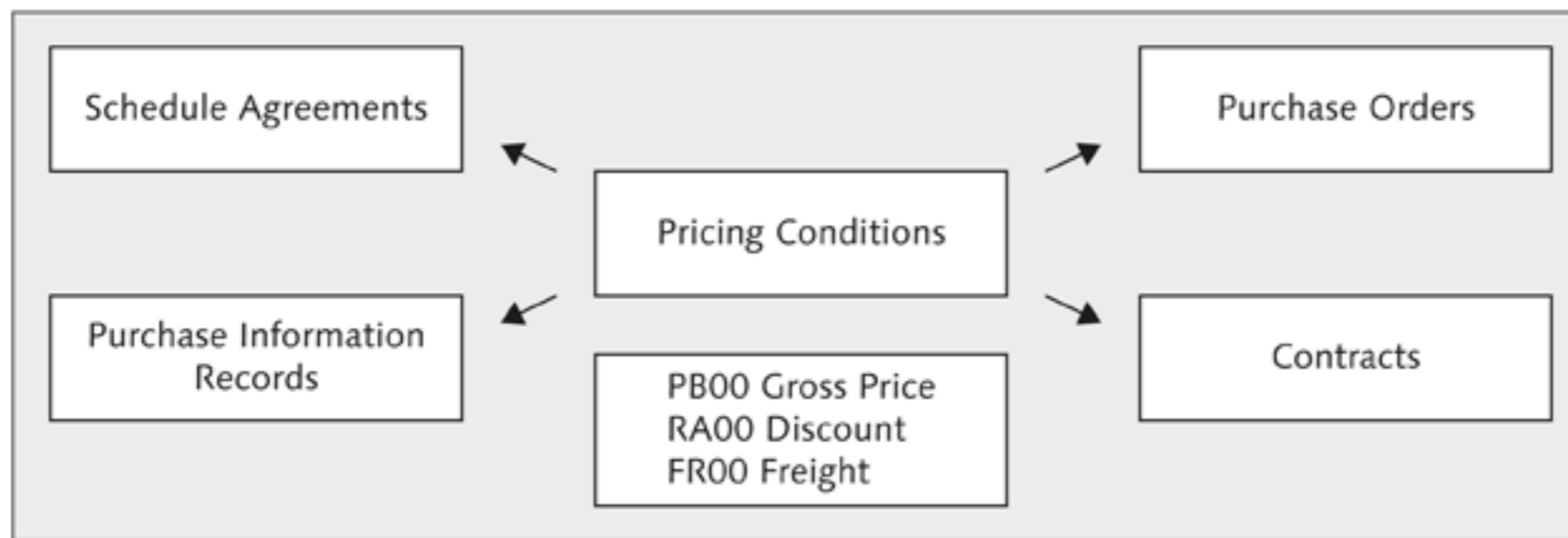


Figure 7.1 Pricing in Purchasing Documents

Now that we've covered purchasing documents, let's get into the pricing aspect of MM.

7.2 Pricing Procedures: Calculation Schema

The following sections explain how MM pricing procedures are determined. MM pricing procedures are also called calculation schemas, as mentioned before. Pricing elements in purchasing documents are defined as condition records. Just like in the SD functionality, the various pricing elements are brought together in a pricing procedure.

Figure 7.2 shows the screen for setting up a calculation schema. The menu path to configure this is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE CALCULATION SCHEMA.

Proce	Descript.
COEBP	Condition Supplement 01CT EBP
EBP000	Purchasing Document (Big) EBP
RM0000	Purchasing Document (Big)
RM0001	Purchasing Master Data-Header
RM0002	Condition Supplement PB00
RM1000	Document
RM1001	Master Data Header
RM1002	Cond.Suppl.Item
RM2000	Stock Transfer Document
RM5000	Subsequent Settlement
RM5001	Subs. sett. (tax trigger)
RM6000	Agency business Add. costs
RM6001	Agency business (vendor)
RM6002	Agency business (customer)
RMIMP0	Import Processing
RMISR0	Purchasing Document (Big)
RMISR1	Purchasing Doc. ISR Internal
RMISRX	Purch. net/Net IS-Retail
RMMP00	Market Price
RMREGU	Payment document

Figure 7.2 Calculation Schema

The calculation schema has the pricing elements (condition types), which we discussed in the prior section, that are associated with it. As shown in the figure, several standard pricing procedures are included in the MM functionality. Each pricing procedure serves a specific purpose. For example, pricing procedure RM0000 is used on standard POs, contracts, and schedule agreements, and it's the most commonly used pricing procedure.

RM0002 is used as a supplemental pricing procedure (providing additional pricing elements that are specifically linked to a pricing element, such as gross price PB00). RM0001 is used as a supplemental pricing procedure assigned to discount pricing element R000.

Let's go over the key steps in determining the pricing procedure for purchasing documents. Pricing procedure determination is called *calculation schema determination*. The steps in determining the pricing procedure are outlined in the following subsections.

7.2.1 Defining Schema Group Vendors

Schema groups are one of the parameters used to determine the pricing procedure for purchasing documents. To define a schema group, follow these steps:

1. Follow the menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE SCHEMA GROUP • SCHEMA GROUPS: VENDOR. The screen shown in Figure 7.3 appears.

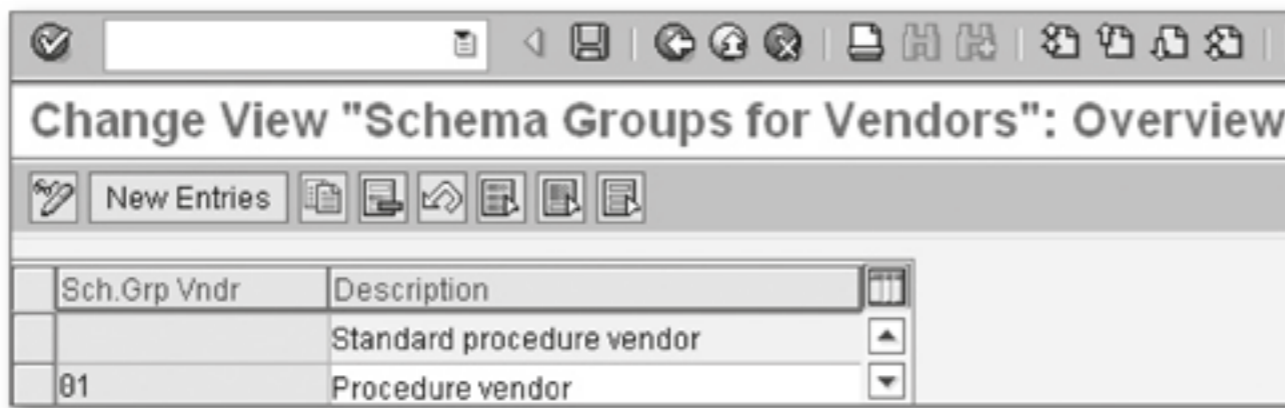


Figure 7.3 Schema Groups for Vendors

2. Link the schema group with the vendor in the purchasing data, as shown in Figure 7.3, by going to SAP MENU • LOGISTICS • MATERIALS MANAGEMENT • PURCHASING • MASTER DATA • VENDOR • CENTRAL • CHANGE.
3. In Transaction XK02, enter the VENDOR number and PURCHASING ORG., and select the PURCHASING VIEW to arrive at the purchasing screen shown in Figure 7.4.

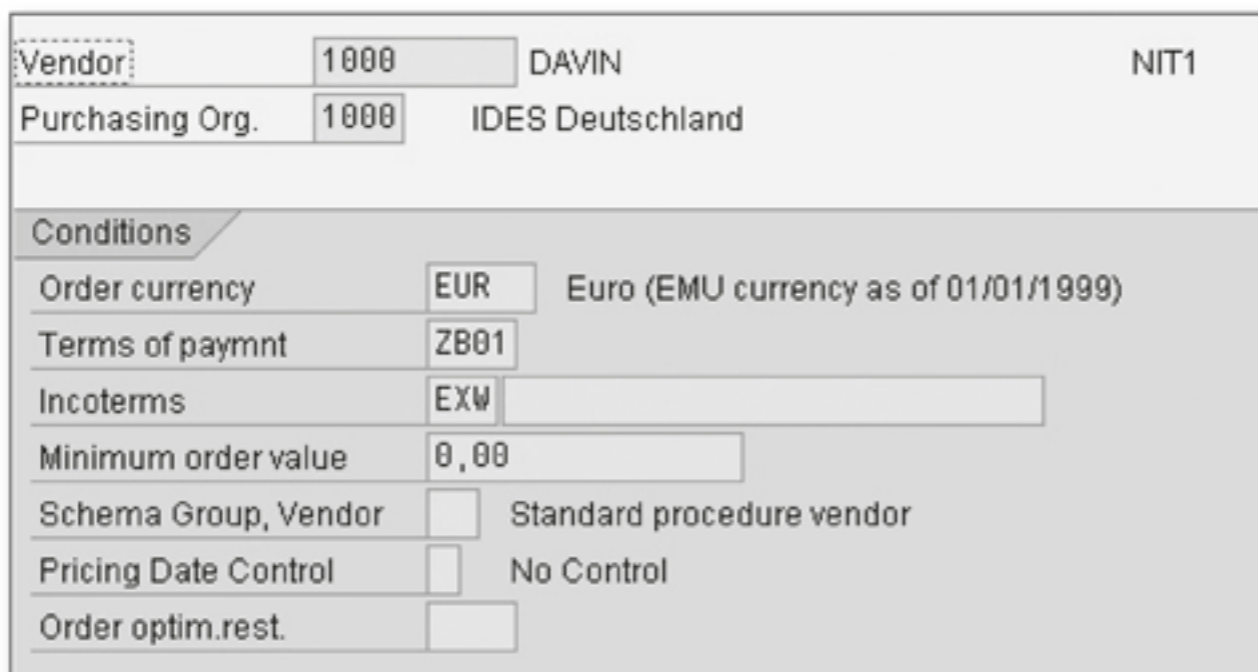


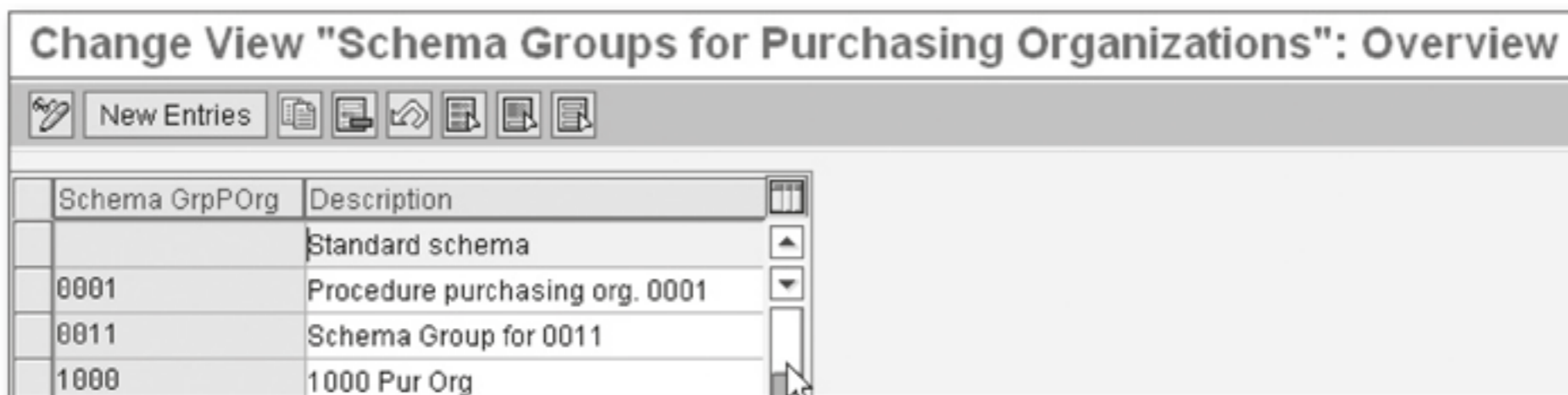
Figure 7.4 Linking a Vendor Schema Group with a Vendor

If no schema groups are defined for the vendor (if the SCHEMA GROUP VENDOR field is blank), then the standard procedure RM0000 is adopted. By changing this parameter, different vendors can have different pricing procedures.

7.2.2 Defining Schema Groups for the Purchase Organization

The next step is to define a schema group for the purchasing organization.

The menu path for defining the schema group for purchase organization is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE SCHEMA GROUP • SCHEMA GROUPS: PURCHASE ORGANIZATION (see Figure 7.5).



Schema GrpPOrg	Description
	Standard schema
0001	Procedure purchasing org. 0001
0011	Schema Group for 0011
1000	1000 Pur Org

Figure 7.5 Purchase Organization Schema

If no schema groups are defined for the purchasing organization (if the field is blank), then the standard procedure RM0000 is adopted. With this parameter, different purchasing organizations can have different pricing procedures.

7.2.3 Assigning Purchasing Organizations to the Schema Group Purchasing Organization

Next you need to assign a purchasing organization to the schema group. This step assigns the schema groups that were defined in the previous step to the purchasing organizations.

The menu path for defining the schema group for purchase organizations is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE SCHEMA GROUP • SCHEMA GROUPS: ASSIGN SCHEMA GROUP TO PURCHASING ORGANIZATIONS (see Figure 7.6).

P...	Desc. Pur. Org.	Sch. Grp Pur. Org.
0001	Einkaufsorg. 0001	0001
0005	IDES Deutschland	0011
0006	IDES USA	1000
0007	IDES Deutschland	

Figure 7.6 Assign a Schema Group to a Purchasing Organization

7.2.4 Assigning Pricing Procedures to the Schema Group Purchasing Organization and Schema Group Vendor

Now that we have defined schema groups for vendors and purchasing organizations, we can assign the calculation schema to a combination of vendor schemas and purchasing organization schemas. The menu path for defining the schema group for purchase organization is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE SCHEMA GROUP • DEFINE SCHEMA DETERMINATION • DETERMINE CALCULATION SCHEMA FOR STANDARD PURCHASE ORDERS (see Figure 7.7).

Because of this flexibility of having both a purchasing organization schema and a vendor schema, different purchasing organizations and different vendors can have separate pricing procedures associated with them.

For example, if the PURCHASING ORGANIZATION SCHEMA 0001 is assigned to purchasing organization 0001, vendors within this purchasing organization can have different calculation procedures by simply defining a vendor schema for vendors with different calculation procedures (as shown in Figure 7.7).

Purchasing Org Schema	Vendor Schema	Procedure
0001	L1	RM0000
0001	L2	RM0001

Figure 7.7 Assigning Pricing Procedure to the Same Purchasing Organization Schema and Different Vendor Schemas

Figure 7.8 illustrates that VENDOR SCHEMA L1 is used in conjunction with PURCHASING ORGANIZATION SCHEMA 0001 to have its pricing procedure be RM0000.

Schema L2 can be defined as the vendor schema and then use with PURCHASING ORGANIZATION SCHEMA 0001 to have a different pricing procedure: RM00001.

In a similar manner, vendors belonging to different purchasing organizations can also have different pricing procedures. For example, VENDOR SCHEMA group L1 can be used in conjunction with another Purchasing Organization Schema: 0002 to have a different pricing Procedure. Figure 7.8 illustrates this concept.

Purchasing Org Schema	Vendor Schema	Procedure
0001	L1	RM0000

Figure 7.8 Assigning Pricing Procedures to Different Purchasing Organization Schemas and the Same Vendor Schemas

For Sharp Industries, because its pricing requirements can be met by using pricing procedure RM00000, the company decided to use purchasing organization schema 0001 and vendor schema L1. In other words, all of the vendors were assigned with schema group L2. The purchasing organization is assigned with purchasing organization schema 0001.

So far, we have gone over the steps for defining and assigning pricing procedures for purchasing documents. In the next section, we'll review the application of this function within a stock transport order. Based on the requirements for Sharp, standard pricing procedure RM0000 can be used for regular POs because it has all of the pricing elements, including price, discounts, and taxes.

7.2.5 Calculation Schema for Stock Transport Purchase Orders

Stock transport orders are special POs that are used to transfer goods between plants. Special pricing procedures can be defined for stock transport orders by using the calculation schema. This can be done by assigning the stock transport purchase document type and the schema group purchasing organization to a pricing procedure. SAP ERP has provided procedure RM2000. The stock transport order has pricing conditions relevant for stock transfers, including ordering costs (cost of moving from issuing to receiving plant) and other freight charges, so a unique pricing procedure is used for stock transport orders. Sharp Industries uses the standard pricing procedure RM2000 for stock transport orders.

You can make the configuration by following menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE SCHEMA GROUP • DEFINE SCHEMA DETERMINATION • DETERMINE CALCULATION SCHEMA FOR STOCK TRANSPORT ORDERS (see Figure 7.9).

In this screen, you assign the purchasing organization schema and the stock transport PO to a pricing procedure. Stock transport orders can be labeled as DOC. TYPE "UB", "LB", and so on, as shown in Figure 7.9.

Change View "Maint. View: Determine Schema for Stock T					
New Entries					
Schema Grp	POrg	Doc. Type	Suppl.Plnt	Proc.	Description
		LU	☉	RM2000	Stock Transfer Document
		UB		RM2000	Stock Transfer Document
R001		UB		RMISR1	Purchasing Doc. ISR Internal

Figure 7.9 Pricing for Stock Purchase Orders

Another example of a different calculation scheme is for the market prices of the goods Sharp Industries is buying. Let's review how that is configured within the MM functionality.

Calculation Schema for Market Prices

The calculation schema can also be defined for market prices. The *market price* represents the average price of a material that can be maintained for a purchase organization. Maintaining this price enables you to compare this market price with other vendors to determine if a vendor is expensive or not. This schema is used to compare different vendor prices during vendor evaluation. Each purchasing organization can be associated with a market price through the calculation schema.

Figure 7.10 illustrates that the MARKET PRICE SCHEMA "RMMP00" is assigned to purchasing organization "0001". Note that a market price can be maintained for any material using this pricing procedure for purchasing organization "0001".

Now that we've reviewed the pricing procedure concept, definitions, and scheme, let's look at how to use the pricing procedure within purchasing business transactions.

POrg	Desc. Pur. Org.	Market Price Schema	Description
0001	Einkaufsorg. 0001	RMMP00	Market Price
0005	IDES Deutschland		
0006	IDES USA		
0007	IDES Deutschland		
0008	IDES USA		

Figure 7.10 Calculation Schema for Market Price

7.3 Pricing in Purchasing Documents

Similar to the procedures in SD, the pricing procedures are applicable to purchasing documents. Pricing in purchasing documents can apply to POs, schedule agreements, contracts, PIRs, and so on. By understanding how pricing is determined in purchasing documents, you can apply the same principles for your client or company needs.

In this section, we'll go over some of the key purchasing documents and discuss how pricing applies to them. The following subsections explain how pricing is determined for various purchasing documents.

Note

Pricing in purchasing documents can be time-dependent or time-independent. Time-dependent pricing means the pricing has a specific time period in which the pricing is active. Pricing in contracts and PIRs are time-dependent. Schedule agreements and quotations can have time-dependent or time-independent conditions. This is controlled by the document type. This indicator for time-dependent conditions is specified in configuration and is explained in Sections 7.3.1 and 7.3.4 for quotations and schedule agreements.

7.3.1 Pricing in Purchase Quotations

Pricing in purchase quotations is determined by a combination of the schema groups defined by vendors and purchasing organizations. In Section 7.2, you learned how the calculation schema is determined using the schema group defined for purchasing organizations and vendors.

As a general practice, scales can be used for the various pricing condition types used in quotations. *Scales* provide a way for discounts to be offered based on quantities purchased. For example, the scales might be defined so that for quantities purchased between 100 and 1000 pieces, a discount of 5% is offered to the vendor. For quantities purchased between 1001 and 5000 pieces, a discount of 6% can be offered.

Also, the pricing conditions in quotations are usually time-dependent. This requirement is controlled by the setting in configuration for the quotation document type.

The menu path to display the screen shown in Figure 7.11 is SPRO • MATERIALS MANAGEMENT • PURCHASING • RFQ/QUOTATION • DEFINE DOCUMENT TYPES.

Type	NoRge Ext	Updat	FieldSel.	Sltml	Time-D
AB	61	SAP	ANA		<input type="checkbox"/>
AN	61	SAP	ANA		<input checked="" type="checkbox"/>

Figure 7.11 Time-Dependent Setting for Quotations

Next, let's discuss the purchasing contracts.

7.3.2 Pricing in Purchase Contracts

Pricing in purchase contracts is determined by a combination of the schema groups that are defined by vendors and purchasing organizations. This is similar to how pricing is determined in quotations and is time-dependent. You can maintain scales for the various pricing condition types used in contracts. Note that conditions in contracts are time-dependent as well. Conditions in a contract apply to all contract release orders created with reference to this contract. Sharp Industries use contracts for several of its components to negotiate better prices with its suppliers.

7.3.3 Pricing in Schedule Agreements

Pricing in purchasing schedule agreements is determined by a combination of the schema groups, which is defined by vendors and purchasing organizations. This process is similar to how pricing is determined in quotations. The menu path to

configure pricing in schedule agreements is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONTRACTS • DEFINE DOCUMENT TYPES.

Also, the pricing conditions in schedule agreements can be set as time-dependent or time-independent. This is controlled by the setting in configuration for the schedule agreement document type. To access this screen, follow the menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • SCHEDULE AGREEMENTS • DEFINE DOCUMENT TYPES (see Figure 7.12).

Type	Doc. Type Descript.	Time-D.C
LP	Scheduling Agreement	<input checked="" type="checkbox"/>
LPA	Scheduling Agreement	<input checked="" type="checkbox"/>
LU	St. Trnsp. Sch. Agmt	<input checked="" type="checkbox"/>

Figure 7.12 Schedule Agreement Time-Dependency Setting

Sharp Industries uses schedule agreements with some of its key suppliers because it expects the suppliers to deliver according to the delivery schedules specified in the schedule agreement.

Now that we've discussed some of the key documents, let's review some of the master data that influence MM pricing.

7.3.4 Pricing in Purchase Info Records

Prices in PIRs are set for a purchasing organization and can also be made plant-dependent. This scenario is similar to how pricing is determined for all other purchasing documents. Also note that the pricing conditions in POs are time-dependent.

After a pricing information record has been defined for a vendor and material, this record is automatically proposed on the PO.

Even if a PIR doesn't exist for a vendor and material, the system can automatically create one. This action is controlled by the info record update on the PO line item. To access this setting, go to menu path PURCHASE ORDER CHANGE • ITEM DETAIL • MATERIAL DATA • INFO UPDATE (see Figure 7.13).

The screenshot shows the SAP 'Create Purchase Order' (Create PO) interface. At the top, there are navigation icons and a title bar. Below the title bar, there are buttons for 'Document Overview On', 'Hold', 'Print Preview', 'Messages', and 'Personal Setting'. The main header area contains fields for 'Standard PO', 'Vendor' (1000 DAVIN), and 'Doc. date' (01.10.2010). Below the header is a table with columns: S, Itm, A, I, Material, Short Text, PO Quantity, O, C, Deliv. Date, Net Price, and Curr. The first row shows item 10, material M-12, short text 'MAG DX 15F/Fe', PO quantity 10, and net price 10,00 EUR. Below the table are buttons for 'Default Values' and 'Addl Planning'. At the bottom, there is an 'Item' field with '[10] M-12, MAG DX 15F/Fe' and a set of tabs: 'Material Data', 'Quantities/Weights', 'Delivery Schedule', 'Delivery', 'Invoice', 'Conditions', and 'Account Assignmer'. The 'Material Data' tab is active, showing fields for 'Material group' (00207), 'Revision Level', 'Vendor mat. no.', 'EAN/UPC', 'Vendor sub-range', 'Batch', 'Vendor Batch', and 'InfoUpdate' (checked).

Figure 7.13 Info Record Update for Pricing

When you set the INFOUPDATE indicator at the bottom-right of Figure 7.13 for pricing, an info record is automatically created, and the price is suggested for new POs.

When a new PO is created, the pricing condition is not updated in the PIR. All other fields such as standard quantity, reminders, and sales person on the PIRs are populated from the PO. The price on the PO is suggested from the last PO, which is stored in the PIR (when no price exists on the info record).

Every time a new PO is created, the system updates the latest PO created for that material and vendor in the PIR. The price on this PO is then pulled into the new PO created.

To access this field, that is, where the latest PO for the material and vendor is stored, go to menu path PURCHASE INFO RECORD CHANGE • GO TO • PURCHASE ORGANIZATION 2 DATA. This is shown in Figure 7.14.

Display Info Record: Purch. Organization Data 2			
General Data		Purch. Org. Data 1	
Info Record	5300006240		
Vendor	1000	DAVIN	
Material	M-12	MAG DX 15F/Fe	
Material Group	00207	Monitors	
Purchasing Org.	1000		Standard
References			
Quotation		Quotation from	
Purchasing Doc.	4500017465 10	Document Date	01.10.2010

Figure 7.14 Price Suggested from the Last Purchase Order Created

When a new PO is created, the PIR is now used as the source to supply all of the fields available in the PIR. If the price is manually maintained in the PIR, then this is the price suggested for new POs. The PIR price can also be maintained at the plant level, so each plant can have its own price, which is suggested on the PO when the material and plant are entered on the PO. On the PO that is created, the price maintained in the PIR is automatically suggested by the system. The user has to review the price suggested.

To create info records at the plant level when a PO is created, you need to activate a setting in the configuration, in addition to checking the INFOUPDATE indicator on the PO.

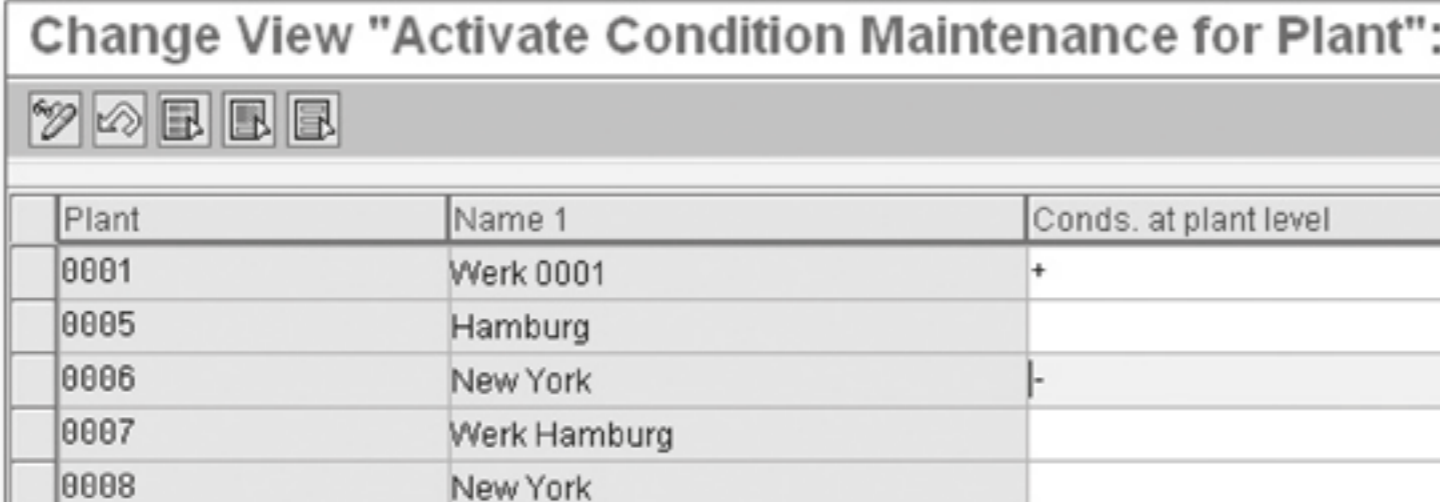
The screen to control this setting can be accessed through menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE CONDITION CONTROL AT PLANT LEVEL (see Figure 7.15).

The screen shown in Figure 7.15 illustrates the info records, which can be created at plant level or purchasing organization level by choosing the following settings:

- ▶ To create info records at the plant level, enter "+" in the CONDS. AT PLANT LEVEL field.
- ▶ To create info records at the purchasing organization level, leave the CONDS. AT PLANT LEVEL field blank.

- ▶ To prevent the system from creating info records at the plant level, enter "-" for the CONDS. AT PLANT LEVEL field.

Change View "Activate Condition Maintenance for Plant":



Plant	Name 1	Conds. at plant level
0001	Werk 0001	+
0005	Hamburg	
0006	New York	-
0007	Werk Hamburg	
0008	New York	

Figure 7.15 Plant Condition Control

For example, if the CONDS. AT PLANT LEVEL field is set to blank, then if an info record is created, the system displays a message as shown in Figure 7.16. This message indicates that the PIR can only be created at the purchasing organization level and not at the plant level.

Create Info Record: Initial Screen

Vendor DAVIN
 Material
 Purchasing Org. IDES Deutschland
 Plant
 Info Record

Help - Create Info Record: Initial Screen

Plant info records may not be used in plant 1000

Message no. 06716

Diagnosis

The entry of plant data for **plant** 1000 is not allowed.

Procedure (system administrator)

If it is to be possible to enter plant data, you must change the setting in Customizing.

Figure 7.16 Error in Info Record Creation

Now that you've seen how the master data is maintained, let's review how this data is determined in business transactions.

7.3.5 Pricing in Purchase Orders

Pricing is determined in the purchasing document and carried forward. In the following sections, we'll review the pricing within the purchasing documents.

Pricing in Standard Purchase Orders

Pricing in POs (i.e., standard PO—document type "NB") is determined by a combination of the schema groups, which are defined by vendors and purchasing organizations. Note that the pricing conditions in POs are independent of time.

Figure 7.17 illustrates the pricing procedure determination in a standard PO.

The screenshot shows the 'Analysis Pricing' window. On the left, a tree view lists procedures under 'ZM0000':

Procedure	Description
ZM0000	Purchasing Docum...
PB00	Gross Price
PBXX	Gross Price
VA00	Variants/Quantity
VA01	Variants %
GAU1	Orignl Price of Gold
GAU2	Actual Price of Gold
RB00	Discount (Value)
RC00	Discount/Quantity
RA00	Discount % on Net
RA01	Discount % on Gross
HB00	Header Surch.(Value)

On the right, an 'Overview' table shows condition messages:

Condition type	Message	Description
PB00	110	Access not executed (Requ
PBXX	207	Condition has been found
VA00	102	Access not made (initializ
VA01	102	Access not made (initializ
GAU1	001	Manual condition
GAU2	111	Condition ignored (require
RB00	001	Manual condition
RC00	001	Manual condition

Figure 7.17 Pricing Procedure "ZM0000" Determined for a Standard Purchase Order

Because the calculation schema for the purchasing organizations schema is left blank and the vendor schema is blank, the PO uses the calculation schema ZM0000 on the PO as shown.

Sharp Industries uses POs for several of its purchases from suppliers. It also uses release orders (i.e., POs against contracts).

The pricing procedure ZM0000 is determined by the combination of the purchasing organization schema being blank and the vendor schema being blank. In configuration, this combination determines the pricing procedure ZM0000. To access the screen, use the menu path PURCHASE ORDER CHANGE • CONDITIONS • ANALYSIS.

Let's now review the pricing procedure as applicable to the stock transport order, which is another variation of the PO document type. Stock transport orders use the document type "UB".

Pricing in Stock Transport Orders Document Type "UB"

Stock transport orders are special POs that are used to transfer goods between plants. For example, if Sharp Industries needs to move laptops and computer products from one distribution center to another distribution center, a stock transport order is used. Special pricing procedures can be defined for stock transport orders. Figure 7.18 shows a stock transport order between a supplying and receiving plant.

Stock transport ord. 4500017109 Created by Jennifer Nerlich

Document Overview On | Print Preview | Messages | Personal Setting

Stock transport ord. 4500017109 | Supplying Plant CHD1 Werk Hamburg | Doc. da

Header

S	Itm	A	I	Material	Short Text	PO Quan	O	C	Deliv. D	Curr	Matl	Plnt
	10		U	TP_FROZEN_01	Eis	1	KG	D	08.05.20	EUR	Food	Werk Hamburg

Item [10] TP_FROZEN_01, Eis

Material Data | Quantities/Weights | Delivery Schedule | Delivery | Conditions | Account

Qty 1 KG | Net 0,00 EUR

Pricing Elements

N	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr.	Sta
<input type="checkbox"/>	P101	Val.Price Supply.Plnt	12,00	EUR		1 KG	12,00	EUR	
<input checked="" type="checkbox"/>		Delivery Costs	0,00	EUR		1 KG	0,00	EUR	

Figure 7.18 Stock Transport Order Between Supplying and Receiving Plant

The pricing procedure is determined based on the calculation schema associated with the stock purchase document type. Figure 7.19 shows the determination of stock transport pricing procedure RM2000 being used on the PO.

The pricing procedure RM2000 is determined through the calculation schema determination, which was explained in detail in Section 7.2.

Procedure	Description
RM2000	Stock Transfer Docu...
P101	Val.Price Supply.Pln
FRB1	Freight (Value)
FRC1	Freight/Quantity
FRA1	Freight %
FRC2	Freight/Quantity
Delivery Costs	Delivery Costs
GRWR	Statistical Value

Condition type	Message	Description
P101	213	Amount copied from material valuation data
FRB1	001	Manual condition
FRC1	001	Manual condition
FRA1	001	Manual condition
FRC2	001	Manual condition
Delivery Costs	200	Subtotal
GRWR	011	Condition ignored (requirement 008 not fulfilled)

Figure 7.19 Stock Transport Order Pricing Analysis

To access the screen shown in Figure 7.19, use the menu path SAP MENU • PURCHASE ORDER CHANGE • CONDITIONS • ANALYSIS. Enter the PURCHASE ORDER NUMBER, and go to CONDITIONS • ANALYSIS.

Figure 7.19 illustrates that the correct pricing procedure has been determined based on the calculation schema determination we defined for stock transport orders.

7.3.6 Market Prices for Purchasing Organizations

Market prices are maintained so they can be used in evaluating vendors. For example, if Sharp Industries is buying keyboard accessories from various vendors and has determined that the average price of these keyboards across the vendors is about \$200. This price then can be used as a basis for comparing the individual vendors who provide the same keyboards to determine if they are charging a lower or higher price based on the market price. In vendor evaluation, the system can assign a lower score if the vendor charges a higher price than market price and a higher score if the vendor charges a lower price than the market price. Eventually, these scores for prices are added with other metrics for vendor evaluation such as delivery, quality, and so on, to assign a score to the vendor.

You use Transaction MEKH to maintain market prices. The menu path to access this transaction is SAP MENU • LOGISTICS • MATERIALS MANAGEMENT • CONDITIONS • PRICES, select MARKET PRICE. After you enter the condition maintenance, enter

the appropriate data into the PURCHASING ORGANIZATION and MATERIAL fields, as shown in Figure 7.20.

Figure 7.20 Maintaining Market Price for Material

You can determine the market price through the calculation schema RMMPO0 that is maintained for the purchasing organization, which has the pricing element MP01.

After you save the data from Figure 7.20, the screen defines the market price definition and indicates that you need to enter the market price for the material. If no value exists, a screen appears where you can maintain the value, as shown in Figure 7.21.

Material	Description	Amount	Unit	p.	U.	C	S.	Valid From	Valid to
M-12	G DX 15F/Fe	100,00	EUR	1	PC	C		02.10.2010	31.12.9999
<input checked="" type="checkbox"/>									
<input checked="" type="checkbox"/>									

Figure 7.21 Maintaining Market Price

Maintain the PURCH. ORGANIZATION, MATERIAL, AMOUNT, CURRENCY, UNIT OF MEASURE, and VALID FROM/VALID TO dates fields as shown in Figure 7.21.

7.4 Summary

In this chapter, you learned the definition of a calculation schema, which is another term for a purchasing procedure. The calculation schema contains all of the pricing elements associated with a purchasing document such as gross price, freight, discounts, and taxes.

We explained how a calculation schema is associated with a purchasing organization schema and vendor schema. We showed how the calculation schema is used to determine prices in various purchasing documents, including quotations, contracts, schedule agreements, PIRs, POs, and stock transport orders. We also explained how the market prices are determined using calculation schema.

In the next chapter, we'll explore condition techniques in MM documents.

Condition techniques are not only used in Sales and Distribution but also in Materials Management pricing calculations for purchase orders, contracts, and quotations.

8 Pricing Condition Techniques in Materials Management Documents

In the previous chapter, we explored how pricing procedures are set up in Materials Management (MM). In this chapter, you'll learn how the net price is calculated by using the various pricing elements (called condition types) such as gross price, discounts, surcharges, and taxes.

In this chapter, you'll develop a deeper understanding of the workings of pricing conditions in the MM functionality. To understand how pricing conditions work, we first need to understand the condition technique. The condition technique in MM works the same way as in the Sales and Distribution (SD) functionality.

For example, a vendor's price for a material is often made up of different components. You vendor may offer to sell you a material at a certain price, but additional factors may affect what you pay. Prices, discounts and surcharges, freight costs, and the like are represented in the system as pricing conditions. The system applies these conditions to arrive at the net and effective purchase prices in purchase orders (POs). Let's review the configurations details with conditions and price determination.

8.1 Configuration Steps for Pricing in Materials Management

The term *pricing* is used broadly to describe the calculation of prices and costs. *Conditions* represent a set of circumstances that apply when price is calculated. The *condition techniques* refer to the method the system uses to determine prices from information stored in condition records. In the Purchasing subcomponent, the various elements used in the condition technique are set up and controlled in the

customization. During PO processing, the system uses the condition technique to determine a variety of important pricing information. For example, the system automatically determines which gross should apply and which discounts and surcharges are relevant given the conditions that apply. The condition technique works by configuring the following key elements in the sequence described:

- ▶ Condition types
- ▶ Access sequences
- ▶ Condition tables
- ▶ Calculation schema

When each of the key elements are set up, pricing configuration is complete. In the following sections, you'll not only learn how to set up pricing step by step but also how each of these key elements are controlled. These elements help you build a pricing procedure.

Now let's explore each of these key elements in the following sections.

8.2 Pricing Condition Types in Materials Management

A condition type is a representation in the system of some aspect of your daily pricing activities. You can define different condition types for each kind of price, discount, or surcharge that occurs in your business transactions. The first step in defining pricing in MM is configuring condition types. A condition type in MM can represent gross price, discounts, surcharges, costs, taxes, and so on. A condition type has several controls associated with it. For example, a condition type can be a discount or gross price depending on the condition class set for the condition type. As shown in Figure 8.1, if the COND. CLASS is "B", then the condition type represents price. These controls are extremely important because each one influences how the condition type functions (i.e., if it's a discount or tax condition type, header or item condition type, etc.).

You can access the condition type configuration screen by following the menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE CONDITION TYPES. In prior releases of SAP, with SAP ERP R/3, you can use Transaction TM/06 to access this configuration setting. Figure 8.1 shows condition type PB00. (We have split the screen into two parts for easier explanation. You'll see the rest of the screen in Figure 8.4 in a few pages.)

Change View "Conditions: Condition Types": Details			
<input type="button" value="New Entries"/> <input type="button" value="Print"/> <input type="button" value="Home"/> <input type="button" value="Back"/> <input type="button" value="Forward"/> <input type="button" value="Refresh"/>			
Condit. type	PB00	Gross Price	Access seq. 0002 Gross Price
			Records for access
Control data 1			
Cond. class	B	Prices	Plus/minus <input type="checkbox"/> positive a
Calculat.type	C	Quantity	
Cond.category	H	Basic price	
Rounding rule	<input type="checkbox"/>	Commercial	
StrucCond.	<input type="checkbox"/>		
Group condition			
<input type="checkbox"/> Group cond.	GrpCond.routine <input type="checkbox"/>		
<input type="checkbox"/> RoundDiffComp			
Changes which can be made			
Manual entries	<input type="checkbox"/> No limitations		
<input type="checkbox"/> Header condit.	<input checked="" type="checkbox"/> Amount/percent	<input checked="" type="checkbox"/> Qty relation	
<input checked="" type="checkbox"/> Item condition	<input type="checkbox"/> Value	<input type="checkbox"/> Calculat.type	<input type="checkbox"/> Delete

Figure 8.1 Pricing Condition Data

8.2.1 Control Data 1

We'll now go over some of the key fields for the pricing condition type in the following subsections by using Figure 8.1 as an example. These fields are used to control the pricing condition.

Condition types are differentiated broadly using the condition class and more finely using the condition category. The condition category also has various control functions. For example, condition category U (let's say for special material discounts and surcharges) causes a new price determination process to be carried out at the time of goods receipt, and condition category E (for cash discount) causes the discount to be derived from the terms of payment.

Condition Class

The COND. CLASS field determines how the pricing condition is categorized. The most commonly used classes are listed here:

► B for Prices

For example, when a condition has to be created as a gross price, then this condition class is used.

▶ **A for Discounts**

In the variant configuration application for quantity discounts or weight discounts, this condition class is used.

▶ **D for Taxes**

Tax condition types such as NAVS or NAVM use condition class D. New condition classes cannot be created in SAP ERP because classes are hardcoded in the SAP ERP system.

Calculation Type

The `CALCULAT.TYPE` field determines how the condition type needs to be calculated. The calculation happens dynamically when a purchasing document such as a PO is created. For example, in the PO, if the calculation type is "C", the condition type is calculated based on the line item quantity. Alternatively, if the condition type has calculation type "B", the condition type on the PO is calculated as a fixed dollar amount. The commonly used calculation types are listed here:

- ▶ **B:** For fixed amounts
- ▶ **A:** As a percentage
- ▶ **C:** As a quantity

Calculation type "G" is used when you need to define your own formula or procedure. When "G" is assigned to a condition type in the pricing procedures that contain the effected condition type, usually a condition basis formula and a condition value formula must be assigned to this calculation type. But if the condition basis is of no importance, or if both the condition basis and the condition value are determined within one condition value formula, you don't need to use a condition basis formula.

The calculation type (or rule) determines how the system calculates prices, discounts, or surcharges for a condition. For example, the system can calculate a price as a fixed amount or as a percentage based on quantity, volume, or weight. A discount or surcharge can be a percentage of the gross price, a fixed amount, or a quantity-dependent amount.

The formulas defined for MM work the same way as in SD. In other words, the formulas are defined using Transaction VOFM. Chapter 3 covered the formulas and requirements.

Note

Condition categories allow you to classify conditions and categorize them together.

Rounding Rule

The ROUNDING RULE setting helps round up the condition value, round down the condition value, or determine a value according to your business standards. If you set the ROUNDING RULE as ROUND UP, the pricing value for the condition type is rounded up. For example, if the condition type value is \$10.459, you can determine that it's rounded up value needs to be \$10.46, if the setting is ROUNDED UP. If the ROUNDING RULE is set as COMMERCIAL, the value is rounded off. For example, if the value is \$10.454, then the value is rounded off to \$10.45.

Plus/Minus Value

The plus/minus sign determines whether a condition is treated as a negative or positive amount. Negative amounts are discounts (deductions); positive amounts are surcharges (additions). The PLUS/MINUS value setting displays the pricing conditions on the purchasing documents with a negative or positive sign, depending on whether a "+" or "-" sign is chosen. You have two options to pick from in this screen element: positive or negative. A blank value represents a positive. The condition value will have a prefix of "+" for positive values and "-" for negative values. For example, if the purchase order has freight value of \$5, the condition will be shown as +5 USD. If the purchase order has discount of \$5 then the condition will be shown as -5 USD.

Group Condition

A group condition relates to several items of a document. For a group condition, the values (price, order quantities, weight, or volume) of the relevant items are added, and the total is used as the condition basis. If the GROUP COND. field is checked, the pricing condition type is determined based on the cumulative value of line items.

For example, you want to apply a discount based on the cumulative value of the line items value. You have to set up condition type ZP00 with the GROUP COND.

indicator checked. Also, you must set up a master condition record for the condition type ZP00 with scales as shown in Figure 8.2.

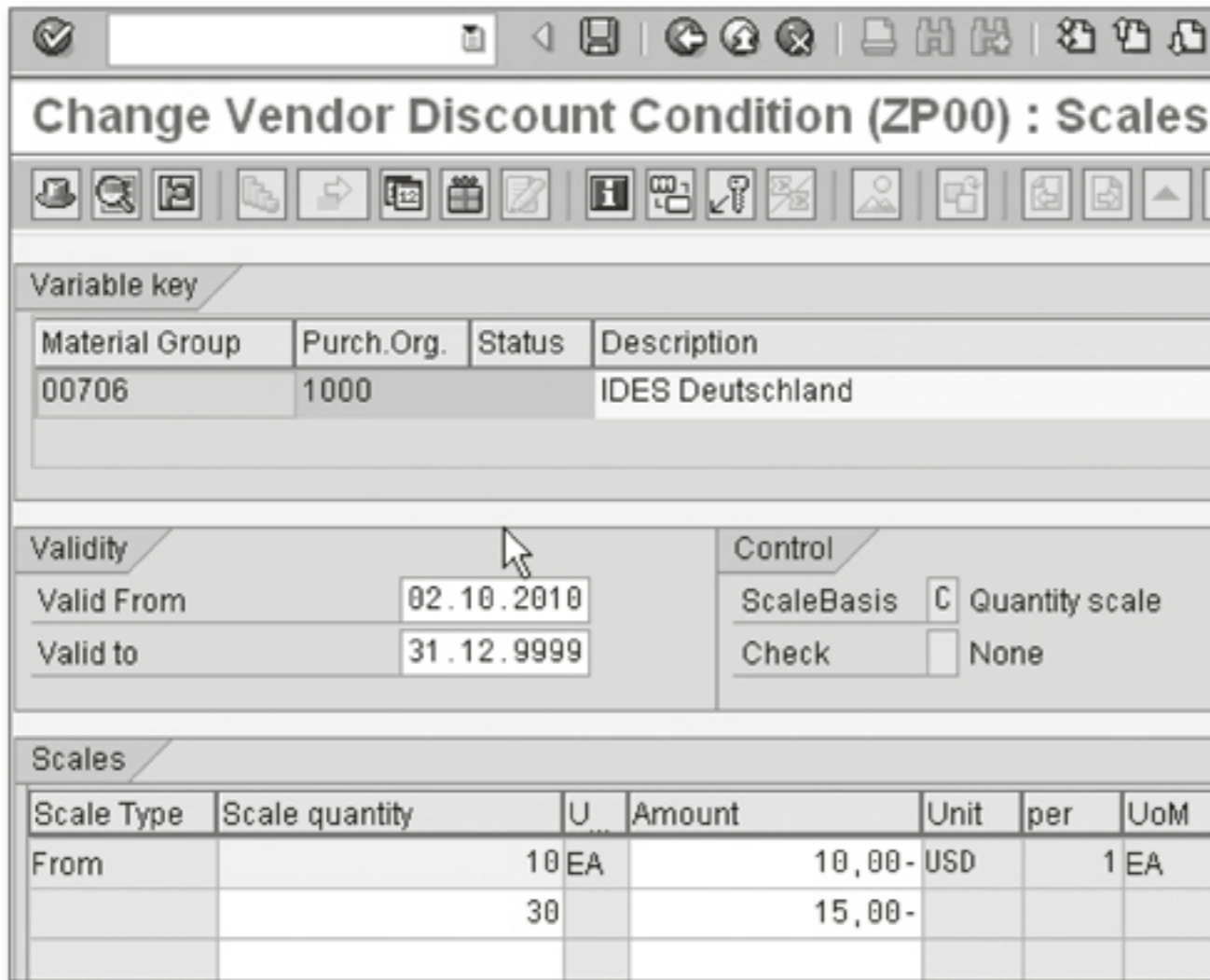


Figure 8.2 Condition Type ZP00 with Scales for 10 Units and 30 Units, Respectively

When you create PO line items for materials that have material group "0706", the condition type ZP00 is calculated for the cumulative value of the line items. (The material group is an example used in this demonstration for test purposes.)

A PO is created with two line items: Material BATMATS and BATMASX. As shown in Table 8.1, you create a PO with 2 line items that belong to material group 0706. One item has 10 pieces and the other has 25 pieces.

Material	Quantity	Material Group
BATMAS	10	0706
BATMASX	25	0706

Table 8.1 Purchase Order Containing Different Materials, Using Two Materials and Vendor Discount Group 0706

Individually, the PO line items will not have a \$15 discount. But, cumulatively, the total for the PO is 35 pieces (i.e., exceeds 30 pieces) for the material group and thus gets the group discount of \$15. Figure 8.3 illustrates this example.

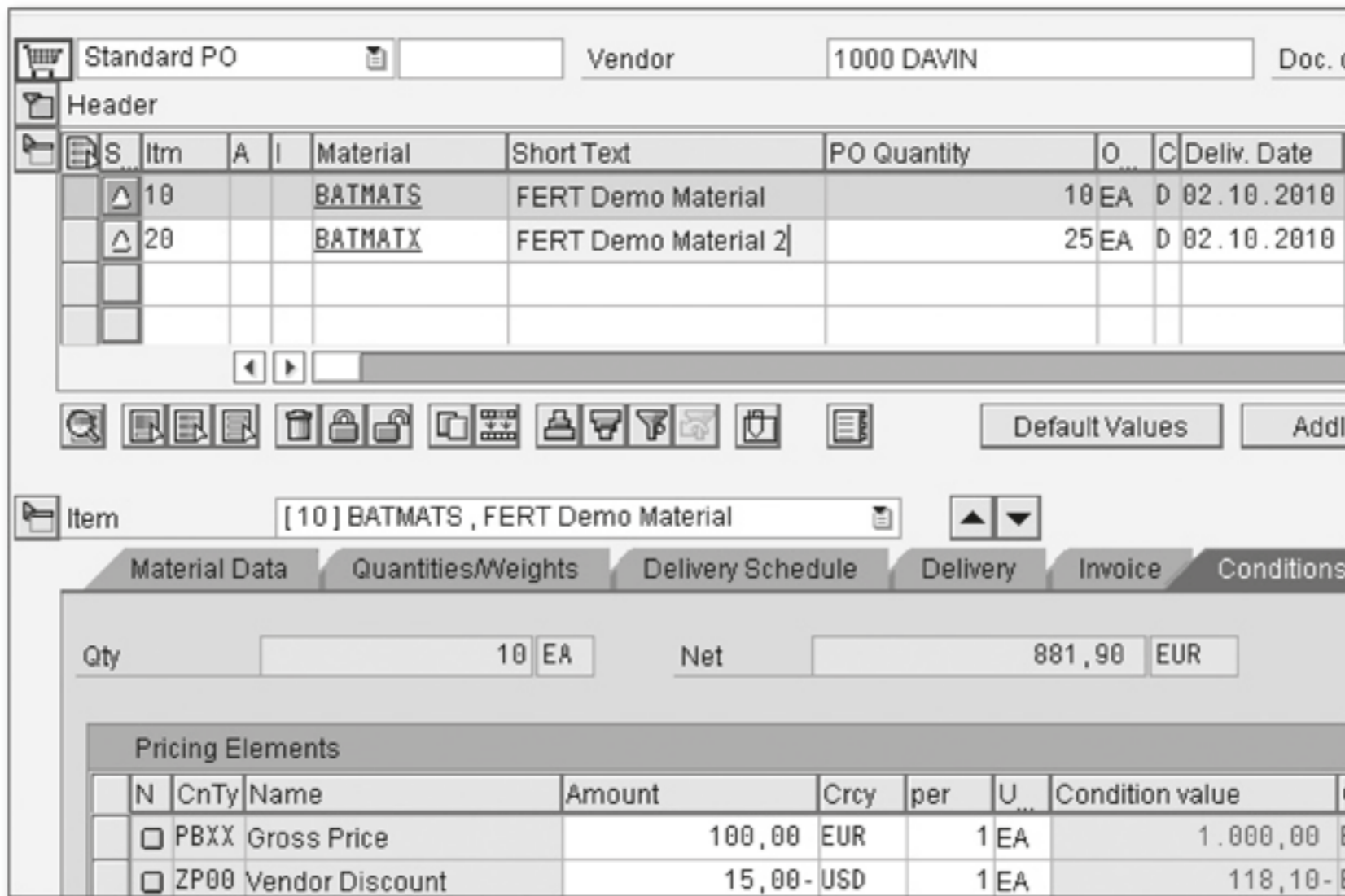


Figure 8.3 Discount Condition ZP00 Calculated for Cumulative Quantity of 30 Pieces

Figure 8.3 displays the vendor discount scale for quantity 10 through 30 with a validity date. With the individual PO item discount, we only get the 10% discount, but with cumulative, we get the group discount of 15%. Figure 8.4 shows the group discount for conditions.

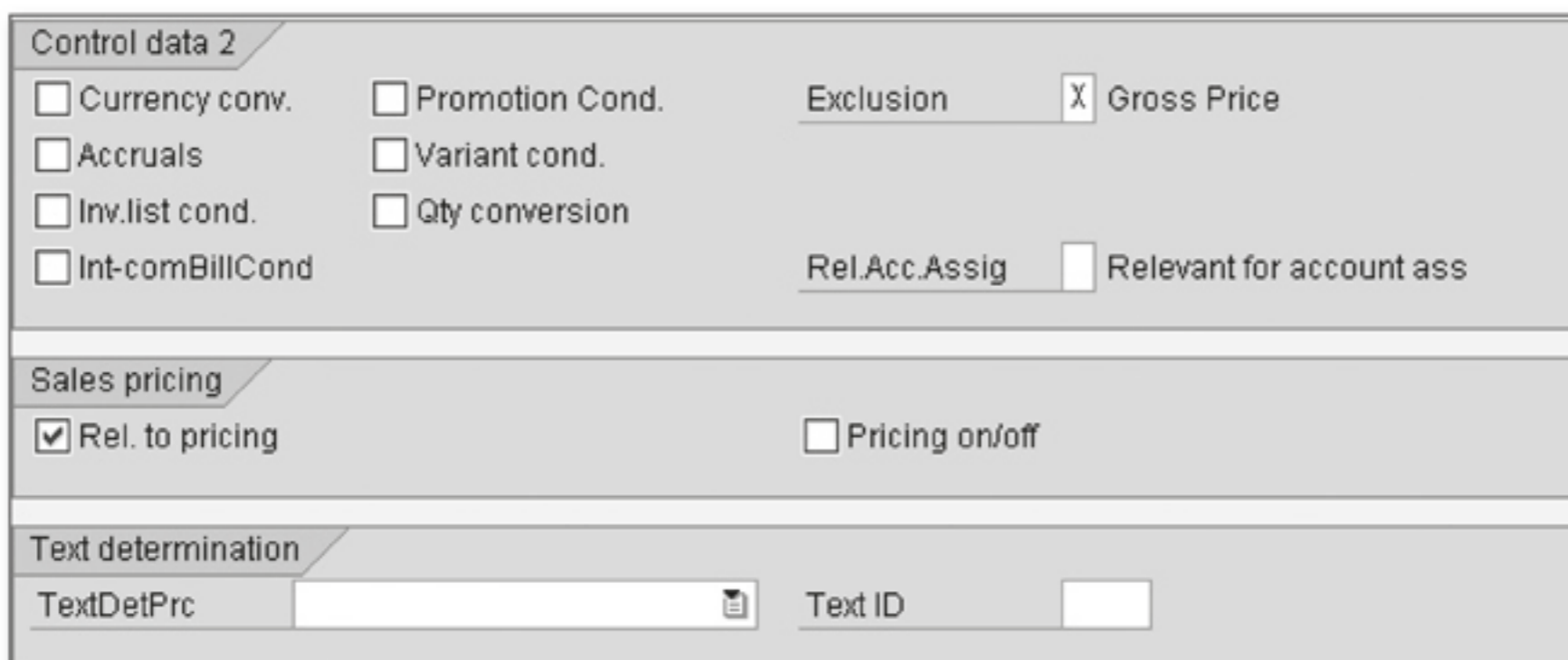


Figure 8.4 Group Discount Condition ZP00

Figure 8.4 displays the CONTROL DATA 2 section view of the group condition type ZP00. To set the condition type as a group, you enter "X" for GROSS PRICE in the

EXCLUSION field. The group condition is set up within the pricing condition types in the relevant fields specified.

Rounding Difference Comparison

Looking back at Figure 8.1, if the ROUNDDIFFCOMP indicator is set, the system compares the condition value at the header level with the total of the condition values at the item level. The difference is then added to the largest item.

Group Condition Routine

The GRPCOND.ROUTINE field is a formula that can be used to control the base for determining the scale value. For example, the group condition base can be the total weight of all of the line items, which has material group "0706". You can explicitly initiate the determination of the scale amount on the basis of the cumulative item values on the header condition screen by activating the conditions. As you know, when POs are created, a discount or surcharge belonging to a condition group is taken into account only in respect to those materials that have been assigned to the condition group by their info records. You can make use routine to utilize the weight as the parameter for group discount calculation.

8.2.2 Changes Which Can Be Made

This area titled CHANGES WHICH CAN BE MADE basically controls whether a condition can be changed on the sales order, if a valid condition record is found, if it takes priority over manual entry, or if it can only be processed automatically (i.e., cannot be changed on the sales orders). Let's quickly review the fields in this screen area:

- ▶ The HEADER CONDIT. or ITEM CONDITION checkboxes allow you to specify whether the condition type appears as a header or line item.
- ▶ The DELETE setting controls whether the condition type can be deleted from the sales document.
- ▶ The VALUE setting controls whether the value can be overwritten on the sales documents.
- ▶ The CALCULAT. TYPE checkbox controls whether you can change the calculation type within the processing of the sales document.

Now that we've covered the key configuration fields with the condition type as shown in Figure 8.1, let's continue with the review of the remaining configurations, as shown in Figure 8.5. Recall that Figure 8.1 displays the top portion of the configuration definition. Figure 8.5 shows the rest. In the following subsections, we'll discuss the MASTER DATA, SCALE, CONTROL DATA 2, SALES PRICING, and TEXT DETERMINATION screen areas.

Master data	
valid from	<input type="checkbox"/> Today's date
Valid to	<input type="checkbox"/> 31.12.9999
RefConType	<input type="checkbox"/>
RefApplicatio	<input type="checkbox"/>
PricingProc	RM0002
delete fr. DB	Do not delete (set the deleti... ▼)
	<input type="checkbox"/> Condition index
Scales	
Scale basis	<input checked="" type="checkbox"/> Quantity scale
Check value	<input type="checkbox"/> None
Scale type	<input type="checkbox"/> can be maintained in con
Scale formula	<input type="checkbox"/>
Unit of meas.	<input type="checkbox"/>
Control data 2	
<input type="checkbox"/> Currency conv.	<input type="checkbox"/> Promotion Cond.
<input type="checkbox"/> Accruals	<input type="checkbox"/> Variant cond.
<input type="checkbox"/> Inv.list cond.	<input type="checkbox"/> Qty conversion
<input type="checkbox"/> Int-comBillCond	
Exclusion	<input checked="" type="checkbox"/> Gross Price
Rel.Acc.Assig	<input type="checkbox"/> Relevant for account ass
Sales pricing	
<input checked="" type="checkbox"/> Rel. to pricing	<input type="checkbox"/> Pricing on/off
Text determination	
TextDetPrc	<input type="text"/>
Text ID	<input type="text"/>

Figure 8.5 Condition Type Configuration (Master Data, Scales, Control Data, Sales Pricing and Text Determination Procedure)

8.2.3 Master Data

In MASTER DATA tab the REFERENCE CONDITION TYPE, REFERENCE APPLICATION, PRICING PROCEDURE, VALID FROM, and VALID TO dates are configured together as a unit.

A pricing condition type can sometimes reference another pricing condition type. The reference condition type is particularly useful when the condition records for the reference condition type have to be created only once and the referencing

condition type can use it. The referencing condition type can have a different calculation type, description, or access sequence. The pricing condition that has a reference condition can have its own access sequence. Although they share the same condition tables, they don't need to be in the same sequence.

A pricing condition type can sometimes reference another pricing condition type. The reference condition type is particularly useful when the condition records for the reference condition type have to be created only once and the referencing condition type can be referenced. The referencing condition type can have a different calculation type, description, or access sequence. The pricing condition that has a reference condition can have its own access sequence, but they share the same condition tables though they do not need to be in the same sequence.

While configuring this condition type, you need to input the reference condition type, the reference pricing procedure, and reference application. Let's go over a real-life scenario and the steps to configure a reference condition type. The application of the reference condition will impact your condition maintenance.

Example

Let's say a large-scale retail company named Super Retailer Inc. is in the business of selling a variety of retail products, including toys, consumer electronics, video games, and so on. Super Retailer sells its products through hundreds of its stores located all over United States. The stores replenish their inventory from the distribution centers where the suppliers deliver the products.

Consumers buy the retail products through any of these stores, but the stores have to transfer the retail products from the distribution center to the store. There is a price associated with the issue of products from the distribution center to the store. This transfer price of the issuing site becomes the delivered price of the store.

To configure this scenario, a reference condition type can be configured using the following steps:

1. Set up pricing condition type VKP0, which represents the warehouse transfer price of the issuing distribution center.
2. Assign the condition type to pricing procedure VKP000, which represents the procedure for calculating the warehouse transfer price.
3. Set up pricing condition type P100, which represents the purchasing price of the receiving store. In the *MASTER DATA* section of the condition type, input the

REFERENCE CONDITION TYPE as "VKP0", APPLICATION TYPE as "V", and REFERENCE PRICING PROCEDURE as "VKP000".

There are also other configurations that impact the condition record maintenance. Let's review them next.

Delete from Database

During the transaction processing, the DELETE FROM DATABASE option allows you to delete the pricing condition and set up the system reaction to it. This indicator is shown in Figure 8.5 in the MASTER DATA tab. The following list shows your selection options with Release 4.6A and prior:

▶ **[] (blank):**

You can set the indicator so that the condition record is no longer used in pricing. The condition record is then archived in the archiving run. This is how this functionality worked prior to Release 4.6A.

▶ **A:**

You can delete the condition records from the database. You'll receive a pop-up message asking whether the condition record should actually be deleted or whether the deletion indicator should simply be set. If you select the record to be deleted, it is deleted from the database; if you select the option to set for deletion, the record can be deleted from the database through a deletion program later.

▶ **B:**

You delete the condition records from the database. You only receive a pop-up message if there are condition supplements maintained in the system.

With the SAP ECC release, the options include the following:

▶ **DO NOT DELETE**

Restricts the record from being deleting from the database.

▶ **WITH POPUP**

Prompts you with a pop-up before deleting, as a confirmation.

▶ **WITHOUT POPUP**

Deletes without asking for confirmation.

After you decide to maintain the condition record, you must perform some house-keeping. The condition index can help improve the performance.

Condition Index

The `CONDITION INDEX` in the `MASTER DATA` tab is an indicator to determine if you want the condition index to be updated or not. Indexes are specified for faster searches. For example, if all of the condition records need to be accessed for a condition type regardless of materials, then you should use this setting.

As part of the condition value, we've seen the maintenance of scales, so let's review that in the next section.

8.2.4 Scales

The scale basis or reference magnitude for scales depends on the condition type. A scale can be based on quantity or dollar value, for example. As you know, condition records are stored in tables: `KONP` (time-dependent conditions), `KONH` (header conditions), `KONM` (quantity scales), and `KONW` (values scales). When you create a condition record for a condition, you can define the pricing scale. For example, a scale based on quantity can determine that the more you purchase from a vendor of a particular material, the lower the price. You can also create a condition record with graduated scales.

In this `SCALES` tab, as shown in Figure 8.5, you can define the configuration settings relevant to the scale basis, scale formula, unit of measure, check value, and scale type for condition types.

Scales Basis

The scale type and scale basis for a scale are defined in customizing for the condition type. There are `FROM` scales (scale type A) and `To` scales (scale type B). If no scale type has been assigned to a condition type in customizing, you can specify whether the scale is to be maintained as a `FROM` or `To` scale before entering lines of the scale. For example, the scale can relate to a money value (scale basis B), a quantity (scale basis C), or a weight (scale basis D or E). This indicator, shown in Figure 8.5 in the `SCALES` tab, can control the basis for scales. The basis can be quantity, value, weights, and so on.

Check Value

The CHECK VALUE field controls how the scale can be maintained, in either ascending or descending order.

Scale Type

The SCALE TYPE indicator controls the validity of the scale. You can set the scale to be from a certain quantity, up to a certain quantity, or in intervals (up to quantity 25 for one condition value, 25 units for another, through 50 units for another, etc.). The possible values for the scale type are listed here:

- ▶ [] (**blank**): Can be maintained in condition record.
- ▶ **A**: Base scale.
- ▶ **B**: To scale.
- ▶ **C**: Not used.
- ▶ **D: Graduated scale**: Allows you to price an item for each level of a pricing scale. By comparison, when you use normal scales, the system determines one price depending, for example, on the item quantity; the same price then applies to each unit of the item. With graduated scales, the result is that multiple prices can appear in the pricing screen for an individual item.

An example of a graduated scale is defined here:

- ▶ 1 through 10 units, price = \$15
- ▶ 11 through 20 units, price = \$12.5
- ▶ 21 through 30 units, price = \$12

If a purchase sales order is placed with a supplier for 26 pieces, the first 10 units are valued at \$15/piece, the next 10 units are at \$12.5/piece, and the last 6 units are at \$12/piece.

On the other hand, if for the same example, we use "B", then the scale is defined as follows:

- ▶ Up to 10 units = \$15
- ▶ Up to 20 units = \$12.5
- ▶ Up to 30 units = \$12

The 26 units are at a discount of \$12.

If the scale type is A, then the entire 26 units are valued at \$12. The scales are defined as follows:

- ▶ From 1 unit = \$15
- ▶ From 11 units = \$12.5
- ▶ From 21 units = \$12

Scale Formula

The SCALE FORMULA setting, as shown in Figure 8.5 in the SCALES tab, can be used for alternate determinations of scale basis value, if the standard scale bases provided by SAP ERP are not sufficient. To configure this setting, a scale formula routine needs to be set up.

To set up the scale formula, use Transaction VOFM, and go to FORMULA • SCALE BASIS.

Unit of Measure (UOM)

Unit of Measure (UOM) is used for group conditions. The system proposes the unit of measure when you maintain records for group conditions that are either weight dependent or volume dependent. This proposed value cannot be overwritten.

Now that we understand how some of the control parameters for condition types that can be set up, let's move on to the next section in the configuration of the condition type.

8.2.5 Control Data 2

The CONTROL DATA 2 section (refer to Figure 8.4) has configuration settings that let you configure the currency conversion, gross price, variant, and quantity conversion on your pricing document. We'll go over the key elements individually in the following subsections.

Currency Conversion

The CURRENCY CONV. option controls when the currency conversion takes place, for example, before the multiplication of the quantity or after the multiplication

of the quantity on the total. Selecting this indicator results in the conversion after the multiplication of quantity.

Example

Hi-Tech Electronics is in the business of assembling computers. The assembly of these computers is in United States and the components for the assembly are purchased in Taiwan. The POs for the import of these components are placed in Taiwan dollars and the system calculates the pricing in USD for the freight condition type. This condition type has the CURRENCY CONV. indicator marked so that the freight is calculated after the quantity is multiplied, and then the currency is converted to avoid rounding off issues.

Accruals

The ACCRUALS indicator controls the accruals amount. For example, the rebate pricing conditions are accrued over a period of time prior to settlement. If this indicator is selected, then the accrual appears as statistical on the sales document, the statistical conditions are set in the calculation scheme. This indicator ensures that the condition is not taken into account in the calculation of the net price.

Variant Condition

When the VARIANT COND. indicator is selected, pricing conditions are set up for variants of materials. This is used when variant configuration is activated, which is discussed in more detail in Chapter 10.

When purchasing complex products such as computers, which come in multiple options, variant configuration is used to represent the product.

You can use this condition, for example, in the high-tech industry so that when the assembly manufacturers buy from the component manufacturers, surcharges can be added for different CPUs. When an 18 GHz CPU processor is purchased, a surcharge of \$10 is added.

Follow these steps to configure this variant in the system:

1. Set up variant condition VA00, where the VARIANT COND. indicator has to be checked in configuration.
2. Define a configuration profile for the desktop T-AQ300. Defining a configuration profile is explained in detail in Chapter 10.

- Define a dependency procedure that makes a call to the variant, as shown in Figure 8.6.

Change Variants/Quantity Condition (VA00) : Overview			
Vendor	1000	DAVIN	
Purch. Organization	1000	IDES Deutschland	
Plant	1000	Werk Hamburg	
Info record category	0	Standard	
Valid On	03.10.2010		
Plant Info Record: Variants			
Material	Variant	Description	Amount
T-AQ300	VARIANT_CPU_PUR		10,00
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Figure 8.6 Defining a Dependency to Call the Variant

- Set up a variant condition value using a purchasing info record (PIR). The PIR is the master data that is maintained for the variant condition VA00. Set a value of \$10 for the Desktop (T-AQ300) and the CPU 18GHz (VARIANT_CPU_PUR) combination.

This screen displays a PO with the MATERIAL T-A0300 for which the procedure is determined. In the example PO created with material T-A0300, the variant condition VA00 is triggered. The condition type VA00 is determined within the pricing element in the purchase document.

Intercompany Condition

The INT-COMBILLCOND indicator identifies that the condition type is an intercompany condition type and activated on intercompany sales orders, for example, IV01, IV02. They are defined as statistical conditions on the regular orders.

Exclusion Indicator

The EXCLUSION indicator is used when a condition record needs to be excluded. For example, when some customers are already receiving favorable prices, then the discount should be excluded. To achieve this pricing condition for the favorable customer, the document is set with an EXCLUSION indicator.

When this indicator is set, all of the discounts are ignored for the customer. Value "A" can be set in the condition type as a configuration parameter for this purpose, or it can be set for a specific customer. Condition exclusion procedure "C" can be used when you want to use the most favorable sum of condition values with multiple discounts maintained in the system. Condition exclusion procedure "D" can be used with either or can be used between most favorable condition value or most favorable sum of condition values.

Relevancy for Account Assignment

The REL.ACC.ASSIG indicator controls how the account assignment is performed. If it's a blank condition type, it's relevant for account assignment. If "B-" is chosen, then the accounting indicator is taken into account for the account assignment.

The information from the condition record is forwarded to Controlling (CO) with the classification "accounting indicator." The system links the condition record to the underlying billing document item to find the accounting indicator that has been assigned to a particular transaction.

Now that you understand the control parameters in the CONTROL DATA 2 section, let's move to the next section, SALES PRICING.

8.2.6 Sales Pricing

Sales pricing settings are relevant only for retail companies. The SALES PRICING section allows you to manage the sales price calculation. Sales price calculation in retail companies is carried out as a two-step process:

1. Determine the purchase price.
2. Determine the sales price.

Relevancy to Sales Pricing

Setting the REL. TO PRICING indicator ensures that this condition type is taken into account during purchase price determination in the sales price calculation function. The indicator can be maintained when you define condition types and is set as a default value when condition records are generated. This default can be changed when the pricing relevance can be changed. In Figure 8.4, the REL. TO PRICING indicator is set.

In scales, the indicator is used to select the scale line used for price determination in sales price calculation.

Pricing On/Off

If you check the PRICING ON/OFF indicator when you create or change a condition record, the default indicator relevant to pricing can be changed. If this indicator is set, you can define whether each individual condition record is to be taken into account in the sales price calculation function.

The next section, TEXT DETERMINATION, is the last set up in the configuration.

8.2.7 Text Determination Procedure

The text determination procedure is the same for SD and MM. This procedure identifies the sequence in which the text types appear. Each text procedure can be associated with multiple text IDs. This is done in customizing in text determination. These texts will appear on the condition records.

For example, if the condition type RA00 has the TEXTDETPRC value of "Discount/Surcharges" and the TEXT ID as 0002, the condition type will be printed on the PO with the comment as "Permits" because the TEXT ID 0002 description is Permits.

The text procedure and determination are maintained in the text determination procedures, which you can find by following menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • TEXT CONTROL. From there, you can select the following: DEFINE TEXT TYPES, DEFINE ACCESS SEQUENCES FOR DETERMINING TEXTS, and DEFINE AND ASSIGN TEXT PROCEDURES. Alternatively, the Transaction is VOTXN.

In the following subsections, we'll describe the different fields that appear on these various configuration nodes mentioned above and how you can use them to help configure the text determination procedure for MM condition types.

Text Types

First, you need to configure the text types. While you are in the preceding configuration step, click the folder TEXT ID'S IN TEXTPROCEDURE, as shown in Figure 8.8. In this step, you select the text types that can be associated with pricing texts. The

text type is a four-digit ID that is used to identify the text types, as listed in Figure 8.8. Any number of text IDs can be defined for pricing conditions.

The TEXT OBJECT for pricing conditions is "KONP" as shown in Figure 8.7.

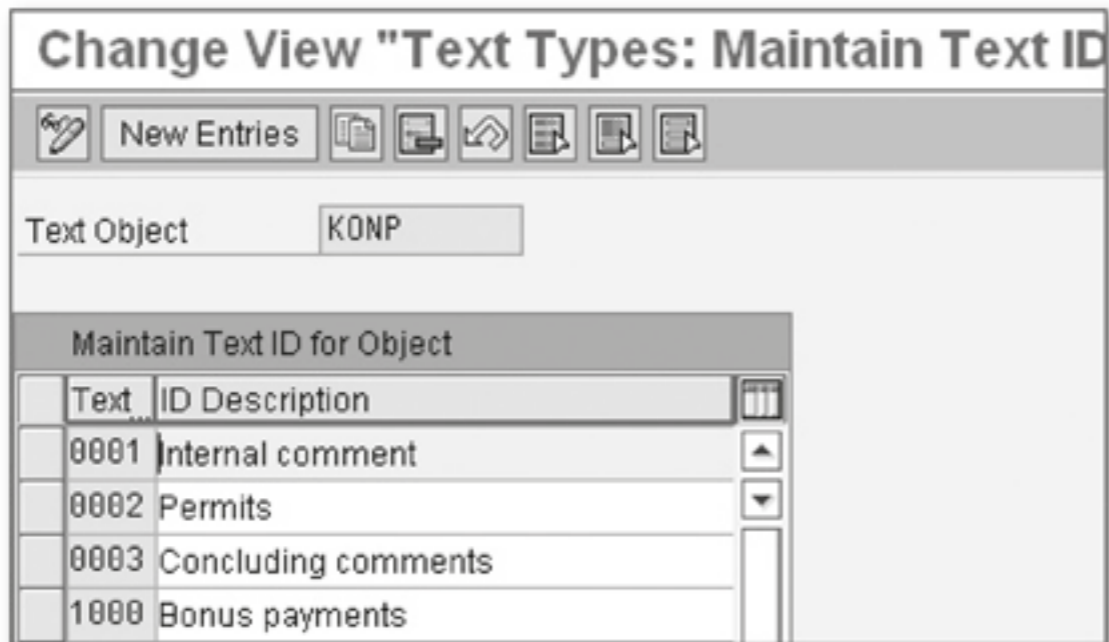


Figure 8.7 Maintain Text Ids and Descriptions for Text IDs

Text Procedures

After you've defined the text types, you must next configure the text procedures. The various pricing conditions types—prices, discounts, freights, and so on—are grouped together as text procedures so that each of these groups can define its own text types. Pricing conditions now have their own TEXT PROCEDURE "01" as shown in Figure 8.8.

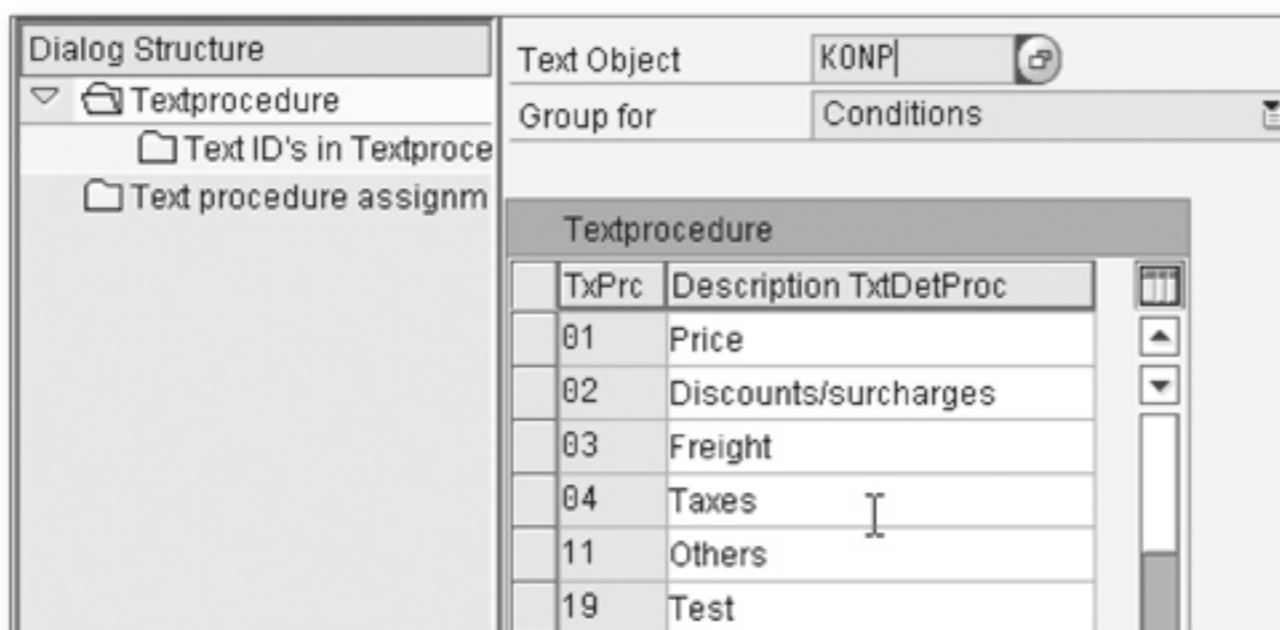


Figure 8.8 Text Procedures for Pricing Conditions

Next, let's review the text determination procedure.

Next, assign the text procedures to the text type in the sequence in which these text types are called. For example, if pricing text procedure has three text types, assign these three text types as sequence number 10, 20, and 30 as shown in Figure 8.9.

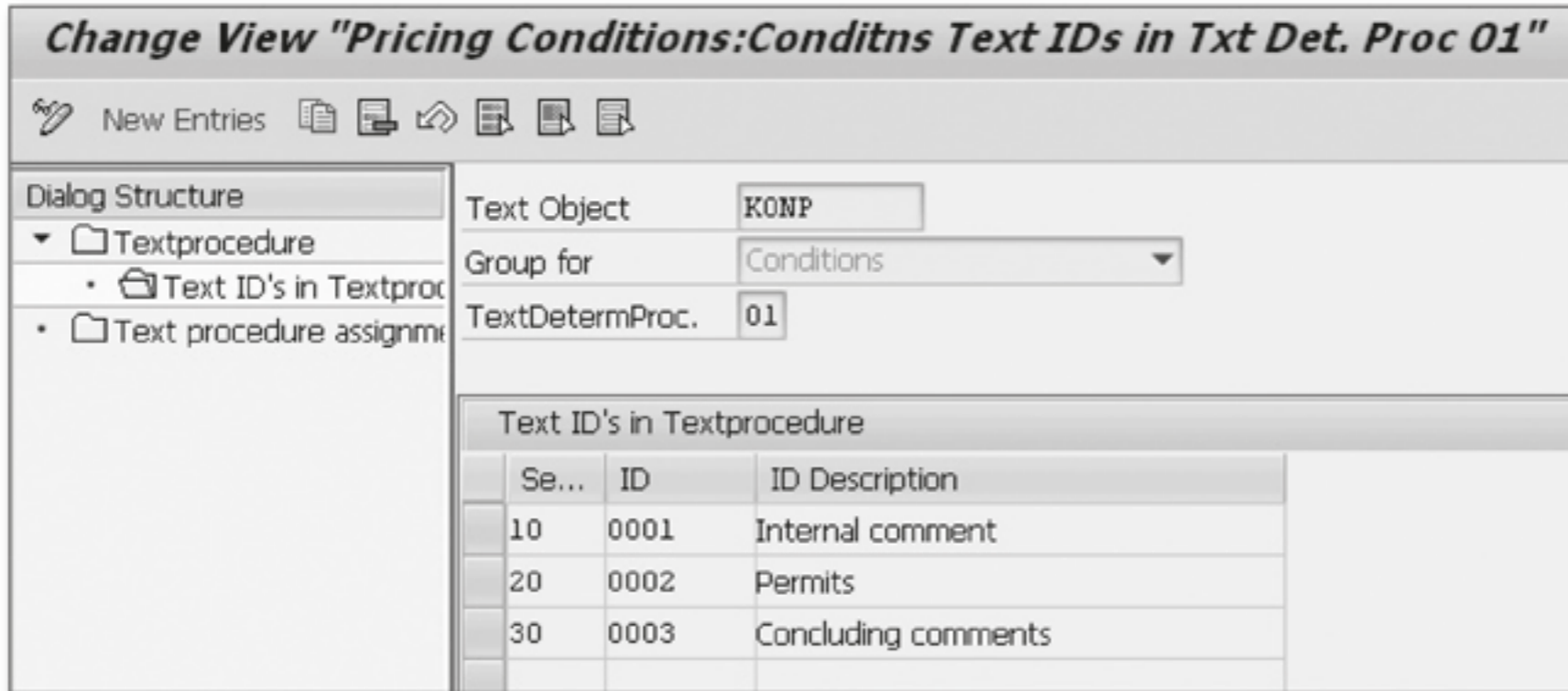


Figure 8.9 Assigning Sequence IDs to Text Determination Procedure

Assign Text Procedure to Condition Type

After you've defined the text type, sequence, and text procedure, you need to assign the text procedure to the desired condition type. You do this by selecting the TEXT PROCEDURE ASSIGNMENT in the left dialog structure as shown in Figure 8.10.

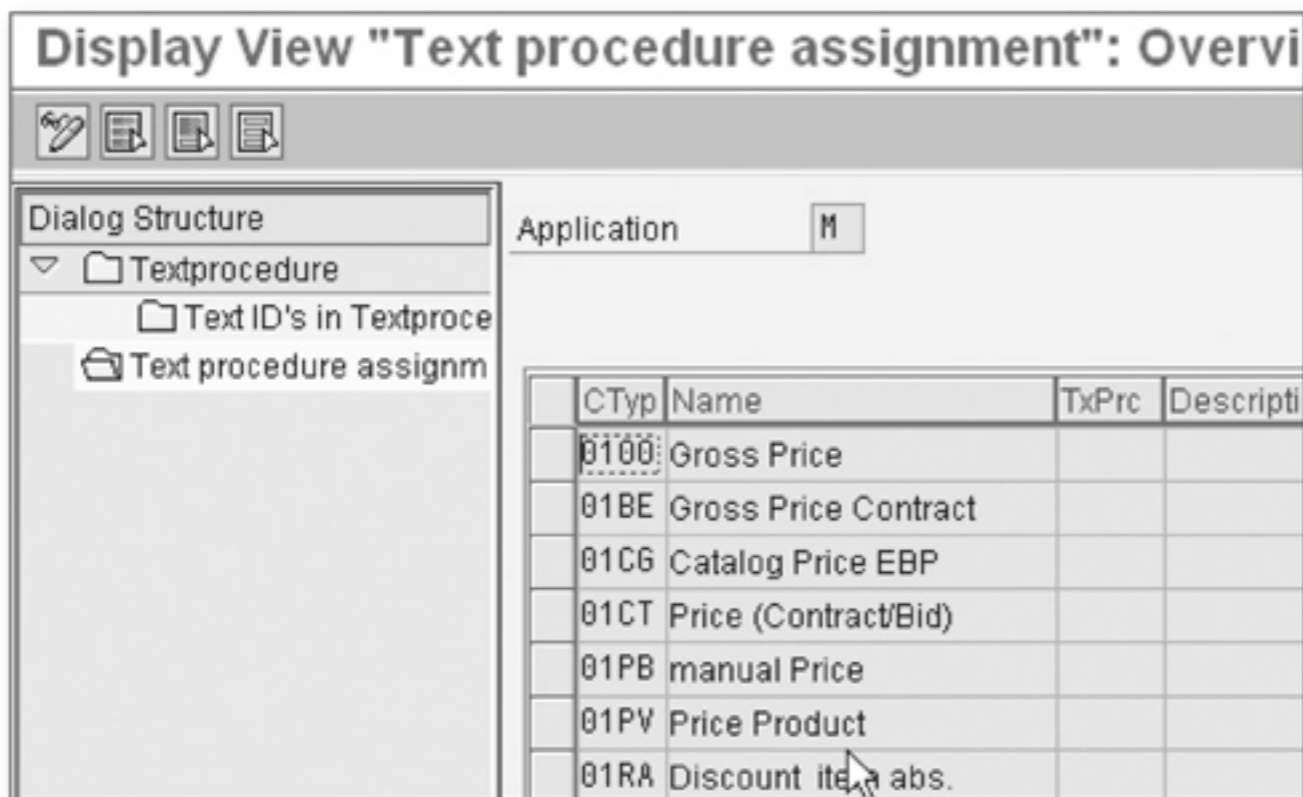


Figure 8.10 Configuring Text Procedures

This concludes the configuration of text types. This configuration enables you to print the correct text for the various pricing condition types.

We have just walked through a detailed configuration setup for the condition type, which is a very important aspect of pricing. The next step is to configure access sequences.

8.3 Access Sequences in Materials Management

A pricing condition can be defined for a customer, a customer and material, a material/material group and customer, and so on. Various combinations of materials, customer groups, and material pricing groups are possible. An access sequence is the way a condition type accesses the various possible combinations.

Access sequences are the crucial link between pricing condition types and pricing tables and fields. In other words, access sequences provide the pricing conditions the mechanism to define a pricing condition for a vendor or vendor/material combination or vendor/material/plant combination, and so on.

The menu path for defining access sequences is SPRO • LOGISTICS • MATERIALS MANAGEMENT • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE ACCESS SEQUENCES.

SAP ERP offers several standard pricing access sequences that are used with the existing pricing condition types. If the standard pricing conditions provided by SAP ERP are not sufficient for your business use, then you can define custom access sequences, just like you can define custom condition types.

The access sequence identifies the sequence in which the various combinations of fields can be accessed. For example, Figure 8.11 (in the next subsection) shows the access sequence PB00, which is associated with condition type 002.

8.3.1 Condition Type

The No. column in Figure 8.11 represents the sequence in which the various combinations of fields are accessed. The pricing condition first looks for number "5" or "EMPTIES". This is the first access. The No. column is manually configured by entering a "5" or leaving it blank.

Change View "Accesses": Overview

New Entries [Icons]

Dialog Structure

- Access Sequences
 - Accesses
 - Fields

Access sequence: 0002 Gross Price

Overview Accesses

No.	Tab	Description	Requiremnt	Exclusive
5	118	"empties" Prices (Material-Dependent)	43	<input checked="" type="checkbox"/>
10	68	Outline Agreement Item: Plant-Dependent		<input checked="" type="checkbox"/>
13	16	Contract Item		<input checked="" type="checkbox"/>
15	16	Contract Item		<input checked="" type="checkbox"/>
20	67	Plant Info Record per Order Unit	36	<input checked="" type="checkbox"/>
25	17	Material Info Record (Plant-Specific)	35	<input checked="" type="checkbox"/>
30	66	Info record per order unit	34	<input checked="" type="checkbox"/>
35	18	Material Info Record		<input checked="" type="checkbox"/>
40	25	Info Record for Non-Stock Item (Plant-Specific)	38	<input checked="" type="checkbox"/>
45	28	Info Record for Non-Stock Item	11	<input checked="" type="checkbox"/>
60	67	Plant Info Record per Order Unit	37	<input checked="" type="checkbox"/>
65	17	Material Info Record (Plant-Specific)	37	<input checked="" type="checkbox"/>
70	66	Info record per order unit	37	<input checked="" type="checkbox"/>
75	18	Material Info Record	37	<input checked="" type="checkbox"/>

Figure 8.11 Assesses Sequence Associated with the Condition Types

If the pricing condition cannot find a record, it goes to the next number "10", which is OUTLINE AGREEMENT ITEM: PLANT DEPENDENT. In this way, the pricing condition seeks a condition record by the sequence.

The TABLE column represents the combination of fields. For example, table 118 represents material. The standard tables for MM pricing can be found in the maintain condition table under SPRO • LOGISTICS • MATERIALS MANAGEMENT • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE ACCESS SEQUENCES.

The REQUIREMNT column represents a condition that needs to be fulfilled to access the condition table. To configure this step, use Transaction VOFM. In Transaction VOFM, go to REQUIREMENTS • PRICING. The requirements can be configured here. For example, requirement 043 ensures that a particular table is accessed only if the CARRY OUT PRICING indicator equals A. So the coding for requirement 043 is as shown here:

```
form kobed_043.
  sy-subrc = 4.
  if komp-kposn ne 0.
    check: komp-prsfd = 'A'.
  endif.
```

```

    sy-subrc = 0.
endform.
* Prestep
form kobev_043.
    sy-subrc = 0.
endform

```

The purpose of this coding is to ensure that the pricing table is accessed only if the CARRY OUT PRICING indicator (KOMP-PRSF) = A; that is, access the pricing tables only if it's pricing relevant. Let's review the access sequence and requirements that can be applied to the pricing procedure.

8.3.2 Access Sequence and Requirements

An access sequence is a search strategy that the system uses to find valid data for a particular condition type. It determines the sequence in which the system searches for data. The access sequence consists of one or more accesses. The sequence of the accesses establishes which condition records have priority over others. The accesses tell the system where to look first, second, and so on, until it finds a valid condition record.

Figure 8.10, shown earlier, displays the sequence number and the access (also known as the table associated with the condition records for access). The preceding configuration provides the requirement column, which is ABAP code as displayed in Figure 8.12.

```

ABAP Editor: Display Include LV61A043
Include LV61A043 Active
1  * Item pricing for empties
2  form kobed_043.
3      sy-subrc = 4.
4  if komp-kposn ne 0.
5      check: komp-prsfd = 'A'.
6  endif.
7      sy-subrc = 0.
8  endform.
9  * Prestep
10 form kobev_043.
11     sy-subrc = 0.
12 endform.

```

Figure 8.12 Requirement 43 ABAP code

Requirement 43 is associated with the include LV61A043, as displayed in Figure 8.12. When you double-click on the requirement fields in Figure 8.11, the screen shown in Figure 8.12 appears.

Every requirement has a routine associated with it, in other words, ABAP code that performs validation on it when the particular condition type is invoked. Figure 8.12 displays the ABAP code associated with the requirement, and Figure 8.13 displays the fields associated with the access sequence.

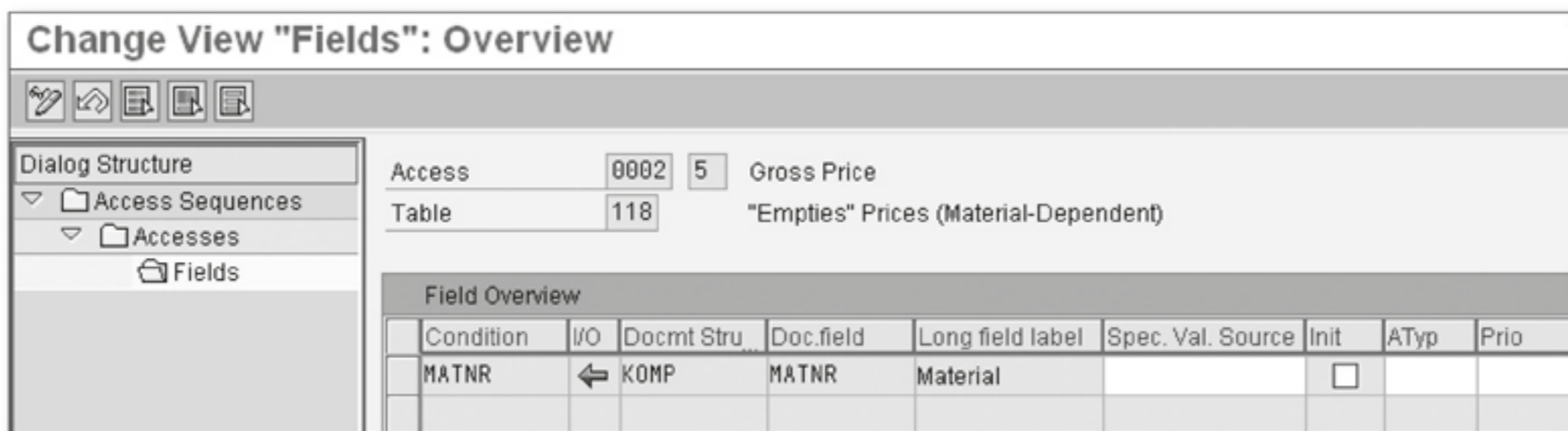


Figure 8.13 Fields Assigned to the Accesses

Let's now review the other configuration set up associated with the access table and the conditions fields.

8.3.3 Check Pricing or Exclusion Indicator

The EXCLUSIVE indicator controls whether the system stops searching for a record after the first successful access for a condition type within an access sequence. In Figure 8.11, shown earlier, you can see the EXCLUSIVE checkbox next to the REQUIREMNT column. By checking this EXCLUSIVE indicator, the search for condition records will stop as soon as the appropriate condition record is found. In the earlier example, the system first checks for sequence 5 to see if there is a valid material record. If it finds a record, then the search for a valid record stops there. The search does not continue to sequence 20.

Special Value Source

When you double-click the FIELDS folder in the DIALOG STRUCTURE in Figure 8.13 (shown earlier), the system displays the fields pertaining to the access sequence.

Here, the special value source field can be used to define a different field instead of the proposed source. For example, we can define the source to always be a special material T-AQ301. In order to do this, input the material T-AQ301 in the source field.

When a purchase order is created for material T-AQ300, it will use T-AQ301 as a source because of the special value source (see Figure 8.13).

Figure 8.14 displays the CREATE PURCHASE ORDER screen, where the MATERIAL entered is the T-AQ300.

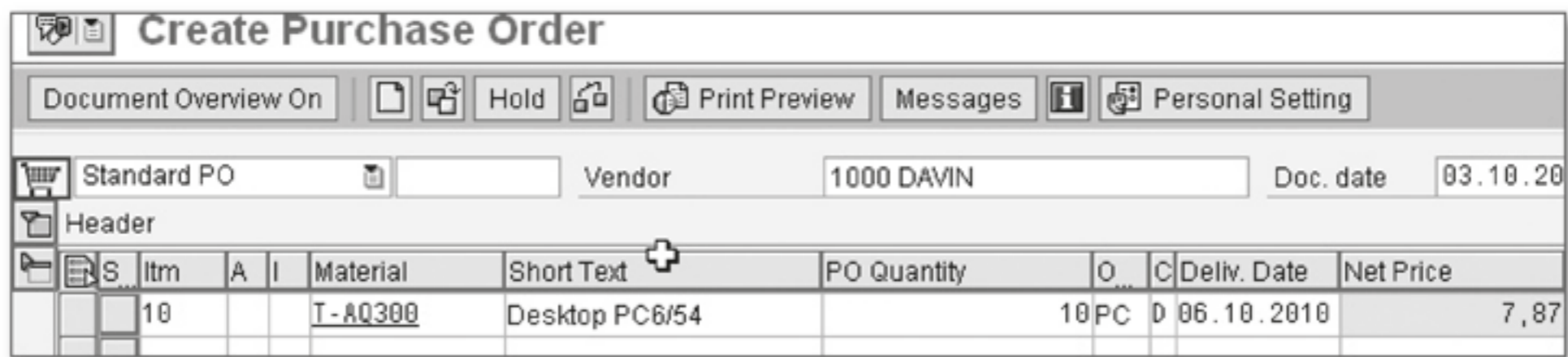


Figure 8.14 Create Purchase Order with the Base Material T-AQ300

Figure 8.15 shows how the pricing of the T-AQ301 is being applied for T-AQ300. Notice that the screen shown in Figure 8.14 displays the purchase order with the material T-AQ30 and the pricing used from the material T-AQ301. Figure 8.15 provides the analysis of the pricing within the purchase order. In order to go to pricing analysis, select the line item, click on the CONDITIONS tab and select ANALYSIS. This will take you to the analysis screen as shown in the Figure 8.15.

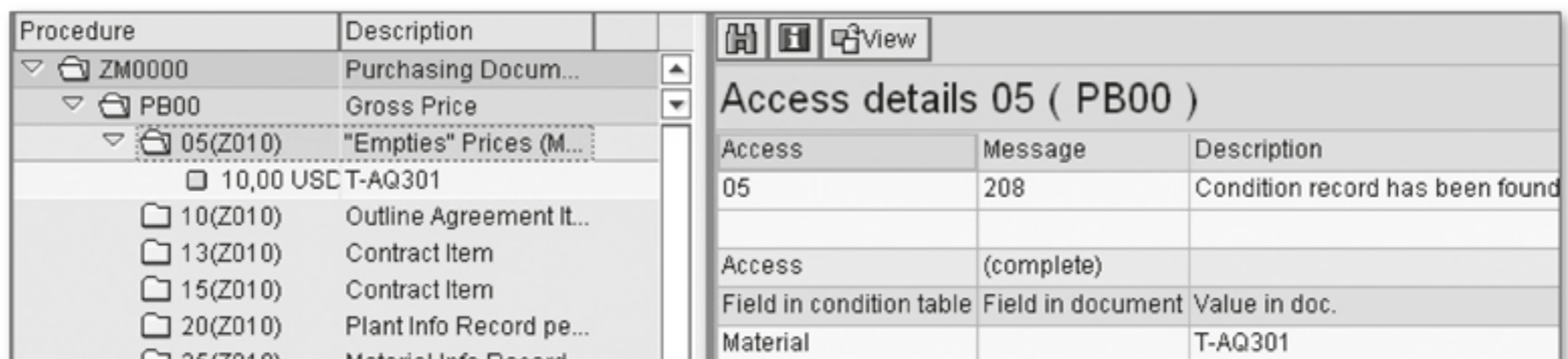


Figure 8.15 Pricing of T-AQ301 Applied for T-AW300.

Let's consider an example of maintaining a condition record. When a condition record is maintained for material T-AQ300, the system proposes to maintain the value. Also, instead of a constant value, a table and field name can be given as input as well.

When a PO is created for material T-AQ300, it uses T-AQ301 as a source because of the SPEC. VAL. SOURCE setting you made in previously in Figure 8.14.

Notice that the screen shown in Figure 8.14 displays the PO with the material T-AQ300 and the pricing used from the material T-AQ301. Figure 8.15 provides the analysis of the pricing within the PO. To go to pricing analysis, select the line item, click the CONDITIONS tab, and select ANALYSIS. While you are in any of the PO create, change, or display screen (refer to Figure 8.2) and in the CONDITIONS tab, you can click ANALYSIS to get the details on how the search for this condition was performed.

Processing Types in Access/Priority

Again referring back to Figure 8.13, the columns ATYP and PRIO refer to the processing types in access/priority. The fields ATYP and PRIO control how the value in the SPECIAL VALUE SOURCE column is used during condition access. If the value in SPECIAL VALUE SOURCE is blank, then the access sequence looks for the value defined in the actual source, such as the value in MATNR.

If the value in ATYP equals "A", then the access sequence looks for the value defined in the SPEC. VAL. SOURCE (Freely definable value). So if the priority is given as 1, then the system looks for the field defined in the SPEC. VAL. SOURCE column.

If the value in ATYP equals "B", then the field is not relevant, so the system picks a condition record available as long as a condition record exists (independent of the value of the key field).

If the value in ATYP equals "C", then the condition table is used.

Now that you know how to configure access sequences, we'll next discuss how to configure condition tables.

8.4 Condition Tables and Fields

A *condition table* defines the combination of fields (the key) that identifies an individual condition record. A condition record is how the system stores the specific condition data that you enter in the system as condition records.

SAP ERP offers several standard pricing condition tables that are used with the existing access sequences. If the standard pricing conditions tables provided by SAP ERP are not sufficient, then you have the option to define custom tables.

Example

An electronics company called Alpine Electronics is in the business of selling laptops. Alpine is offering discounts for a variety of products, including a 35% discount on all touch-screen cameras and \$150 off on all 27-inch LCD HD displays. Also, a discount of 20% is being offered to all military personnel on laptops.

The 35% discount on touch-screen cameras can be configured by material as a field in the condition table. Similarly, the \$150 discount for the 27-inch LCD HD display can also be configured by material as a field in the condition table. In the last scenario, a combination of customer groups to represent the military personnel and material needs to be set up as fields for the condition tables.

As you can see, you might need to create a table for the access sequence. Let's review the condition table in detail in the next section.

8.4.1 Condition Tables

The condition table defines the fields that can be used for each sequence. The menu path for defining condition tables is **SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • MAINTAIN CONDITION TABLE**. This screen contains change and display condition tables and allowed fields. The Transaction is *M/03*.

You might have to define or create a condition table associated with the access sequence.

To create a custom condition table, perform the following steps:

1. Use menu path **SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • MAINTAIN CONDITION TABLE**, and choose **CREATE CONDITION TABLE**.
2. Enter a three-digit code to represent the custom table to be created, and press . For example, condition table 630 is entered in the Figure 8.16. The system displays a list of allowed fields, which you can use to create the custom table.
3. Select the desired fields of the custom table by double-clicking the available list of fields.
4. Select the **GENERATE** button, and assign a package (related objects in the ABAP Workbench are grouped together in a package). The assignment of an object to a package is entered in the object directory (TADIR). The package determines the transport layer that defines the transport attributes of an object.

Change Condition Table (Pricing Purchasing): Field Overview	
<input type="radio"/> Technical view <input type="radio"/> Other description <input type="radio"/> Field attributes...	
Table	630 Vendor/Plant <input type="checkbox"/>
	<input checked="" type="checkbox"/> With validity period <input checked="" type="checkbox"/> with release status
Selected fields	FieldCatlg
Long Key Word	Long Key Word
Vendor	Import
Plant	Import code no.
	Incoterms
	Incoterms (Part 2)

Figure 8.16 Creating a Pricing Custom Table 630

5. Select the SAVE button, and assign a transport request to the table that you generated. The system generates a table (A630) in the background. This table stores the table contents for the vendor group/material combination. The description for the table is automatically assigned.

You can make limited changes to the condition table that you just created, such as the description of the table. But if you want to add new fields, you must delete the condition table and recreate it.

8.4.2 Condition Fields

The pricing fields used in condition tables are listed in the field catalog. The menu path to access the field catalog is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • EXTEND FIELD CATALOG FOR CONDITION TABLES.

Before we create new condition fields in the field catalog, it's important to understand the pricing communication structures used in MM. If the condition field is not readily available in the pricing catalog, then the new fields have to be added to the pricing structure. The pricing catalog is located in structure KOMG, which has the following tables:

- ▶ **KOMK:** Pricing header
- ▶ **KOMP:** Pricing line items

The new fields have to be included in the structure KOMKAZ for header fields and KOMPAZ for line item fields. Condition tables are created from the list of available fields, which are listed in the field catalog.

Sometimes the list of allowed fields may not be sufficient. For example, if your company issues a requirement to create a freight condition type based on the port of discharge, you'll find that this is not a standard field that SAP ERP offers. Therefore, you must create a new Z-field for this purpose.

Define a Z-Field

To define the new Z-field, follow the menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • EXTEND FIELD CATALOG FOR CONDITION TABLES.

To set up a purchasing group as a custom field in the field catalog, the following steps need to be configured:

1. Create the purchasing group as a data element using Transaction SE11 (as shown in Figure 8.17). The purchasing group is not available as a standard field for pricing.

The screenshot shows the 'Dictionary: Maintain Data Element' window for data element ZEKGRP. The 'Data element' field contains 'ZEKGRP' and is marked as 'Active'. The 'Short Description' is 'Purchasing Group'. The 'Data Type' tab is selected, showing the 'Elementary Type' section with 'Domain' selected. The domain is 'EKGRP' with a 'Purchasing Group' label. The data type is 'CHAR' (Character String) with a length of 3 and 0 decimal places. Other options like 'Predefined Type', 'Reference Type', and 'Reference to Predefined Type' are also visible but not selected.

Attributes	Data Type	Further Characteristics	Field Label
Dictionary: Maintain Data Element			
Data element	ZEKGRP	Active	
Short Description	Purchasing Group		
<input checked="" type="radio"/> Elementary Type			
<input checked="" type="radio"/> Domain			
	EKGRP	Purchasing Group	
	Data Type	CHAR	Character String
	Length	3	Decimal Places 0
<input type="radio"/> Predefined Type			
	Data Type		
	Length	0	Decimal Places
<input type="radio"/> Reference Type			
<input type="radio"/> Name of Ref. Type			
<input type="radio"/> Reference to Predefined Type			
	Data Type		
	Length	0	Decimal Places 0

Figure 8.17 Custom Data Element Definition

- In Figure 8.18, you can see how the newly defined customs data element is added or appended to the pricing structure. Include the data element that has been created, ZEKGRP, in the pricing communication structures, KOMP. This pricing communication item has the structure ZAKOMPAZ, as shown in Figure 8.18. Note that you'll need a developer access key to perform this function.
- After the key has been assigned, the new field ZEKGRP can be assigned. Figure 8.19 displays the field catalog for purchasing pricing along with the plant and material group for assignment.

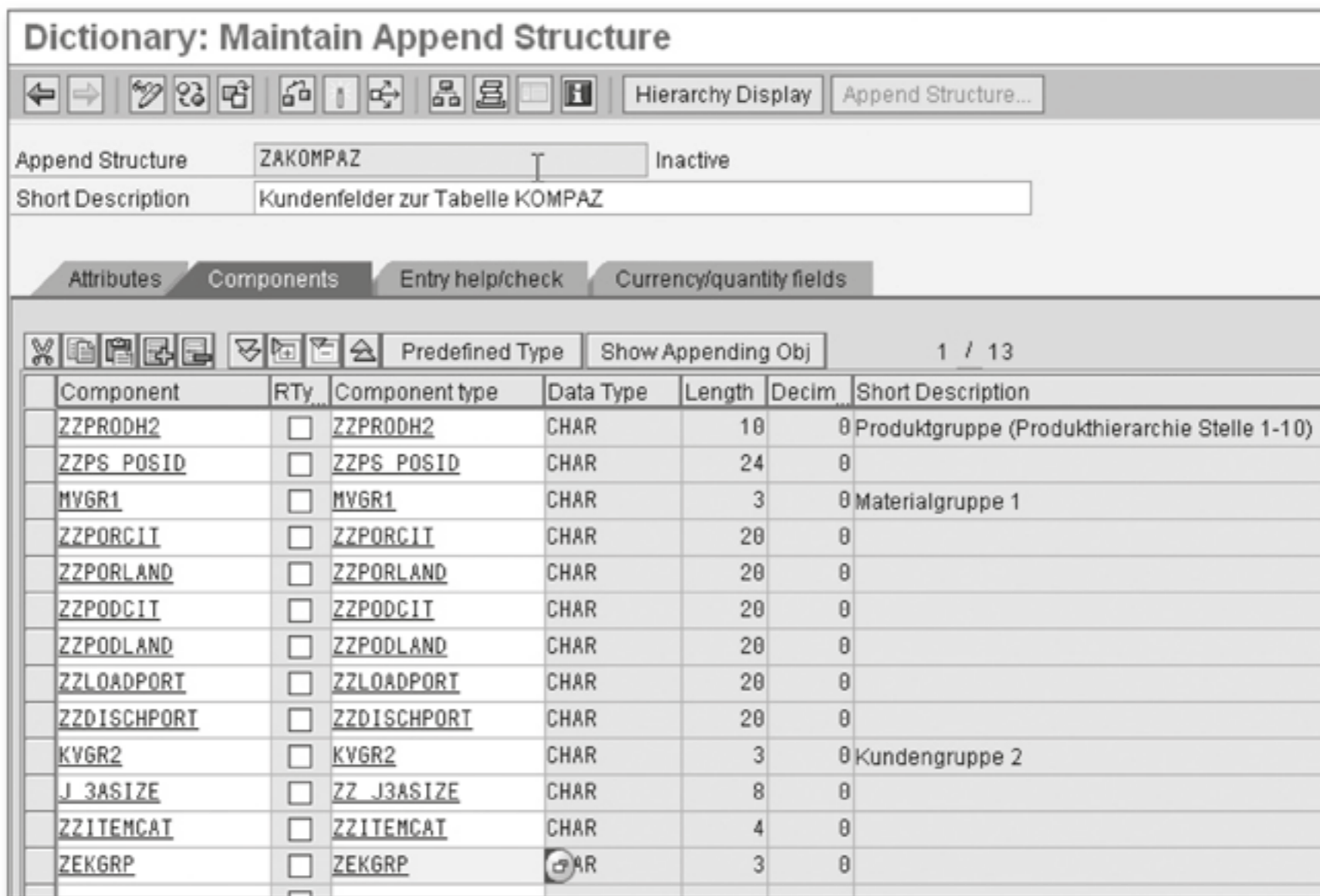


Figure 8.18 Purchasing Group Appended as a New Data Element to ZAKOMPAZ Structure

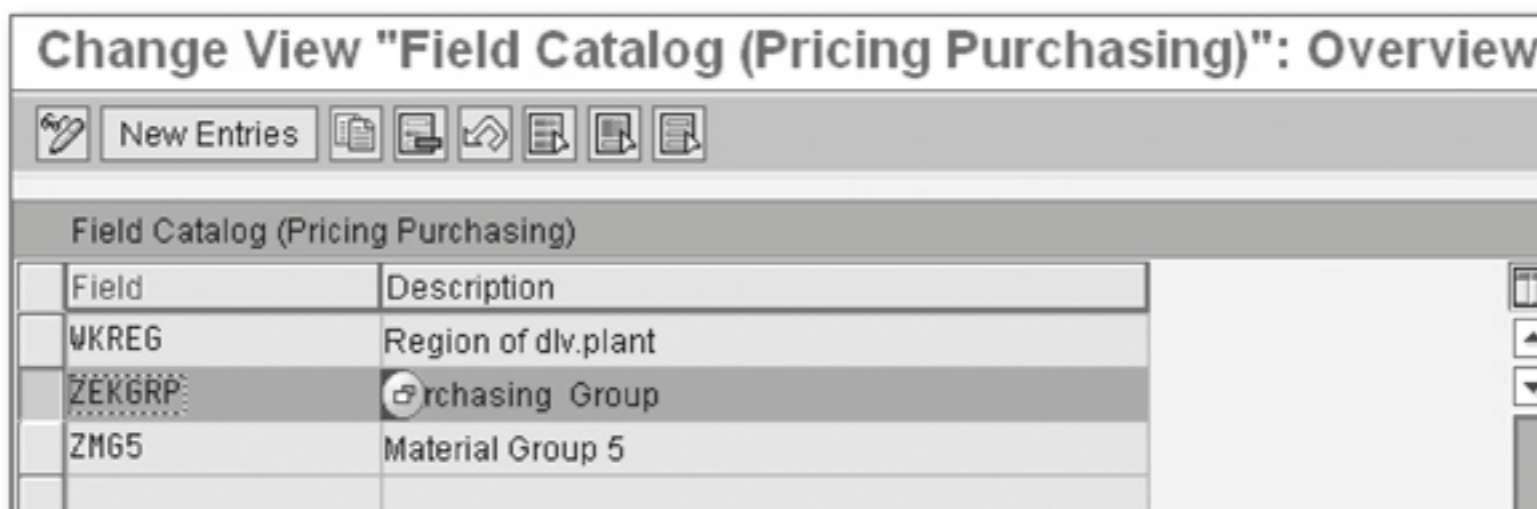


Figure 8.19 ZEKGRP Included in KOMKAZ

Now the new field is available in the field catalog as shown in Figure 8.19 and can be included when a custom table is created. To include the new field in a custom table, follow the steps in Section 1.4.1. Figure 8.20 illustrates that the new custom field ZEKGRP can be included in custom table 630.

Change Condition Table (Pricing Purchasing): Field Overview

Technical view | Other description | Field attributes...

Table: 630 Pur Group/Vendor/Plant

With validity period
 with release status

Selected fields	FieldCatlg
Long Key Word	Long Key Word
Purchasing Group	Import
Vendor	Import code no.
Plant	Incoterms
	Incoterms (Part 2)
	Info record category
	Invoicing Party

Figure 8.20 Creating Custom Table 630 using Custom Field ZEKGRP - Purchasing Group

The new field in the communication structure is filled with a value from the document by inserting the code `MOVE EKKO-EKGRP TO KOMK-ZEKGRP` in ZXM06U14/ZXM06U15. This is necessary so that master condition records can be defined for the purchasing group.

Note

You can insert custom specific ABAP code into the main INCLUDE program.

The INCLUDE programs are invoked using the following function modules:

- ▶ INCLUDE ZXM06U14 via EXIT_SAPLMEKO_001 (enhancement KOMK)
- ▶ INCLUDE ZXM06U15 via EXIT_SAPLMEKO_002 (enhancement KOMP)

These custom programs or code are included as part of the user exit within the program SAPLMEKO.

You should now have a firm understanding of how to work with tables and fields, where the data are stored. In the next section, we'll look at calculation schemas in MM.

8.5 Calculation Schema in Materials Management

Calculation schemas in MM are similar to the pricing procedure in SD. This is the final step in configuring pricing in MM. Although this was covered in Chapter 7, we'll cover it briefly in this chapter for completeness. MM pricing procedures are also called calculation schemas, as we mentioned before. Pricing in purchasing documents is defined in condition records. The various pricing elements are brought together in a pricing procedure.

The menu path to configure this is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE CALCULATION SCHEMA.

The calculation schema has pricing elements (condition types), which we discussed in the prior section, that are associated with it. As shown in Chapter 7, Section 7.2, MM includes several standard pricing procedures. Each pricing procedure serves a specific purpose. For example, pricing procedure RM0000 is used on standard POs, contracts, and schedule agreements and is the most commonly used pricing procedure.

RM0002 is used as a supplemental pricing procedure (i.e., provides additional pricing elements specifically linked to a pricing element, such as gross price PB00). RM0001 is used as a supplemental pricing procedure assigned to discount pricing element R000.

To configure MM pricing procedure calculation schema, refer to Chapter 7, Section 7.2.

8.6 Requirements, Formula Condition Values, and Condition-Based Formula

Requirements, condition values, and condition-based formulas are tools that were developed by SAP ERP to facilitate the definition of pricing. They are referred to as VOFM routines. VOFM routines are available as standard functionality in SAP ERP but are also customizable if the standard routines don't meet your needs.

These routines provide additional capabilities in pricing for things that cannot be met by just defining condition types, accesses, tables, and fields. These are valuable tools in pricing configuration.

To better understand this concept, let's use an example. When a discount is defined for an entire purchasing document, it's distributed to the line items according to the cumulative dollar value of the items. Some companies require the distribution of the discount by volume rather than dollar value. This can't be accomplished in SAP ERP without the use of VOFM routines. By defining a VOFM routine in this example, it's possible to distribute the discount by volume. VOFM routines are basically ABAP codes that can be plugged into pricing procedures. They are also called VOFM routines because they can be accessed using VOFM routines. We'll discuss in detail what each of these elements mean, and how you can set them up in your system.

8.6.1 Requirements

Requirements provide flexibility in pricing procedures to define certain conditions before a condition type is activated. In other words, if the conditions are not met, then the condition type is not invoked.

Keep in mind that for MM, the application used has to be "M". This can be configured when defining the requirement by defining "M" for the application field. "M" signifies the application for the MM. The menu path for defining requirements is VOFM • REQUIREMENTS • PRICING. The VOFM transaction can be accessed through different menu paths, but the common method is through IMG • LOGISTICS EXECUTION • SHIPPING • DEFINE COPY REQUIREMENTS.

You can maintain your own pricing requirements or use existing pricing requirements. You can define new pricing requirements starting from number 900 on. SAP ERP has reserved this number range for defining new pricing requirements. Note that to define pricing requirements, a developer access key is required. The developer access key or number is provided by SAP, when you register the object.

A best practice to defining new requirements is to overwrite an existing requirement that is similar to the new requirement that needs to be created.

Let's say, for example, that we have to create a requirement where a pricing condition type is activated. If the vendor material group is equal to A2, the code can be defined as shown in Figure 8.21.

Include	RV61A911	Inactive
1	*****	
2	*** Attention: copied routine! ***	
3	*** Attention: ***	
4	*** Character string 011 is replaced by 911 everywhere ! ***	
5	*****	
6		
7	*(INSERT R3IK900422	1
8	* Insert Check for Vendor Material group with a specific value.	
9	*) INSERT	
10	* Item without material	
11	form kobed_911.	
12	sy-subrc = 4.	
13	*(INSERT R3IK900422	1
14	if komp-wglif = 'A2'	
15	*) INSERT	
16	*(DELETE R3IK900422	2
17	*) if komp-kposn ne 0.	
18	*) DELETE	
19	*(DELETE R3IK900422	3
20	*) check: komp-matnr eq space.	
21	*) DELETE	
22	endif.	
23	sy-subrc = 0.	
24	endform.	
25	* Prestep	
26	form kobev_911.	
27	sy-subrc = 0.	
28	endform.	

Figure 8.21 Requirement with Vendor Material Group = "A2"

After the pricing requirement has been created, you need to assign it to the pricing procedure for the appropriate condition type. This is done in Transaction M/08 by entering the requirement against the condition type in the REQUIREMENT field.

8.6.2 Formula Condition Values

A formula condition value is another useful way of controlling pricing procedures. In some cases, the pricing condition needs to be calculated by a special formula. You can do this by inserting a small ABAP code in the condition value. The code is the logic to calculate the formula.

The menu path to access the condition value is VOFM • FORMULAS • CONDITION VALUES. The procedure for creating a condition value is the same as for requirements. An existing condition value formula, which is similar to the condition value you want to create, can be copied over the existing code to create a new condition value formula. Just as with requirements, an access key is required to create a new condition value.

Example

Let's consider an example of creating a condition value where we are calculating the value stored in XWORKD (EDI Confirmed Price) and subtracting it from the price for the material when the material group is A11. In this case, the EDI confirmed price is stored in subtotal D, which is represented by XWORKD.

Follow these steps to create this formula condition routine:

1. Use Transaction VOFM to go to FORMULA • CONDITION VALUE.
2. Place the cursor on formula condition VALUE 40, and overwrite it with the custom routine you want to create ("939" as shown in Figure 8.22). Overwriting just creates a new routine 939 but doesn't change routine 40.
3. Enter the DEVELOPER ACCESS KEY to create the custom code. This access key will be provided by a systems administrator. After the developer access key is entered, you can modify the code.
4. Insert the code as shown on line "11" in Figure 8.22.

Include	RV64A939	Active
1	*****	
2	*** Attention: copied routine! ***	
3	*** Attention: ***	
4	*** Character string 040 is replaced by 939 everywhere ! ***	
5	*****	
6		
7	* EDI value difference	
8	form frm_kondi_wert_939.	
9		
10	{ INSERT R3IK900422	1
11	if not Xworkd is initial and komp-matkl= 'A1' .	
12	{ INSERT	
13	{ INSERT R3IK900422	2
14	*	
15	{ INSERT	
16	{ DELETE R3IK900422	3
17	{ if not xworkd is initial.	
18	{ DELETE	
19	xkwert = xworkd - komp-netwr.	
20	else.	
21	clear xkwert.	
22	endif.	
23		
24	endform.	

Figure 8.22 Condition Value 939

5. Save the new condition value "939" as created.
6. Activate it by going to PROGRAM in the top of the menu and selecting ACTIVATE.
7. Assign the new formula to condition value "939" and to the calculation schema by using Transaction M/08 and inserting "939" in the ALT CALCULATION TYPE field. Save your changes.

Now let's discuss condition-based values.

8.6.3 Condition-Based Value

Condition-based value formulas are used to define an alternative to the condition basis (e.g., quantity, value etc.) that standard SAP ERP provides. For example, your standard SAP ERP system provides quantity or value as the basis of calculating the price. If the basis is volume, gross weight or net weight are to be used as the basis for calculating the price. This can be done by using condition-based value formulas.

For example, say that the basis for calculating a condition type we want to define a formula to increase the base quantity by a factor of 10.

The menu path is VOFM • FORMULAS • CONDITION BASED VALUES. After you get to this screen, you can create a custom condition-based value formula by following these steps:

1. Use Transaction VOFM to go to FORMULA • CONDITION BASED VALUE.
2. Place the cursor on formula condition-based value 44, and overwrite it with the custom routine you want to create, 925, as shown in Figure 8.23 (Overwriting just creates a new routine 925 but doesn't change routine 40).
3. Enter the DEVELOPER ACCESS KEY to create the custom code. This access key will be provided by a systems administrator. After the developer access key is entered, you can modify the code.
4. Insert the code as shown on line "4" in Figure 8.23. Save the new condition value that you've created as "925".
5. Activate it by going to PROGRAM in the top of the menu and selecting ACTIVATE.

- Assign the new formula condition value 925 to the calculation schema by using Transaction M/08 and inserting "925" in the BAS_{TYPE} (Condition Formula for Basis) field. Save your changes.

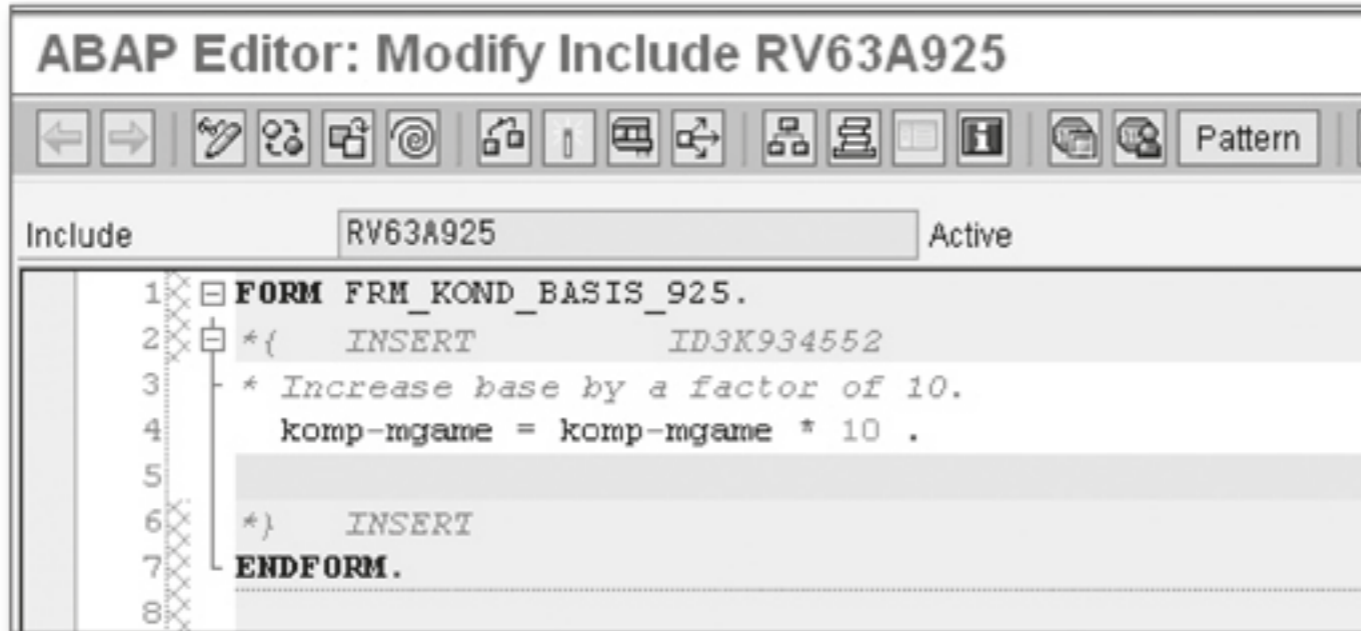


Figure 8.23 Modify Include RV63A925

You can create a new routine by copying an existing routine and providing an access key. Refer to Figure 8.23.

Now that you have a good understanding of requirements, condition values, and condition-based values, you have most of the tools necessary to set up pricing in MM.

Next we discuss condition exclusion procedures.

8.7 Condition Exclusion Procedures

Business users maintain condition records by using condition types. The condition types have access sequences, which in turn provide the capability to maintain various combinations of prices such as material, material/customer, and so on. When maintaining these condition records, sometimes more than one condition record becomes applicable. To manage these exceptions, condition exclusion is used.

Condition exclusion procedures are used when multiple conditions become valid. Rules must be defined to select certain conditions and disregard others. You need to set up exclusion conditions within the calculation schemas to determine specific condition types. This is better illustrated with an example.

Example

Super Electronics procures various products such as cameras, LCDs and so on from Integra, a regular supplier. The vendor can receive the discounts in a variety of ways either as a net percentage discount or a gross percentage discount. Each of these discounts can be represented, for example, by condition type RA00, RA01, and so on, so multiple discount conditions may be applicable. You only want one discount applied and not all of them, so you need an exclusion procedure.

Exclusion groups provide the capability to group these multiple discounts together, compare them, and select one possible discount for the supplier.

Continuing with the Super Electronics example, let's say that a vendor has the following discounts applicable:

- ▶ RA00: Net % discount
- ▶ RA01: Gross % discount
- ▶ RB00: Value discount
- ▶ RC00: Quantity discount

There are different applications or scenarios in which the condition exclusion groups can be applied, so let's look at them individually

8.7.1 Condition Types Belonging to the Same Condition Group

In the example, if RA00 and RA01 are net and gross discounts, you group them in the same group because only the most favorable discount should be activated for the vendor. RA00 and RA01 will be grouped together in an exclusion group: Z001. Grouping them together enables the discounts RA00 and RA01 to be compared and then the most favorable discount given to the vendor from among the condition types. This comparison of condition types and choosing the most favorable or least favorable condition is enabled by a special indicator called EXCLUSION RULE. If the most favorable discount is to be provided to the vendor, then exclusion group "A" is used. All of the other condition types in the group will be deactivated.

8.7.2 Condition types Belonging to Multiple Condition Groups

Let's say that the exclusion groups are defined so that one group has discounts, and the other group has freight. In this case, the system picks the best discount possible from the exclusion and deactivates the other discounts. On the other hand, if the other exclusion group includes freights, then the freight condition type that offers the lowest freight possible is offered to the customer.

If both of the exclusion groups have discounts, then the system sums the discounts for each group and gives the higher discount total to the vendor.

For example, let's assume that that vendor's discounts are defined for ZA10 as 10% and ZA20 as 19%. If you want the vendor to receive the worst discount possible, follow these configuration steps:

1. Define the exclusion groups.
2. To assign condition types to exclusion groups, first maintain the condition exclusions for the calculation schemas.
3. To define an exclusion group, follow the menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE CONDITION EXCLUSION • DEFINE CONDITION EXCLUSION GROUP (see Figure 8.24).

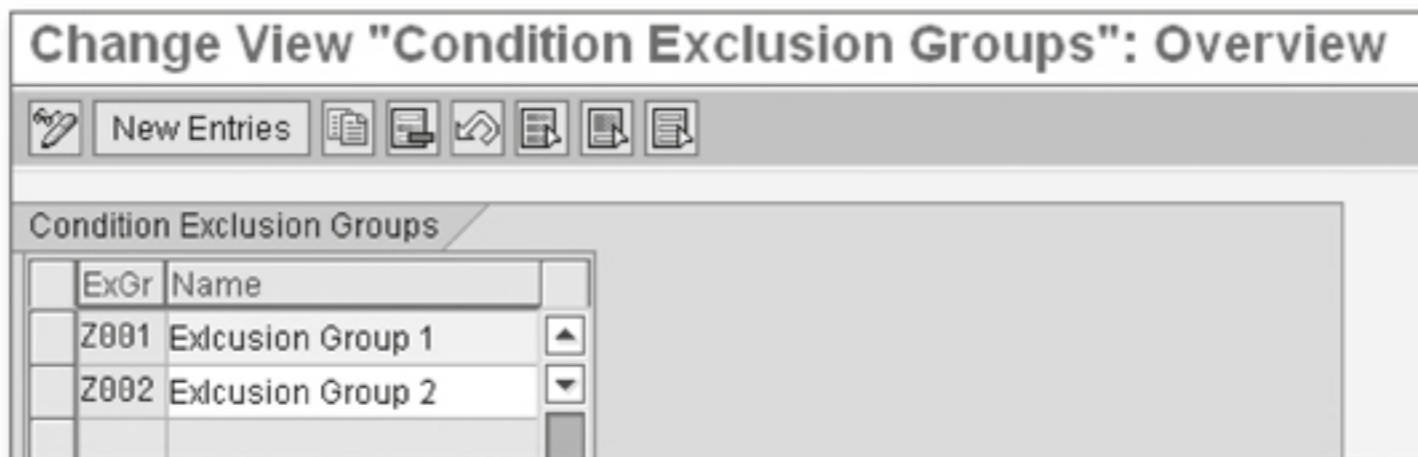


Figure 8.24 Z001 Exclusion Group

4. Assign the condition types to the exclusion group. The menu path to do this is SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE CONDITION EXCLUSION • DEFINE CONDITION EXCLUSION GROUP • ASSIGN CONDITION TYPES TO EXCLUSION GROUP (see Figure 8.25).

ExGr	Cond.exclusion group	CTyp	Condition Type
Z001	Exlcusion Group 1	ZA10	Discount 1
Z001	Exlcusion Group 1	ZA20	Discount 2

Figure 8.25 Assign Condition Types to Exclusion Group Z001

- Following the assignment of the exclusion group to the condition type, you need to assign the exclusion group to the calculation scheme, as shown in Figure 8.26. The least favorable condition type is to be used within the condition procedure. To do this, assign the exclusion rule "L" in the calculation schema for the exclusion group Z001 as shown in the figure.

Sno	Cpr	Procedure	ExGr1	Group 1
1	L	Least favorable betw	Z001	Exlcusion Group 1

Figure 8.26 Assign Exclusion Group to Calculation Schema

- Now that the configuration steps are complete, condition records have to be defined in order for the condition types ZA10 and ZA20 to be created. To do this, use Transaction MEK1 and define the condition records for condition types ZA10. Enter a discount value of 10%. Similarly, maintain the condition record for condition type ZA20, and enter a discount value of 19%. The transaction code to access this is through SAP EASY MENU • MATERIAL MANAGEMENT • PURCHASING • MASTER DATA • CONDITIONS • OTHERS • CREATE.

Now that the exclusion groups have been configured and the master condition records have been created for ZA10 and ZA20, let's see how this configuration setting influences the discounts during the purchase order creation process and confirm that the settings work.

8.7.3 Create a Purchase Order

Let's create a PO to demonstrate the application of exclusion. To create a PO, use Transaction ME21N, or use the SAP EASY MENU • MATERIAL MANAGEMENT • PURCHASING • PURCHASE ORDER menu path. Enter the purchasing document type "NB", Vendor, Material, and so on as shown in Figure 8.27. Upon entering this information, the system automatically determines the discounts ZA10 and ZA20.

When a PO is created, the system takes discount ZA10 and ignores the condition ZA20 because of the least favorable discount condition. The condition value ZA10 of \$10 is indicated by a small green square in Figure 8.27. The better discount, ZA20 of \$19, is deactivated and indicated by a small yellow triangle.

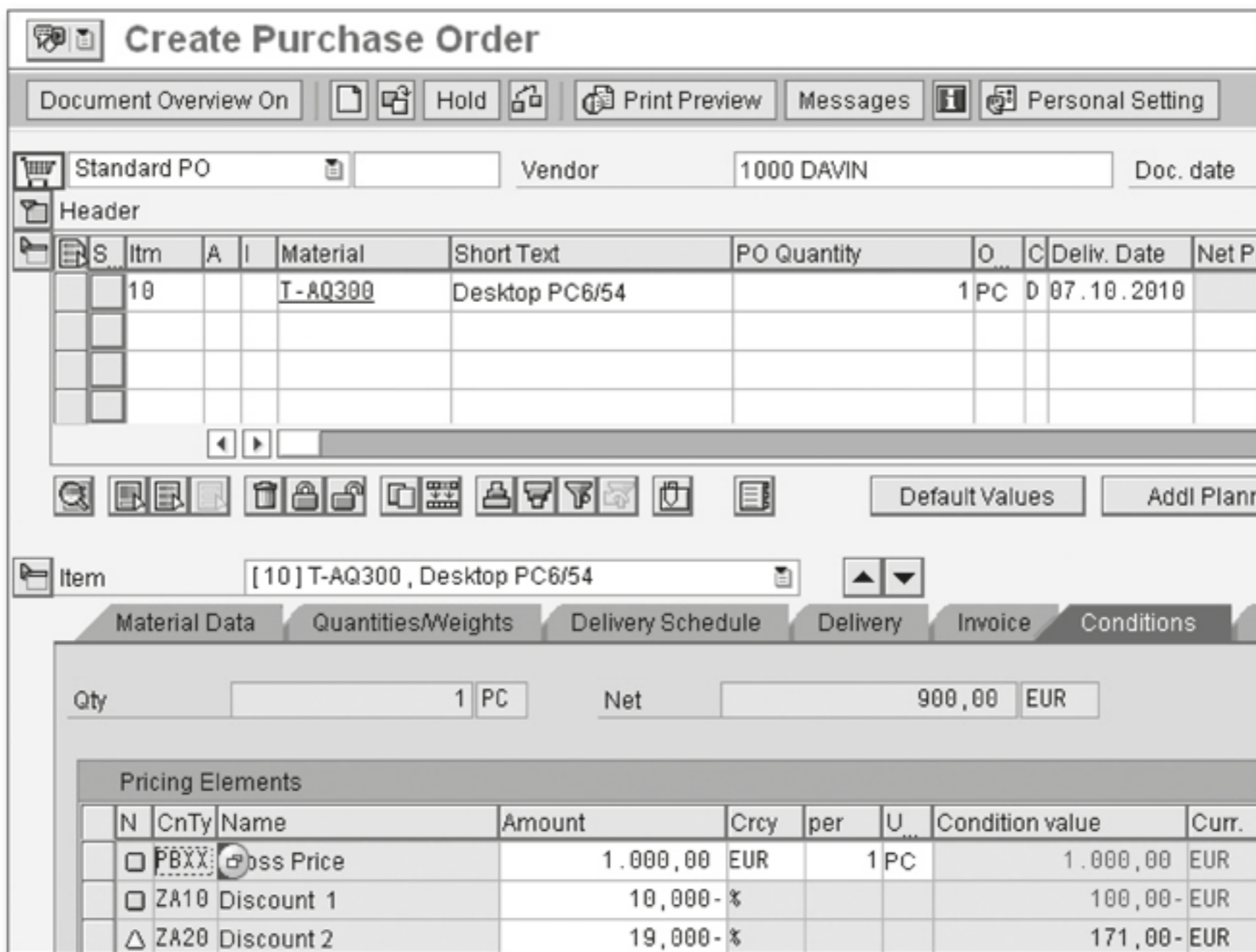


Figure 8.27 Condition Exclusion with Least Favorable Price

In the next section, we'll review the pricing master data maintenance.

8.7.4 Pricing Condition Records

Pricing condition records can be created for condition records that have access sequences. If the condition records do not have access sequences, they have to be manually defined on the purchasing documents. Conditions defined in such a manner are available across all purchasing documents, contracts, scheduling agreements, PIRs, POs, and so on. They can be overwritten on these purchase documents.

Figure 8.28 illustrates how pricing can initially be maintained as condition records. These condition records are proposed on the contracts, scheduling agreements, PIRs, and POs.

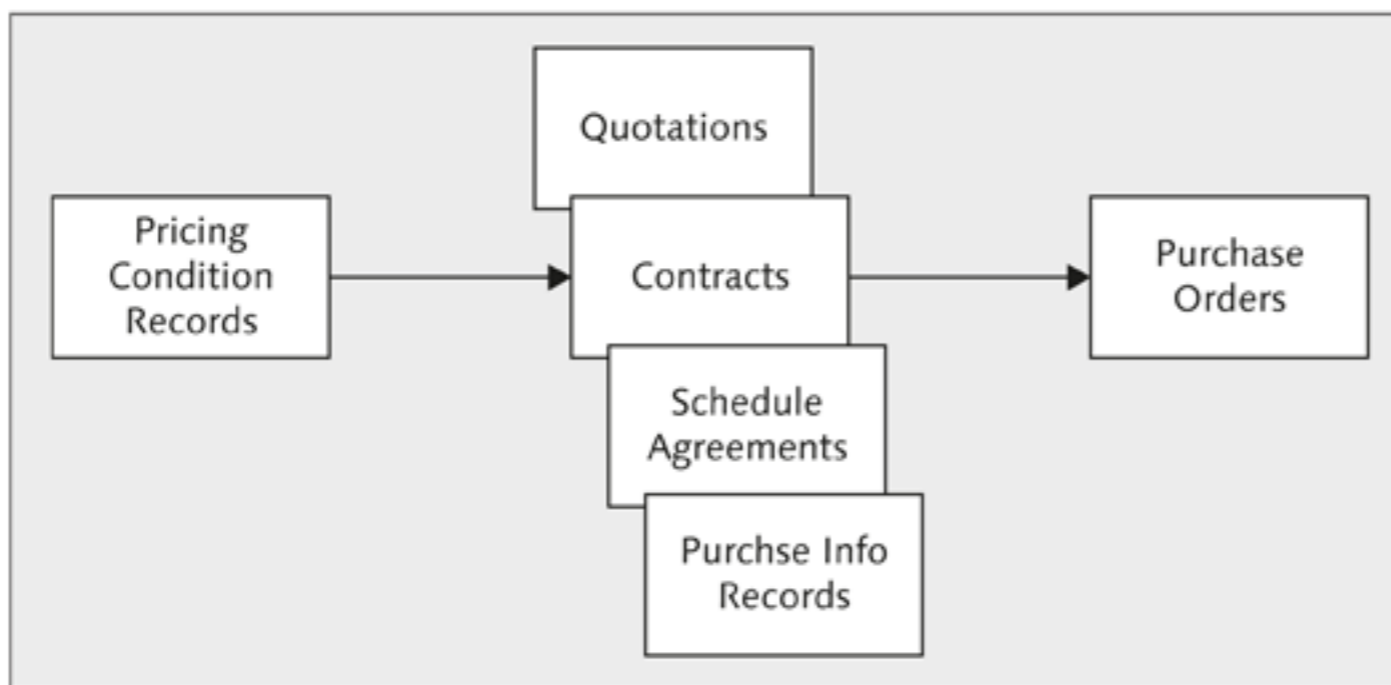


Figure 8.28 Pricing Condition Records

When a PO is created with reference to a quotation, quotation contract, or scheduling agreement, the pricing on these purchase documents takes precedence. The menu path for defining master pricing condition records is LOGISTICS • MATERIAL MANAGEMENT • PURCHASING • MASTER DATA • CONDITIONS • OTHER • CREATE. The Transaction is MEK1.

In the input screen, you need to input the pricing CONDITION TYPE manually.

The KEY COMBINATION section displays the various possible ways (access sequences) the condition can be defined (see Figure 8.29).

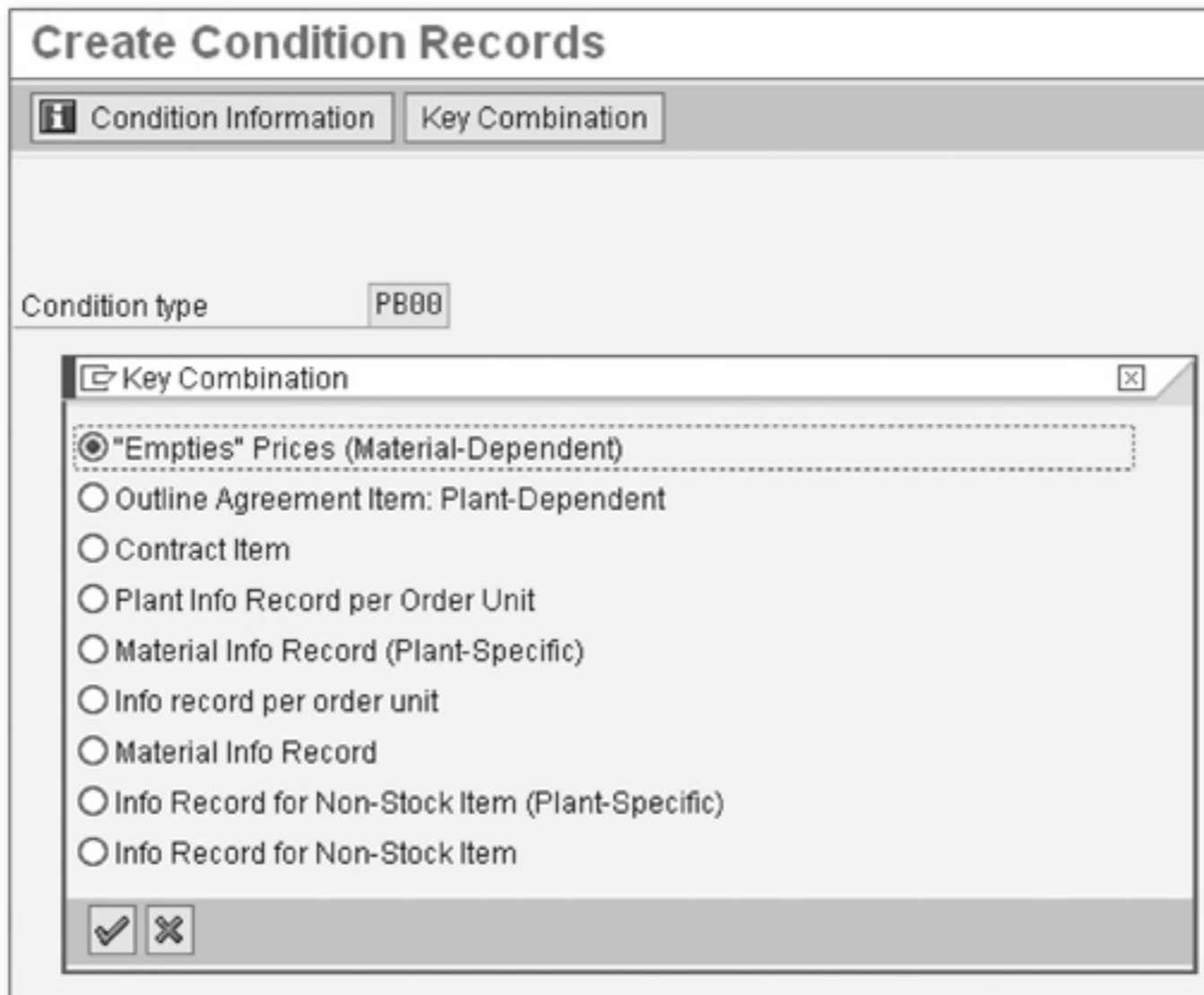


Figure 8.29 Condition Record Key Combination

Figure 8.30 displays the different options proposed by the system based on the key field combinations defined in the table.

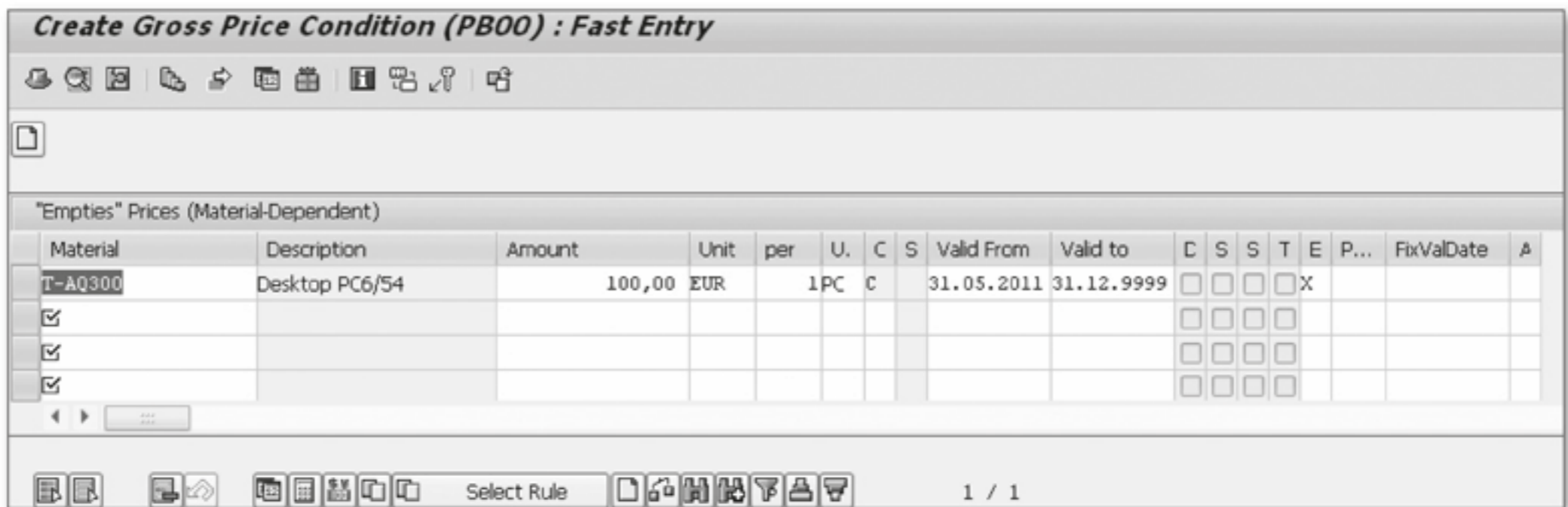


Figure 8.30 Condition Record Maintenance

Now let's look at some of the fields that are used when creating a condition record.

Key Condition Record Fields

The information from the fields PAYMENT TERMS, FIXED VALUE DATE, and ADDITIONAL VALUE dates are typically defaulted from the customer master. These fields can also be changed on the pricing condition records. When the values for these fields are maintained in the pricing condition record, the values maintained in the pricing condition record take precedence.

You can use the SELECT RULE icon to copy condition records. For example, if the condition record for T-AQ300 has to be copied for a range of materials from T-AQ301 to T-AQ310, the input can be given for the range of materials. The proposed price can be overwritten as well. Figure 8.31 displays the configuration setting for copying rules.

SC	No	Source condit.type	TA	Target application	TaCoT	Target condit.type
PB00	01	Gross Price	M	Purchasing	PB00	Gross Price

Figure 8.31 Copying Rule for Condition Type PB00

Copying Conditions

The rules have to be defined for copying conditions and copying condition types for the select rule to work.

Perform the following steps to copy a condition record:

1. Define the copying rule for the required condition type by specifying the source and target using the menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • COPY CONTROL FOR CONDITIONS • DEFINE COPYING RULES FOR CONDITIONS TYPES.
2. Enter the SOURCE CONDIT.TYPE and TARGET CONDIT TYPE as "PB00" because we want to copy condition records for the same condition type.

3. Enter the sequence number (No) as 01. The TARGET APPLICATION M automatically defaults.
4. Define the copying rule for the tables. In this case, we are defining the copying rules for SOURCE TABLE "118" as shown in Figure 8.32. The rules are defined based on what condition records need to be copied. In our example, we want to copy the condition records for a material. The MATERIAL field is contained in table 118, so table 118 is chosen. Also the source and target tables are one and the same in our example, so both have values of 118.
5. Enter the sequence number as "1" and a text for the DESCRIPTION field in the screen that appears when you follow the menu path SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • COPY CONTROL FOR CONDITIONS • DEFINE COPYING RULES FOR CONDITIONS.

Change View "Copying Rules for Conditions": Overview

New Entries

Source application

SourceTabl	No	Copy Rules for Text	TargetAppl	TargetTabl	DR	
118	1	1	M	118	<input checked="" type="checkbox"/>	▲
445	1	1	M	445	<input checked="" type="checkbox"/>	▼

Figure 8.32 Source and Target Tables for Copying Control

Now the configuration for copying condition records is complete.

Now we can copy the condition records of T-AQ300 to a range of materials, namely, T-AQ301 to T-AQ302. The input screen to perform this copying is shown in Figure 8.33. Follow these steps:

1. Input the source MATERIAL as T-AQ300, the TARGET MATERIAL as T-AQ301 to T-AQ302, and the TARGET CONDITION TYPE as PB00.
2. Select the checkbox DISPLAY LIST, and click EXECUTE.

Figure 8.33 displays the condition value maintenance for the condition value PB00 (Gross Price) for the different material.

Copying : Material to Material

Options

Characteristics of source conditions

Condition table	118	"Empties" Prices (Material-De
Condition type	PB00	Gross Price
Material	T - AQ300	Desktop PC6/54

Selection of target field

Target material

T - AQ301	T - AQ302
-----------	-----------

Characteristics of new conditions

Target condition type	PB00
Condition sort term	
New validity start date	
New validity end date	

Display list

Figure 8.33 Select Range of Materials to be Copied

3. After the pricing condition is copied, save it. This is shown in Figure 8.34.

Change Gross Price Condition (PB00) : Overview

Valid On 04.10.2010

"Empties" Prices (Material-Dependent)

Material	Description	Amount	Unit	per	U	C	S
T - AQ300	Desktop PC6/54	10,00	USD	1 EA	C		
T - AQ301	Desktop PC6/54	10,00	USD	1 EA	C		
T - AQ302	Desktop PC6/54	10,00	USD	1 EA	C		

Figure 8.34 Prices Copied from Source Material to Target Materials

On the top menu, follow the path PRICE CHANGE OVERVIEW • GO TO • DETAILS to bring you to the screen shown in Figure 8.35, which displays the material copying selection based on the target condition type.

Validity Period	
Valid From	29.10.2010
Valid to	31.12.9999
Amounts	
Amount	10,00 USD per 1 KG
Lower limit	
Upper limit	
Control	
Calculation type	D Gross weight <input type="checkbox"/> Deletion Indicator
Scale basis	C Quantity scale <input checked="" type="checkbox"/> Relevant to pricing
Scale Type	A Base-scale
Exclusion	X Gross Price

Figure 8.35 Pricing Details

The LOWER LIMIT and UPPER LIMIT values in this screen are used to set upper and lower thresholds for the pricing condition types. If they exceed the limit on the sales order, then a warning message is triggered that the upper or lower thresholds are being exceeded when manually changing the prices. We discussed the EXCLUSION INDICATOR earlier—when a customer already has a favorable price, then that customer is ineligible to receive additional discounts.

The scales can be used to control up-to, from, or base scales, as discussed earlier in this chapter.

Condition Supplements

You can use condition supplements to maintain additional conditions for the main condition record. You can control this in configuration by associating a supplement pricing procedure to the condition type. For example, condition type PB00 is associated with pricing procedure RM0002 and has discount conditions KA00, RA00, and so on associated with it. Refer to Chapter 7 for a refresher on copying from contracts, schedule agreements, quotations, and so on.

8.7.5 Header versus Line Item Pricing

A pricing condition may be applicable for all of the line items of a sales document. For example, freight, insurance, and so on, are pricing elements that may be applicable for the entire purchasing document. It may also be apportioned to the individual line items of a PO. It's important to understand header versus line

item pricing because some conditions can be defined as header pricing conditions and others as line item pricing, and this is a configurable activity.

The configuration of header and line item is controlled by condition types, and Transaction *M/08* is used to set this indicator for the condition type. You select the **HEADER CONDITION** indicator for header condition types and the **ITEM CONDITION** indicator for item pricing.

Header Pricing

A header condition is indicated by selecting the **HEADER CONDITION** indicator in Transaction *M/06*. The basis of distribution can be controlled by the **CALCULATION TYPE** indicator in Transaction *M/06*. So, for example, if the header freight has to be distributed to the line item based on a percentage basis, then you can control this by choosing the calculation type as a percentage sign (%).

Line Item Pricing

If the pricing condition has the **HEADER CONDITION** indicator blank, then it's a line item condition type. These condition types can be entered at the line item level and are aggregated to the header automatically. The analysis screen also helps determine if a pricing was a manual condition as in condition type *PB00*. Also, subtotals are identified by a calculator icon as in **GROSS VALUE**.

Pricing Analysis in Purchase Orders

When POs use the pricing procedure to calculate pricing, it's possible to analyze what pricing procedure was used, what condition types were used, and what access sequences found a condition record. Also, the pricing values can be updated based on recent changes or updates to pricing conditions.

To conduct a pricing analysis on a PO, go to **PURCHASE ORDER • CHANGE • SELECT THE LINE ITEM • GO TO • ITEM • CONDITIONS**. Select the **ANALYSIS** icon, and the screen shown in Figure 8.36 appears.

The analysis reveals that pricing condition *PB00* has multiple access sequences and that a pricing condition record has been deleted. You can also use this analysis to troubleshoot whether the correct pricing condition records are being retrieved, whether a pricing condition is manual, and so on.

Next, let's review another important aspect of the pricing: printing pricing in the documents.



Figure 8.36 Pricing Analysis of ZM0000

8.8 Printing Pricing Conditions

The print ID in the pricing procedure controls how the pricing conditions are printed on the purchasing documents, such as POs or contracts. Not all pricing conditions on the pricing procedure have to be printed on the POs. For example, the cost condition type is not printed on the PO. Some pricing conditions, such as freight, may be printed at the header level. Figure 8.37 displays the pricing procedure.



Figure 8.37 Print ID Controls How the Conditions Are Printed

The print ID can have several possible values. Some of the key values are as follows:

- ▶ [] (**blank**): Condition is not printed.
- ▶ **X**: Condition is printed at the item level.
- ▶ **S**: Condition is printed at the totals level (i.e., if there are multiple line items, then the pricing condition is not shown as individual line items but at the totals level).
- ▶ **A**: Condition is added to the net value and printed but not shown individually.
- ▶ **B**: Printed as a total if it's a nonzero condition.

Some additional settings in the pricing procedure include **MANUAL**, **STATISTICS**, **REQUIRED**, **SUBTOTALS**, and **ACCRUALS** as shown in Figure 8.38.

Change View "Control": Overview

Procedure: RM0000 Purchasing Document (Big)

Control

Reference Step Overview							
Step	Co	CTyp	Description	Manual	Requi	Statistics	Accruals
1	1	PB00	Gross Price	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1	2	PBXX	Gross Price	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	0	VA00	Variants/Quantity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	0	VA01	Variants %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	0	GAU1	Orignl Price of Gold	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	0	GAU2	Actual Price of Gold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	1	RB00	Discount (Value)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	2	RC00	Discount/Quantity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	3	RA00	Discount % on Net	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	4	RA01	Discount % on Gross	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	5	HB00	Header Surch.(Value)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	6	ZB00	Surcharge (Value)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	7	ZC00	Surcharge/Quantity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	8	ZA00	Surcharge % on Net	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Figure 8.38 Manual, Statistics, and Required Settings

8.8.1 Manual

You should check the box in this column when you need to manually input a pricing condition. A manual pricing condition is used in certain business cases, where you need a condition value not to be automated, for example, a special discount based on the quality of the product or complaints against this vendor. This condition might be manually inputted during the PO creation or reviewed with the PO change. Another example of manual pricing condition is that freight can sometimes be unplanned, so it may have to be manually entered on POs.

8.8.2 Required

The REQUIRED setting is used when a pricing condition is mandatory on the sales order. The sales order will not be completed until this pricing condition is entered.

8.8.3 Statistics

The STATISTICS pricing condition is used when the pricing condition value doesn't have to be included as part of the total value of the PO but is displayed on the PO. Rebate condition types are marked statistical on the POs. The rebate value is calculated but doesn't add to the value of the PO. These conditions are marked as statistical on the purchasing pricing procedure and can be used later when settling rebates.

When rebate agreements are settled, these conditions are used to calculate the rebate.

8.8.4 Subtotals

The SUBTOTALS indicator provides a flexible way of storing the pricing conditions values that are calculated. The SUBTOTALS indicator is used in further calculations. SAP ERP provides several fields for storing these subtotals as shown in Figure 8.39.

These values are selected as part of the SUBTOTAL field selection shown in Figure 8.40.

Condition subtotal (1) 27 Entries found

Subtot...	Short Descript.
	No separate sub-totals
1	Carry over value to KOMP-KZW11
2	Carry over value to KOMP-KZW12
3	Carry over value to KOMP-KZW13
4	Carry over value to KOMP-KZW14
5	Carry over value to KOMP-KZW15
6	Carry over value to KOMP-KZW16
7	Carry over value to KOMP_BONBA (rebate basis 1)
8	Copy values according to KOMP-PREVA (preference value)
9	Copy values to KOMP-BRTWR (gross value)
A	Carry over price to KOMP-CMPRE (credit price)
B	Carry over value to KOMP-WAWWR (cost)
C	Carry over value to KOMP-GKWRT (statistical value)
D	Copy value to XWORKD
E	Copy value to XWORKE
F	Copy value to XWORKF
G	Copy value to XWORKG
H	Copy value to XWORKH
I	Copy value to XWORKI
J	Copy value to XWORKJ
K	Copy price to XWORKK
L	Copy price to XWORKL
M	Copy price to XWORKM
Q	VAT base amount for internally posted material (only IS-OIL)
S	Copy values to KOMP-EFFWR (effective value)

Figure 8.39 Subtotals Indicators

Change View "Control": Overview

New Entries | BC Set: Change Field Values

Procedure: RM0000 Purchasing Document (Big)

Control

Reference Step Overview										
Step	C...	C...	Description	F..	T.	M...	R..	S...	P	SuTot
1	1	PB00	Gross Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	9
1	2	PBXX	Gross Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	9
2	0	VA00	Variants/Quantity			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
3	0	VA01	Variants %			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
4	0	GAU1	Orignl Price of Gold			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
5	0	GAU2	Actual Price of Gold			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
10	1	RB00	Discount (Value)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
10	2	RC00	Discount/Quantity			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
10	3	RA00	Discount % on Net			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
10	4	RA01	Discount % on Gross	1		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
10	5	HB00	Header Surch.(Value)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	
10	6	ZB00	Surcharge (Value)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	

Figure 8.40 Subtotals Selections

The subtotal selected in the previous screen is "9 (Copy values to KOMP-BRTWR (gross value))".

8.8.5 Account Key

An account key is the way each pricing condition type is linked to a GL account. We'll cover this setting in detail later in Chapter 12. Figure 8.41 displays the AccKey column where the account key is maintained.

Change View "Control": Overview

New Entries BC Set: Change Field Values

Procedure: RM0000 Purchasing Document (Big)

Control

Reference Step Overview											
Step	C...	C...	Description	F..	T.	M...	R..	S...	S..	AccKey	
17	0	EDI1	Confirmed Price			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	D		
19	0	EDI2	Value variance			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
20	0		Net incl. disc.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7		
21	1	NAV3	Non-Deductible Tax			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
21	2	NAV4	Non-Deductible Tax			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
22	0		Net incl. tax	20	21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
31	1	FRA1	Freight %	20		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		FRE	
31	2	FRB1	Freight (Value)	20		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		FRE	
31	3	FRC1	Freight/Quantity	20		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		FRE	
31	4	RUE1	Neutral % Accruals	20		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		FRE	
31	5	RUB1	Neutr. Accruals(Val.)	20		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		FRE	
31	6	RUC1	Neutral Accruals/Qty	20		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		FRE	

Figure 8.41 Pricing Scheme Assignment for Account Key

Next to the AccKey column is the ACCRUALS column, which we'll review next to conclude the pricing scheme definition with purchasing.

8.8.6 Accruals

Accruals are maintained for rebate agreements. Some of the condition types such as BO01 and BO02 are examples of rebates that are posted to accrual accounts. An account key is associated with the accruals account key, which is in turn linked to a GL account. We'll discuss account keys and accruals in Chapter 12, which discusses the FI integration with MM.

8.9 Summary

In this chapter, we covered MM pricing in detail. You should have a firm knowledge of how to configure your own custom pricing conditions, access sequences, condition tables, and fields. We went over the significance of each field associated with the condition types and access sequences. We also explained how custom requirements, condition-based values, and condition values can be set up. We discussed condition exclusions by providing examples. We also discussed the setup of master pricing conditions.

You learned about the influence of print ID on printing the condition types as well as the additional settings for pricing related to pricing procedure, including manual, required, statistical, accruals, and account keys.

Now that you understand the various techniques available in configuring MM pricing, you should be able to analyze requirements for MM pricing for any company and set it up with very little help.

The next chapter covers more advanced topics in MM pricing.

Special pricing, such as delivery costs, taxes, planned delivery costs, foreign currency, and external services management, are applied to business transactions and have different applications and impacts based on how they are used.

9 Special Topics in Materials Management Pricing

In addition to standard pricing conditions available in your SAP ERP system, certain special pricing conditions are also available in Materials Management (MM). In this chapter, we'll examine the various special pricing conditions in MM and see how they are used. The topics covered in this chapter such as taxes, planned delivery costs, foreign currency, and so on require a solid understanding of the relationship to pricing because all of these topics influence the price on the purchasing documents. For example, planned delivery costs are agreed on with the vendor or the carrier before a purchase order (PO) is created. These costs are usually associated with the shipments. We'll also review the weight-dependent or volume-dependent pricing. This chapter provides configuration tips as well as specific information relating to these pricing topics because not all of the pricing topics require configuration.

9.1 Taxes, Planned Delivery Costs, and Foreign Currency

Taxes can be calculated differently in each country. For example, VAT (value-added tax) uses input and output tax and is prevalent in European countries. The United States uses sales and use taxes; goods purchased for production or resale which aren't taxed are assessed use taxes, and goods purchased for consumption are taxed with sales tax. The principle of sales tax does not permit the option of offsetting input tax against output tax. The vendor must pay the taxes to the tax authorities. Taxes appear as condition records with the purchase document, and values are maintained as condition records. It's important to understand how they are activated within the pricing scheme.

We define a planned delivery cost for when the costs are agreed on with the vendor or the carrier before a PO is created. These costs are usually freight costs, insurance costs, customs, or the like. Planned delivery costs are classified either as customs or duty. Planned delivery costs impact the overall purchase price and it's important to understand the impact of this cost.

Unlike taxes and delivery cost, currency plays an important functional role in transactions with purchase or sales documents. You might have a currency in which you maintain your condition records, and based on your vendor transaction, you might convert that currency into a local currency. The currency conversion can impact the overall purchasing due to the exchange rate and the currency paid to the vendor.

9.1.1 Taxes

Taxes within the SAP ERP system are treated as conditions within the pricing procedure. Automatic determination of taxes is dependent on the tax indicator in the material master as well as the plant tax set.

Example

A large-scale retail company called Super Retailer Inc., is in the business of selling consumer electronic products, food and clothing in the United States. These products are procured from vendors and then marked up and resold to end consumers.

In addition to this, Super Retailer Inc. also purchases several products for internal consumption. Some of these include office supplies, equipment, and janitorial services. Because these products are for internal consumption, they are subject to taxation.

Let's see how we can configure the system to set up taxes. You can start the U.S. tax procedure by specifying a procedure for the country. This is a Financial Accounting (FI) setting, and the menu path to configure this screen is SPRO • FINANCIAL ACCOUNTING • FINANCIAL ACCOUNTING GLOBAL SETTINGS • TAX ON SALES/PURCHASES • BASIC SETTINGS • ASSIGN COUNTRY TO CALCULATION PROCEDURE (see Figure 9.1).



Figure 9.1 Assign Tax Procedure to Country

Now you must maintain the tax codes for each country through Transaction FTXP. The tax code is a two-digit code used to represent taxable and nontaxable items. I0 is the code used to represent taxes when no tax is applicable, and I1 is the tax code used when tax is applicable.

You maintain tax codes I0 and I1 in the configuration step. The following values are maintained: I0 (No Tax) and I1 (Full Tax). Figure 9.2 shows the screen displaying the details for Full Tax I1. The values maintained for taxes are standard values that are usually maintained. Figure 9.2 displays the three taxes determined: A/P SALES TAX 1 EXP. (VS1) with 6% for state, A/P SALES TAX 2 EXP. (VS2) with 1% for county, and A/P SALES TAX 3 EXP. (VS3) with 1% for city taxes.

Maintain Tax Code: Tax Rates

Properties Tax accounts Deactivate line

Country Key United States
 Tax Code A/P sales tax, 6%State 1%County 1%City distribute
 Procedure
 Tax type Input tax

Percentage rates

Tax Type	Acct. Key	Tax Percent. Rate	Level	From Lvl	Cond
Base Amount			100	0	BASB
A/P Distributed			200	0	
A/P Sales Tax 1 Inv.	NVV		210	100	AP1I
A/P Sales Tax 2 Inv.	NVV		220	100	AP2I
A/P Sales Tax 3 Inv.	NVV		230	100	AP3I
A/P Sales Tax 4 Inv.	NVV		240	100	AP4I
A/P Undistributed			300	0	
A/P Sales Tax 1 Exp.	VS1	6,000	310	100	AP1E
A/P Sales Tax 2 Exp.	VS2	1,000	320	100	AP2E
A/P Sales Tax 3 Exp.	VS3	1,000	330	100	AP3E
A/P Sales Tax 4 Exp.	VS4		340	100	AP4E

Figure 9.2 Tax Code I1 Setup

In the next section, let's look at the condition record maintenance.

Maintain Condition Records

The next step is to maintain the condition records for NAVS (tax condition type) with one of the access sequences shown using Transaction MEK1. In our example,

we choose the access sequence that has Material/Plant/Origin/region combination as an example. Because the tax percentages are derived from Transaction FTXP, the AMOUNT field is maintained as "0.00" here even for I1 (taxable) items.

To maintain condition records, follow these steps:

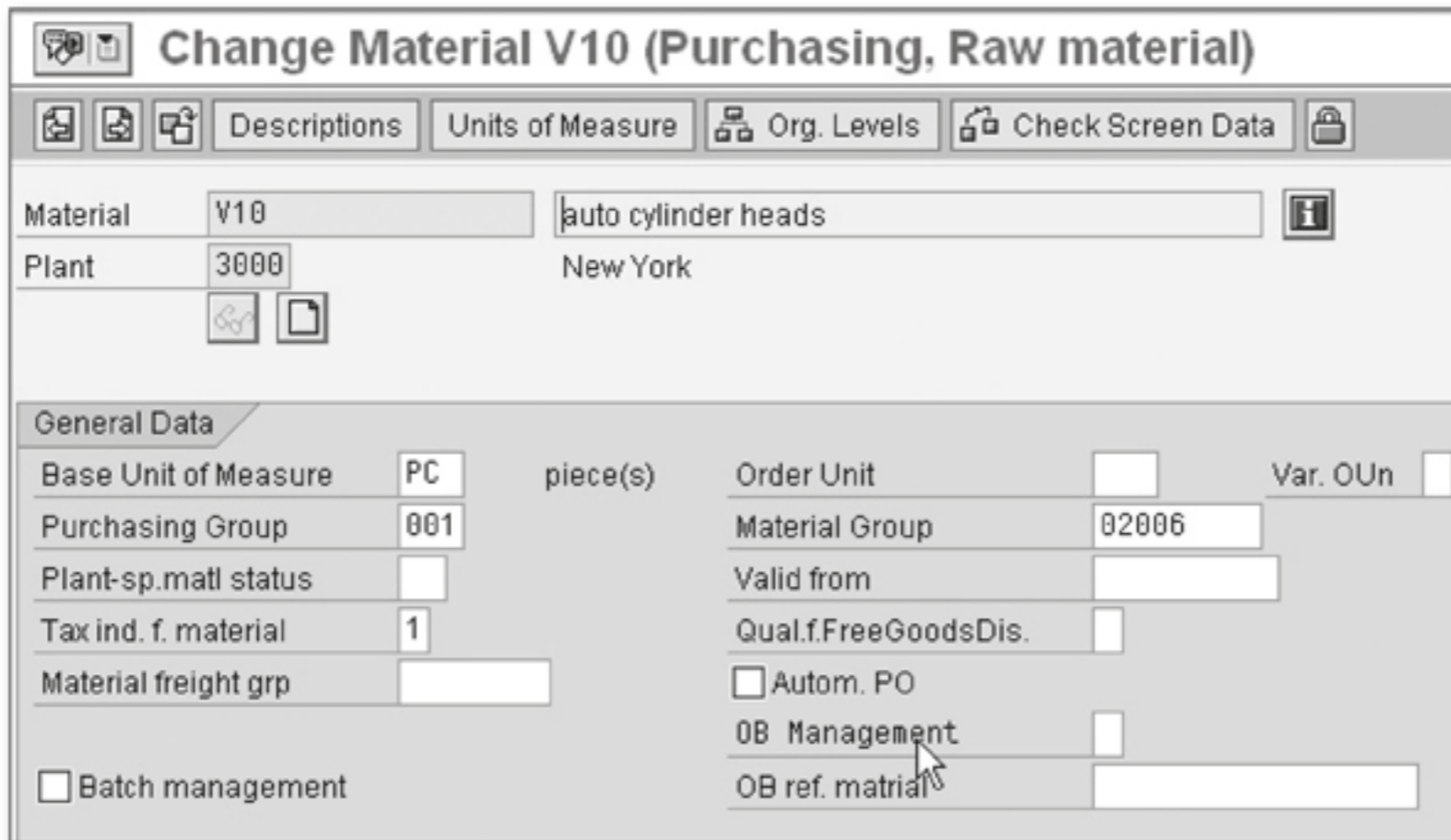
1. Follow the menu path SAP EASY ACCESS • LOGISTICS • MATERIALS MANAGEMENT • PURCHASING • MASTER DATA • CONDITIONS • OTHER • CREATE (MEK1).
2. Enter tax condition type "NAVS" in the input screen. The values that are maintained for various combinations are shown in Figure 9.3.

Display Non-Deductible Tax (NAVS) : Overview										
Destination Country		US		United States						
Valid On		12.10.2010								
Taxes: Material, Plant, Origin and Region										
T	T	I	R	Name	Amount	Unit	Valid From	Valid to	Tax ...	W/t ...
			0	Same region	0,00		12.10.2010	31.12.9999	I0	
1	0	0	1	Different region	0,00		12.10.2010	31.12.9999	I0	
1	0	1	0	Same region	0,00		12.10.2010	31.12.9999	I0	
1	0	1	1	Different region	0,00		12.10.2010	31.12.9999	I0	
1	1	0	0	Same region	0,00		12.10.2010	31.12.9999	I1	
1	1	0	1	Different region	0,00		12.10.2010	31.12.9999	I1	
1	1	1	0	Same region	0,00		12.10.2010	31.12.9999	I1	
1	1	1	1	Different region	0,00		12.10.2010	31.12.9999	I1	

Figure 9.3 Condition Records for Tax Determination

3. Materials are specified as being taxable or not by using the material master records. Access the material master screen through Transaction MM01 (Material Master Create) or Transaction MM02 (Material Master Change). Follow the menu path SAP EASY ACCESS • LOGISTICS • PURCHASING • MASTER DATA • MATERIAL MASTER • CREATE/CHANGE.
4. When you enter the transaction code, it asks you to specify the material by presenting you with a pop-up window. Select the views where you want the data to be maintained. Specify whether the material is taxable or nontaxable in the purchasing view, as shown in Figure 9.4.

5. Go the purchasing view by selecting the PURCHASING view in the Transaction MM01 (Material Master Create) or Transaction MM02 (Material Master Change).
6. Enter the value "1" in the TAX IND. F MATERIAL field for taxable materials and a value of "0" for nontaxable materials. Figure 9.4 displays the tax indicator that is identified in the material master record.



Change Material V10 (Purchasing, Raw material)

Material: V10 | auto cylinder heads

Plant: 3000 | New York

General Data

Base Unit of Measure	PC	piece(s)	Order Unit		Var. OUn	<input type="checkbox"/>
Purchasing Group	001		Material Group	02006		
Plant-sp.matl status	<input type="checkbox"/>		Valid from			
Tax ind. f. material	1		Qual.f.FreeGoodsDis.	<input type="checkbox"/>		
Material freight grp			<input type="checkbox"/> Autom. PO			
<input type="checkbox"/> Batch management			OB Management	<input type="checkbox"/>		
			OB ref. material			

Figure 9.4 Specify the Tax Indicator in the Material Master

Now that you've set up the configuration required for tax calculation and the master data for tax condition types, let's see how the tax calculation works on the PO.

Purchase Order

To access the PO creation configurations, follow these steps:

1. Use Transaction ME21N, or follow the menu path SAP EASY ACCESS • MATERIALS MANAGEMENT • PURCHASING • PURCHASE ORDER • CREATE OR CHANGE.
2. Input the PURCHASING DOCUMENT TYPE NB, the MATERIAL, QUANTITY, and so on. Select the INVOICE tab to display the TAX CODE I1 that is selected automatically based on the TAX INDICATOR "1" in the material master and the configuration settings (see Figure 9.5).

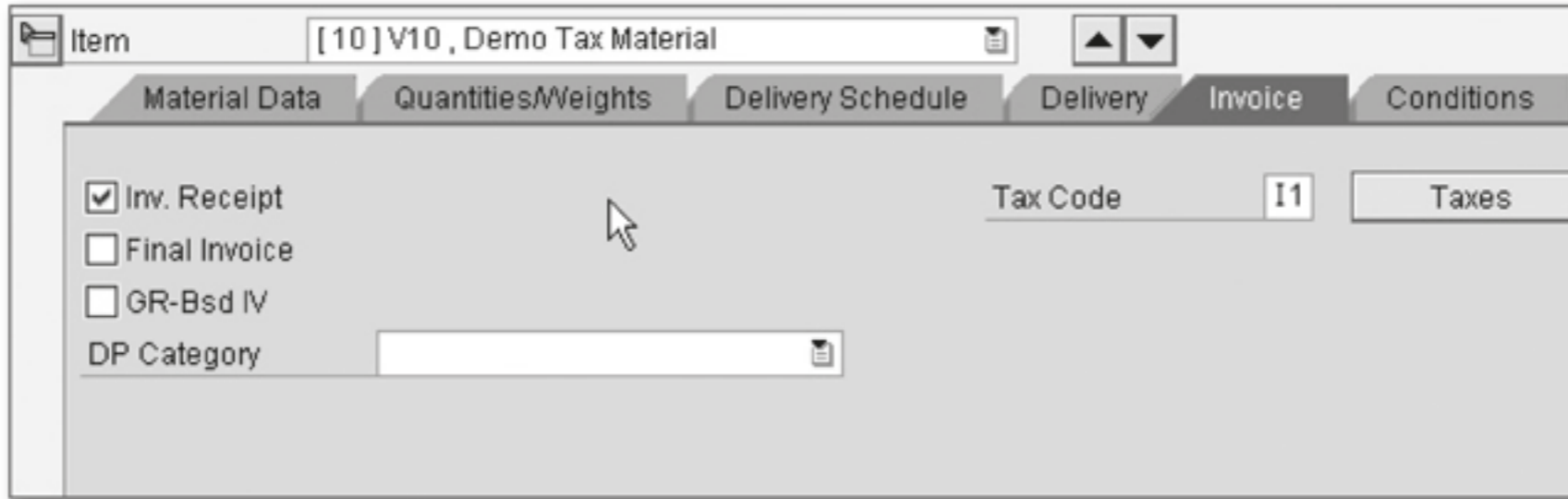


Figure 9.5 Tax Code I1 Selected by Condition Technique

3. Select the TAXES button to display the taxes as shown in Figure 9.6. This figure displays how the taxes have been calculated for a taxable material. The TAX CALCULATION screen shows the values that were defined using Transaction FTXP. This shows that the total input tax is 8%.

Item	10	Material	V10
		Net	100,00 USD
		Tax	8,00

Pricing Elements									
	N	CnTy	Name	Amount	Crcy	per	U..	Condition value	Curr.
<input type="checkbox"/>			BASB Base Amount					100,00	USD
			A/P Distributed	100,00	USD	1		100,00	USD
			A/P Undistributed	100,00	USD	1		100,00	USD
<input type="checkbox"/>			AP1E A/P Sales Tax 1 Exp.	6,000	%			6,00	USD
<input type="checkbox"/>			AP2E A/P Sales Tax 2 Exp.	1,000	%			1,00	USD
<input type="checkbox"/>			AP3E A/P Sales Tax 3 Exp.	1,000	%			1,00	USD
			A/P Use Tax Distribu	108,00	USD	1		108,00	USD
			<input checked="" type="checkbox"/> Sales Tax	108,00	USD	1		108,00	USD

Figure 9.6 Tax Procedure TAXUS Triggered to Calculate 8% Input Tax

4. When you are in the PO screen, go to ITEM • CONDITION.
5. Go to the TAX ANALYSIS screen as shown in Figure 9.7, where an analysis on taxes can be run. This screen shows the tax procedure, tax conditions, and corresponding tax percentages. The values shown on the screen provide a way of confirming that the correct tax procedure, tax conditions, and values are derived.

Procedure	Description	View		
▼ TAXUS	Sales Tax - USA	Overview		
BASB	Base Amount	Condition type	Message	Description
A/P Distributed		BASB	207	Condition has been found (without
▶ AP1I	A/P Sales Tax 1 Inv.			
▶ AP2I	A/P Sales Tax 2 Inv.	A/P Distributed	200	Subtotal
▶ AP3I	A/P Sales Tax 3 Inv.			
▶ AP4I	A/P Sales Tax 4 Inv.	AP1I	009	Condition record is missing
A/P Undistributed		AP2I	009	Condition record is missing
▼ AP1E	A/P Sales Tax 1 Exp.	AP3I	009	Condition record is missing
▼ 10(MWST)	Tax Classification	AP4I	009	Condition record is missing
<input type="checkbox"/> 6,000 %	I1			
▼ AP2E	A/P Sales Tax 2 Exp.	A/P Undistributed	200	Subtotal
▼ 10(MWST)	Tax Classification			
<input type="checkbox"/> 1,000 %	I1	AP1E	208	Condition record has been found
▼ AP3E	A/P Sales Tax 3 Exp.	AP2E	208	Condition record has been found
▼ 10(MWST)	Tax Classification	AP3E	208	Condition record has been found
<input type="checkbox"/> 1,000 %	I1			
▼ AP4E	A/P Sales Tax 4 Exp.			

Figure 9.7 Tax Condition Analysis

Next, let's look at planned delivery costs.

9.1.2 Planned Delivery Costs

Certain costs are taken into account for delivering goods. These are costs that can be associated with your goods delivery, freight, or insurance, and they are accounted within your transactions. These costs can be determined either at the time of creating the PO or later in the process, when the vendor has delivered the goods and services. When the delivery costs are known in advance, they are called *planned delivery costs*. On the other hand, if the costs are only known at the time of delivery or invoicing, they are called *unplanned delivery costs*.

Sometimes the planned delivery costs can also be related to another vendor. In this case, a specific vendor can be entered for delivery costs at the time of invoice in the DETAILS tab. Unplanned delivery costs are not entered at the time of PO. They are entered at the time of invoice.

Example

A leading medical devices company, Probics Inc., manufactures medical devices such as stents, diagnostic products, X-ray machines, and so on. The company procures the components that make up these medical devices from a vendor called Medico. Medico is a fairly large-scale vendor that owns its own fleet of carriers to deliver the products to Probics Inc. The vendor charges freight and unloading charges, which are determined at the time of creating the PO. These charges are communicated in advance by the vendor because Medico has a fairly accurate way of predicting the delivery costs, having done business with Probics for a long time.

To set up this scenario, the freight charges are maintained as a freight condition type FRA1 or FRA2. The freight charges can be maintained on the PO as illustrated in Figure 9.8.

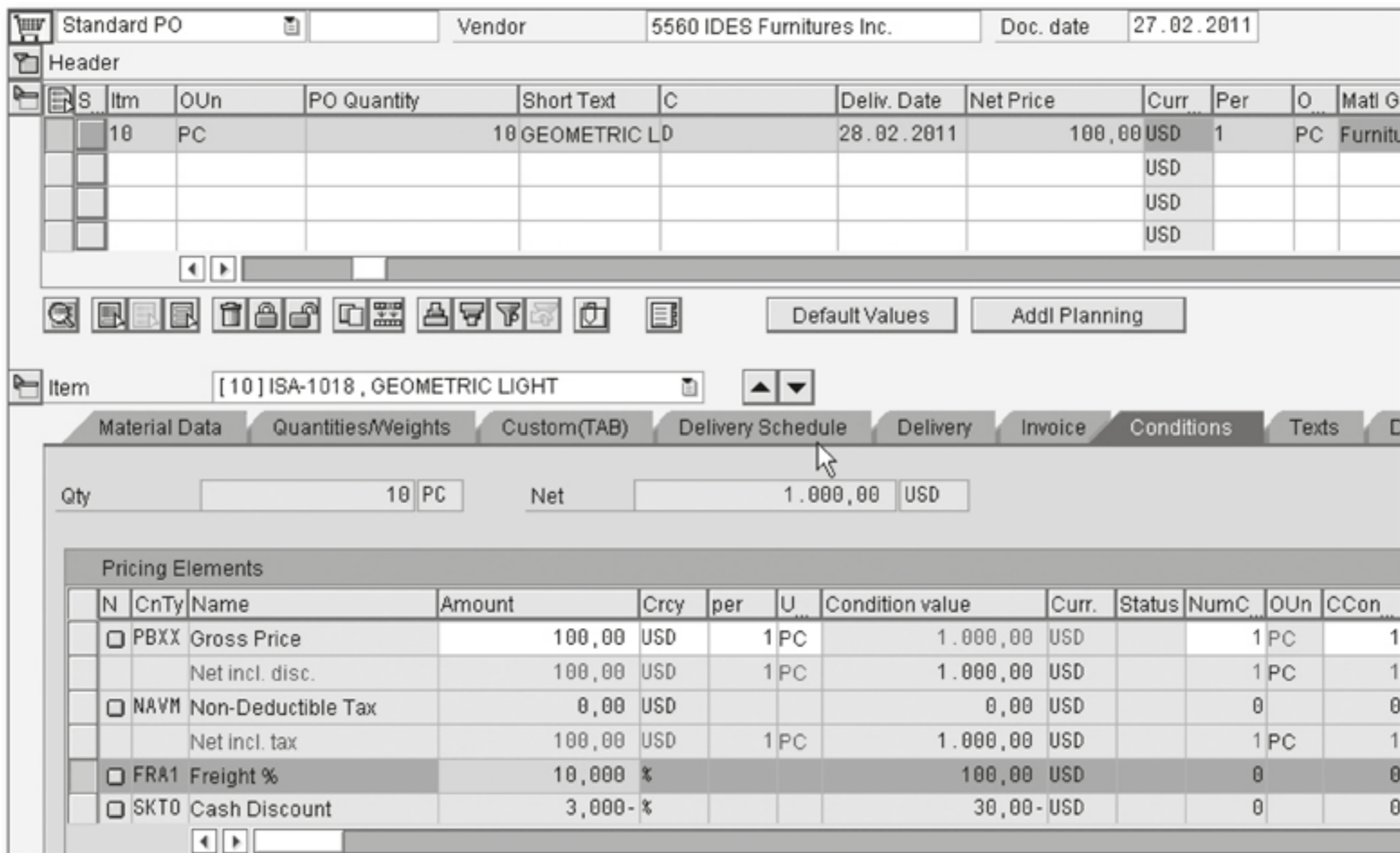


Figure 9.8 Planned Delivery Costs

In this example, if the carrier for Probics Inc. is different from the carrier for Medico, then the freight charges can be defined for this carrier on the PO as well. This can be done by entering a different vendor/carrier for the freight charge FRA1.

To do this, go to the PO line item, select the CONDITIONS tab, select the freight CONDITION TYPE "FRA1", and choose the CONDITION DETAIL Icon (magnifying glass). Go to the details of the freight condition, and enter the carrier/vendor in the VENDOR field as shown in Figure 9.9.

Item - Conditions - Detail			
Item	10	Application	M
Condition type	FRA1	Freight %	CondPricingDate 27.02.2011
Condition values			
Amount	10,000	%	
Cond.base value	1.000,00	USD	
Condition value	100,00	USD	
Control			
Condition class	A	Discount or surcharge	
Calculat.type	A	Percentage	<input checked="" type="checkbox"/> Statistical
Condit.category	B	Delivery costs	<input checked="" type="checkbox"/> Accruals
Cond.control	C	Changed manually	<input checked="" type="checkbox"/> Changed manual.
Condit.origin	C	Manually entered	
Account determination			
Account key	FRE		
Accruals	FR1		
		Vendor	7000

Figure 9.9 Item Condition Display with the Freight Condition Type FRA1 Details

Now, let's review unplanned delivery costs that might impact your purchase price.

Unplanned Delivery Costs

As we already mentioned, unplanned delivery costs are not entered at the time of PO but at the time of invoice. Continuing with the example of Probits Inc., if the carrier charges additional freight costs, this can be entered at the time of invoice as shown in Figure 9.10.

The screenshot shows the SAP Invoice Details screen. The 'Transaction' is 'Invoice' and the 'Balance' is 0,00 USD. The 'Details' tab is active, showing the following fields:

Unpl. Del. Csts	200	Exch. Rate	1,00000
Currency	USD	Inv. Party	5560
Doc. Type	Gross inv. receipt	Bus. Area	
Assignment		G/L	160000
Header Text		Planning Day	13.03.2011
Plg level	F1		

The 'Vendor 0000005560' information is displayed on the right:

Company: IDES Furnitures Inc.
 Crossroad 10-17
 ATLANTA GA 30345
 Phone: 002-885-900
 Bank acct: 8890889
 First Union Bank & Trust, Main Office

The 'PO reference' section shows 'Purchase Order/Scheduling Agreement' 4500017442. The 'Material' section shows 'Goods/service items'.

Item	Amount	Quantity	Or...	Purchase...	Item	Smart Number
1	1.000,00		10 PC		4500017442	10

Figure 9.10 Unplanned Delivery Costs Entered on the Invoice

This screen displays the delivery cost, which is maintained for any unplanned delivery document within the invoice, as agreed with your vendor PO. The unplanned delivery cost is maintained within the DETAILS area of the screen: UNPL DEL. CSTS of \$200.

Next, let's move on to the impact of the foreign currency exchange as it applies to the document.

9.1.3 Foreign Currency

Currency is another special topic that plays an important role in overall determining the value of the purchase price. Based on the vendor location, the PO might be issued in a different currency, which means the documents might be using different local currencies. The currency conversion needs to be understood, since the pricing determination impacts the value determined for the product or service sold or bought and finally accounted for. This requires manually changing the currency on the PO to the necessary currency.

Sometimes, it's necessary to issue POs in a currency that is different from your document currency, so you'll need to change the currency manually.

Example

The default currency is USD for a vendor based out of Germany. The currency has to be changed to Euros when issuing the PO to the vendor. Probics Inc. wants to source the goods from Asia and Europe, so the company might be dealing with two different currencies. From a profitability point of view, Probics needs to convert these transaction currencies into one standard company currency for accounting and another company currency against the sales price, in order to determine the profit margin and account postings.

The following steps need to be executed to change the currency manually:

1. Use Transaction ME22N to change the PO. On the PO, go to HEADER • DELIVERY/ INVOICE tab. The menu path is SAP EASY MENU • LOGISTICS • MATERIAL MANAGEMENT • PURCHASING • VENDOR UNKNOWN • CHANGE.
2. Enter the currency in which the PO has to be created in the CURRENCY field. In our example, we are using "EUR". The system calculates the net value based on the currency exchange that is defined in the system. If the exchange rate varies at the time of invoice, this new exchange rate can be entered at that time. You can change currency by updating the currency as shown in the CURRENCY field of the DELIVERY/INVOICE tab shown in Figure 9.11.
3. Enter the invoice amount using Transaction MIRO. The menu path is SAP EASY ACCESS • MATERIALS MANAGEMENT • LOGISTICS INVOICE VERIFICATION • DOCUMENT ENTRY • ENTER INVOICE.
4. Enter the new exchange rate in the EXCHANGE RATE field of the invoice.
5. Enter the PO number in the PO REFERENCE tab. Confirm that the balance shows as zero.
6. Save the invoice.
7. If the exchange rate cannot be changed, specify the rate as a fixed exchange rate in the EXCH. RATE FIXED indicator, as shown in Figure 9.11.

By selecting this indicator, the PO is being proposed in USD, even though the proposed currency is EUR in our example.

The screenshot shows the 'Create Purchase Order' window in SAP. At the top, there are navigation icons and buttons for 'Document Overview On', 'Hold', 'Print Preview', 'Messages', and 'Personal Setting'. Below this, the document type is 'Standard PO' and the vendor is '1000 DAVIN'. The document date is '12.10.2010'. The 'Delivery/Invoice' tab is active, showing various conditions and terms. The 'Payment Terms' are set to 'ZB01', with three options: '14 days 3,000 %', '30 days 2,000 %', and '45 days net'. The 'Currency' is set to 'EUR' and the 'Exchange Rate' is '1,00000'. There is a checkbox for 'Exch. Rate Fixed' which is currently unchecked. The 'Incoterms' are set to 'EXW' and there is a checkbox for 'GR Message' which is also unchecked.

Figure 9.11 Foreign Currency Purchase Order

9.1.4 Weight-Dependent or Volume-Dependent Pricing

You can use the weight or volume to calculate the pricing, provided they are maintained in the documents. If your company maintains weight or volume data on the PO, the purchasing conditions can then calculate the pricing based on weight or volume. The calculation type for the condition has to be maintained as gross weight or volume dependent (D or F). This is done in configuration when defining the condition type by entering the calculation type for the condition as "D" or "F". This configuration step is explained in detail in Chapter 8, Section 8.2.1.

For example, let's say that pricing condition PB00 has been set with F (volume dependent), and the pricing condition record has been set as \$1.25 USD/CCM. Additionally, the material master has VOLUME = 10 CCM /1 EA. When a PO is raised for 10 EAs, the volume is 100 CCM, so the price is \$125 USD. This setup and calculation is shown in Figure 9.12.

The screenshot shows the 'Item' data for '[20] H11, Volume Condition Demo'. The 'Quantities/Weights' tab is active. It displays two columns of data for comparison. The left column shows the material master data: PO Quantity 10 EA, PO Qty in SKU 10 EA, Net Weight 2 KG /1 EA, Gross Weight 3 KG /1 EA, Volume 10 CCM /1 EA, and Points /1 EA. The right column shows the calculated values for the purchase order: Order Unit <-> Ord. Price Unit 1 EA <-> 1 CCM, Order Unit <-> SKU 1 EA <-> 1 EA, Net weight 20 KG /item, Gross weight 30 KG /item, Volume 100 CCM /item, and Points 0.000 /item.

Figure 9.12 Volume-Dependent Pricing Condition Calculation

Figure 9.12 displays the PO QUANTITY, ORDER UNIT, NET WEIGHT, GROSS WEIGHT, and VOLUME for the calculation. There are prices that are dependent on the PO item quantity to determine the unit price. Let's review this in the next section.

9.1.5 Conditions Dependent on Purchase Order Price Unit

The PO unit of measure can be different from the base unit of measure. The base unit of measure is the unit that is maintained within the material master basic view, in which the material is usually recorded for inventory or maintenance purposes. The sales and purchase units of measure might differ; for example, you might procure a complete roll of packing material from your vendor, then pack it in packages, store it in packages, and sell it in packages. Also, the PO price unit can be different from the PO unit.

Example

Confectioners Distribution procures candies from a vendor. These chocolates are marked up and eventually sold to customers. The chocolates are ordered in kilograms (KG) but are stocked in (EAs) or as individual items as pieces. Also, when the chocolates are procured from the vendor, the order price unit is in KG as well.

To configure this scenario, follow these steps:

1. You need to maintain the order price unit in a purchase info record (PIR) as shown in Figure 9.13. To maintain the variable order unit in the PIR, follow the menu path SAP EASY ACCESS • LOGISTICS • MATERIALS MANAGEMENT • PURCHASING • MASTER DATA • INFO RECORD • CHANGE.
2. Set the VAR. ORDER UNIT as ACTIVE by entering "1" so that the order unit can be changed on the PO.

Purchase Order Unit of Measure				
Order Unit	KG			
Conversion	2	KG	<->	1 EA
Var. Order Unit	1	Active		

Figure 9.13 Variable Order Unit Active for Purchase Order Unit of Measure (UOM)

3. Maintain the pricing condition on the PIR by defining the price per unit using the menu path LOGISTICS • MATERIALS MANAGEMENT • PURCHASING • MASTER DATA • INFO RECORD • CHANGE.
4. Maintain the order price unit as "KG" on the PIR. Use menu path SAP EASY ACCESS • MATERIAL MANAGEMENT • PURCHASING • MASTER DATA • INFO RECORD • CREATE.
5. Go to Transaction ME11, and enter the VENDOR, MATERIAL, PURCHASING ORGANIZATION, and PLANT as inputs on this screen.
6. Maintain the pricing condition record for a net price of \$12 USD per KG (KG is the order price unit).
7. Create a PO for this material. The purchasing price is calculated based on the KG unit of measure as shown. Notice that because the pricing conditions have been maintained for "KG", the PO quantity of 15 EA is converted to 30 KG and priced at \$260 USD.

The next section provides another aspect of purchasing that is linked to external service management.

9.2 External Services Management

You can use external services management within MM for services procurement. For example, several companies employ personnel for janitorial services such as cleaning stores, distribution centers, and so on. In addition to that, companies also employ contractors to work on software projects. Such services might include consulting services, labor, or maintenance tasks performed by external contractors. These services also include bid invitation, award of services, order placement, service order confirmation, and invoicing.

Pricing for external services is different from pricing for products because external services, such as consulting and janitorial services, are usually paid in terms of hours worked.

The master data used for external services is different from regular procurement. For example, where you use the material master in regular procurement, you use procurement service master records in external services. Figure 9.14 provides a pictorial representation of this cycle.

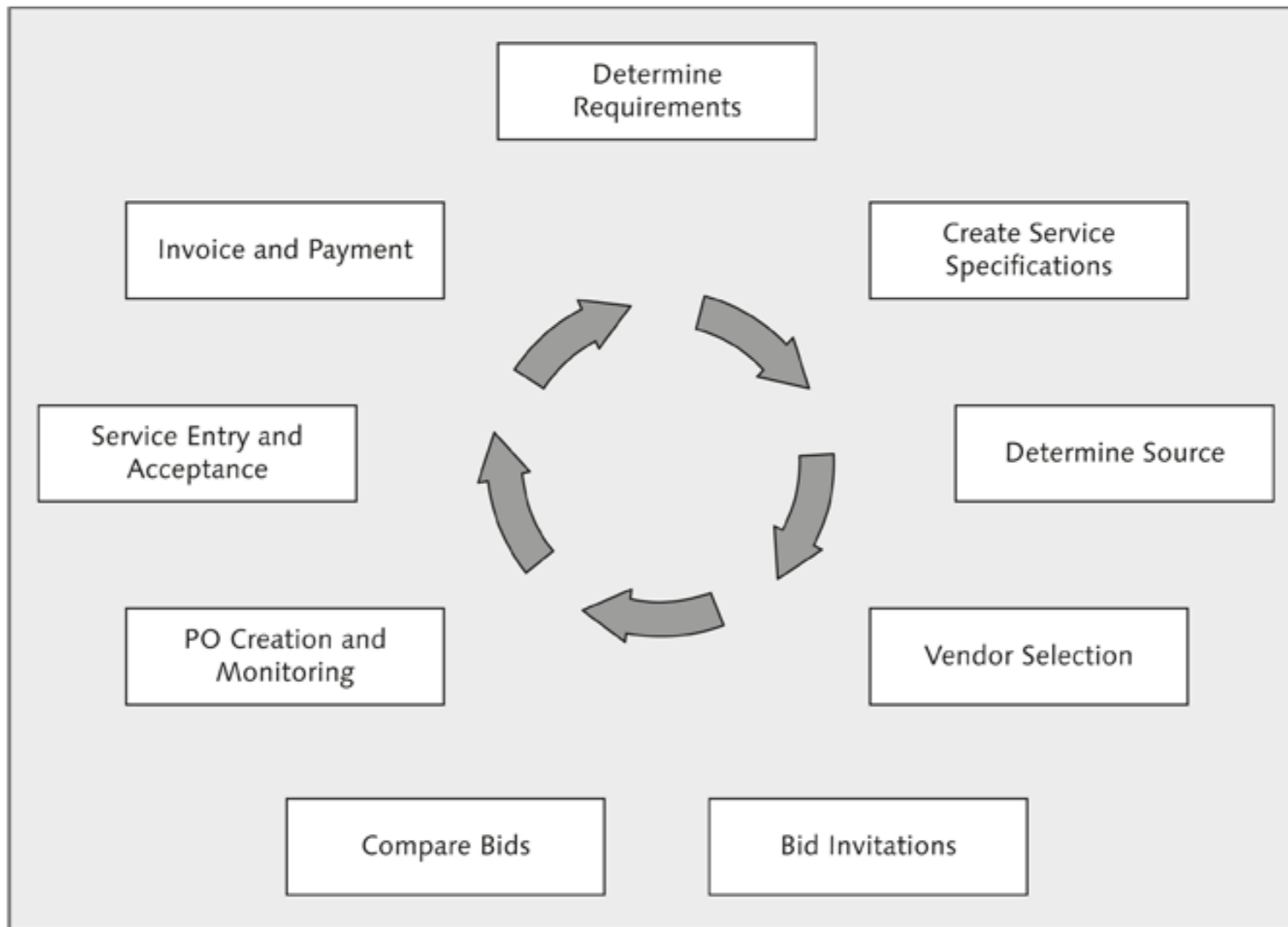


Figure 9.14 Service Procurement Cycle

The cycle starts with the determination of the requirement, and as a next step, the service specification or service order is created. This initiates the determination of the source and vendor selection. The bid from the vendors are received and compared for final selection. Following the finalization, the PO is created and issued to the vendor. After the service is rendered, the service entry is maintained and accepted. Finally, the invoice is entered, and payment is issued.

In the following sections, you'll learn about the master data required to perform external services management as well as how the pricing procedure and pricing conditions are set up.

9.2.1 Service Master

One of the key considerations for external service procurement is the service material master record. The service master condition record contains the description of the service rendered.

The service master can be set up using Transaction AC03. The menu path is SAP EASY ACCESS • LOGISTICS • MATERIALS MANAGEMENT • SERVICE MASTER • SERVICE.

After following this path, you should see the SERVICE MASTER screen as shown in Figure 9.15.

The screenshot shows the SAP Service Master screen for activity 18, 'Install purification T-piece'. The screen is divided into several sections:

- Activity Number:** 18, with the description 'Install purification T-piece'.
- Service Category:** Maint. Services - Ext. There are checkboxes for 'Short Txt Change Allowed' and 'Deletion Indicator'.
- Base Unit of Measure:** PC, with the unit 'piece(s)'.
- Basic Data:** This section contains:
 - Mat/Srv.Grp:** 007, with a dropdown arrow and the text 'Services'.
 - Division:** (empty)
 - Valuation Class:** ZUS1, with the text 'service 1'.
 - Formula:** (empty)
 - Graphic:** (empty)
 - Tax Tariff Code:** (empty)
 - Authorization Group:** (empty)
 - Tax Indicator:** (empty)
- Standard Serv. Cat.:** This section contains:
 - Service Type:** (empty)
 - SSC Item:** (empty)
 - Edition:** 0
- Additional Tabs:** A list of tabs is shown at the bottom: Time Mgmt, Purch. Data, Internal Work, and Long Txt.

Figure 9.15 Service Master

The service master contains several fields. The important fields for our discussion are described here:

- ▶ **VALUATION CLASS**
Provides a way to expense the correct General Ledger (GL) accounts when the services are performed.
- ▶ **MAT./SRV. GROUP in the BASIC DATA view**
Provides a way of grouping together various services performed. Reports can be run by the material group to identify the POs by material group.
- ▶ **STANDARD SERV. CAT.**
Differentiates different services according to usage.

The additional tabs can also be maintained for the service master:

- ▶ **PURCH. DATA tab**
Provides the key fields necessary for procuring external services. For example, EAN CATEGORY and EAN represent the unique European Article Number or

Universal Product Code (UPC) associated with the service. UPC is prevalent in the United States, and EAN is used in European countries. This number helps identify the service uniquely across all geographic regions. PURCHASING STATUS provides a way of controlling whether POs can be created for the services. If for some reason the service is no longer required, then a two-digit code can be maintained that blocks the service from being procured.

- ▶ **INTERNAL WORK** tab
Provides the conversion between the base unit of measure where the service master is stored and the conversion to the unit of work.
- ▶ **TIME MANAGEMENT** tab
Provides fields to categorize the wage that is paid to perform the service and a way of hierarchically relating the service to a higher level of service. For example, building roof or electrical installation services can be hierarchically grouped under house construction. Hierarchical services provide another way of grouping and categorizing services.

Now that you understand how service masters are set up, the next key considerations are the master conditions. The pricing conditions are defined by service masters that we just explored.

9.2.2 Service Master Pricing Conditions

The prices for services are stored in various ways. For example, the prices can be stored at the services level (market price/own estimate) as shown in Figure 9.16. The menu path for maintaining this feature is LOGISTICS • MATERIALS MANAGEMENT • SERVICE • SERVICE CONDITIONS • FOR SERVICE • ADD. Alternatively, you can use Transaction ML45 to access this function.

Figure 9.16 shows the service material of “Install purification T-Piece”, which represents the service performed. The service fee amounts to 120 USD.

Create Total Price Condition (PRS) : Fast Entry										
Service Conditions (Own Estimate)										
Activity	Description	Amount	Unit	per	U	C	S	Valid From	Valid to	
18	Install purification T-piece	120,00	USD	1	PC	C		08.11.2010	31.12.9999	

Figure 9.16 Price Maintenance by Service

Pricing conditions for services can be maintained by the vendor providing services for a manufacturing plant, distribution center, stores, and so on. The services can be priced specific to the plant using the menu path LOGISTICS • MATERIALS MANAGEMENT • SERVICE • SERVICE CONDITIONS • FOR SERVICE • FOR VENDOR WITH PLANT. Alternatively, the pricing conditions for services can be maintained by the vendor performing the service and can be applicable for any plant. This is called the "Vendor without Plant" pricing condition. The menu path for this is LOGISTICS • MATERIALS MANAGEMENT • SERVICE • SERVICE CONDITIONS • FOR SERVICE • FOR VENDOR WITHOUT PLANT. Alternatively, you can use Transaction ML39.

Figure 9.17 shows how this pricing condition is maintained by a vendor for a specific service activity identified by service material "Install Purification T-Piece" and the service charge accounted for 120 EUR.

Create Total Price Condition (PRS) : Fast Entry										
										
Purch. Organization		1000	IDES Deutschland							
Vendor		1021	Noe Tech Company AG							
Activities for Vendor										
Activity	Description	Amount	Unit	per	U...	C	S...	Valid From	Valid to	
18	Install purification T-piece	120,00	EUR	1	PC	C		08.11.2010	31.12.9999	

Figure 9.17 Price Maintenance by Vendor and Service

Similarly, prices can be maintained by vendor and plant, as shown in Figure 9.18. You can access the screen by following the menu path LOGISTICS • MATERIALS MANAGEMENT • SERVICE • SERVICE CONDITIONS • FOR SERVICE • FOR VENDOR WITH PLANT, or you can use Transaction ML33 to access it directly.

Create Total Price Condition (PRS) : Fast Entry										
										
Purch. Organization		1000	IDES Deutschland							
Vendor		1021	Noe Tech Company AG							
Plant		1000	Werk Hamburg							
Activities for Vendor with Plant										
Activity	Description	Amount	Unit	per	U...	C	S...	Valid From	Valid to	
18	Install purification T-piece	120,00	EUR	1	PC	C		08.11.2010	31.12.9999	

Figure 9.18 Price Maintenance by Vendor and Plant

After the prices are stored against the service, they are automatically proposed in pricing specifications. Now that you understand how the pricing conditions are maintained, let's see how the pricing procedure is determined for service items.

9.2.3 Pricing Procedure Determination for Services

The pricing procedure for services is maintained the same way as for stock items, which was discussed in Chapter 8 but the difference is that there is a separate customizing area for services. The menu path for defining services can be accessed through LOGISTICS • MATERIALS MANAGEMENT • EXTERNAL SERVICES MANAGEMENT • MAINTAIN CONDITION FOR SERVICES (see Figure 9.19).

Choose Activity	
Activities	
Perf.	Name of Activity
	Conditions: Condition Types
	Access: Maintain (Price Services)
	Create Condition Table (Service)
	Change Condition Table (Services)
	Display Condition Table (Services)
	Conditions: Schema for Services
	Variable Calculation Schema for Services
	Conditions: Exclusion Indicator

Figure 9.19 Pricing Procedure Determination for Services

As shown in Figure 9.19, the condition types, access sequences, condition tables, and so on are maintained the same way as for regular POs. Now let's maintain the calculation schema for services by following these steps:

1. Select the option **CONDITIONS: SCHEMA FOR SERVICES**. The calculation schema is defined here as shown in Figure 9.20.
2. After the calculation schema has been defined, you need to assign it to the appropriate document category. For example, if the pricing procedure has to be determined for POs, then the calculation schema has to be defined by document category "F" and the purchasing document type (e.g., "NB"). You do this by selecting **VARIABLE CALCULATION SCHEMA** in Figure 9.20. This is identified

by the VARIABLE CALCULATION SCHEMA FOR SERVICES configuration step, as seen in Figure 9.21.

Step	Co.	CTyp	Description	Fro	To	Ma	R	Stat	P	SuTot	Reqt	CalTy
5	1	PRS0	General Price Compon			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	X			
5	3	PRS1	Percentage of Wage			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	X			
5	5	PRS2	Overheads			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	X			
5	7	PRS3	Misc Price Component			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	X			
10	0		Overall Pricing Components	5	5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	X	6		
12	1	PRS	Total Price			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	X	5		
12	2	PRXS	Total Price			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	X	5	5	
13	0	PRS4	Relevant Value			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				10

Figure 9.20 Calculation Schema for Service Pricing Procedures

As shown in Figure 9.21, pricing procedure ZSV000 has been defined for a combination of DOC. CAT. "F" and purchasing document TYPE "NB".

Doc. cat.	Type	Doc. Type	Description	Proc.	Description
A	AN	RFQ		MS0000	Performance Procedure
B	EC	Purch.requis. EBP		EBP000	Performance Procedure EBP
B	NB	Purch.requis. Stand.		MS0000	Performance Procedure
F	EC	Purch.requis. EBP		EBP000	Performance Procedure EBP
F	NB	Purch.requis. Stand.		ZSV000	Services Pricing Procedure
K	GCTR	Value contract		EBP000	Performance Procedure EBP
K	LSRM	Sched. agreement/SRM		EBP000	Performance Procedure EBP

Figure 9.21 Service Pricing Procedure Determination

When a PO is created, then the pricing procedure ZSV000 is used to determine the pricing procedure. In a similar way, the pricing procedures for services can be determined for contracts, quotations, and so on, by a combination of the document category and document type. Figure 9.22 illustrates how the pricing procedure is determined in the PO.

The pricing procedure is determined based on a combination of document category types. For example, the pricing procedures for services for value contracts can be defined uniquely by a combination of the document category "K" (contract document category) and document type "GCTR" (value contract document type). This results in the determination of pricing procedure "EBP000".

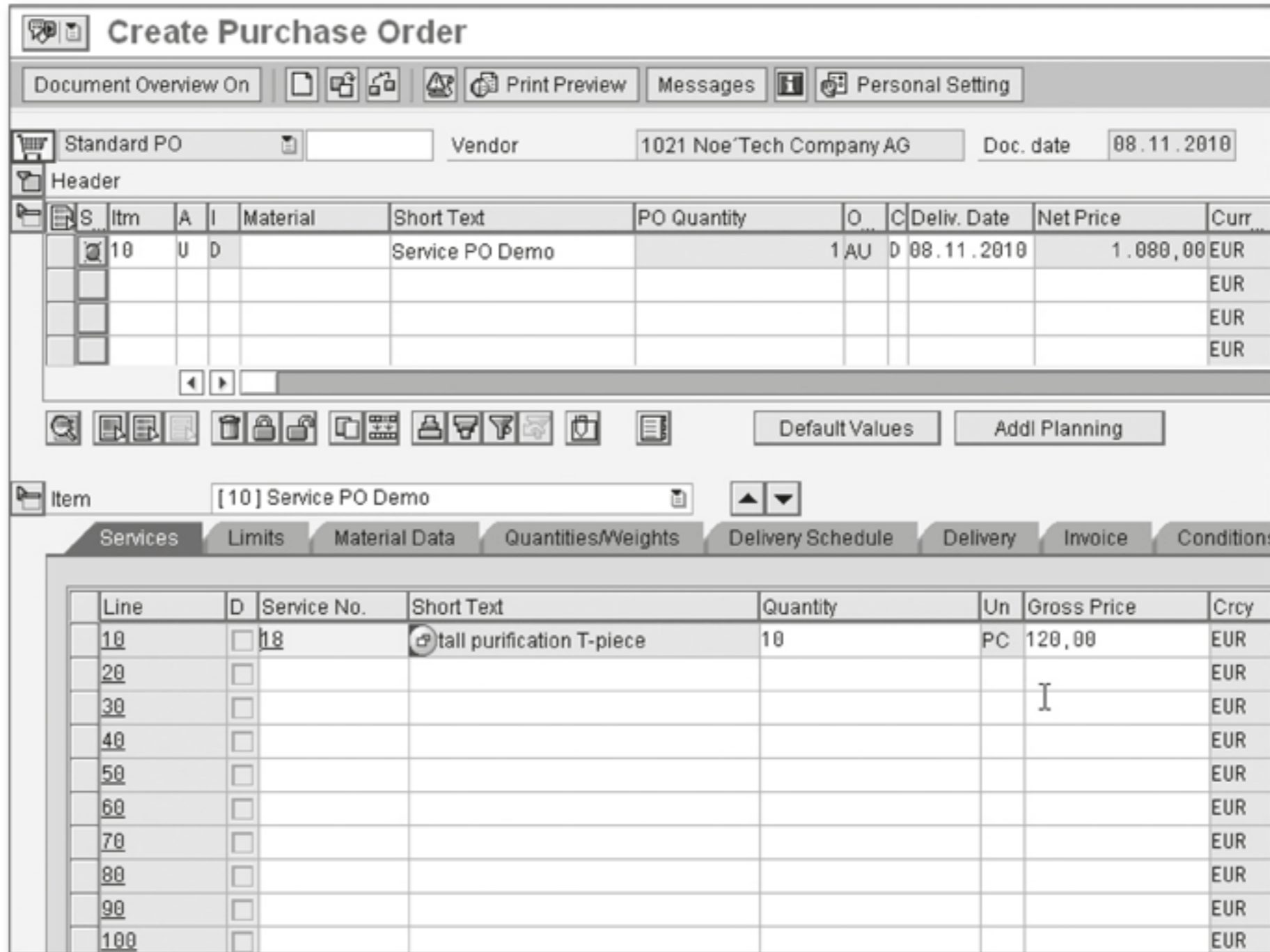


Figure 9.22 Service Purchase Order Creation

Note that POs for service items require using item category "D" (service item category). Also, because no material is entered, an account assignment category "U" (unknown) is used as an example. The pricing analysis in Figure 9.23 shows that the pricing procedure ZSV000 has been determined based on the combination of document category "F" and the purchase document type "NB".

Because pricing condition PRS has been maintained for the purchasing organization, plant, and vendor, the price of \$120 USD has been determined.

The screenshot shows the SAP Analysis Pricing interface. On the left, a tree view displays the pricing procedure structure under ZSV000. The right pane shows an 'Overview' table of conditions.

Procedure	Description
ZSV000	Services Pricing Pr...
PR00	General Price Com...
PR01	Percentage of Wage
PR02	Overheads
PR03	Misc Price Compon...
PR04	Overall Pricing Comp
PR05	Total Price
10(0010)	Contract Condition...
20(0010)	Contract Condition...
30(0010)	Activities for Vendor...
120,00 E	0000000000000000...
40(0010)	Activities for Vendor
50(0010)	Activities + Purchas...
60(0010)	Service Conditions ...

Condition type	Message	Description
PR00	001	Manual condition
PR01	001	Manual condition
PR02	001	Manual condition
PR03	001	Manual condition
Overall Pricing Comp	200	Subtotal
PR05	208	Condition record has been found
PR0X	111	Condition ignored (requirement 005 not fulfilled)
PR04	207	Condition has been found (without condition record)

Figure 9.23 Pricing Analysis

9.3 Summary

In this chapter you learned about sales/use taxes, how you can set them up by country, and how the taxes are calculated. This knowledge will be very useful when you set up taxes for your own company.

You also learned how pricing can be influenced by ordering units, weight/volume, and so on. This gives you an alternative way of pricing POs with the order units the vendors are familiar with instead of the base SKUs of your own company. Also, this is done automatically by the system.

Another takeaway from the information in this chapter is that freight/transportation costs can be maintained by different vendors on the same POs and that unplanned delivery costs can also be captured by the system. You can think about how unplanned costs are currently captured in your company and how you can manage it more effectively.

Finally, you learned that external services are priced differently from inventoried items. With this knowledge, you can set up pricing for external services for your company.

In the next chapter, we'll explore a completely different topic: variant configuration.

Variant configuration allows you to vary the products with changes to the component; variant configuration pricing helps support this business process. You'll learn how products that have various options, such as cars, are priced.

10 Variant Configuration Pricing

As a consumer, you want products such as cars and computers to have multiple options when they are being sold. In a business sense, however, you'll know that with options comes complexity. For example, computers have the very basic options of desktops and laptops. Desktops come with various options for monitors (32-inch, 16-inch, etc.). Memory, CPU, and other accessories all come in different capacities and sizes. So how can we price all of these various options for these products? Variant configuration provides the answer. In this chapter, you'll learn about the terms specific to variant configuration—classes and characteristics, configurable materials, configuration profiles—and understand how all of these variables help set up variant configuration pricing.

To understand the concept of variant configuration, let's consider an example of a customer buying a car. There are always several options, such as choosing a regular model, sports model, or SUV model. Within each of these models come several other choices. For instance, the wheels can be alloy wheels or regular wheels. There can also be several color choices for both the interior and exterior.

Variant configuration provides a flexible way of managing products that have a large number of parts and options. Variant configuration is used in various industries such as high-tech, aerospace, chemicals, automotive, and many others.

Variant configuration is integrated with multiple applications within SAP ERP such as the material master, Sales, Purchasing, classification, MRP, and production orders. To understand variant configuration, it's useful to understand some basic terminology within variant configurations, which we'll discuss next.

10.1 Variant Configuration Terms

It's important to understand some of the terms that make up variant configurations because these are used across the different configurations. Knowing these terms will help you understand how variant configuration is constructed and applied in your business world. Some of the terms that are commonly used are characteristics, class, and dependencies, among others listed here:

► **Characteristics**

Characteristics are defining features of a product; for cars, this might be the various features that influence the model, engine, and color. These characteristics can have different values, which directly influence pricing. For example, the color of the car can be silver, black, or red. Characteristics are assigned to a class. Transaction CT04 is used to maintain characteristics. The menu path is SAP EASY ACCESS • CROSS APPLICATION COMPONENTS • CHARACTERISTICS.

► **Class**

Class represents the grouping of characteristics. For variant configuration, class 300 is used. For example, the various characteristics such as CPU, case color, case model, RAM, and so on, are all grouped together under a class named PC_CLASS. Transaction CL02 is used to maintain classes. The menu path is SAP EASY ACCESS • CROSS APPLICATION COMPONENTS • CLASSES.

► **Dependencies**

Dependencies are how combinations of features are controlled. For example, leather interiors are available only for sports or luxury models. Dependencies help control the combination of options that are not allowed.

► **Configurable material**

Because products such as cars can have numerous options, it's not necessary to create a material for each of these variations. These variations might constitute different materials, and configurable materials that consist of a bill of material (BOM) can be used to construct it. A configurable material is basically a material that contains all of the various possible options that can go with a configurable product, such as a car. By assigning class 300 (variants), which groups together these various options, it provides a more efficient way of representing complex products such as cars and computers.

Configurable materials are represented with material type KMAT. In SAP ERP, they represent configurable products. To create a configurable material, you use Transaction MM01 and choose material type KMAT.

► **Super BOM**

A super BOM (bill of materials) represents all of the possible components that go into making a configurable product. The BOM contains not only components that are used only for specific variants but also components that are used in all variants. A super BOM has additional functions such as assigning object dependencies to the BOM items. For example, a BOM for a laptop can contain all of the hard disks variations, (7GB, 9.2GB, 15GB, etc.) and keyboard variations (e.g., Standard keyboard Spain, Standard keyboard France, etc.). In addition, a dependency can be built between these various options. For example, you can choose a component desktop standard case only for a 7GB hard disk drive. The Transaction to create a BOM is CS01. The menu path is SAP EASY ACCESS • PRODUCTION • MASTER DATA • BILL OF MATERIAL • CREATE.

► **Super routine**

A super routing represents all possible operations in making a product. For example, in computer manufacturing or assembly, where there are several ways to make a product, the routing describes the different ways to make the final product computer. For example, different size hard drives, different types of keyboards in various languages, and clock speed of 5 GHz and 10 GHz are all possible variations. Super routing provides the capability to store all of these different operations by keeping records of the different routing with the master data of routing.

► **Configurable profile**

The configurable profile controls the configuration process in the sales order. This is similar to the control settings, which retain the configuration of the product that is ordered within the sales order. Transaction CU41 is used for maintaining the configurable profile. The menu path is SAP EASY ACCESS • MATERIAL MANAGEMENT • MASTER DATA • ENVIRONMENT • CONFIGURABLE PROFILE • CREATE.

Figure 10.1 shows the various factors that need to be taken into consideration for variant configuration. Characteristics, classes, object dependencies, configurable BOMs and routings, as explained here, are elements needed for variant configuration to work. Materials, configuration profiles, and object dependencies (constraints, selection conditions, and procedures) are all necessary to make variant pricing work as well.

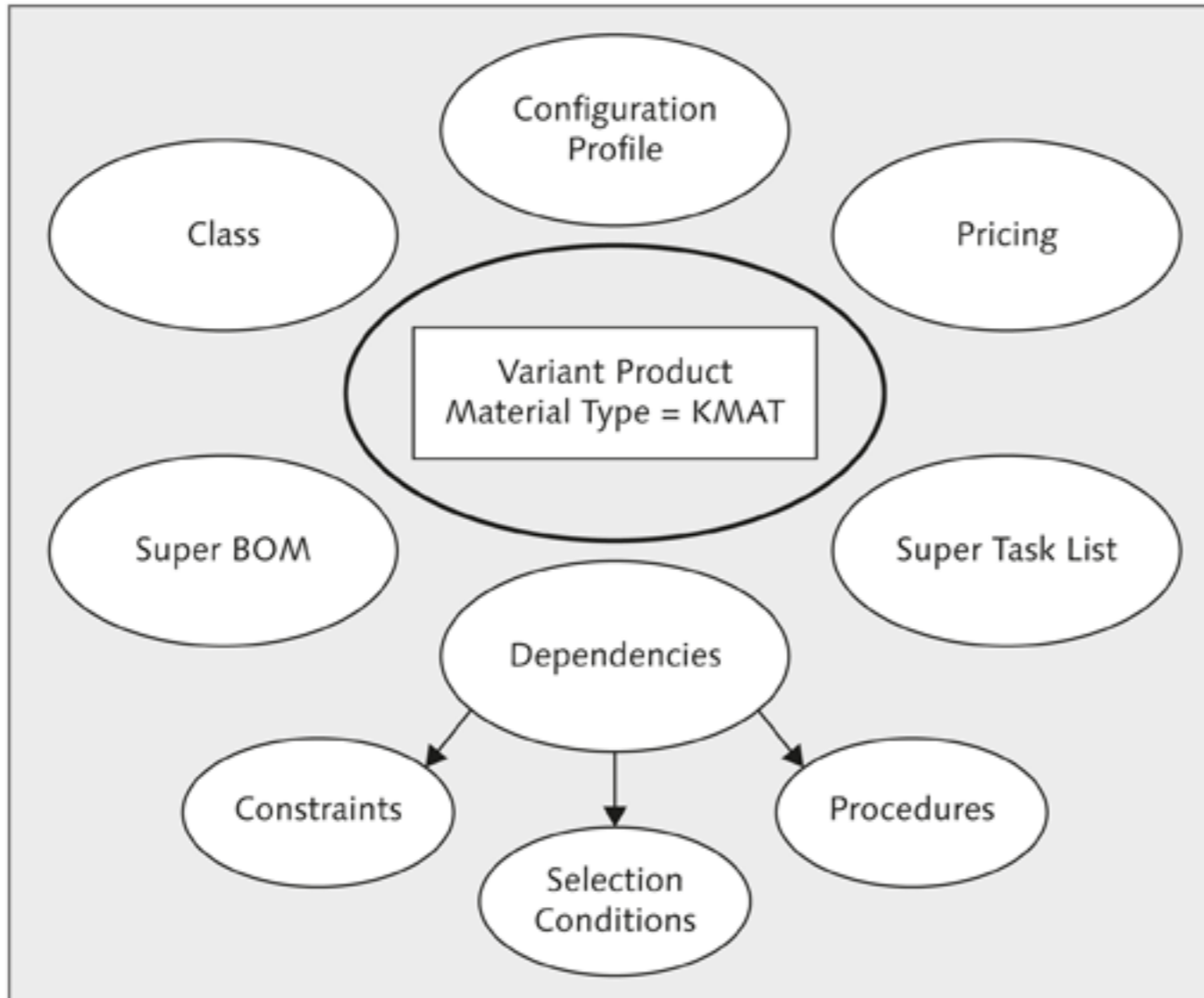


Figure 10.1 Variant Configuration Key Elements

Next, let's review the variant configuration pricing parameters.

10.2 Variant Configuration Pricing Parameters

Now that you understand some basic terminology, let's consider the key elements that are required to set up pricing using variant configuration pricing. We'll use Pinnacle Computers as an example, which is in the business of manufacturing and selling computers.

Let's say that Pinnacle is selling a desktop. This desktop comes with various components such as RAM, CPU, keyboards, and monitors. Each of the components comes with various options. For example, RAM can be 32, 64, or 128 MB. Now let's see how we can enable this desktop for pricing.

10.2.1 Set Up the Configurable Material Master

The first step in variant configuration is to set up the material master using material type KMAT (configurable material). To set up the material master, use Transaction

MMK1 or navigate to the menu path SAP EASY ACCESS • LOGISTICS • MATERIAL MASTER • MATERIAL • CREATE (SPECIAL) • SELECT CONFIGURABLE MATERIAL. Alternatively, use Transaction MM02, and enter the "KMAT" in the MATERIAL TYPE field.

You also need to set the material up with ITEM CATEGORY 0002, which represents the configuration item category (see Figure 10.2).

The screenshot shows the SAP MM02 transaction for material T-AQ300. The material description is 'Desktop PC6/54'. The 'Descriptions' section shows the material description in English (EN), Romanian (RO), Slovenian (SL), and Hungarian (HR). The 'General data' section shows the following fields:

Base Unit of Measure	PC	piece(s)	Material Group	012
Old material number	IDES: DPC6		Ext. Matl Group	
Division	07	Lab/Office		
Product allocation		Prod.hierarchy	001250010000000100	
X-plant matl status	<input type="checkbox"/>	Valid from		
<input type="checkbox"/> Assign effect. vals		GenitemCatGroup	0002	Configuration

Figure 10.2 Variant Configuration Item Category Assignment

In configuration, this item category group is assigned to item category TAC (variant configuration), and this item category is relevant for pricing (see Figure 10.3). The subordinate item category TAE is not relevant for pricing.

Note

Item category 0002 represents pricing done at the header level. In other words, the components of this superior material are not relevant for pricing and are for informational purposes only. For example, when a computer is priced, the pricing is shown only at the header level as the total of all of the components that make up the laptop. The component level items—CPU, RAM, or case type—are not priced.

SaTy	ItCGr	Usg.	HLevtCa	DfltC	MitCa	MitCa	MitCa	
OR	0002			TAC	01			▲
OR	0002		TAC	TAE				▼

Figure 10.3 Variant Configuration Item Category

Item category 0004 is also used when pricing is done at the component level, which is associated with item category TAM and is not relevant for pricing. The subordinate order items have item category TAN. Order items with this item category transfer requirements and are relevant to pricing. For example, when a computer is priced, the pricing is shown only at the component level as the total of all of the accessories that make the laptop. The pricing at the component level items—such as CPU, RAM, and case type—are priced.

When setting up the material master for variant configuration, you have to choose the item category group "0004" or "0002", depending on whether the pricing is done at the header level or item level.

Set Up Class

For variant configuration, class type 300 is used to create classes. Classes represent a way of grouping various characteristics together.

Figure 10.4 shows how a class is set up. The menu path for setting up a class is SAP EASY ACCESS • CROSS APPLICATIONS COMPONENTS • CLASSIFICATIONS • MASTER DATA • CLASSES. You can also use Transaction CL02.

To set up the class, perform the following steps:

1. In the CL02 overview screen, manually enter CLASS "DPC1" and CLASS "300" (variant class).
2. Press , and go to the Basic DATA screen. Enter a DESCRIPTION, set the STATUS as "Released", enter the class group as "PC", and save.

Variant configuration class assignments are assigned to the material and the class type. We now need to set up the characteristics as the next step.

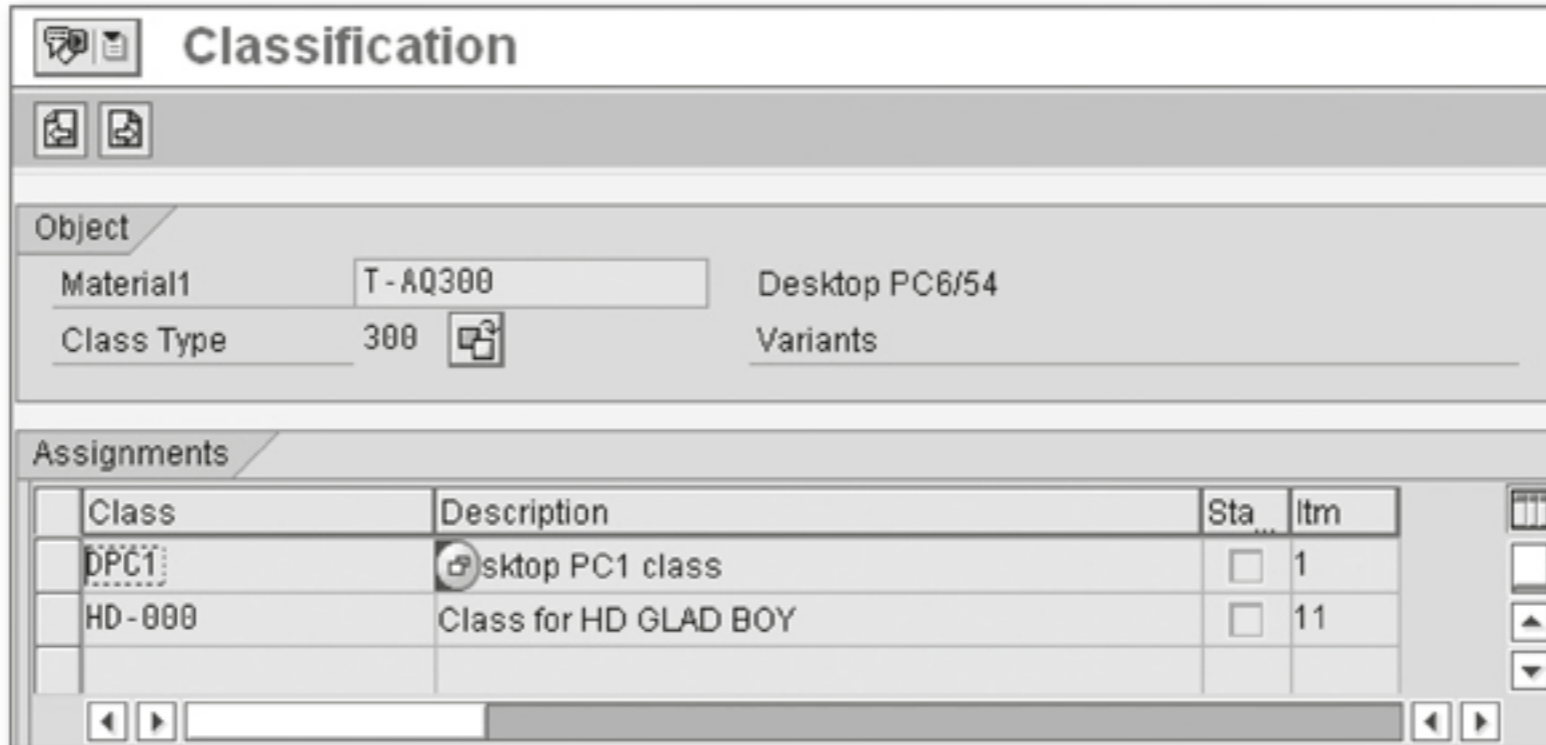


Figure 10.4 Variant Configuration Class Assignment

Set Up Characteristics

Characteristics provide the flexibility to define the various options for a product variant. Characteristics represent the features of the product. Each characteristic can have multiple values. Let's take the example of the computer, with different options to choose from, in terms of the clock speed of the computer and memory, which might in combination determine the computer model that has a set list price.

The material is associated to characteristics by assignment to class type 300 and CLASS DESKTOP CLASS. The menu path for setting up characteristics is SAP EASY ACCESS • CROSS APPLICATIONS COMPONENTS • CLASSIFICATIONS • MASTER DATA • CHARACTERISTICS or you can access the screen directly with Transaction CT04. You can assign multiple characteristics to the same class.

Perform the following steps:

1. On the overview screen of Transaction CT04, enter the CHAR. (e.g., "DPCX_CASE"). Enter the DESCRIPTION of the characteristic, enter the characteristic group, and set the status as released.
2. Define possible options for the characteristic in the VALUES tab by defining an ID and DESCRIPTION for each option. For example, for DPCX_CASE, the possible values are the following:
 - ▶ Description: Standard Casing, Id-0001
 - ▶ Description: Slim Casing, Id-0002

3. Save the characteristics you just created. Figure 10.5 displays the characteristics associated with the class, and Figure 10.6 displays the typical characteristics value.

The screenshot shows the SAP Variant Configuration Pricing interface for class DPC1. The 'Char.' tab is active, displaying a table of characteristics. The table has columns for Char., Description, Data, N, D, Unit, R, Org. Areas, Std, O, I, and Origin. The 'R' column contains checkboxes, with the checkbox for 'DPCX_RAM_QUANTITY' checked. The 'O' and 'I' columns contain empty checkboxes.

Char.	Description	Data	N	D	Unit	R	Org. Areas	Std	O	I	Origin
DPCX_COUNTRY	Country / desktop PC	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_CASE	Case Type for Desktop PC	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_DESIGN_CASE_R	Case material	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_DESIGN_CASE_COLOR	Case color	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_DESIGN_CASE_SLOT	Number of slots	NUM	1	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_CPU	Processor for Desktop PC	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_RAM_QUANTITY	RAM for Desktop PC	NUM	3	0		<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_RAM_8MB	Quantity of 8 MB RAM-Mod	NUM	1	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_RAM_16MB	Quantity of 16 MB RAM-Mod	NUM	1	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_RAM_32MB	Quantity of 32 MB RAM-Mod	NUM	1	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_HDD	Hard disk for desktop PC	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_FDD	additional drives	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_MONITOR	Monitor	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_ACCESSORIES	PC Additional Cards	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
DPCX_KEYBOARD	Keyboard for desktop PC	CHAR	3	0		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	

Figure 10.5 Characteristic Values

4. Repeat these steps for each characteristic that needs to be set up.
5. When you're finished, assign all of the characteristics you created in this manner to class DPC1 in Transaction CL02 in the CHAR. tab as shown in Figure 10.5.

In Figure 10.6, we can see the assignment of characteristics and Class, as well as the associated characteristics' values. Now that we have defined the characteristics' value, we need to set up the configuration profile.

Display Characteristic

Class: DPC1 Desktop PC1 class
 Class Type: 300 Variants
 Characteristic: DPCX_MONITOR Monitor

Basic data | Descriptions | **Values** | Addnl data | Restrictions

Additional Values Other Value Check

Char. Value	Description	D	O	S
001	Monitor 17 inch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
002	Monitor 21 inch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 10.6 Variant Configuration Characteristics

10.2.2 Setting Up the Configuration Profile

The configuration profile allocates a configurable material to a class that has characteristics for describing the configurable product. To create a configuration profile, follow these steps:

1. Follow the menu path SAP EASY ACCESS • LOGISTICS • CENTRAL FUNCTIONS • VARIANT CONFIGURATION • CONFIGURATION PROFILE • CREATE (or use Transaction CU41).
2. In the dialog box, select MATERIAL as the object. Enter "T-AQ300" as a configurable material name in the MATERIAL field.
3. The configuration profile has a BASIC DATA screen where the configuration parameters are set and the Configuration Initial screen. Figure 10.7 displays the configuration parameters set up with process where this applies, Sales Order, Order BOM and if you want the component to show up, then select COMPONENT AVAILABILITY under Order Functions section, as shown in the Figure 10.7. When the SALES ORDER (SET) indicator is selected, relevant sales order components are shown as subitems of the header material.
4. In the CONFIGURATION PROFILE OVERVIEW screen, enter "T-AQ300" as the PROFILE NAME and "300" as the CLASS TYPE. Press to continue to the next screen, which is shown in Figure 10.8

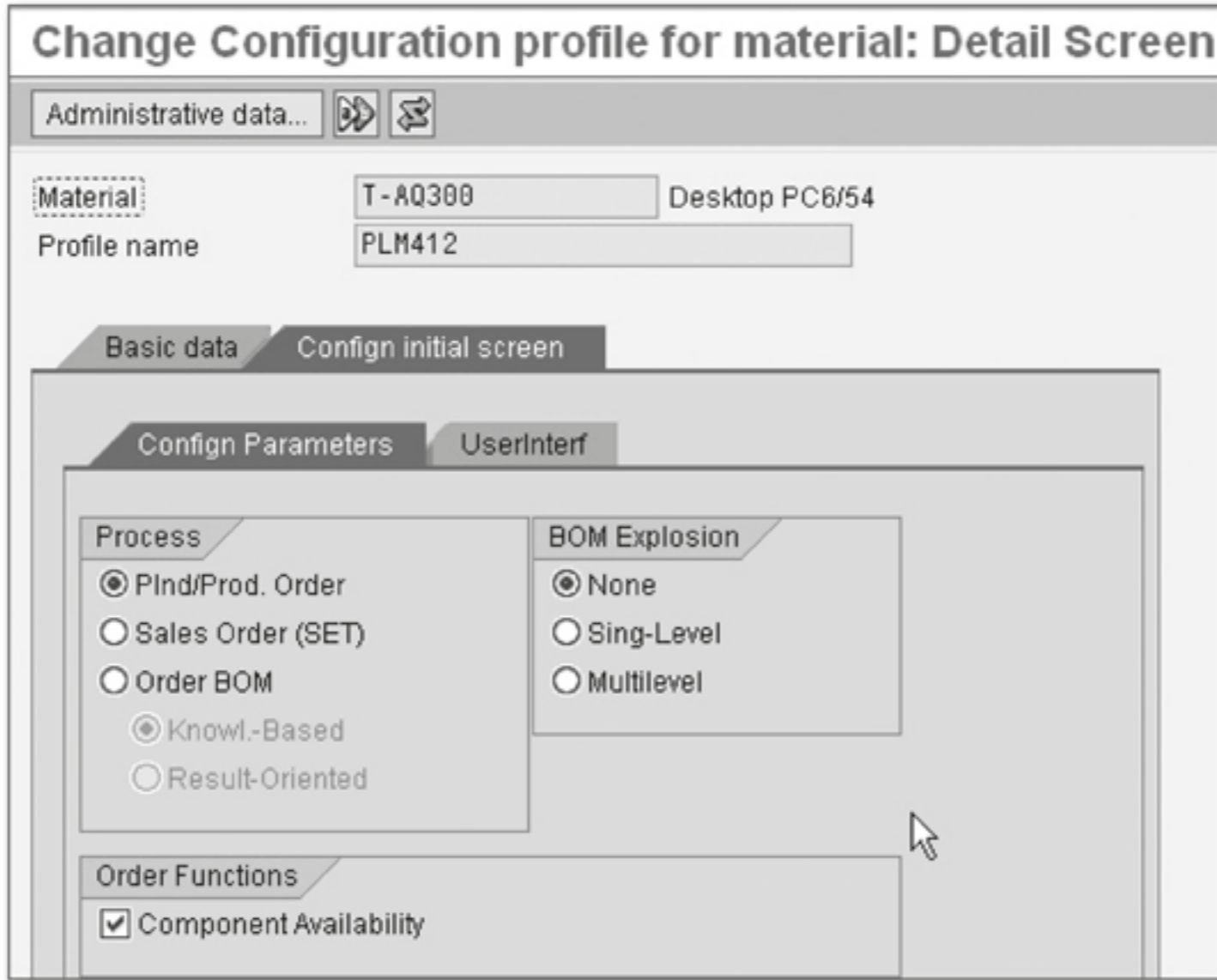


Figure 10.7 Variant Configuration Profile

Figure 10.8 shows how a configuration profile has been set up for material T-AQ300. It has a 21-inch monitor and a 7 GB E-IDE hard disk.

Characteristic Value Assignment		
Char. description	Characteristic Value	Inf.
Country / desktop PC	USA	
Case Type for Desktop PC	design case	
Case material		
Case color		
Number of slots		
Processor for Desktop PC	700 MHz CPU	
RAM for Desktop PC	32	
Quantity of 8 MB RAM-Modules	8	
Quantity of 16 MB RAM-Modules	0	
Quantity of 32 MB RAM-Modules	0	
Hard disk for desktop PC	7 GB E-IDE hard disk	
additional drives	3.5 inch Floppy drive	
Monitor	Monitor 21 inch	
PC Additional Cards		
Keyboard for desktop PC	US keyboard	
Voltage / power supply	100-120 Volt / 60 Hz	
Hard disk controller card	IDE card	
Number of cards	0,000	
Country	California	

Figure 10.8 Characteristics Value Assignment

By defining these configuration profiles, you can build dependencies between each component that are specific to the configuration profile.

Multiple configuration profiles can be set up for a material. The purpose of the configuration profile is to provide options at the time of creating a sales order. By defining various configuration profiles, you can minimize the amount of data entry required for each option. If an object has multiple configuration profiles, you must select a profile during configuration. You can only make changes to a configuration with the profile that you first used to configure the object.

Next, let's look at setting up the variant conditions.

10.2.3 Setting Up Variant Conditions

The configuration profile has several screens. Fields are shown or hidden depending on what you enter for the BOM explosion and configuration process. The parameters you maintain apply to the material as a header material in a BOM structure. You cannot define separate settings for a configurable material as an assembly. An assembly is used as a mechanism to construct a product, and a configurable material is a variable option used to come up with the final product.

Variant conditions determine the price of a configurable material based on the characteristics and characteristic values used to describe these configurable materials. To use a variant condition, you must create characteristics called *reference characteristics* that refer to table fields.

Follow these steps to create a reference characteristic:

1. Set up the CHARACTERISTIC "SURCHARGE2" using Transaction CT02. Enter the description, status (released), data type as character format, and number of characters as "26" in the BASIC DATA tab.
2. In the ADDNL DATA tab shown in Figure 10.9, enter the TABLE NAME "SDCOM" and FIELD NAME "VKOND". Select the indicators NOT READY FOR INPUT and NO DISPLAY. This characteristic is not displayed because the values are inferred from the condition records, and no value can be assigned to the characteristic on the CHARACTERISTIC VALUE ASSIGNMENT screen.
3. Save the characteristic you just created.

Change Characteristic

Characteristic: SURCHARGE2

Change Number: []

Valid From: 29.10.2010

Validity: []

Basic data | Descriptions | Values | **Addnl data** | Restrictions

Reference to Table Field

Table Name: SDCOM | Field Name: VKOND

Document

Document: []

Document Type: []

Document Part: []

Doc. Version: []

Procedure for Value Assignment

Not Ready for Input

No Display

Display Allowed Values

User Entry Handling

Unformatted Entry

Figure 10.9 Characteristic Change View

Next, you need to assign the reference characteristic "SURCHARGE2", which you've already set up. This characteristic value for SURCHARGE2 is determined from the table, unlike other characteristics, where the user defines the value set. You can create several pricing reference characteristics that refer to one table field, but creating only one pricing reference characteristic for all of the configurable materials is considered a best practice. This is good from a consistency point of view because the same reference characteristic is used for the pricing of all of the configurable materials. This makes maintaining characteristics easier. To assign the reference characteristic, follow these steps:

1. Assign the characteristic value to class DPC1. To create a reference characteristic, follow the menu path SAP EASY ACCESS • LOGISTICS • CENTRAL FUNCTIONS • VARIANT CONFIGURATION • ENVIRONMENT • CLASSIFICATION • MASTER DATA • CHARACTERISTICS, or alternatively use Transaction CT04.

2. Enter the name "SURCHARGE2" for the reference characteristics in the CHARACTERISTIC field. Go to the ADDITIONAL DATA tab, and enter "SDCOM" in the TABLE NAME field and "VKOND" in the FIELD NAME field.
3. Select the indicators NOT READY FOR INPUT and NO DISPLAY. This characteristic is not displayed because the values are inferred from the condition records, and no value can be assigned to the characteristic on the CHARACTERISTIC VALUE ASSIGNMENT screen.
4. Assign reference characteristic "SURCHARGE2" to the class DPC1, which we created in the first step. Unlike other characteristics, reference characteristics do not require you to maintain basic data for reference characteristics because the basic data (such as description and data format) is copied from the referenced table field. You can change these entries if you need to though. By default, the reference characteristic is a multivalue characteristic.

10.2.4 Setting Up Variant Pricing Conditions

Variant configuration uses special pricing condition types, which we discussed in Chapter 9. In this chapter, we'll discuss how to set up variant pricing conditions as well as how to build dependencies between the various components to influence pricing. Your standard SAP ERP system provides the following condition types:

- ▶ **VA00:** Surcharge/discount is expressed as an absolute amount.
- ▶ **VA01:** Surcharge/discount is expressed as a percentage.

Custom pricing conditions can also be created with reference to condition types VA00 or VA01. The prices are determined according to the placement of the condition type in the pricing procedure. Variant conditions help maintain variant keys and the corresponding surcharges for various characteristic values.

To create a variant condition, follow the menu path SAP EASY ACCESS • LOGISTICS • SALES AND DISTRIBUTION • MASTER DATA • CONDITIONS • SELECT USING CONDITION TYPE • CREATE, or alternatively use Transaction VK11. Condition type ZK01 has been created as a copy of VA00, and several variants have been maintained for condition type ZK01 as shown in Figure 1.10. Custom condition types are created when the standard variant condition types do not meet the requirements. For example, if the variant condition has to be set up by sales organization/distribution channel

and material group, then a custom variant condition is required because this is not available as standard.

In this case, we are demonstrating the creation of a variant custom condition type.

Change Variant Costs Condition (ZK01) : Overview										
Sales Organization		1000	Germany Frankfurt							
Distribution Channel		10	Final customer sales							
Material1		T-AQ300	Desktop PC6/54							
Valid On		28.10.2010								
Variants										
Variant	Description	Amount	Unit	per	U	C	S	Valid From	Valid to	
CASE_001		75,00	EUR		1	PC	C	16.06.2005	31.12.9999	
DISK_001		200,00	EUR		1	PC	C	16.06.2005	31.12.9999	
MON_001		300,00	EUR		1	PC	C	16.06.2005	31.12.9999	
PROC_001		100,00	EUR		1	PC	C	16.06.2005	31.12.9999	

Figure 10.10 Define Pricing Condition Records for Variants

Following the setup of the pricing condition records for variants, we need to set up the object dependencies.

10.2.5 Setting Up Object Dependencies

Object dependencies are used to describe the interdependencies among characteristics, characteristics values, and BOMs for checking the consistency and completeness of the configuration. They are also used for inferring values of the characteristics. The following subsections give the basic definitions of each of the types that SAP ERP supports.

Preconditions

A *precondition* is used to define whether a specific characteristic value can be used or whether the value can be assigned to a specific characteristic. This dependency type is applicable only for characteristics and characteristic values.

An example of how this is defined is when material T-AQ300 has characteristic PROCESSOR, which has values 700, 733, and 750 Megahertz CPUs. T-AQ300 also

has the characteristic RAM Memory, which has 16-, 32-, or 64 MB associated with it. A precondition can be defined that a 700 Megahertz CPU cannot be used with 16 MB RAM. To achieve this, following these steps:

1. Create a dependency by using Transaction CU01 or by navigating the menu path SAP EASY ACCESS • LOGISTICS • CENTRAL FUNCTIONS • VARIANT CONFIGURATION • DEPENDENCY • SINGLE DEPENDENCY • CREATE.
2. Enter the DEPENDENCY ID "Z_DPCI_PRECONDITION", the DESCRIPTION, and the DEPENDENCY TYPE as shown in Figure 10.11.

Change Dependency: Basic Data

Dependency editor | Descriptions

Dependency: Z_DPCI_PRECONDITION SCE Format

General Data

Description: 16 MB RAM Dependency Documentation

Status: 1 Released

Dependency Group:

Maintenance Auth.:

Dependency Type

Precondition Action Selection condition Procedure

Administrative Data

Created By: IDADMIN Created On: 29.10.2010

Changed By: Changed On:

Figure 10.11 Define Preconditions Basic Data

3. Add a code by selecting the DEPENDENCY EDITOR button as shown in Figure 10.11.

Example

In this example, the system should determine the close speed based on the CPU of the computer configuration.

Select DEPENDENCY EDITOR, and insert the following code:

```
// Not (DPCX_CPU = '001'). DPCX_CPU with value "001" refers to 700 MHz CPU//.
```

This code will be assigned to characteristic DPCX_RAM_QUANTITY with value "16" (16 MB RAM). The purpose of this code is to ensure that when a desktop has 16 MB RAM, a 700 MHz CPU cannot be selected.

4. Assign the precondition defined to Z_DPCI_PRECONDITION created in the prior step to the CHAR. VALUE DPCX_RAM_QUANTITY, where the value is 16 MB RAM. Figure 10.12 displays the assignment.

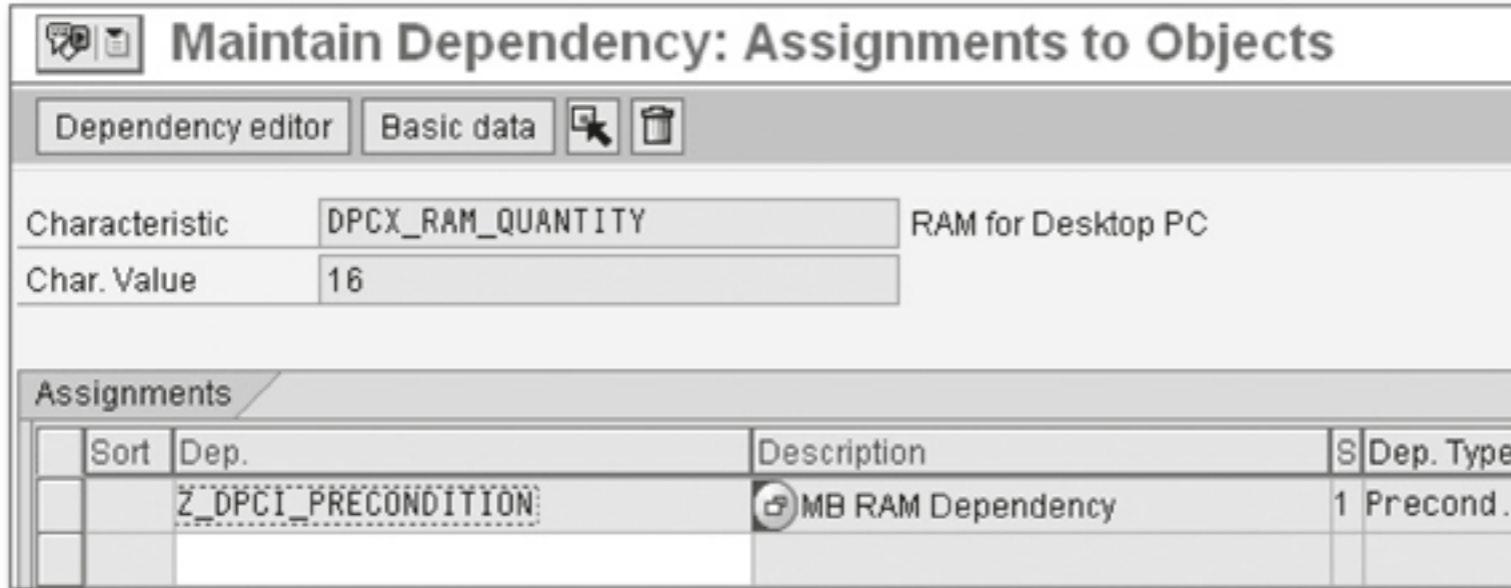


Figure 10.12 Assigning a Precondition to a Characteristic

Now the 16 MB RAM cannot be chosen with a 700 MHz CPU. If the 16 MB RAM quantity is chosen inadvertently, the system issues an error message, as shown in Figure 10.13.

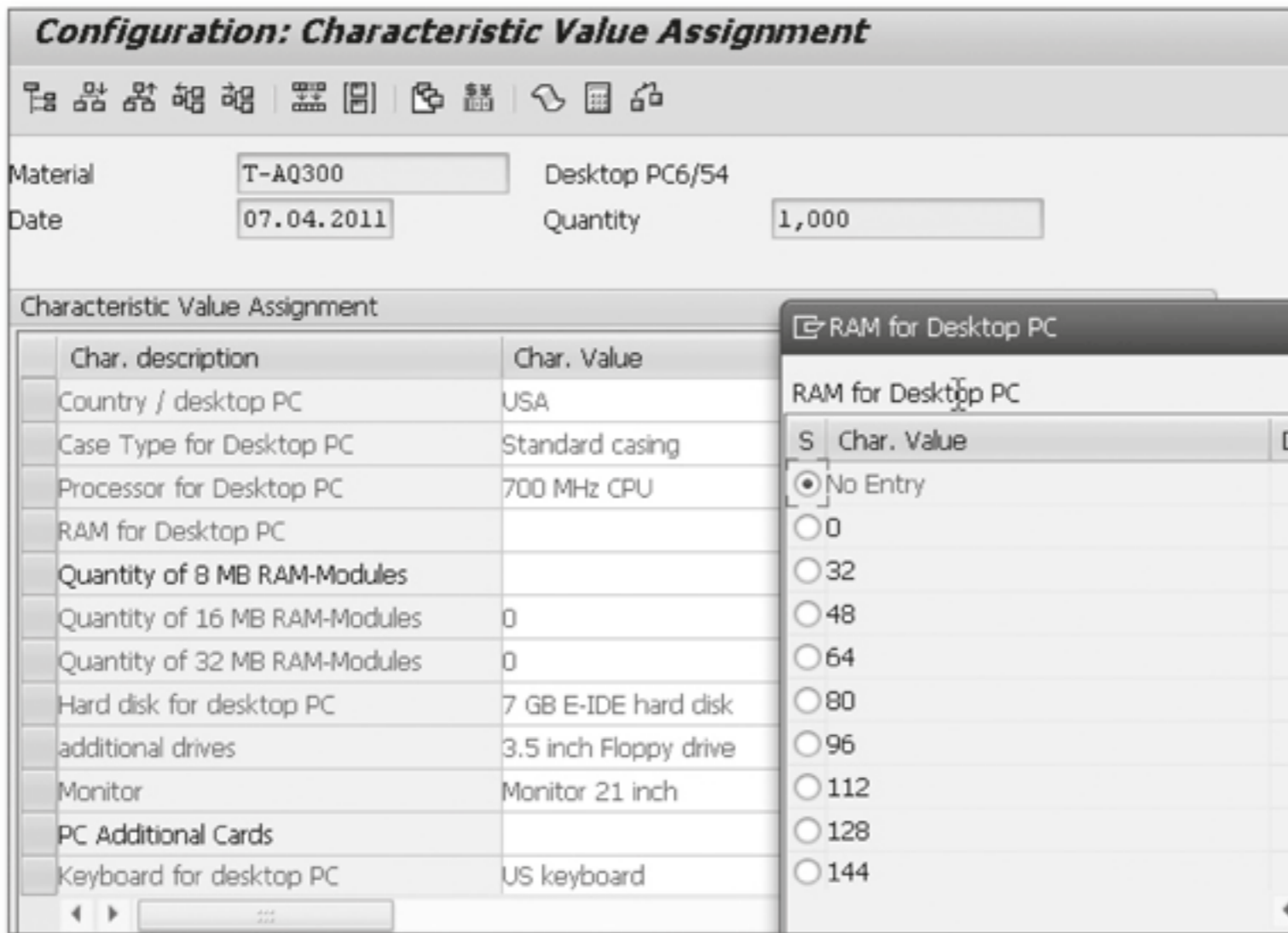


Figure 10.13 Error Message Issue Pop-Up Window

Selection Condition

A selection condition is used to define items as mandatory and is applicable only for characteristics and BOM items. Items are chosen as mandatory, for example, when a product is chosen as an additional accessory. For example, if a desktop PC6/54 has been chosen, it's necessary to choose a case type (e.g., Standard Case, Designer Case, etc.) for the desktop.

Action

Action is another way of building object dependency, just like constraints and selection conditions. Action is used to infer values for characteristics and is applicable for characteristics, characteristic values, BOM items, and configuration profiles. There is a slight difference between action and procedure. The following example illustrates how an action can be assigned to a configuration profile.

The Object Dependencies editor helps in defining dependencies or constraints between various objects. For example, if the hard disk (i.e., the appropriate controller) needs to be chosen based on the hard disk drive, then an action object drive dependency is required. Follow these steps to define the action and set up the object dependencies:

1. Create a dependency using Transaction CU01. Enter the Id as "DPCX_A_HDD_CONTROLLER".
2. Enter the description and choose the dependency type as ACTION. Figure 10.14 displays the action as DPCX_A_HDD_CONTROLLER, description as DPCX Hard disk controller set assigned to the material T-AQ300, and the profile as PLM412.
3. Select the DEPENDENCY EDITOR button, and insert the code for the example defined for the hard disk and controller. (If the hard disk drive is a 15 GB or a 20 GB hard drive, then the hard disk controller card is an SCSI type 1 card. On the other hand, if the hard disk drive is a 7 GB or a 10 GB hard drive, then the hard disk controller card is an IDE card.)

This is inserted as a code in the Dependency Editor as shown in Figure 10.14.

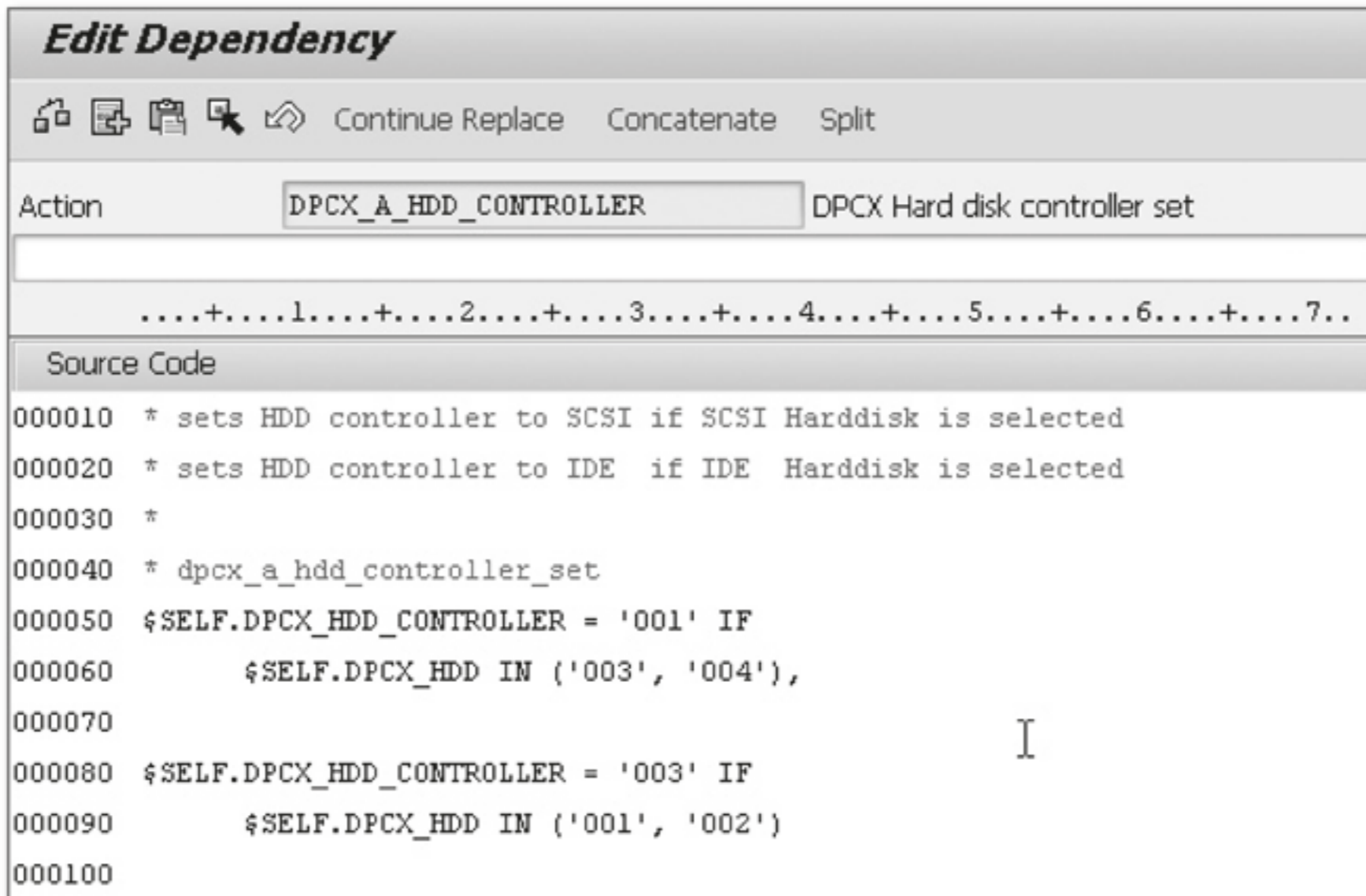


Figure 10.14 Defining an Action

Figure 10.14 displays the source code for setting the hard disk and CPU, as follows:

```
$SELF .DPCX_HDD_CONTROLLER = '001' IF
    $.DPCX_HDD IN ('003', '004'),
$SELF .DPCX_HDD_CONTROLLER = '003' IF
    $.DPCX_HDD IN ('001', '002')
```

In this example, the hard disk drive has four values: 001 to 004. Each of these values represents a 7 GB, 9 GB, 15 GB, or 20 GB hard drive. So if the hard disk drive is 15 GB or 20 GB, the SCSI1 controller card is chosen. Otherwise, the IDE controller card is chosen.

This setup can be simulated in the configuration profile. For example, if we decide to change the hard disk controller card from 003 (IDE card) to a 001 (SCSI type 1 card), the system will issue an error message (see Figure 10.15) because of the built-in dependency defined through an action.

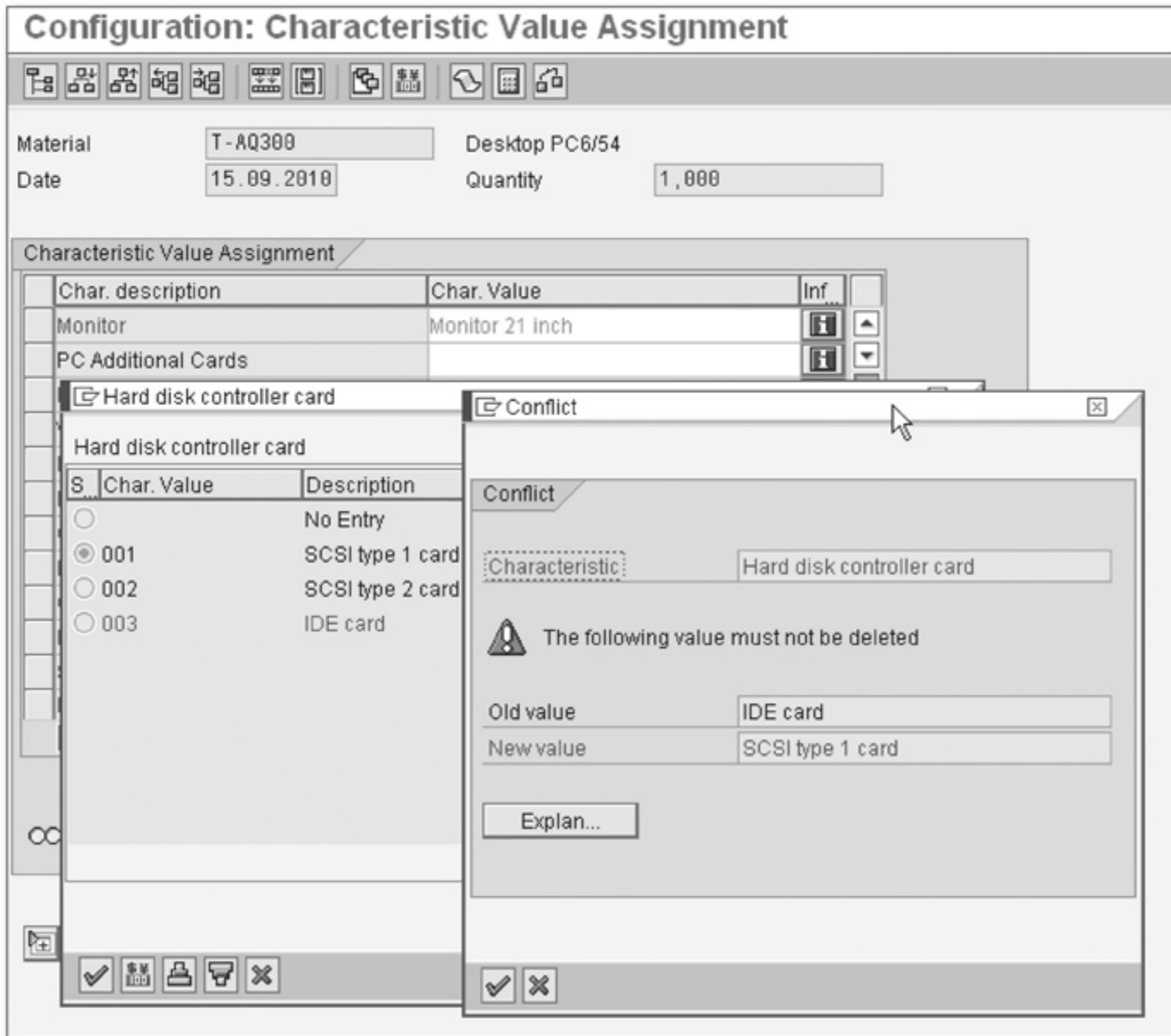


Figure 10.15 Action Dependency Issues an Error

Procedure

Procedure is used to infer values for characteristics and is applicable for characteristics, characteristic values, BOM items, and the configuration profile.

There is a slight difference between action and procedure. Unlike an action, a procedure is a sequence of instructions that must be processed in the exact sequence defined. So values inferred via procedures can overwrite each other, which is not true for actions.

Let's define an example that illustrates how the procedure can be used to determine the price of a configurable material. Innovative Computers sells laptops and desktops worldwide and is located in the United States. The desktops that Innovative Computers carries consist of various components and accessories such as hard disks, controllers, and keyboards. The pricing for the computer will vary

depending on the options chosen. For example, the pricing for an 8 MB RAM computer is different from a 16 MB RAM computer. This is defined as a code in the Dependency Editor.

Follow these steps to price this configurable material:

1. Create the dependency using Transaction TCU01. Choose the dependency type PROCEDURE in this case. A dependency procedure has been defined for the configuration profile PLM412, as shown in Figure 10.16.

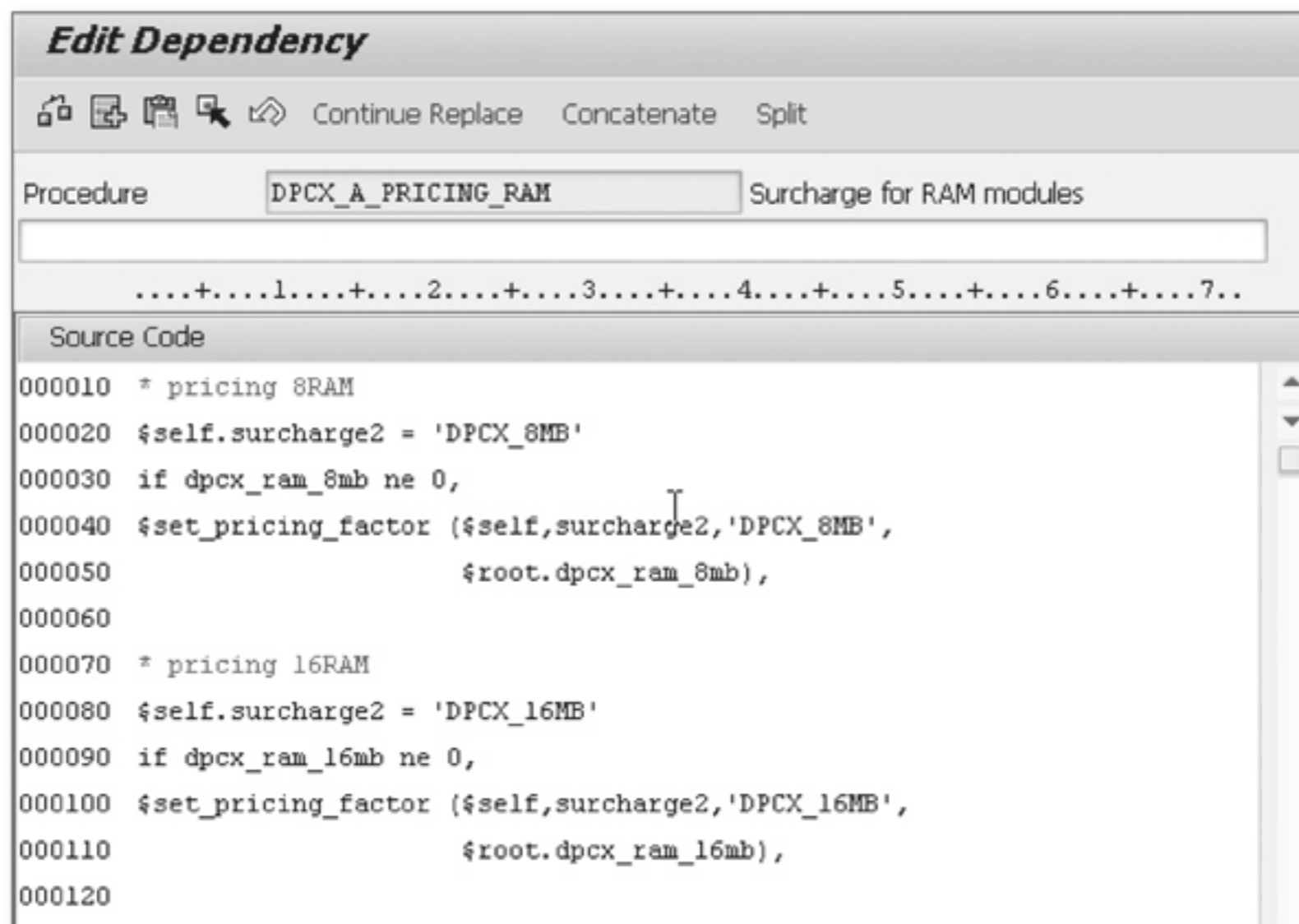


Figure 10.16 Defining a Dependency Procedure

2. In Figure 10.16, a procedure is used to determine the pricing of the configurable material. Depending on the characteristic, "Quantity of 8, 16, 32 MB RAM modules," being a nonzero quantity, the pricing is determined as a factor of the quantity chosen. Surcharges or discounts can depend partly on a specific characteristic value and partly on other factors, such as length. This method of pricing can also be expressed in dependencies. To do this, you enter the factor by which you want the surcharge or discount to be increased or reduced, as well as entering the variant condition.

`$SET_PRICING_FACTOR ($SELF, <characteristic> , <variant key> , <factor>)` is a built-in function in a procedure. This expression contains the following information:

- ▶ The characteristic that refers to structure SDCOM, in which variant conditions are defined.
- ▶ The variant key used to infer the condition for a characteristic value, which is the factor by which the surcharge increases. You can enter the factor as a constant, a numeric expression.

3. In Figure 10.17, assign the CHARACTERISTIC VALUE to the material, which is used for the pricing factor calculation.

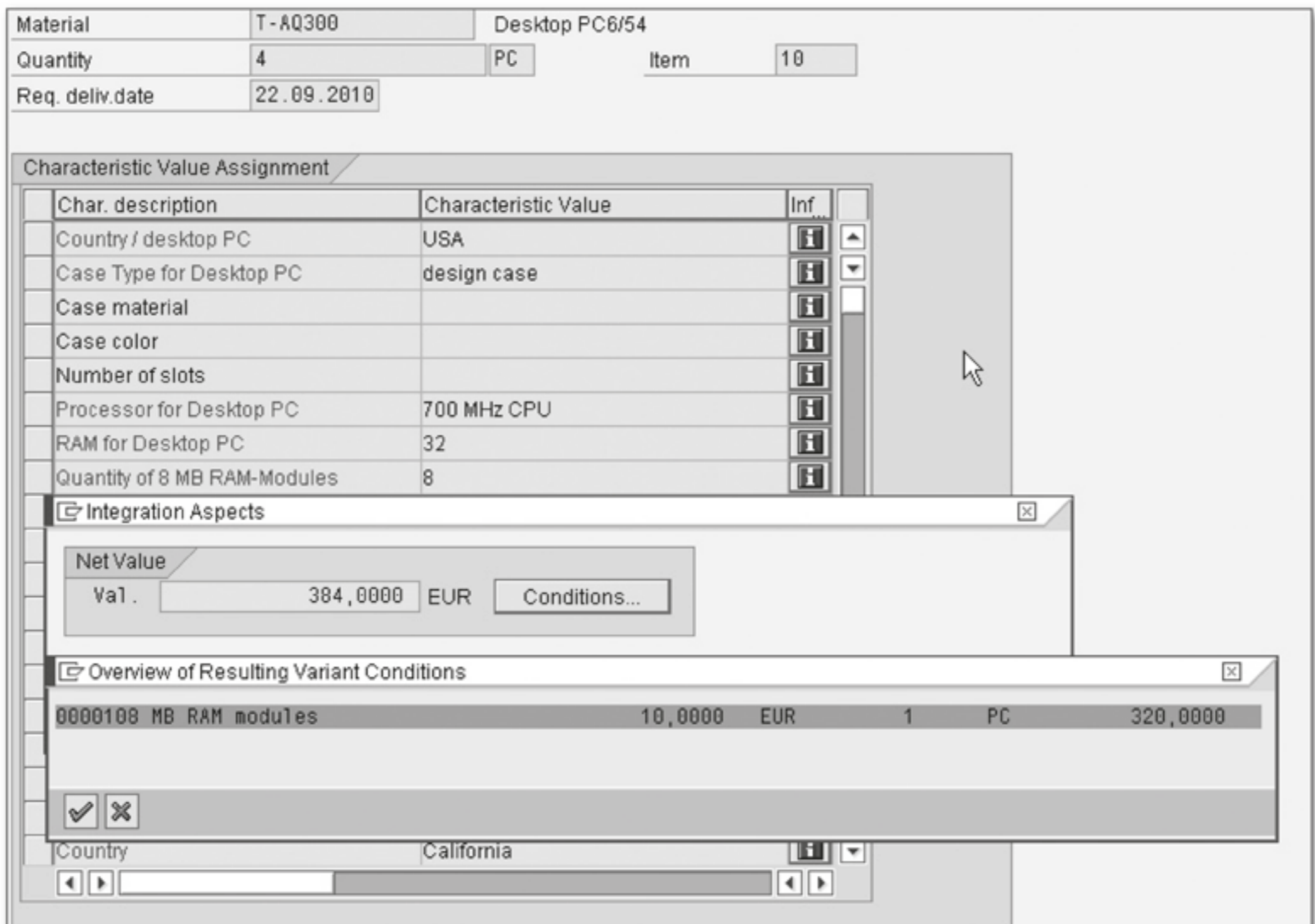


Figure 10.17 Characteristic Value Assignment

4. As shown in Figure 10.18, if you choose 8 MB of RAM, the system multiplies the quantity of 8MB RAM chosen with the quantity of T-AQ300 desktops purchased. If 8 units of 8 MB RAM is chosen, and the number of desktops T-AQ300 is 4,

then the pricing factor is $8 \times 4 = 32$. So the variant condition price is multiplied by a factor of 32. We know that if the variant condition price for an 8 MB RAM computer is \$10, then the surcharge added will be $10 \times 32 = \$320$.

The screenshot displays the SAP Variant Configuration Pricing interface. At the top, the material is identified as 'T-AQ300 Desktop PC6/54' with a quantity of 4. A callout box on the right provides a breakdown of the pricing factor calculation: Desktops = 4, 8 MB Ram Quantity = 8, Pricing Factor = 4x8, and Surcharge = 32x10 = 320 EUR. The 'Characteristic Value Assignment' table shows 'Quantity of 8 MB RAM-Modules' set to 8. Below this, the 'Net Value' is calculated as 384,0000 EUR. The bottom of the screen shows a table with columns for material, quantity, unit, currency, and price, with a row for '0000100 MB RAM modules' showing a price of 320,0000.

Figure 10.18 Pricing Factor Calculation

Figure 10.19 displays the procedure associated with the material and the profile. The source code incorporates the table with the pricing value for the hard disk drive and the surcharges.

The screenshot shows the 'Edit Dependency' window. The procedure is 'DPCX_A_PRICING_HDD' with the description 'surcharge for hard disk'. Below the procedure name, there is a sequence of numbers: '.....+.....1.....+.....2.....+.....3.....+.....4.....+.....5.....+.....6.....+.....7..'. The 'Source Code' section contains the following ABAP code:

```

000010 * pricing hdd
000020 TABLE DPCX_T_PRICING
000030     (DPCX_CHARACTERISTIC_NAME = 'DPCX_HDD',
000040     DPCX_CHARACTERISTIC_SVAL3 = $root.DPCX_HDD,
000050     DPCX_VARCONDITION         = $self.surcharge2)
    
```

Figure 10.19 Dependency Object Display

Note

`$Root` refers to the highest-level configurable material in a configuration. `$Self` refers to the material to which the dependency is allocated. These are object variables to describe configurable materials in a configuration structure.

Sometimes, your procedure can also use variant tables. You can use these tables to store a combination of values for different characteristics.

Variant Tables

Variant tables come in handy when several values need to be maintained. For example, in the case of the CPU, you could have options CPU_120, CPU_133, and CPU_166. Similarly, with RAM, there are options with 16 MB and 32 MB. The variant table can help select these options with object dependencies.

To use a variant table to calculate variant configuration pricing), follow these steps:

1. Create the variant table DPCX_T_PRICING to represent these variant combinations. This table is maintained using the menu path SAP EASY ACCESS • LOGISTICS • CENTRAL FUNCTIONS • VARIANT CONFIGURATION • TOOLS • TABLE STRUCTURE or you can alternatively use Transaction CU61. The table is created and released (see Figure 10.20).

Display Table: Characteristics

Value Assignment Alternative Characteristic Table Contents

Table: DPCX table for pricing

Chars

Characteristic	Key Field	Description
DPCX_CHARACTERISTIC_NAME	<input checked="" type="checkbox"/>	DPCX Characteristic Name
DPCX_CHARACTERISTIC_SVAL3	<input checked="" type="checkbox"/>	DPCX Characteristic Value
DPCX_VARCONDITION	<input type="checkbox"/>	DPCX Variant Condition

Figure 10.20 Defining a Table

- Maintain the contents for the table by following menu path LOGISTICS • CENTRAL FUNCTIONS • VARIANT CONFIGURATION • TOOLS • MAINTAIN TABLE STRUCTURE, or use Transaction CU62 (see Figure 10.21).

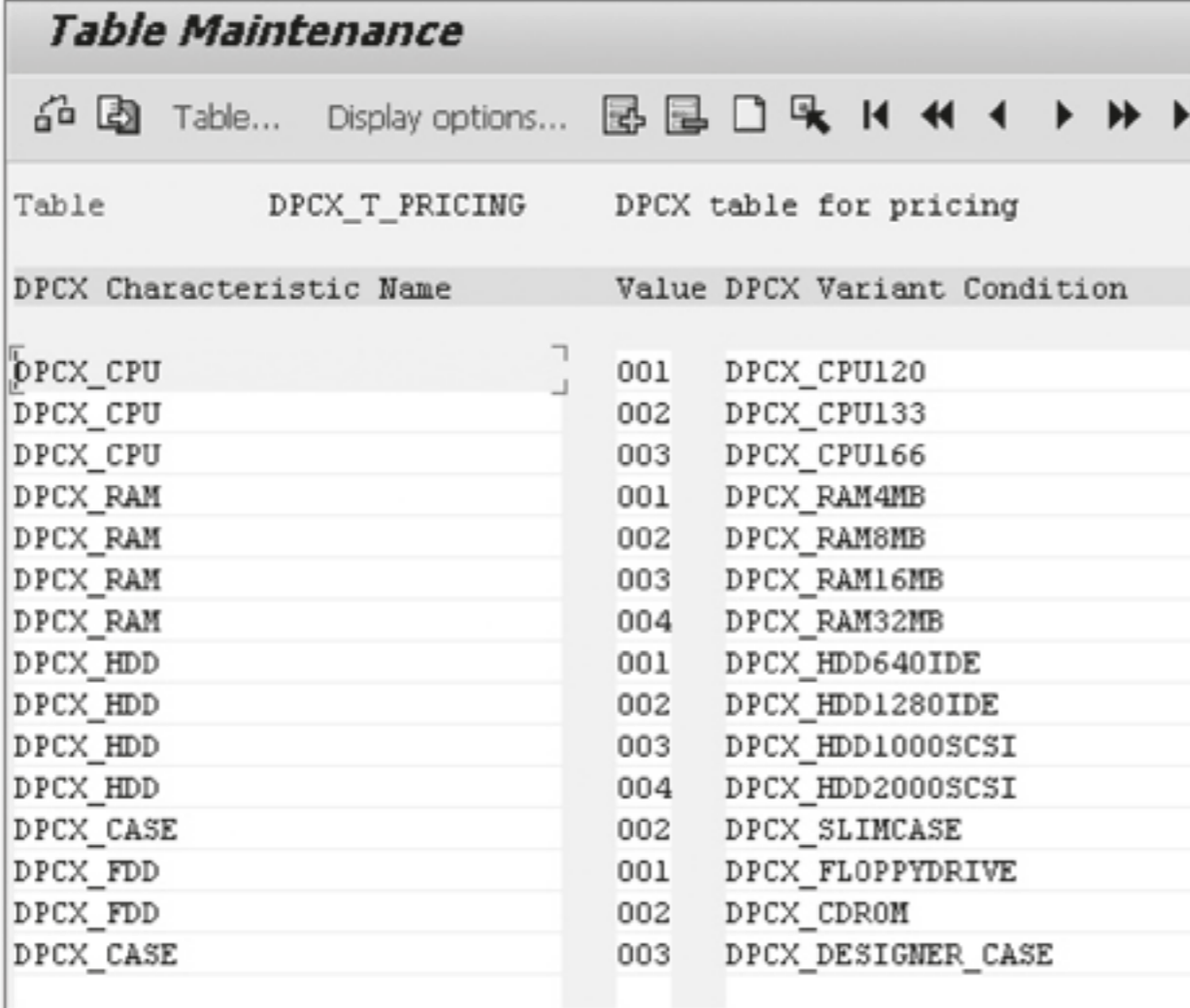


Table Maintenance			
Table... Display options...			
Table	DPCX_T_PRICING	DPCX table for pricing	
DPCX Characteristic Name	Value	DPCX Variant	Condition
DPCX_CPU	001	DPCX_CPU120	
DPCX_CPU	002	DPCX_CPU133	
DPCX_CPU	003	DPCX_CPU166	
DPCX_RAM	001	DPCX_RAM4MB	
DPCX_RAM	002	DPCX_RAM8MB	
DPCX_RAM	003	DPCX_RAM16MB	
DPCX_RAM	004	DPCX_RAM32MB	
DPCX_HDD	001	DPCX_HDD640IDE	
DPCX_HDD	002	DPCX_HDD1280IDE	
DPCX_HDD	003	DPCX_HDD1000SCSI	
DPCX_HDD	004	DPCX_HDD2000SCSI	
DPCX_CASE	002	DPCX_SLIMCASE	
DPCX_FDD	001	DPCX_FLOPPYDRIVE	
DPCX_FDD	002	DPCX_CDROM	
DPCX_CASE	003	DPCX_DESIGNER_CASE	

Figure 10.21 Table Maintenance

Based on the characteristic name and value, the system chooses the appropriate variant condition. Each of the variant conditions defined in this table have a corresponding surcharge/discount that is maintained in the pricing variant condition.

- Maintain the description of the variant condition using Transaction VK30 in menu path SAP EASY ACCESS • LOGISTICS • CONTROL FUNCTION • VARIANT CONFIGURATION • ENVIRONMENT • PRICING • DEFINE KEY.
- Define a procedure for calculating the surcharge for the characteristic Hard Disk Drive. The procedure can be set up as discounts/surcharges using Transaction CU01. In the Transaction CU01 overview screen, enter the DEPENDENCY name "DPCX_A_PRICING_HDD". Select the DEPENDENCY EDITOR button, and insert the code:

```
TABLE DPCX_T_PRICING
(DPCX_CHARACTERISTIC_NAME ='DPCX_HDD',
```

```
DPCX_CHARACTERISTIC_SVAL3 = $root.DPCX_HDD,  
DPCX_VARCONDITION = $self.surcharge2)
```

In the listing, a procedure `DPCX_A_PRICING_HDD` has been defined for calculating the surcharge for the characteristic Hard Disk Drive. When the characteristic `DPCX_HDD` is chosen (i.e., when Hard Disk Drive is chosen), table `DPCX_T_PRICING` is accessed to determine the prices.

5. Assign the procedure created in the previous step to a configuration profile using Transaction CU41.
6. In the overview screen, enter the MATERIAL "T-AQ300" and the PROFILE NAME "PLM412". Select the DEPENDENCIES button, and enter the DEPENDENCY "DPCX_A_PRICING_HDD". The application is demonstrated in Figure 10.19, shown earlier.

Maintain the Variant Pricing

Now that you've set up and configured variant pricing, let's review the steps to maintain the variant pricing:

1. Maintain the discounts/surcharges using Transaction VK11. When the characteristic `DPCX_HDD` and the corresponding value are maintained in the variant configuration, the procedure `DPCX_A_PRICING_HDD`, as illustrated in Figure 10.19 earlier, is invoked. The procedure calls the function table `DPCX_T_PRICING`, which passes the parameter `DPCX_HDD` and its value. It finds a match for `DPCX_HDD` and value "001" (7 GB E-IDE hard disk) and obtains the value `DPCX_HDD640IDE`.
2. The pricing is now calculated by obtaining the value of the variant pricing condition from this table. The system uses the `DPCX` characteristic name and `DPCX` characteristic value and finds a match for the variant condition `DPCX_HDD640IDE` in the table. Then the system searches for a variant condition with `DPC_XHDD640IDE` and the corresponding surcharge. A discount of 100 EUR is thus obtained from the variant condition as shown in Figure 10.22.

Another important aspect for object dependencies is the constraints.

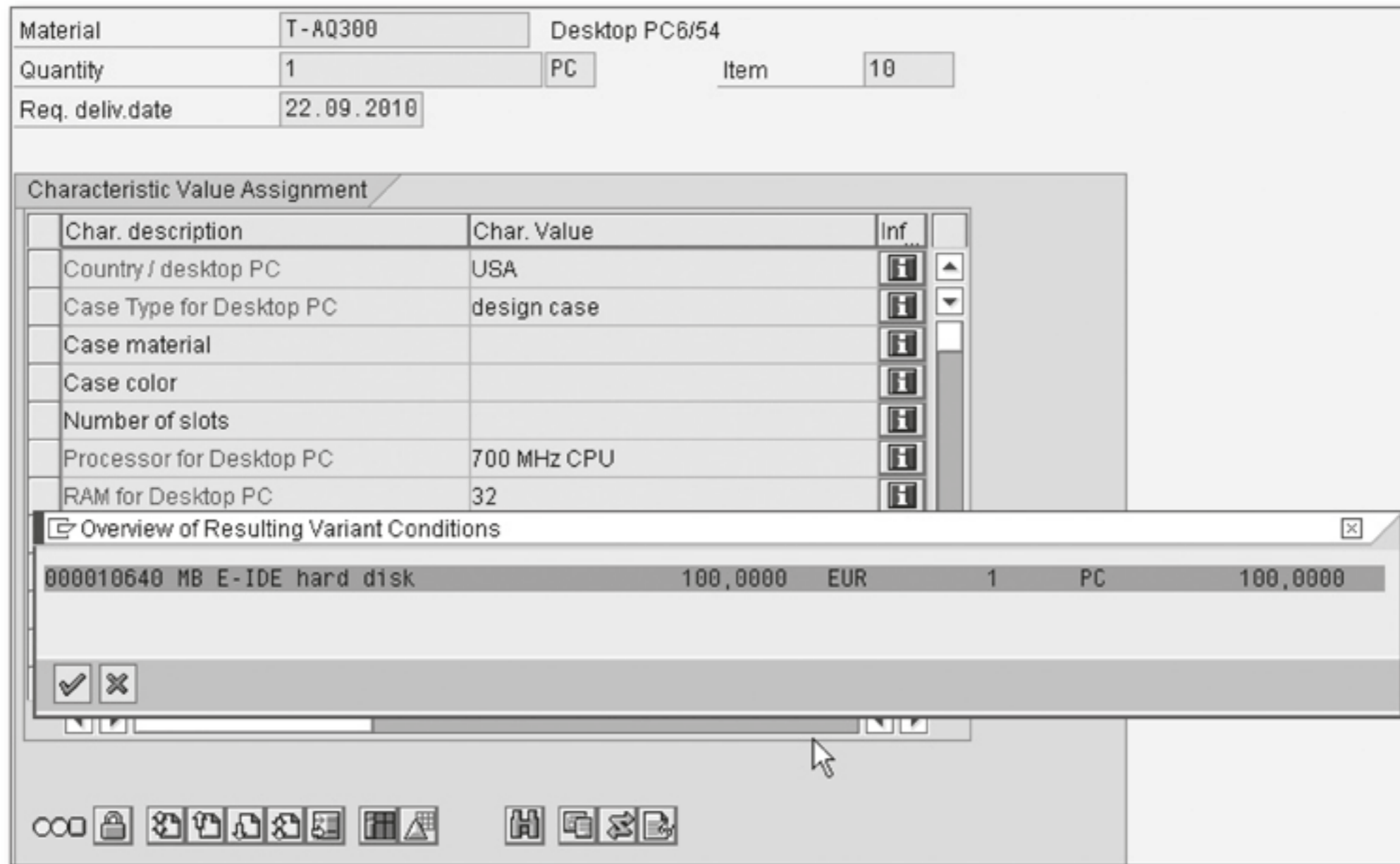


Figure 10.22 Calculating Pricing from Variant

Constraint

Constraint is used to define dependencies among characteristics of several configurable materials and is applicable only for configuration profiles. In this example, we have demonstrated where we defined the selection of the CPU to determine the CPU clock speed. These two characteristics can be used as a constraint with the object dependencies.

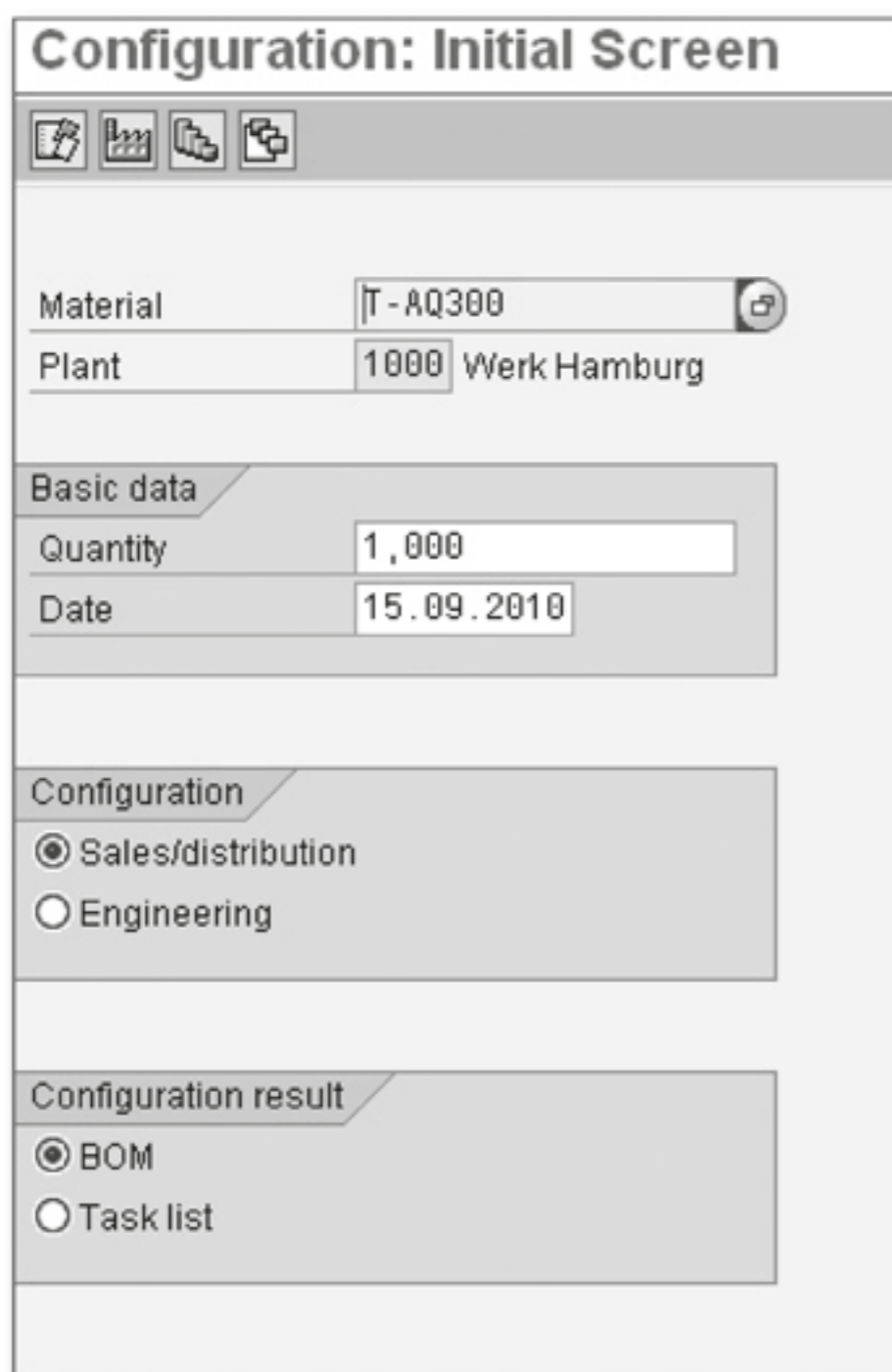
In the next section, we'll go over one of the functionalities within the variant configuration that allow you to simulate the model.

10.3 Variant Configuration Modeler and Sales Order Pricing

A useful functionality in variant configuration is using the variant configuration modeler. The variant configuration modeler is used to simulate the various object dependencies defined for configuration profiles, characteristics, and characteristics values. Specifically from a pricing perspective, it provides the capability to test that

the correct variant conditions are chosen for different scenarios. To perform these tests, follow these steps:

1. Use the menu path SAP EASY ACCESS • LOGISTICS • CENTRAL FUNCTIONS • VARIANT CONFIGURATION • ENVIRONMENT • CONFIGURATION SIMULATION. Alternatively, you can use Transaction CU50 to enter the initial screen, as shown in Figure 10.23.
2. To test that you have the correct conditions, enter the correct information in the MATERIAL, PLANT, and QUANTITY fields, and choose the correct CONFIGURATION radio button.



Configuration: Initial Screen

Material

Plant Werk Hamburg

Basic data

Quantity

Date

Configuration

Sales/distribution

Engineering

Configuration result

BOM

Task list

Figure 10.23 Configuration Simulator

3. Select the configuration (), and select the configuration profile. If there are multiple profiles, the system will provide the option to select the one you want.

After you select the configuration profile, the system displays the characteristics and values defined for the profile. In the configuration profile, you can test the various object dependencies. Also, the system validates that the correct pricing variant conditions are being chosen as well.

4. Navigate to the CONFIGURATION CHARACTERISTIC VALUE ASSIGNMENT screen by selecting the CONFIGURATION icon or pressing **F8**.
5. In Figure 10.24, you can test various object dependencies by selecting different combinations of characteristics and values. This can be done by changing the values of the various characteristics such as RAM, hard drives, and so on.

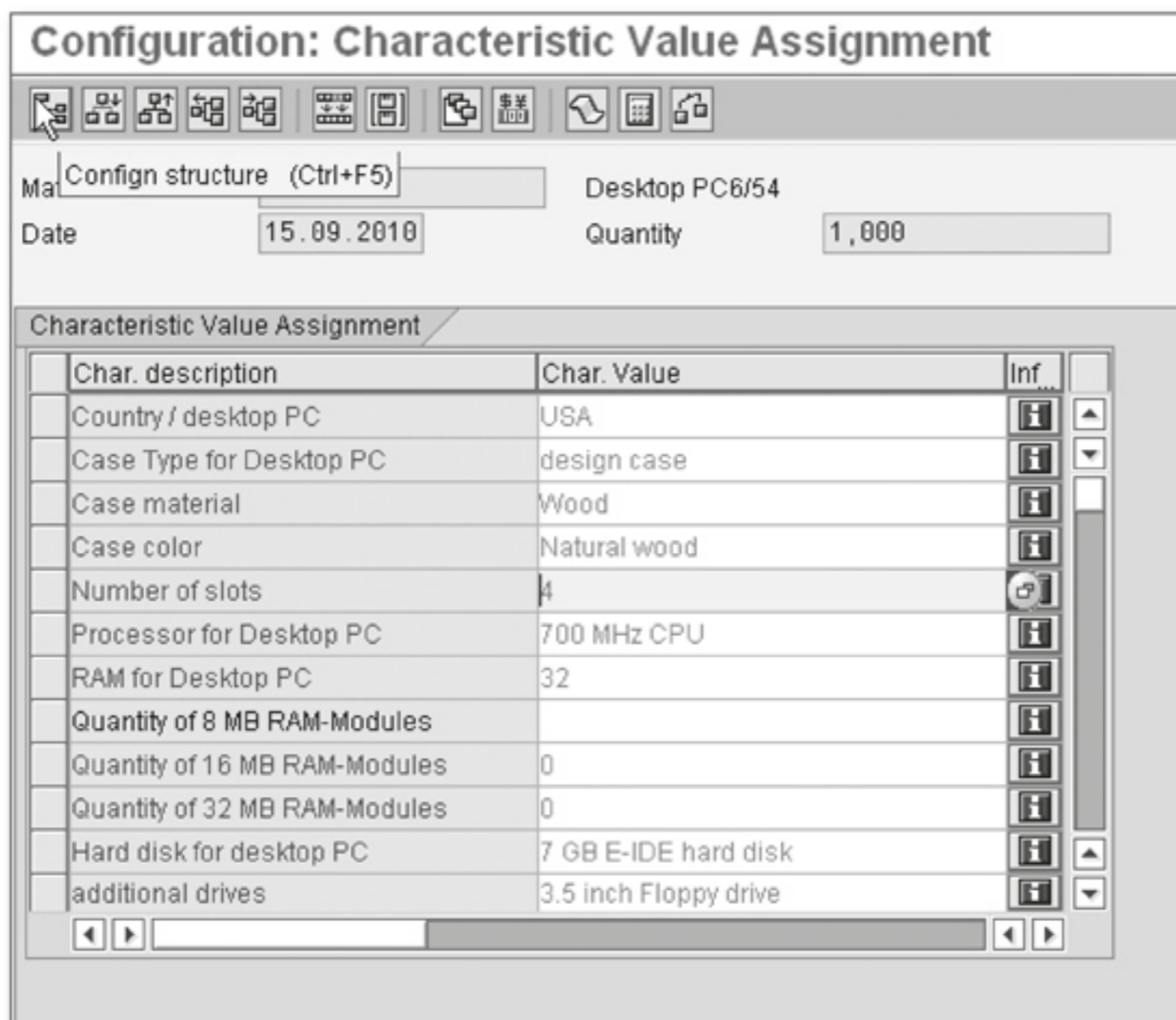


Figure 10.24 Configuration Simulator with Characteristic Values

6. To test the pricing, select the PRICING INDICATOR by pressing **Ctrl** + **Shift** + **F7**. After you select the pricing, you can save the pricing variants, as shown in Figure 10.25.

With the use of the modeler, you can simulate and select the appropriate condition. You can also directly assign the pricing variant condition; in the next subsection, as described next.

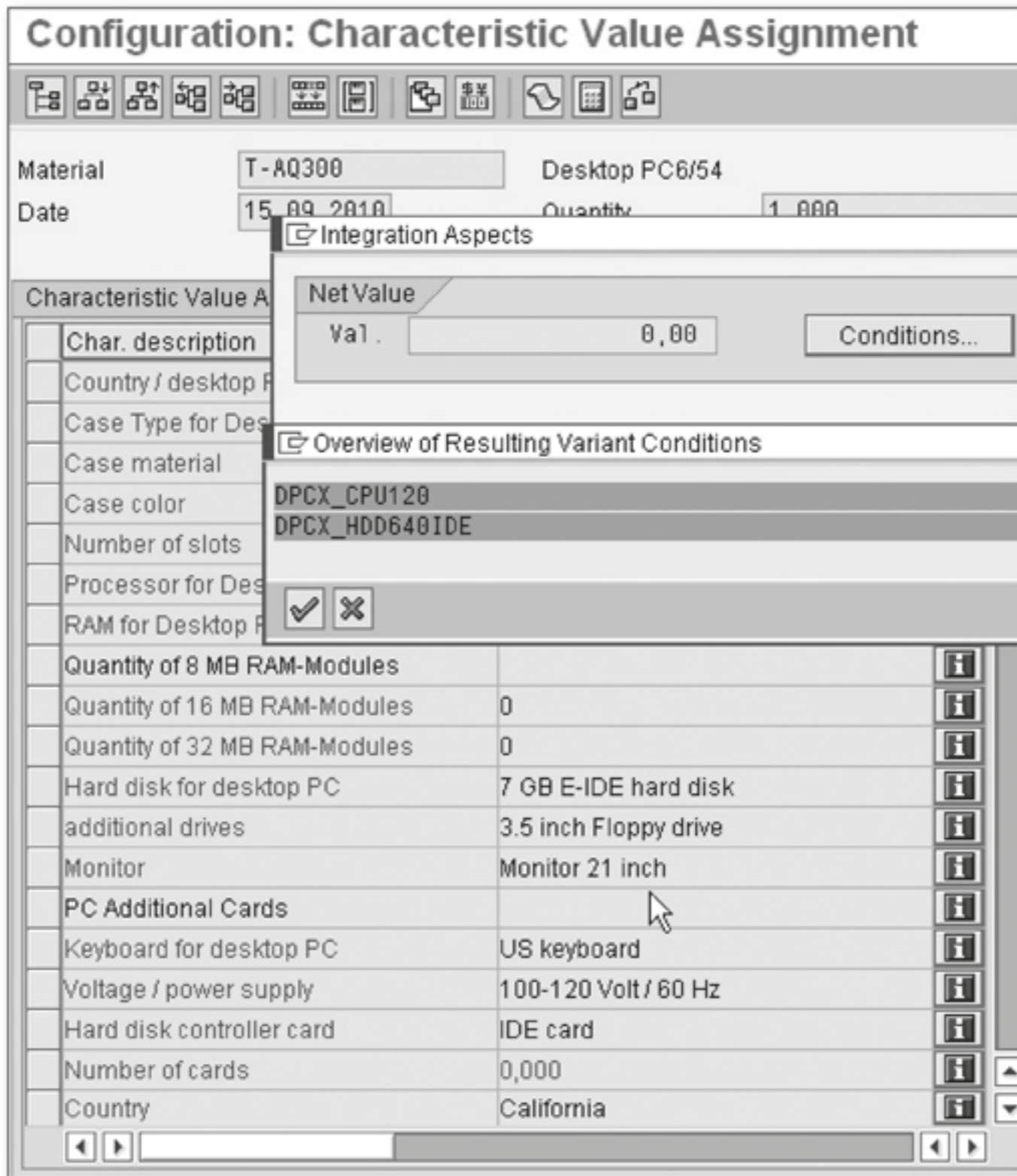


Figure 10.25 Selecting the Pricing Variant Condition

10.3.1 Assigning Pricing Variant Conditions Directly

You can assign pricing variant conditions through actions and procedures, or you can assign them directly here in the configuration profile by linking the variant conditions to the characteristic, as explained in the previous section. To achieve this, the characteristic cannot have any value assigned to it. Follow these steps:

1. Define further variant conditions using Transaction VK11. Select the list of available characteristics values by pressing **[F4]**. Do not actually choose any value, but place the cursor over the characteristic value.
2. Select the **ASSIGN THE VARIANT CONDITION** indicator, and enter the **VARIANT CONDITION** as shown in Figure 10.26. The variant condition is now directly assigned to the characteristic value.

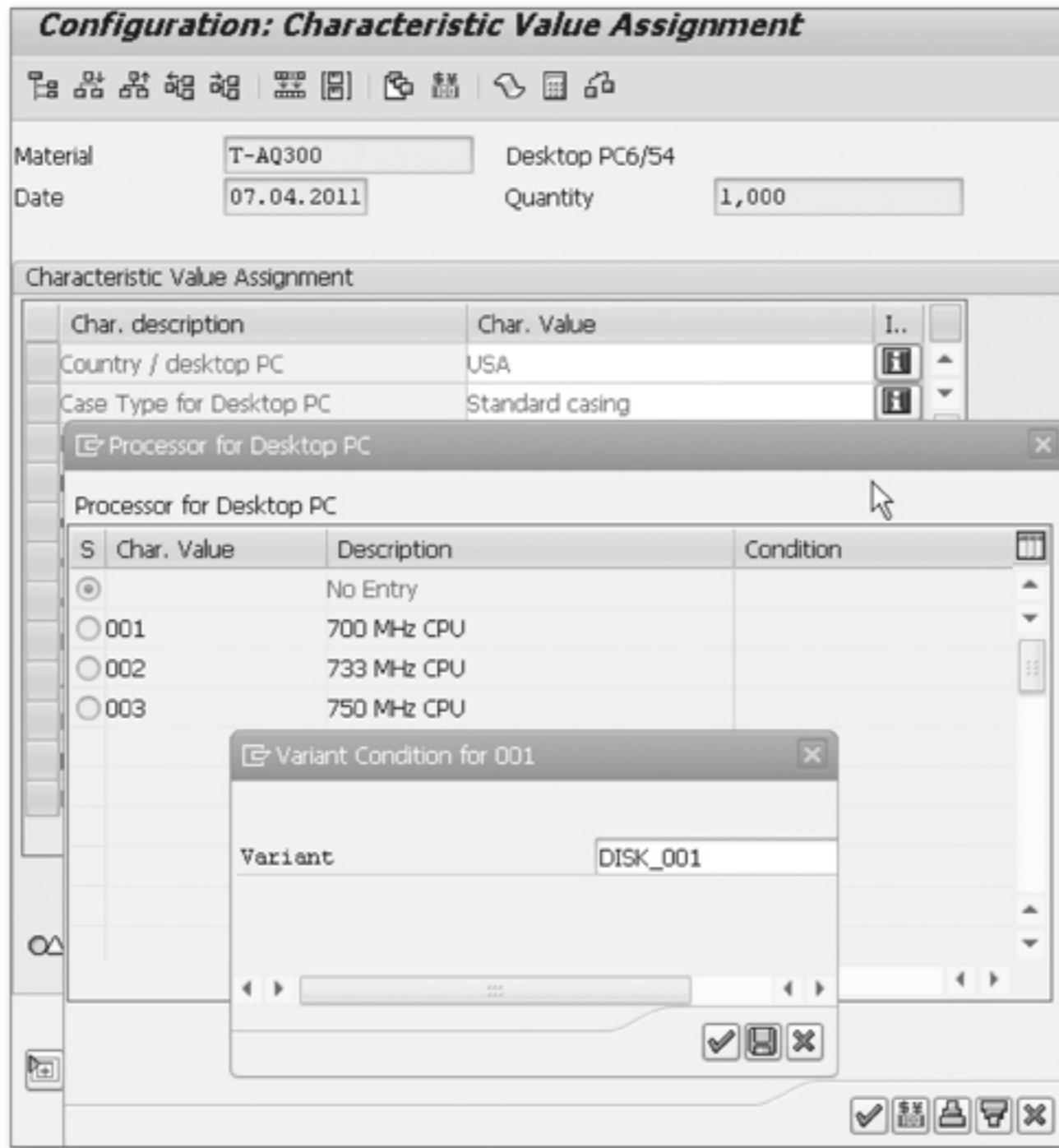


Figure 10.26 Direct Variant Assignment

Note

When assigning the conditions directly, the configuration simulator will not show the price; only the variant key is shown.

Now that you've assigned pricing to the variant condition, these pricing amounts are applied to the sales order processing.

10.3.2 Sales Order Variant Pricing

When a sales order is created for a configurable material, the pricing is calculated based on the configuration profile, object dependencies, various characteristics of the configurable product, the characteristic values, and pricing variant conditions. When a configurable material is entered on the sales order, the configuration profile is displayed. The configuration simulator allows the user to configure the product according to the customer requirements. The variant conditions are automatically selected, and the pricing is automatically calculated, as shown in Figure 10.27.

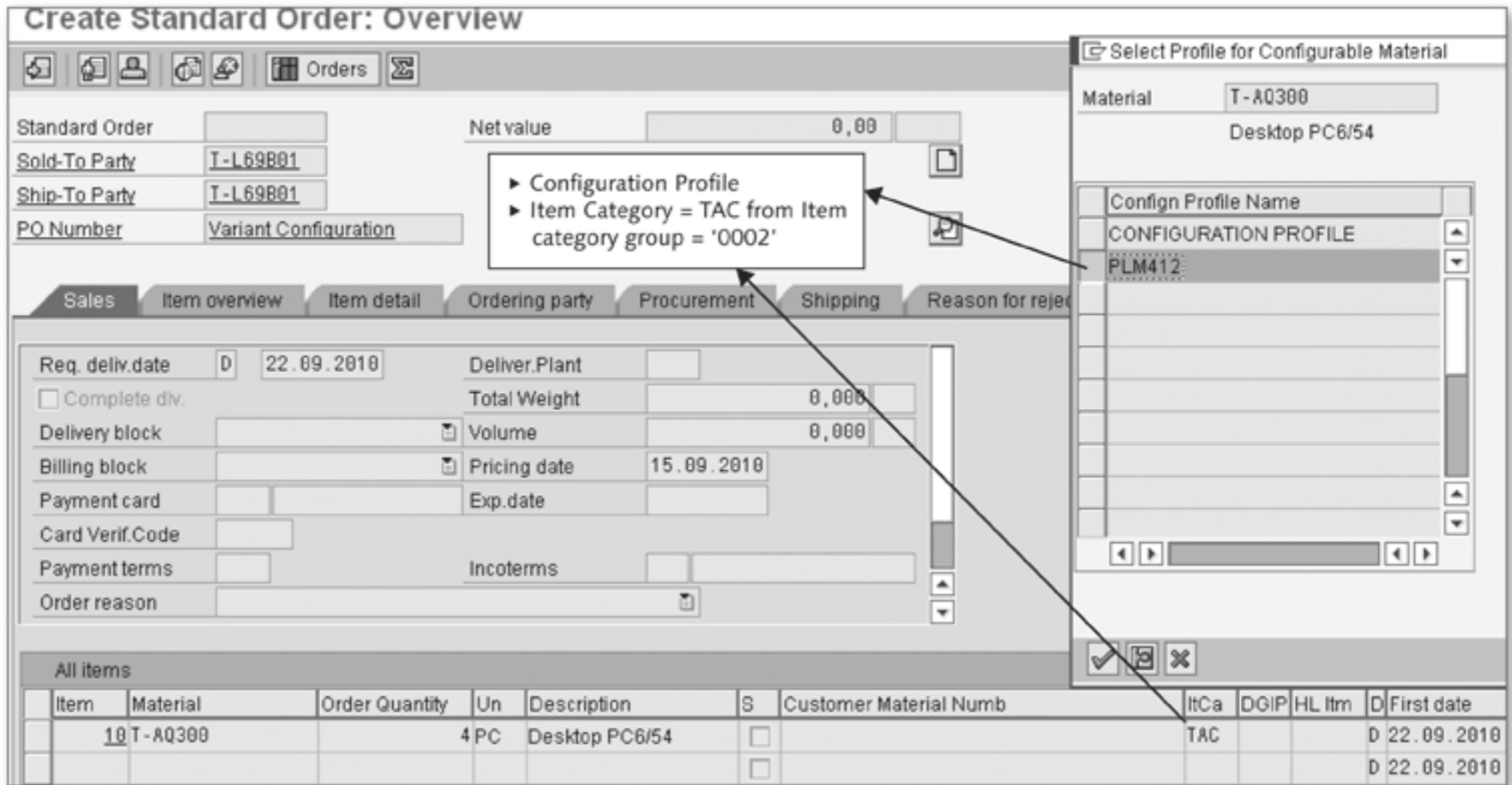


Figure 10.27 Sales Order with Variant Configuration

The pricing is calculated automatically based on the variant conditions set, as shown in Figure 10.28.

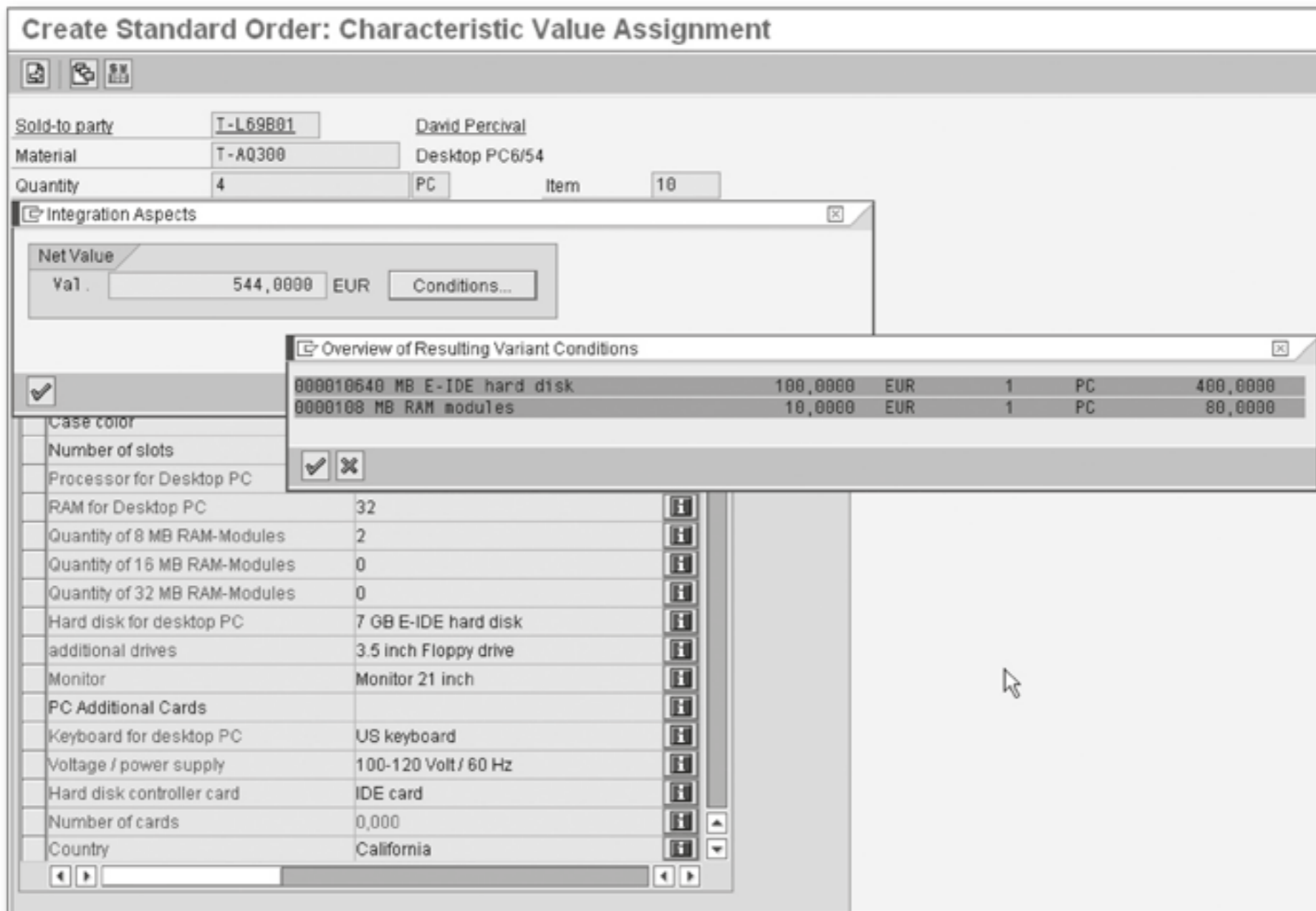


Figure 10.28 Variant Price Calculation

10.4 Summary

In this chapter, you learned about variant configuration and how the various pricing scenarios can be set up. With this knowledge, you should be able determine if variant configuration is a functionality that you want to use in your company for pricing complex products. You now have the tools required to make pricing in variant configurations work. We also described how you can simulate various what-if scenarios using the variant configuration modeler.

In the next chapter, you'll learn about integrating pricing with Financial Accounting (FI).

This chapter shows the link between the various pricing elements, such as discounts, taxes, and gross price, and how they are tied to the financial accounts. You'll learn to configure the system and tie the various price elements to the appropriate financial accounts.

11 Sales and Distribution Pricing Integration with Financial Accounting

Sales and Distribution (SD) pricing integration with Financial Accounting (FI) is the link between the various pricing conditions—such as gross price and discounts—and the General Ledger (GL) accounts. You'll learn how to configure the system to tie the prices, discounts, taxes, and other pricing conditions to the correct GL accounts. By setting up this configuration, the business user can easily find out the total discounts offered for a product, the total revenue earned in a given time period, and so on.

In this chapter, you'll learn how to configure revenue account determination and how to assign account keys to pricing conditions to tie the conditions to a GL account.

Let's consider a real-world application of Supreme Computers, which is a company that sells laptops, desktops, and so on. When Supreme Computers sells these laptops or desktops to consumers, the company wants to see the breakdown of the prices under various categories: gross price, net price, discounts, taxes, rebates, and so on. By this breakdown, Supreme Computers will know the total revenue earned, the discounts offered, the taxes paid and more. The company also wants to know the revenue earned by domestic and international customers as well as by finished goods and trading goods sold.

In the following sections, you'll learn to configure the system as we walk through this example. This configuration is called revenue account determination in SAP ERP because it helps to determine GL accounts relating to revenue such as prices and discounts.

11.1 Revenue Account Determination Overview

The purpose of GL accounting is to provide a comprehensive picture for external accounting and accounts. Your SAP ERP system records all business transactions in SD, which is fully integrated with accounting.

Continuing with the Supreme Computers example, the company wants to record the various prices, discounts, and taxes by GL account. By recording this, Supreme Computers will have a comprehensive picture of the total revenue earned, total discounts offered, taxes paid, and so on.

Figure 11.1 shows how the SD functionality is integrated with GL accounts.

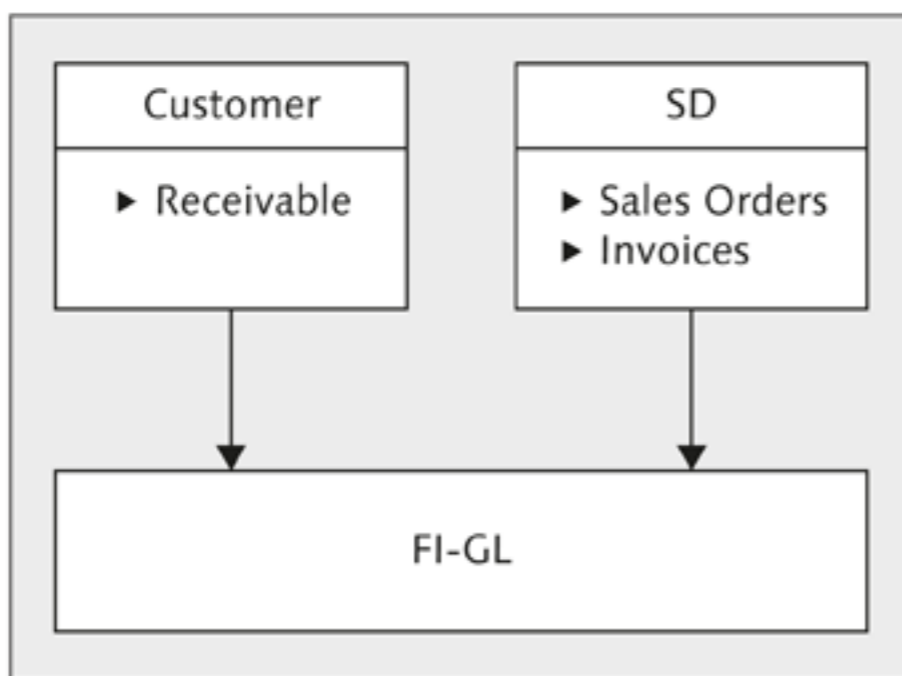


Figure 11.1 SD—FI Integration

As shown in the figure, the receivables, sales orders, and invoices are integrated to FI-GL (General Ledger). The GL account master records contain the data that is always needed by the GL to determine the account's function. In other words, the GL account contains the description, whether it belongs to Profit & Loss (P&L), or the balance sheet.

Figure 11.2 illustrates how a GL for a revenue account is represented. GL accounts are master data elements that are set up by business users using Transaction FS00. The menu path is SPRO • SAP REFERENCE IMG • FINANCIAL ACCOUNTING (NEW) • GENERAL LEDGER ACCOUNTING (NEW) • MASTER DATA • G/L ACCOUNTS • G/L ACCOUNT CREATION AND PROCESSING • EDIT G/L ACCOUNT (INDIVIDUAL PROCESSING • EDIT G/L ACCOUNT CENTRALLY. The *chart of accounts* is the list of the GL accounts and

their corresponding descriptions. GL accounts that are defined in this manner are eventually assigned to the pricing procedure through the revenue account determination process, as we'll explain in upcoming sections.

The screenshot displays the SAP GL Account Display for Domestic Sales Revenue. The form is organized into several sections:

- Header:** G/L Account: 410000, Sales Revenues - Domestic; Chart of Accts: CANA, Chart of accounts - North Am.
- Navigation:** Type/Description, Key word/translation, Information.
- Control in chart of accounts:**
 - Account Group: PL
 - P&L statement acct
 - Balance sheet account
 - Detailed control for P&L statement accounts:** Functional Area: []
- Description:**
 - Short Text: Sales Revenues - Dom
 - G/L Acct Long Text: Sales Revenues - Domestic
- Consolidation data in chart of accounts:** Trading Partner: []

Figure 11.2 GL Account Display for Domestic Sales Revenue

11.2 Revenue Account Determination Configuration

Revenue recognition is the realization of the amount or the value of the service rendered. Revenue recognition controls how much revenue is to be reported in which positing period. It allows you to post revenue to the FI component in SAP ERP independent of billing documents, which are normally posted to revenue accounts. Revenue can be realized on a period basis or on the basis of the individual transactions. There are three different ways to recognize this:

- ▶ **Standard revenue recognition**

The document is posted directly to the revenue account. Revenue is posted to the accruals and then transferred to the revenue account as the second step.

► **Periodic revenue recognition**

Sale is distributed and posted evenly over the contract term. Revenue is posted to the accruals and then transferred to the revenue account as the second step.

► **Service-based revenue recognition**

Based on an event, service order, or confirmation.

The following steps describe the various configuration steps that need to be carried out for revenue account determination. By configuring the steps defined in the following sections, you'll be able to link the pricing conditions to the GL account and derive total revenue earned, total discounts offered, and so on.

11.2.1 Master Data Relevancy for Account Assignment

Account assignment groups are ways you can group customers and materials together that have the same accounting requirements (posting to the same GL accounts). If the revenue account postings are different for trading goods and finished goods, then you can have separate account groups to represent them.

Because Supreme Computers wants to segregate the revenue stream by trading finished goods, you need to first define account groups for trading and finished goods.

Here, you'll set up accounts assignment groups for materials (trading and finished goods) by following these steps:

1. Follow the menu path SPRO • SALES & DISTRIBUTION • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • CHECK MASTER DATA RELEVANCY FOR ACCOUNTS ASSIGNMENT • DEFINE MATERIAL ACCOUNTS ASSIGNMENT GROUPS.

Figure 11.3 displays the material account assignment group. The material account group can be used to segregate the different goods based on the application; for example, you might want to group and post the raw material to a different account and to a different group from the finished product. Let's take the example of Supreme Computers and see how it applies to this business case.

Acct assignment grp	Description
01	Trading Goods
02	Performances
03	Finished Products
Y1	Service Provider
Y2	Returnable goods

Figure 11.3 Defining Material Account Assignment Groups

- Supreme Computers also wants to see revenue account postings by domestic and international customers. You can configure separate account groups to represent them as customer account groups. The menu path for setting up customer account groups is SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • CHECK MASTER DATA RELEVANCY FOR ACCOUNTS ASSIGNMENT • DEFINE CUSTOMER ACCOUNT ASSIGNMENT GROUPS (see Figure 11.4). In this configuration, click NEW ENTRIES, and enter the two-digit ACCTASSGGR and the DESCRIPTION.

AcctAssgGr	Description
01	Domestic Revenues
02	Foreign Revenues
03	Affiliat Comp Revenu
04	Dom. Rev. without CO

Figure 11.4 Customer Accounts Assignment Group

In the next section, we'll review the dependencies of revenue account determination.

11.2.2 Define Dependencies of Revenue Account Determination

Next, you need to create revenue account determination tables and fields if the standard SAP ERP tables do not meet your requirements. The condition tables

are created exactly the same way as pricing condition tables and fields, which is explained in detail in Chapter 3, Section 3.5.

11.2.3 Define Condition Types and Access Sequences

Account determination works similar to the concept of pricing techniques. Similar to the pricing procedure, account determination uses the condition technique to search for the right account posting. In this step, you need to define the revenue account condition types and access sequences. For the most part, the standard access sequences KOFI and standard condition type KOFI are used. The condition type KOFI is assigned to access sequence KOFI, as shown in Figure 11.5. The menu path to access this screen is SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • DEFINE ACCESS SEQUENCES AND ACCOUNT DETERMINATION TYPES • MAINTAIN ACCESS SEQUENCE FOR ACCOUNT DETERMINATION.

The access sequence KOFI has access to the various tables shown.

Change View "Accesses": Overview		
Access sequence KOFI Account determination		
Overview Accesses		
No.	Tab	Description
10	1	Cust.Grp/MaterialGrp/AcctKey
20	2	Cust.Grp/Account Key
30	3	Material Grp/Acct Key
40	5	Acct Key
50	4	General

Figure 11.5 Access Sequence KOFI

Following the definition of the condition type and the access sequence, you need to associated them. To assign the access sequence to the condition type, follow the menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • DEFINE ACCESS SEQUENCES AND ACCOUNT DETERMINATION TYPES • DEFINE ACCOUNT DETERMINATION TYPES. The screen shown in Figure 11.6 appears where you can click NEW ENTRIES to add the condition type (KOFI) and associated access sequence (KOFI).

Change View "Conditions: Types": Overview

New Entries [Icons]

Overview of Condition Types

CTyp	Name	AS	Description
KOFI	Acct determination	KOFI	Account determination
KOFK	Acct Determ.with CO	KOFI	Account determination

Figure 11.6 Assign the Condition Type to the Access Sequence

11.2.4 Define and Assign the Revenue Account Determination Procedure

Revenue account determination configuration is complete with the procedure definition and assignment. It's important to understand the revenue account determination to appreciate the interface and the impact pricing has on FI. The next step is to define the revenue account determination procedure:

1. Follow menu path SPRO • SALES & DISTRIBUTION • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • DEFINE AND ASSIGN REVENUE ACCOUNT DETERMINATION PROCEDURES.
2. On the initial screen, enter PROCEDURE "KOFI00" in the ACCOUNT DETERMINATION field, and double-click it.
3. Double-click CONTROL DATA.
4. Assign CTYP "KOFI" to STEP 10, and save (see Figure 11.7).

Change View "Control data": Overview

New Entries [Icons]

Dialog Structure

- Procedures
 - Control data

Procedure: KOFI00 Account determination

Reference Step Overview

Step	Co.	CTyp	Description	Requiremnt
10	1	KOFI	Acct determination	
10	2	KOFK	Acct Determ.with CO	2

Figure 11.7 Define Revenue Account Procedure

Now you need to assign the revenue account determination procedure to the billing type by following these steps:

1. Follow the menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • ASSIGN REVENUE ACCOUNT DETERMINATION PROCEDURES TO BILLING TYPE.
2. Assign the ACTDPR "KOFI00" to all of the billing types that you'll be using (e.g. invoices, credit/debit memos, etc.), as shown in Figure 11.8.

BillIT	Description	ActDPr	Description
B1	Rebate Credit Memo	KOFI00	🔒
B1E	Exp.RebateCreditMemo	KOFI00	
B2	Rebate Correction	KOFI00	
B2E	Exp. Rebate Correcln	KOFI00	
B3	Rebate Part Settlmnt	KOFI00	
B3E	Exp.RebatePartSettlm	KOFI00	
B4	Rebate Manual Accrls	KOFI00	

Figure 11.8 Assign Billing Type to Revenue Account Procedure

Next, let's review the steps to define and assign account keys.

11.2.5 Define and Assign Account Keys

The account keys enable the system to post amounts to certain types of revenue accounts. For example, the system can post the gross price (generated by the PR00, base price, or PB00, gross price, conditions) to the relevant price revenue account (e.g., ERL). Account keys are freely definable. You may create as many account keys as you need.

To define account keys, follow these steps:

1. Follow the menu path SPRO • SALES & DISTRIBUTION • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • DEFINE AND ASSIGN ACCOUNT KEYS.
2. Continuing with our example of Supreme Computers, you need to define account keys for REVENUE, SALES DEDUCTIONS, and so on (see Figure 11.9). You need to configure only one account key "ERL" for revenues because the domestic or international customer revenue is differentiated by the account groups we are using for domestic and international customers.

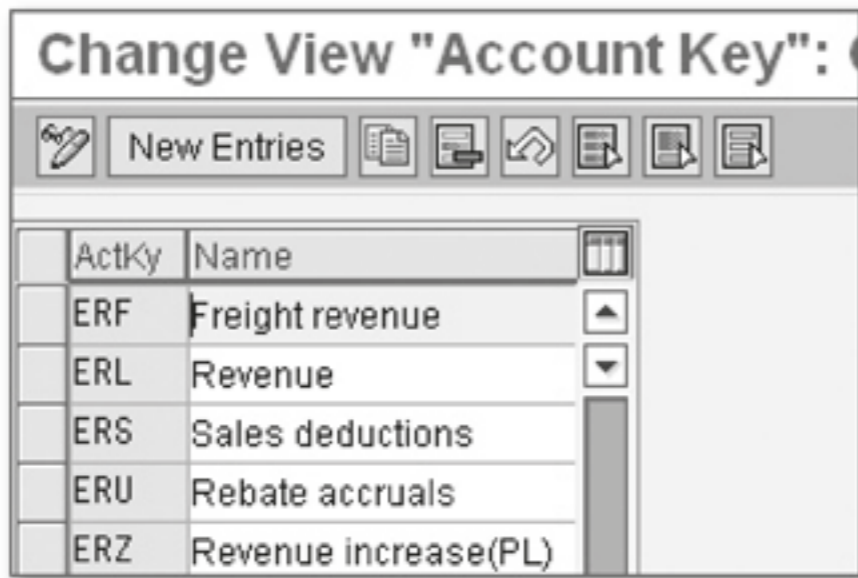


Figure 11.9 Define Account Keys

3. Assign the various account keys to the pricing procedure condition types. The menu path for defining account keys is SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • ASSIGN ACCOUNT KEYS. Here, each condition type is assigned an account key, as shown in Figure 11.10. This is done by assigning the account key “ERL” for all revenue-related accounts. So EK01 (cost), PR00 (list price), PB00 (gross price) PR02 (price increased), and VA00 (variant price) are considered as revenue accounts and associated with revenue account “ERL”.

Proc.	Step	Cntr	CTyp	Name	ActKy	Name
ZVAA01	8	0	EK01	Costs	ERL	Costs revenues
	11	0	PR00	Price	ERL	Sales revenues
	12	0	ZRVS	Reference PR00	ERL	Sales revenues
	13	0	PB00	Price (Gross)	ERL	Sales revenues
	14	0	PR02	Price Increased	ERL	Sales revenues
	15	0	ZK01	Variant Costs	ERL	Sales revenues
	20	0	VA00	Variants	ERL	Sales revenues

Figure 11.10 Revenue Account Key Assignment to Condition Types

Figure 11.10 displays the revenue account determination with the pricing condition type assigned in sequence steps. The account keys are associated here for pricing value posting to the GL account. Following the definition of accounts, we need to assign the GL accounts to the revenue account keys.

11.2.6 Assign General Ledger Accounts to Revenue Account Keys

This is the last step to determine the correct GL account. In this step, the GL account is determined by various combinations, as shown in Figure 11.11. Continuing with the example, Supreme Computers wants to differentiate postings by domestic and international customers, and by trading and finished goods.

You need to use the combination of customer group, material group, and account key. So for each combination of customer account group, material group, and the account key, you must define a GL account.

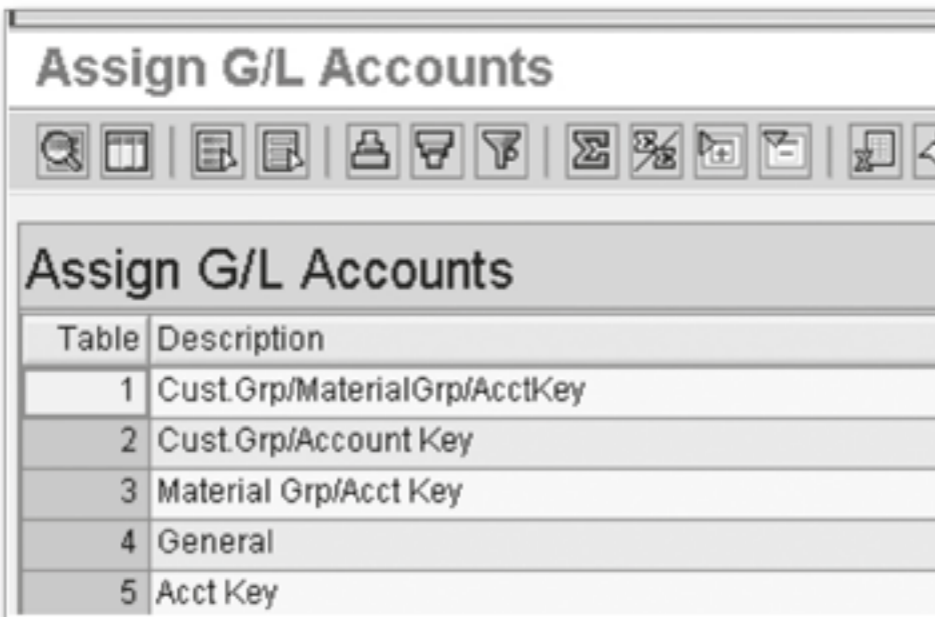


Table	Description
1	Cust.Grp/MaterialGrp/AcctKey
2	Cust.Grp/Account Key
3	Material Grp/Acct Key
4	General
5	Acct Key

Figure 11.11 GL Account Assignment Combinations

Figure 11.11 displays the different tables with the key combinations, where the account assignment data determinations are stored. Similar to the pricing procedure, the account determination consists of condition types and access sequences. The preceding option allows you to maintain the GL account determination based on these proposed combinations: customer group/material group/account key or customer group/account key. You can see that the GL account can be determined by several combinations of customer account assignment group/account assignment keys, or material account assignment group/account assignment keys. These values come from the access sequence KOFI. The GL accounts are now defined for these combinations. The chart of accounts is a necessary entry for all of the tables because it contains the GL accounts, and the GL accounts are controlled by the chart of accounts.

You can navigate to the next screen by double-clicking the CUST. GRP/MATERIAL-GRP/ACCTKEY combination. In the resulting screen shown in Figure 11.12, create

an entry for each combination of customer account group, material account group, and account key.

Change View "Cust.Grp/MaterialGrp/AcctKey": Overview

New Entries

Cust.Grp/MaterialGrp/AcctKey

	App	CndTy.	ChAc	SOrg.	AAG	AAG	ActKy	G/L Account	Provision acc.
	V	KOFK	INTA	1000	02	02	ERF	809000	⊕
	V	KOFK	INTA	1000	02	02	ERL	800000	
	V	KOFK	INTA	1000	02	02	ERS	888000	
	V	KOFK	INTA	1000	02	03	ERF	809000	
	V	KOFK	INTA	1000	02	03	ERL	800000	
	V	KOFK	INTA	1000	02	03	ERS	888000	
	V	KOFK	INTA	1000	03	01	ERF	809000	
	V	KOFK	INTA	1000	03	01	ERL	800000	
	V	KOFK	INTA	1000	03	01	ERS	888000	

Figure 11.12 GL Account Determination

In some cases, the preceding combinations may not be sufficient. For example, you may want the business unit (division), distribution channel, and the order reason as additional fields to determine the revenue postings.

You can use additional fields for revenue account determination. To set this up, you must define a new custom table for revenue account determination. Let's see how you can now use the order reason for the GL account posting:

1. Create a custom TABLE "504", as shown in Figure 11.13. The menu path for defining a custom table is SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • DEFINE DEPENDENCIES OF REVENUE ACCOUNT DETERMINATION • ACCOUNT DETERMINATION • CREATE TABLES, or you can also use Transaction V/12.
2. Enter the table number as shown in Figure 11.13. Select the fields required as shown: ORDER REASON, DISTRIBUTION CHANNEL, and DIVISION.
3. Generate the table by selecting the GENERATE (circle with red and white color or division) icon near the SELECT FIELD button. A new table is generated with a message, as shown in Figure 11.14.

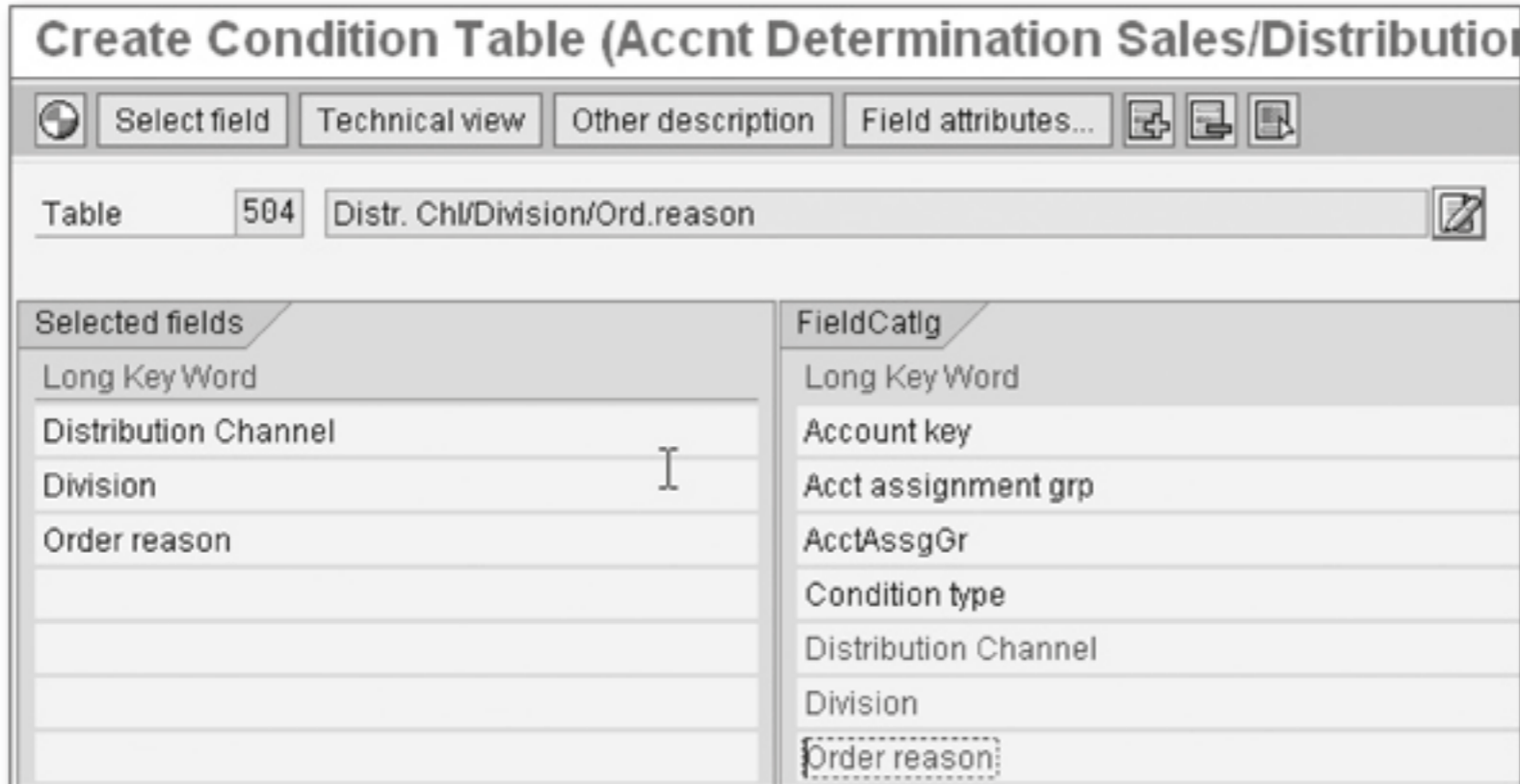


Figure 11.13 Custom Table for Revenue Account Determination

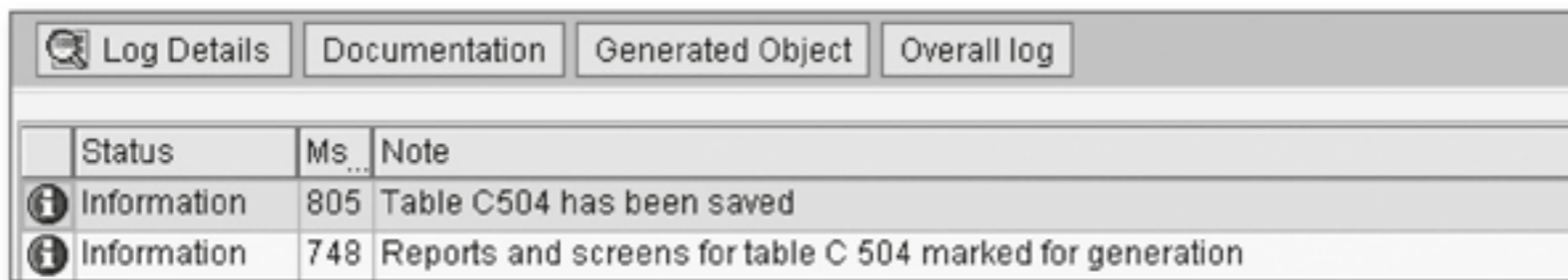


Figure 11.14 Custom Table Generation

- After you have created the table, you can assign it to the access sequence KOFI, as shown in Figure 11.15, which is done using the menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • DEFINE ACCESS SEQUENCES AND ACCOUNT DETERMINATION TYPES • MAINTAIN ACCESS SEQUENCES FOR ACCOUNT DETERMINATION.

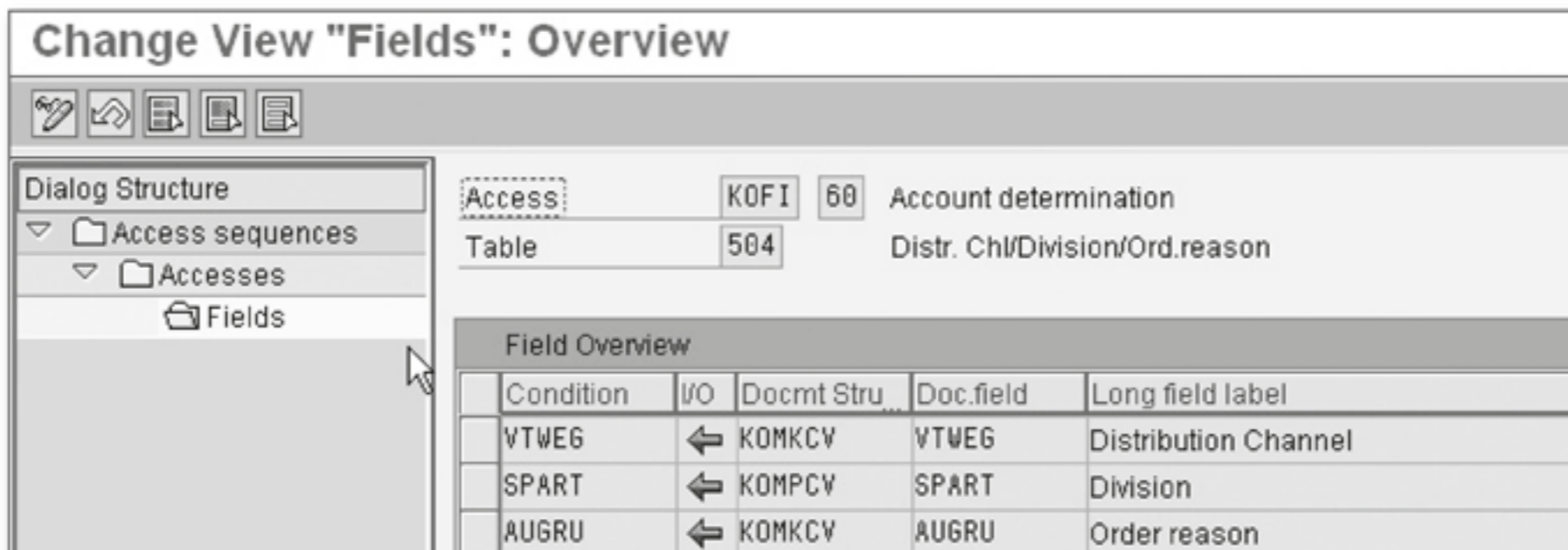


Figure 11.15 Assigning Custom Table to Access Sequence

5. Now that you have defined the custom table with ORDER REASON, DIVISION, and DISTRIBUTION CHANNEL fields, you can assign the new table to the access sequence KOFI. This is done by selecting the NEW ENTRIES button and then adding the table "504", which we created in the previous step, to the access sequence. Save the entries.
6. Figure 11.15 displays the fields that are assigned to the access sequence for revenue accounts determination for GL. You can view this by double-clicking the field to assign the fields to the table.
7. Save the assignment. After this assignment is created, the new table is automatically available to assign GL accounts by distribution channel, division, and order reason. You can set this up in the ASSIGN GL ACCOUNTS customizing transaction through the menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • ASSIGN GL ACCOUNTS (see Figure 11.16).

Table	Description
1	Cust.Grp/MaterialGrp/AcctKey
2	Cust.Grp/Account Key
3	Material Grp/Acct Key
4	General
5	Acct Key
504	Distr. Chl/Division/Ord.reason

Figure 11.16 Assign GL Accounts by Table 504

8. Double-click the last entry, which takes you to the screen shown in Figure 11.17. This screen shows how a revenue account is assigned by a combination of the preceding criteria. It shows that the fields defined in the custom table (i.e., ORDER REASON, DISTRIBUTION CHANNEL, and DIVISION) are now available to be used to assign a GL account.
9. While you are in Figure 11.16, click the table 504 – DISTR. CHL/DIVISION/ORD. REASON entry to open the screen shown in Figure 11.17, which displays the fields that are available as part of the access sequence table 504 for the GL account assignment.

New Entries: Overview of Added Entries						
Distr. Chl/Division/Ord.reason						
App	CndTy	ChAc	DChl	Dv	OrdRs	G/L Account
V	KOFI	CANA	10	10	101	410000

Figure 11.17 Revenue Account Assignment

Now that you understand how custom tables are created, let's explore how to create custom fields.

Create Custom Fields

As we reviewed in the earlier section, the SAP ERP standard determination tables are account, customer account group, material account group, and account key. Let's say with the customer, Supreme Computers, there is a need for further segregating the account for international customers. This segregation could be based on the type business you are dealing with them, in terms of goods or service you are selling them. You can use the sales order type as additional determination criteria to use for this determination via a custom table. For revenue account determination, a standard set of fields are provided. You can see the list of available fields in the field catalog using menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • ACCOUNT ASSIGNMENT/COSTING • REVENUE ACCOUNT DETERMINATION • DEFINE DEPENDENCIES OF REVENUE ACCOUNT DETERMINATION • FIELD CATALOG: ALLOWED LIST OF FIELDS (see Figure 11.18).

Field	Description
AUGRU	Order reason
KSCHA	Condition type
KTGRD	AcctAssgGr
KTGRM	Acct assignment grp
KTOPL	
KVSL1	Account key
LIFNR	Vendor
LLAND	Destination Country
MWSKZ	Tax Code
SPART	Division
VKORG	Sales Organization
VTWEG	Distribution Channel
WERKS	Plant

Figure 11.18 Allowed List of Fields for Revenue Account Determination

If the list of fields is not sufficient for your business purposes, then you can add new fields to the field catalog. To configure this, select the NEW ENTRIES button, which provides an expanded list of fields that can be used for revenue account determination, as shown in Figure 11.21.

New Entries: Overview of Added Entries				
Table Name	Short Description	Short	Medium Field Label	Long field label
KOMCV	Maintenance			
VKORG	Sales Organization	Sales org.	Sales Org.	Sales Organization
VTWEG	Distribution Channel	Distr. Ch1	Distr. Channel	Distribution Channel
KTGRD	Account assignment group for this customer	AcctAssgGr	AcctAssgGr	AcctAssgGr
WERKS	Plant	Plant	Plant	Plant
KTGRM	Account assignment group for this material	AcctAsgmt	Acct asgmt grp	Acct assignment grp
KSCHA	Condition type	Cond.type	Condition type	Condition type
KVSL1	Account key	Acct key	Account key	Account key
SPART	Division	Division	Division	Division
CCINS	Payment cards: Card type	Type	Card type	Payment card type
LOCID	Payment cards: Point of receipt for the transaction	PtOfRcpt	PointOfReceipt	Point of receipt
LIFNR	Account Number of Vendor or Creditor	Vendor	Vendor	Vendor
MWSKZ	Sales Tax Code	Tax Code	Tax Code	Tax Code
BEMOT	Accounting Indicator	AcctIndic	Acctg Indicator	Accounting Indicator
AUGRU	Order reason (reason for the business transaction)	Ord.reason	Order reason	Order reason
KDUMMY	Dummy function in length 1	DUMMY	DUMMY	DUMMY
PDUMMY	Dummy function in length 1	DUMMY	DUMMY	DUMMY
PSTYV	Sales document item category	Item cat.	Item category	Item category

Figure 11.19 Additional Fields for Revenue Account Determination

Let's say we choose PSTYV or Sales Document Item category. Next, select the new field, and save the addition to the field catalog (see Figure 11.20). Now PSTYV is available for creating custom revenue account determination tables, as explained previously.

Change View "Field Catalog (Accnt Determination)	
Field	Description
AUGRU	Order reason
KSCHA	Condition type
KTGRD	AcctAssgGr
KTGRM	Acct assignment grp
KTOPL	
KVSL1	Account key
LIFNR	Vendor
LLAND	Destination Country
MWSKZ	Tax Code
PSTYV	Item category
SPART	Division
VKORG	Sales Organization
VTWEG	Distribution Channel
WERKS	Plant

Figure 11.20 New Field PSTYV Added to Field Catalog

After a new field is added to the field catalog, the new field can be used to create custom tables as described earlier (see Figure 11.21).

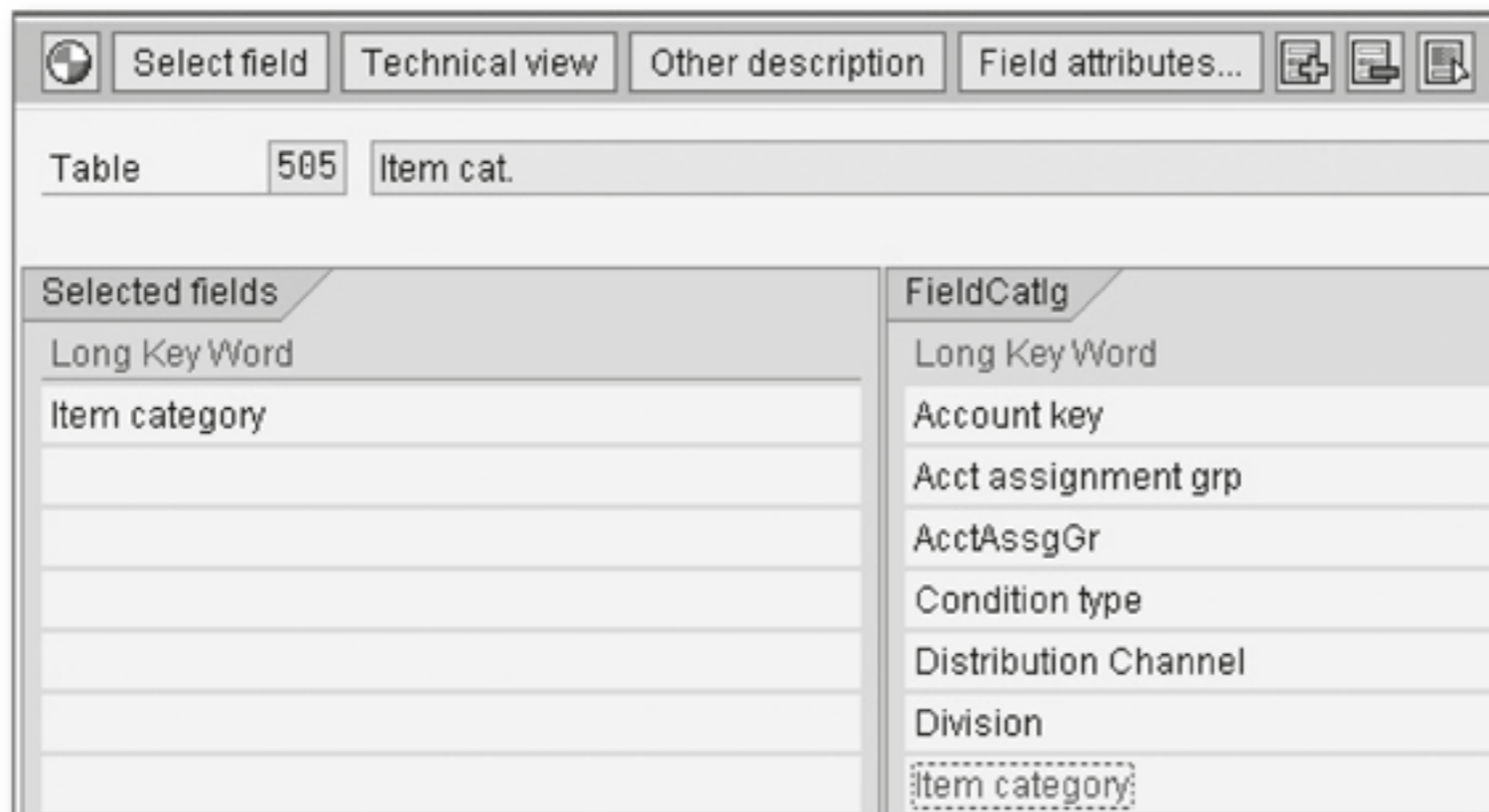


Figure 11.21 PSTYV Available for New Custom Table Creation

Now, let's discuss the master data setup for customers and materials.

11.2.7 Master Data Setup for Customers and Materials

The account assignment groups that we defined in configuration need to be assigned to the materials and customers. For materials, this is done in the SALES ORG 2 VIEW.

Perform the following steps to assign the account assignment groups to material master:

1. Use Transaction MM02, and enter the MATERIAL, SALES ORGANIZATION, DISTRIBUTION CHANNEL, and DIVISION.
2. Go to the SALES ORG 2 View, and populate the material ACCT ASSIGNMENT GRP with the value "01" as shown in Figure 11.22.
3. Use Transaction XK02, and enter the CUSTOMER, SALES ORGANIZATION, DISTRIBUTION CHANNEL, and DIVISION, and then go to the billing screen. The menu path is SAP EASY ACCESS • LOGISTICS • SALES AND DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • CUSTOMER • CREATE • COMPLETE.

Grouping terms			
Matl statistics grp	1	'A' Material	Material pricing grp
Volume rebate group			Acct assignment grp
Gen. item cat. grp	NORM	Standard item	01
Pricing Ref. Matl			NORM
Product hierarchy	00001B000100000003		Standard item
Commission group			
			Prod. Hier. Third Level - Parts A.03

Figure 11.22 Material Account Assignment Group

- Populate the customer ACCT ASSGMT GROUP with the value "01" as shown in Figure 11.23. For customers, the accounts assignment groups are defined in the BILLING VIEW as shown in Figure 11.24 in the next section.

Delivery and payment terms			
Incoterms	EXW	Manufacturing	
Terms of payment	NT30	Net due in 30 days	Paym.guar.proc.
Credit ctrl area			
Accounting			
Acct assgmt group	01	Domestic Revenues	

Figure 11.23 Customer Accounts Assignment Group

You should now have a solid understanding of how the revenue accounts are determined. In addition to revenue account postings, there are accruals that represent cumulative postings and which are accumulated over a period of time as explained next

11.3 Accruals

As we mentioned in the beginning, the document pricing condition amounts can be directly posted to the revenue account or to accruals. With accruals, you post the amount in a staging area before you finally post to the revenue account. Accruals represent accumulated values of condition types. For example, rebate agreements have accruals. Let's consider a real-world example of the auto industry dealers who get a rebate from their manufacturers at the end of the year based on the

total number of vehicles sold. The rebate amount is accrued over a period of time for the cars sold and then settled with the customer in a lump payment. Accruals are being created that post to accounting to give you visibility on how much you owe your customers. Rebate conditions such as BO01 and BO02 all have accrual keys in the pricing procedure, as shown. The accrual key enables posting to the appropriate accrual account.

As shown in Figure 11.24, the rebate accruals are tied to condition types.

Control															
Reference Step Overview															
	Step	Co...	CTyp	Fro	To	Ma...	R...	Stat	P	SuTot	Reqt	CalTy...	BasTy...	AccK	Accru...
	900	0				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		3		2			
	901	0	B001	400			<input type="checkbox"/>	<input type="checkbox"/>			24			ERB	ERU
	902	0	B002	400			<input type="checkbox"/>	<input type="checkbox"/>			24			ERB	ERU
	903	0	B003	400			<input type="checkbox"/>	<input type="checkbox"/>			24			ERB	ERU
	904	0	B004	400			<input type="checkbox"/>	<input type="checkbox"/>			24			ERB	ERU
	905	0	B005	400			<input type="checkbox"/>	<input type="checkbox"/>			24			ERB	ERU

Figure 11.24 Accrual Keys Assigned to the Condition Types

If we recall our pricing procedure definition, as demonstrated in Figure 11.24, the accrual accounts key are maintained next to the account key within the pricing procedure. In the example of service or rebate, the revenues are recognized after a certain period or contract time. Let's take the example of rebate, where the sale is made, and the rebate is recognized following the sale on a different period across several transactions. Assign the rebate accrual condition type BO01 to account key ERB and accrual key ERU.

The accrual key enables the cumulating of the rebate value over a period of time defined in the rebate agreement. At the end of the time period, a rebate agreement is settled. The posting to the accrual account is then cleared at the time of the credit memo settlement and the customer is credited.

11.4 Summary

This chapter provided you with the fundamentals of the financial account determination and how the revenue recognition applies to different business cases. We went over the account revenue determination and its linkages to the pricing

condition types. We reviewed the definition and the assignment of revenue account determination and interfaces with the sales and purchase conditions. Now that you have a solid understanding of how the revenue ,discounts, taxes are calculated , you can set up a pricing procedure for your own company with the various pricing conditions and also tying the condition type to the correct GL account key through the revenue account determination process.

In the next chapter, you'll learn about the Purchasing to FI integration.

Similar to the Sales and Distribution pricing procedure, Materials Management pricing conditions interface with Financial Accounting. These pricing conditions have an impact on the revenue and discount accounts that are set up in conjunction with the pricing procedure.

12 Materials Management Pricing Integration with Financial Accounting

This chapter shows you how Materials Management (MM) and Financial Accounting (FI) functionalities are integrated and how General Ledger (GL) accounts are determined for different pricing elements. In other words, you'll learn how to use account keys for purchase account determination, accruals, freight, rebates, and more.

Pricing integration and account determination are important to understand so that you can configure the system to make the correct GL postings for purchasing.

12.1 Account Determination Overview

Account determination in MM is the process of determining the correct GL accounts for financial postings. In this section, you'll learn how FI and MM are tightly linked. You'll also learn about account keys in pricing procedures and how they are used to determine the GL accounts.

Figure 12.1 shows that the purchase orders (POs) and the invoice transactions flow to the GL component in FI. Similarly, the payments made to the vendors also flow to the GL.

The accounts payable transactions, POs, and invoices are all integrated to the GL, as shown. In MM, the account determination involves elements such as freight accounts and rebates. These postings are controlled by account keys, which are assigned to the pricing condition types associated with base price, discounts, freight, rebates, and so on.

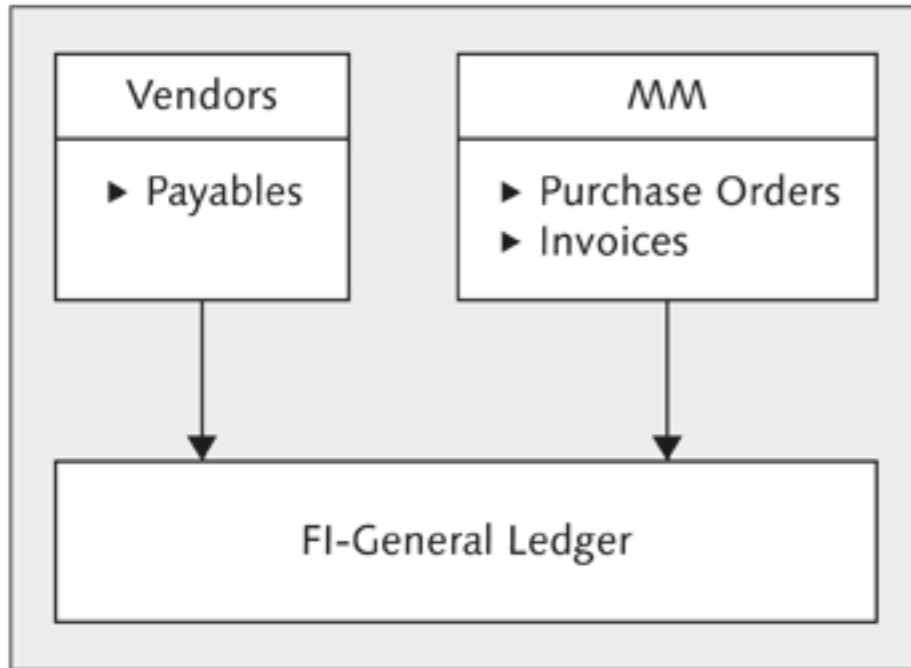


Figure 12.1 FI—MM Integration Overview

Before we launch into the details of pricing procedures, it's important to understand transaction keys, or account keys, in MM. Transaction keys are predefined in the system to enable transaction postings in Inventory Management (IM) and accounting (invoice verification). For each of the movement types in MM, there is a value string that stores these possible transactions. The pricing procedure is associated with transaction keys and accrual keys, as shown in Figure 12.2.

Procedure: ZM0000 Purchasing Document (Sig)

Control

Reference Step Overview

Step	C...	C...	Description	F..	T.	M...	R..	S...	Su...	R...	Cal...	Bas...	Ac...	Acc...
1	1	PB00	Gross Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X 9					
1	2	PBXX	Gross Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X 9	6				
2	0	VA00	Variants/Quantity			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X					
3	0	VA01	Variants %			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X					
4	0	GAU1	Orignl Price of Gold			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X		31			
5	0	GAU2	Actual Price of Gold			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	31	32	32		
10	1	RB00	Discount (Value)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X					
10	2	RC00	Discount/Quantity			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X					
10	3	RA00	Discount % on Net			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X					
10	4	RA01	Discount % on Gross	1		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X					
10	5	HB00	Header Surch.(Value)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X					
10	6	ZB00	Surcharge (Value)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X					

Figure 12.2 Transaction Keys and Accrual Keys

As you can see, the account keys are the mechanism the purchasing pricing procedure uses to determine the GL accounts. The account keys are fixed and cannot be changed by the user. Figure 12.3 illustrates a list of the account keys available for MM pricing.



Act...	Name
AG1	Rev.from agency bus.
AG2	Sales fr.agency bus.
AG3	Exp.from agency bus.
BO1	Rebates
BO2	Volume rebate income
DEL	Delkredere
EIN	Purchasing account
FR1	Freight clearing
FR2	Freight provisions
FR3	Customs clearing
FR4	Consignment payables
FRE	Freight purch. acct.
NRI	NRIPEN
RUE	Prov. misc.del.costs
VST	Input tax

Figure 12.3 Account Keys Available in MM Pricing

The account keys for defining the GL accounts are available in MM. The menu path for configuring GL accounts is **SPRO • MATERIALS MANAGEMENT • VALUATION AND ACCOUNT ASSIGNMENT • ACCOUNT DETERMINATION • ACCOUNT DETERMINATION WITHOUT WIZARD • CONFIGURE AUTOMATIC POSTINGS**, or you can use Transaction **OBYC**. You then select the **ACCOUNT ASSIGNMENT** icon to see all of the account keys available for postings.

Next, we'll explain how the postings are set up for MM, and in the following subsections, we'll explore how these account keys are used.

12.1.1 Key Concepts

Now that we have gone over the account determination overview, we'll highlight some of the key concepts, including account keys and their applications. Account keys are linked in the purchasing pricing procedure through the condition types.

Follow these steps to link the account key and the condition type in the pricing procedure and then link the account keys to GL accounts:

1. Select the pricing procedure (e.g., **RM0000**) using the menu path defined or Transaction **M/07**. Alternatively, you can follow the menu path for purchasing:

SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE CALCULATION SCHEMA.

2. Select the control data to list all of the pricing condition types in the pricing procedure. Assign the account key to the pricing condition type in the pricing procedure.
3. Assign these account keys to GL accounts in Transaction OBYC or by using the menu path SPRO • MATERIALS MANAGEMENT • VALUATION AND ACCOUNT ASSIGNMENT • ACCOUNT DETERMINATION • ACCOUNT DETERMINATION WITHOUT WIZARD • CONFIGURE AUTOMATIC POSTINGS.

The account keys are used to determine the GL accounts depending on whether the companies are using rebates or freights. Account keys are also used for purchase account management. Purchase account management is a functionality that is used in certain European countries due to certain legal requirements.

The following list explains some of the account keys that are typically used by businesses:

- ▶ **Provisions for subsequent (end-of-period rebate) settlement (BO1)**
If you use this function with regard to conditions (e.g., for period-end volume-based rebates), provisions for accrued income are set up when goods receipts are recorded against POs.
- ▶ **Income from subsequent settlement (BO2)**
The rebate income that is generated in the course of a "subsequent settlement" (end-of-period rebate settlement) is posted via Transaction B02.
- ▶ **Purchase account (EIN), purchase offsetting account (EKG), and freight purchase account (FRE)**
These transactions are used only if purchase account management is active in the company code. Due to special legal requirements, this function was developed specially for certain countries (Belgium, Spain, Portugal, France, Italy, and Finland).
- ▶ **Freight clearing (FR1), provision for freight charges (FR2), customs duty clearing (FR3), and provision for customs duty (FR4)**
These transactions are used to post delivery costs (incidental procurement costs) in the case of goods receipts against POs and incoming invoices. Which transaction you should use for which delivery costs depends on the condition types

that are defined in the PO. You can also enter your own transactions for delivery costs in condition types.

▶ **External service (FRL)**

Use this transaction for goods and invoice receipts in connection with subcontract orders. If the account assigned here is defined as a cost element, you must specify a preliminary account assignment for the account in the table of automatic account assignment specification (customizing for Controlling) to be able to post goods receipts against subcontract orders. In the standard system, cost center SC-1 is defined for this purpose.

▶ **Incidental costs of external activities (FRN)**

Use this transaction for delivery costs (incidental costs of procurement) in connection with subcontract orders. If the account assigned here is defined as a cost element, you must specify a preliminary account assignment for the account in the table of automatic account assignment specification (customizing for Controlling) to be able to post goods receipts against subcontract orders. In the standard system, cost center SC-1 is defined for this purpose.

▶ **Provision for delivery costs (RUE)**

Provisions are created for accrued delivery costs if a condition type for provisions is entered in the PO. They must be cleared manually at the time of invoice verification.

▶ **Input tax and purchasing (VST)**

This transaction/event key is used for tax account determination within the "subsequent settlement" facility for debit-side settlement types. This key is necessary in the settlement schema for tax conditions.

Now that we've discussed these functions, we are prepared to review the financial postings for MM. By now you should have an overview of the account keys that are used in Purchasing, so we'll move on to how the actual GL accounts are determined for these account keys. The next section describes how to configure the link between the account keys and GL accounts.

12.2 Financial Accounting Postings for Materials Management

To understand how the financial postings are set up for MM, let's consider an example of a fictitious company called Zip Inc., which is in the business of assembling

computers. The company purchases parts such as keyboards and RAM from a vendor, Athena, for assembly. Zip incurs freight costs and insurance costs for delivery of the keyboards and RAM by Athena to the assembly plants. The freight charges are represented by freight condition FRA1, and Athena charges 5% of the purchases. Zip Inc. doesn't pay these freight charges immediately, but keeps track of the charges. The charges are accumulated over a period of time and paid periodically to Athena.

Perform the following configuration steps to set up the scenario described:

1. Set up a freight condition as a statistical and accrual condition type. This is done in configuration by checking the ACCRUAL and STATISTICAL indicators for the condition type FRA1 in the pricing procedure using Transaction M/08.

The pricing procedure has FREIGHT CONDITION FRA1, which is linked to Transaction FR1.

2. Assign the freight condition type FRA1 with account key "FRE" and accrual key "FR1" This is done using Transaction M/08 and assigning the condition type FRA1 with the account key as "FR1" and accrual key as "FRE".
3. Assign the GL accounts to the FREIGHT clearing account key FR1 so that the GL account can be automatically determined at the time of goods receipt postings. The GL account for FR1 is determined from Transaction OBYC. This is actually an accruals account, which will be cleared when the invoice is posted
4. Now you can set up the linkage between the GL account and account key using the menu path SPRO • MM • VALUATION AND ACCOUNT ASSIGNMENT • ACCOUNT DETERMINATION • ACCOUNT DETERMINATION WITHOUT WIZARD • CONFIGURE AUTOMATIC POSTINGS • ACCOUNT ASSIGNMENT (OBYC). This is shown in Figure 12.4. These postings are controlled by transaction keys. You can use the transaction keys to determine accounts or posting keys for line items, which are created automatically by the system. The transaction keys are defined as SAP ERP standard in the system and cannot be changed by the user. The transactions keys are associated with the pricing condition types.
5. Double click account key "FR1", and assign the GL accounts to the freight clearing account key "FR1". Because the GL accounts are tied to the chart of accounts, it's necessary to specify each posting by the chart of accounts. Figure 12.5 illustrates the assignment.

Maintain FI Configuration: Automatic Posting - Procedures

Group Materials Management postings (MM)

Procedures

Description	Transaction	Account determ.
Rev.from agency bus.	A61	<input checked="" type="checkbox"/>
Sales fr.agency bus.	A62	<input checked="" type="checkbox"/>
Exp.from agency bus.	A63	<input checked="" type="checkbox"/>
Expense/revenue from consign.mat.consum.	AK0	<input checked="" type="checkbox"/>
Expense/revenue from stock transfer	AUM	<input checked="" type="checkbox"/>
Subsequent settlement of provisions	B01	<input checked="" type="checkbox"/>
Subsequent settlement of revenues	B02	<input checked="" type="checkbox"/>
Provision differences	B03	<input checked="" type="checkbox"/>
Inventory posting	BSD	<input checked="" type="checkbox"/>
Change in stock account	BSV	<input checked="" type="checkbox"/>
Inventory posting	BSX	<input checked="" type="checkbox"/>
Revaluation of other consumables	C0C	<input checked="" type="checkbox"/>
Delkredere	DEL	<input checked="" type="checkbox"/>
Materials management small differences	DIF	<input checked="" type="checkbox"/>
Purchase account	EIN	<input checked="" type="checkbox"/>
Purchase offsetting account	EKG	<input checked="" type="checkbox"/>
Freight clearing	FR1	<input checked="" type="checkbox"/>
Freight provisions	FR2	<input checked="" type="checkbox"/>
Customs clearing	FR3	<input checked="" type="checkbox"/>
Customs provisions	FR4	<input checked="" type="checkbox"/>
Purchasing freight account	FRE	<input checked="" type="checkbox"/>
External activity	FRL	<input checked="" type="checkbox"/>

Figure 12.4 FI Postings

Maintain FI Configuration: Automatic Posting

Chart of accounts - North America

Freight clearing

Account assignment

Account	
217300	

Figure 12.5 GL Account for Transaction FRI

Additionally, the ACCOUNT DETERMINATION indicator specifies whether the transaction key is relevant for posting or not. For example, let's consider FREIGHT CLEARING (FR1). The freight clearing account is used to post delivery costs (incidental procurement costs) in the case of goods receipts against POs and incoming invoices.

To configure this scenario, perform the following steps:

1. Create a PO using Transaction ME21N. Enter the freight charges by manually entering an AMOUNT value of 5% for the freight condition on the PO. This is illustrated in Figure 12.6.

The screenshot shows the SAP ME21N interface for creating a purchase order. The 'Conditions' tab is active, displaying a table of pricing elements. The table includes columns for Name, Amount, Crcy, per, U, Condition value, and Curr. The 'FRA1 Freight %' condition is highlighted, showing an amount of 5.000 % and a condition value of 1.88 USD. Other conditions include 'SKT0 Cash Discount' with an amount of 0.000 and a condition value of 0.00 USD. The main header shows a quantity of 1 CCM and a net amount of 37.50 USD.

Pricing Elements									
	N	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr.
				12.50	USD		1 CCM	37.50	USD
<input type="checkbox"/>			FRA1 Freight %	5.000 %				1.88	USD
<input type="checkbox"/>			SKT0 Cash Discount	0.000				0.00	USD

Figure 12.6 Freight Condition Type FRA1

2. Create a goods receipt against the PO setup in the previous setup using menu path LOGISTICS • MATERIALS MANAGEMENT • INVENTORY MANAGEMENT • GOODS MOVEMENT • GOODS MOVEMENT (MIGO) or Transaction MIGO.
3. Enter the PO number in the PO field, and all of the PO information is defaulted. When the goods receipts are posted, the accrual account is posted with the amount to the correct GL account.

Continuing with the previous example, consider that the freight is paid by a different vendor. The transaction information is maintained in the freight condition type FRA1, as shown in Figure 12.7.

Figure 12.8 displays the freight clearing account posting, vendor ACCOUNT 300001. In this example, when the goods receipt is posted, the accrual amount is posted to the correct GL account. But in this case, the posting is against vendor 300001 because the carrier is different from the purchasing vendor.

Item - Conditions - Detail

Item: 10 Application: M
 Condition type: FRA1 Freight % CondPricingDate: 13.10.2010

Condition values

Amount: 5.000 %
 Cond.base value: 37.50 USD
 Condition value: 1.88 USD

Control

Condition class: A Discount or surcharge
 Calculat.type: A Percentage Statistical
 Condit.category: B Delivery costs Accruals
 Cond.control: C Changed manually Changed manual.
 Condit.origin: C Manually entered

Account determination

Account key: FRE
 Accruals: FR1

Vendor: 300001

Figure 12.7 Freight Condition for a Carrier (Vendor Different from Purchasing Vendor)

Display Document: Data Entry View

Taxes Display Currency General Ledger View

Data Entry View

Document Number: 5105600797 Company Code: 1000 Fiscal Year
 Document Date: 13.10.2010 Posting Date: 13.10.2010 Period
 Reference Cross-CC no.
 Currency: USD Texts exist: Ledger Group

Accounting toolbar

C...	Item	PK	S	Account	Description	Amount	Curr.
1000	1	31		300001	Maxcare Inc.	1.88-	USD
	2	40		217300	Freight Clrg Account	1.88	USD

Figure 12.8 Freight Invoice Clearance

Now that you understand how freight condition types are set up and posted, you can set up other conditions such as customs posting clearance and customs provisions transaction key (Transaction Key FR3/FR4) because they work in the same way.

In addition to the regular transaction keys, there are also accrual posting keys. With the aid of the accrual account key, the system can post amounts to certain types of accruals accounts. For example, rebate accruals, which are calculated from pricing conditions, can be posted to the corresponding account for rebate accruals.

Now that you understand how some of the account keys such as FR1, FR3, and FR4 work, let's explore another account key: EIN, or purchase account management.

12.2.1 Purchase Account Management

This functionality is used to comply with European legal requirements. For countries such as Belgium, Spain, Portugal, France, and Italy, purchase accounts must be managed to document the value at which externally procured materials are posted. Purchase accounts are used for statutory reporting.

The purchase account is posted at the time goods receipts and incoming invoices are posted, with the same amount as the stock account. The offsetting entry is posted to a purchase offsetting account. The purchase account is generally not posted upon goods receipts for POs with account assignment. For this to work, the company needs to be activated for purchase account management. This is a configuration activity, so it must be activated by a functional configuration team. The following sections explain some of the basic setup required to activate purchase account management.

12.2.2 Activation of Purchase Account Management at the Company Code Level

When you activate purchase account management at the company code level, this process allows you to manage your purchasing accounts within your company code and helps you posts your materials and purchasing transactions. The menu path is SPRO • IMG • MATERIALS MANAGEMENT • VALUATION AND ACCOUNT ASSIGNMENT • ACCOUNT DETERMINATION • ACCOUNT DETERMINATION WITHOUT WIZARD • PURCHASE ACCOUNT MANAGEMENT • ACTIVATE PURCHASE ACCOUNT IN COMPANY CODE (see Figure 12.9).

Display View "Definition of Purchase Account Mgmt": Overview

Co	Company Name	City	Country	Purch.acct
2200	IDES France	Paris	FR	<input checked="" type="checkbox"/>
2201	IDES France affiliate	Paris	FR	<input checked="" type="checkbox"/>
2222	Wash Out	Mumbai	IN	<input type="checkbox"/>
2300	IDES España	Barcelona	ES	<input type="checkbox"/>
2345	Vakkal impex	Bangalore	IN	<input type="checkbox"/>
2400	IDES España	Madrid	ES	<input type="checkbox"/>

Figure 12.9 Activate Purchase Account Management

For purchase account management, you should note the relevant transaction keys EIN (Purchase Account) and EKG (Offset Account). The relevant accounts for EIN and EKG are set up in Transaction OBYC for a specific chart of accounts. This is set up the same way as described for FR1, FR2, and so on; that is, use Transaction OBYC, double-click EIN, and set up the corresponding GL account. Repeat the same procedure for EIN.

Now let's see what happens when purchase account management is activated.

Activate Purchase Account Management

When purchase account management is activated, goods receipt postings generate additional postings.

For example, a PO is created for \$200. At the time of goods receipt, the material document postings are posted to the inventory account and GR/IR (i.e., debit inventory and credit GR/IR). At the same time, additional entries are created that debit the purchase account (EIN) and credit the purchase offset accounts (EKG).

Calculation of Value for Purchase Account

Purchase accounts can be updated either at the stock value or the GR value. The following example illustrates how the postings work for purchase accounts posted with the stock account.

For example a PO shows 10 EA at 10 USD. Let's assume that the standard price is \$8 each. In this example, at the time of goods receipt, the purchase account is posted with the stock account, and the difference of \$20 is posted to a price difference account (see Table 12.1).

Account	Credit or Debit	USD
Stock	D	\$100
GR/IR	C	\$100
Price Difference	D	\$20
Purchase Account	D	\$80
Purchase Offset	D	\$80

Table 12.1 Example of a Purchasing Account Posted with Stock Account

Let's take another example in Table 12.2, where the purchase accounts are posted to goods receipt and inventory receipt accounts. In this case, the exact amount posted at goods receipt or invoice receipt is posted to the purchase account.

Account	Credit or Debit	USD
Stock	D	\$80
GR/IR	C	\$100
Price Difference	D	\$20
Purchase Account	D	\$100
Purchase Offset	D	\$100

Table 12.2 Example of a Purchasing Account Posted to a Goods Receipt Account

These two tables provide you with insight on how the account posting might be different with different posting accounts.

12.3 Summary

In this chapter, we discussed how the GL accounts are derived for the MM pricing procedure. By understanding this chapter, you'll be able to set up the GL postings for freight, incidental costs, rebate postings, and other conditions, and you'll be able to configure the MM pricing procedure.

We explained the purpose of transaction keys and how they are used to determine GL accounts. We explained some key transaction keys such as Freight Clearing (FR1)

and Customs Clearing (BR1). We also discussed how purchase accounts must be managed to document the value at which externally procured materials are posted and how they are used for statutory reporting.

You have learned about pricing procedures, condition techniques, and condition records over the course of the past 12 chapters. Now let's explore how to write reports to read and review the pricing condition records created.

In the next chapter, you'll learn how to write and run reports in SD and MM.

Reports enable users to analyze Sales and Distribution and Materials Management transactions. This chapter explains some of the key reports used in pricing and discusses how business users can set up and lay out their own pricing reports in SD and MM.

13 Pricing Reports in Sales and Distribution and Materials Management

Within Sales and Distribution (SD) and Materials Management (MM), you use pricing reports to review pricing information. Several standard reports are available in SD such as material price, discounts and surcharges, hierarchies, and more. Similarly, several standard reports are available in MM as well for purchasing info records (PIRs), contracts, and material groups.

The following sections explain how to execute standard SD and MM pricing reports, as well as how to build your own custom pricing reports.

13.1 Pricing Reports and Lists

Unlike with SD, no customizing pricing reports are available in the MM functionality.

Not only can you run standard SD pricing reports but you can also create your own custom SD pricing reports, define pricing layouts, and also sequence the order in which the reporting fields appear.

You can configure the standard pricing reports layout and sequencing in standard pricing reports.

SAP ERP provides standard reports, which we'll review with specific examples for applications. To execute standard SD pricing reports, follow the menu path SAP MENU • LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • CONDITIONS • LIST • PRICING REPORTS to see the initial pricing report screen shown in Figure 13.1.

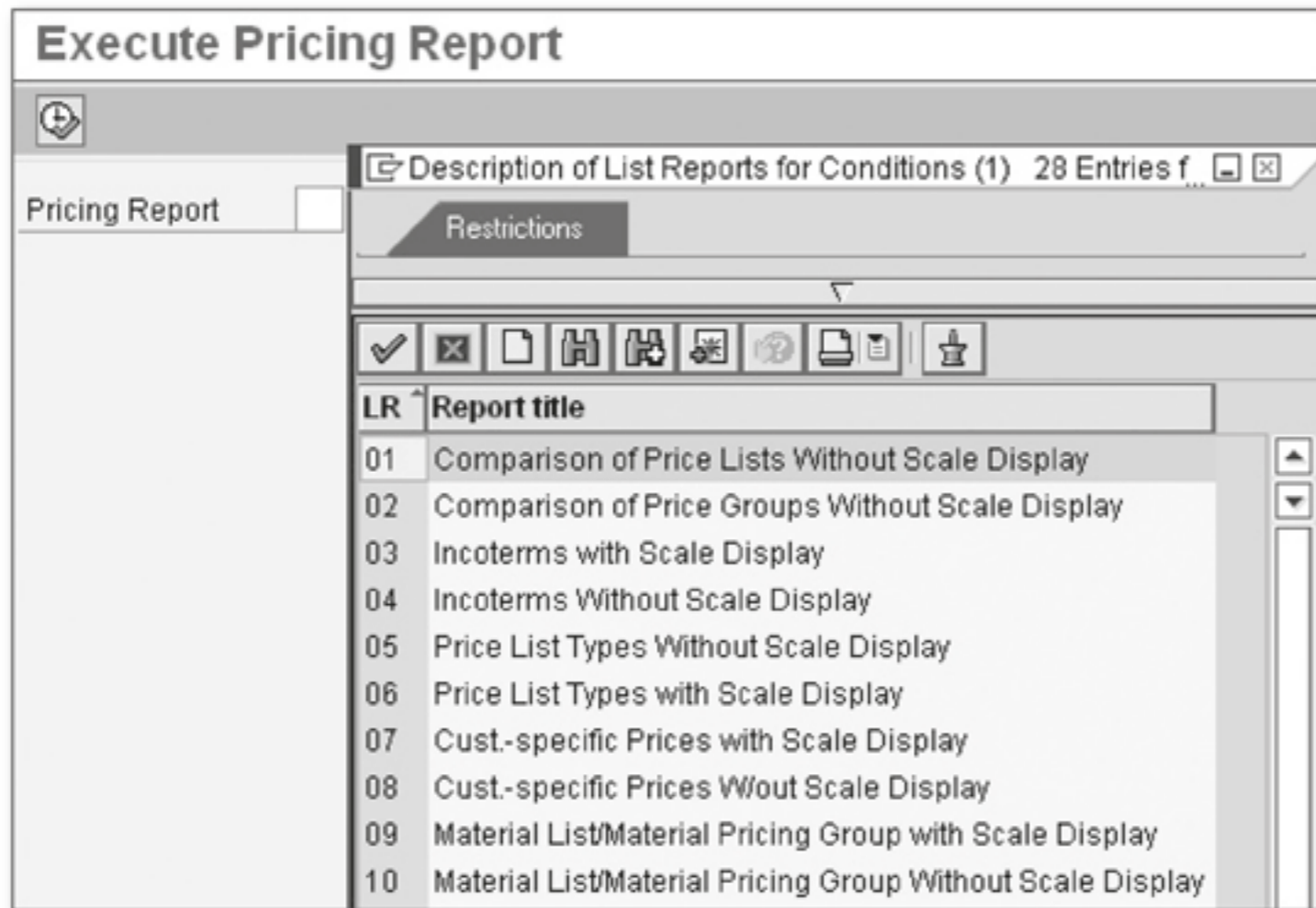


Figure 13.1 Pricing Reports

Standard SAP ERP delivers about 30 pricing reports. The following list describes some of the key reports that are frequently used and the functionality they provide:

► **Pricing Report 13 (Incoterms)**

This report provides the Incoterms pricing conditions and amounts by validity periods.

► **Pricing Report 14 (Tax Report)**

This report provides the tax condition types and amount by country and validity rates.

► **Pricing Report 15 (Material Price Report)**

This report provides the list price (pricing condition PR00) by validity dates for a given sales organization and distribution channel.

► **Pricing Report 17 (Discounts by Customer)**

This report provides the discounts by customer by validity dates for a given sales organization and distribution channel.

► **Pricing Report 21 (Discounts by Customer/Material)**

This report provides the discounts by customer and material (e.g., pricing condition K005) by validity dates for a given sales organization and distribution channel.

► **Pricing Report 30 (Customer Hierarchy)**

This report provides the customer hierarchy conditions amount (e.g., pricing

condition HI01) by validity dates for a given sales organization and distribution channel.

Now that you understand the functionality of some of these standard reports, let's see how these reports can be executed.

In this screen, input the report ID information in the PRICING REPORT field. This is the two-digit field that represents the report you want to execute. For example, to execute the Material Price Report, you use Report ID 15, and click the EXECUTE button. The resulting screen is shown in Figure 13.2.

Material Price			
Sales Organization	1000	to	
Distribution Channel	10	to	
Material		to	
Release status		to	
Condition Type		to	
Validity period			
Validity range	13.10.2010	to	31.12.9999
Condition records exceeding interval named above			
<input checked="" type="checkbox"/> at start of validity period			
<input checked="" type="checkbox"/> at end of validity period			
List screen			
<input checked="" type="checkbox"/> Display scales			
<input checked="" type="checkbox"/> Display validity period			
<input type="checkbox"/> Additional condition fields			
<input type="checkbox"/> Cond. marked for deletion			
<input type="checkbox"/> Exclusive			

Figure 13.2 Execute Pricing Report 15

Now you can fill in the necessary fields—SALES ORGANIZATION, DISTRIBUTION CHANNEL, and VALIDITY RANGE.

You also can select several checkboxes. Selecting the checkboxes DISPLAY SCALES and DISPLAY VALIDITY PERIOD, causes the system to display the scales and validity period of the scales for the report executed.

After you've configured the appropriate fields, click EXECUTE. The output is displayed, as shown in Figure 13.3.

Material Price											
Sales Org. 1000				Dom. Sales Org							
Distr. Channel 10				Direct Sales							
Material											
CnTy	ReSt	S	Scale	qty	UoM	Amount	Unit	Unit	UoM	Valid From	Valid to
H11											
PR00						1,755.00	USD	100	EA	09.10.2009	31.12.9999

Figure 13.3 Output of Report ID 15

This pricing report allows you to dynamically change the fields by double-clicking the report output. This is an interactive report; the pencil icon allows you to change the parameters.

The standard pricing reports also offer the usage of variants. Variants enable users to rerun reports without having to type in the input fields repeatedly. Variants can be used to store default values for input parameters, and the pricing reports can then be run by using these variants.

The variants also have attributes. Attributes can be used to control the input fields. In other words, the input fields can be hidden or made display only. When the business users run the reports, only certain fields will be available as inputs depending on how the attributes are set.

Now that we've looked at the generic report with pricing, let's look at some specific pricing condition reports in the following subsections.

13.1.1 Net Price List

Standard SAP ERP also offers the Net Price List report, which helps to simulate the net price (net price the customer will have to pay) for a customer. This useful report provides the price, cost, discounts, freight, and so on. The report simulates how the pricing procedure works. The menu path for this report is SAP MENU • LOGISTICS • SALES AND DISTRIBUTION • MASTER DATA • CONDITIONS • LIST • NET PRICE LIST. You can also use Transaction V_NL.

There are various subtotals in the report shown in Figure 13.4 (Subtotal 1 through 6). Each of these subtotals represents the totals that are maintained in the pricing procedure through the SUTOT (subtotals) column.

Control											
Reference Step Overview											
Step	Co	CType	Description	Fro	To	Ma	R	Stat	P	SuTot	
8	0	EK01	Equal Costs			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		B	
11	0	PR00	Price			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
13	0	PB00	Price (Gross)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
20	0	VA00	Variant Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X		
100	0		Gross Value			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	1	

Figure 13.4 Subtotal "1" Stores Gross Value

Take a look at subtotal 1 (KOMP-KZWI1), which carries the GROSS VALUE. Similarly, other subtotals carry NET VALUE, DISCOUNTS, FREIGHT, and so on. If you maintain pricing conditions for pricing procedures, such as PR00 and K007, the system uses these condition records to arrive at the gross price and net price, for example.

Let's consider the example of Acme Computers, a company that sells desktops and laptops. Acme Computers has several customers who purchase the company's desktops and laptops.

A product (H13) and customer (1000000) have pricing condition records that are maintained for PR00 (Price) = \$16.90, K007 (Customer Discount) = 5%, and KF00 (Freight) = EXW, \$1000/Ton. The pricing report takes all of this information into consideration to simulate the price.

For another use-case scenario example, consider Pro-Tech Electronics, which sells hardware and accessories such as hard drives, keyboards, and cables. Any product sold by the Tech to the customer can have a gross price, discounts being offered to the customer during holidays, freight charges if the product has to be shipped, and more. Product H11 (Model 32 x 64 laptop) is being sold to a customer John West (100000) at a price of \$1690.00 and at a discount of 5%. The product is being shipped to the customer via FedEx, so the customer is incurring some freight charges as well.

Let's see how the pricing report calculates the net price being charged to the customer and also displays all of the pricing conditions such as price and discount.

To create the net price list, follow these steps:

1. Follow the menu path for this report: LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • CONDITIONS • LIST • NET PRICE LIST (V_NL).

Input the customer (SOLD-TO PARTY) and MATERIAL for which the price has to be simulated as shown in Figure 13.5. Execute the report.

The screenshot shows the 'Create net price list' form in SAP. It is divided into several sections:

- Organizational Data:**
 - Sales Organization: 1000
 - Distribution Channel: 10
 - Division: 10
- Customer Data:**
 - Sold-To Party: 100000
- Material Data:**
 - Plant: 1000
 - Material: H11 to []
- Default Data:**
 - Pricing Date: 13.10.2010
 - Billing Type: FX
 - Order Type: OR
 - Item Category: TAN
 - Price Simulation

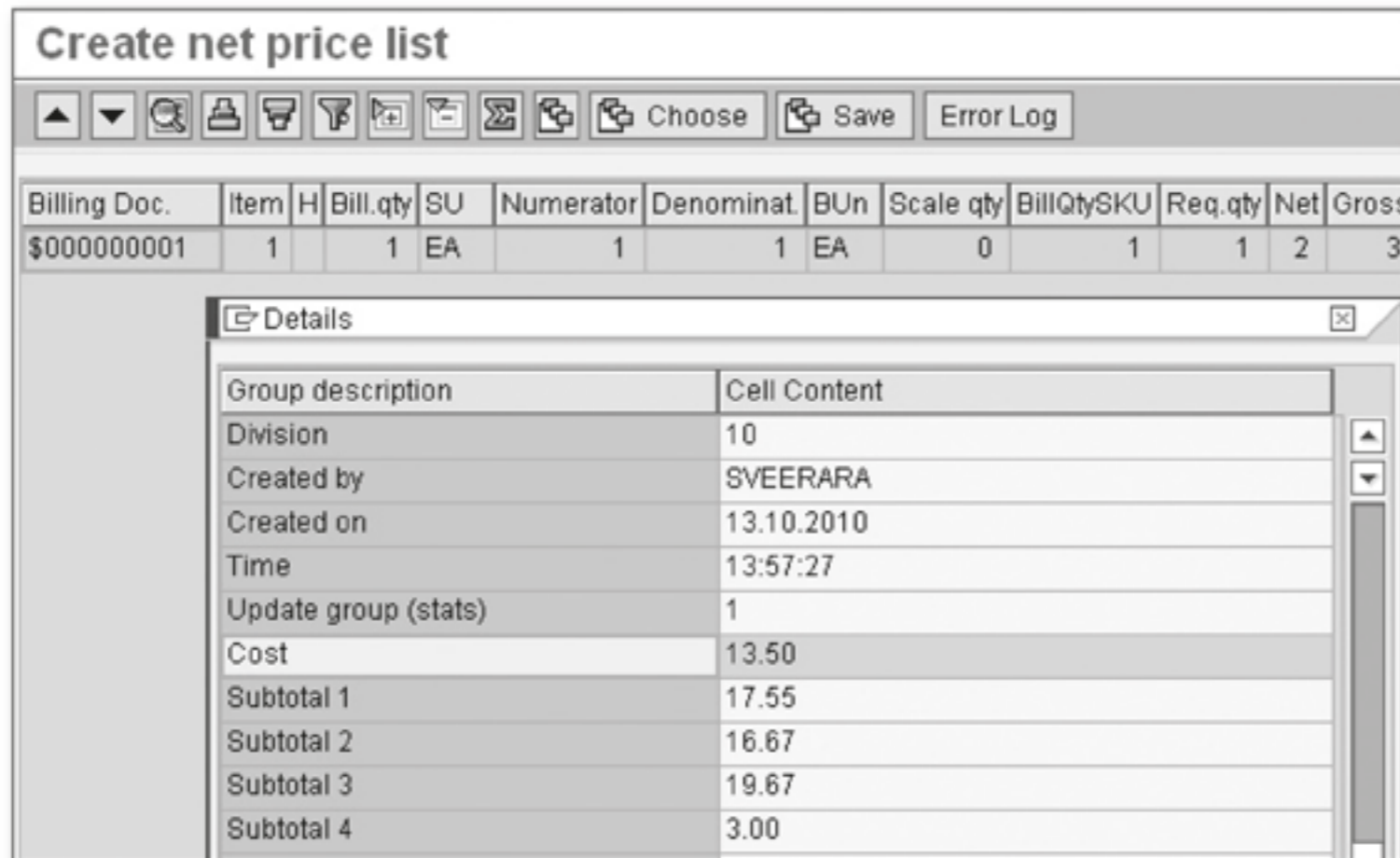
Figure 13.5 Price Simulation Report

This screen provides the option to run the report in simulation and review the output. Price simulation report enables you to determine the profitability of selling a product by inputting various list prices, discounts, and so on. By using this report, a quick quote can be provided to customer John West. This report simulates the actual price that will be charged to John West based on the net price and discounts that have been defined for this customer.

2. Enter the input parameters for the SALES AREA (SALES ORGANIZATION, DISTRIBUTION CHANNEL, and DIVISION), CUSTOMER, and MATERIAL, and execute the report. The output of the report is shown in Figure 13.5 for these selection parameters.

In this example, the COST is obtained from the material master and is stored in the accounting view as cost. SUBTOTAL 1 is gross price (PR00 + tax), SUBTOTAL 2 is net value taking discounts (K007) into account, and SUBTOTAL 3 is inclusive of freights (KF00). SUBTOTAL 4 is just the freight amount (KF00). This report simulates the behavior of a standard pricing procedure (RVAA01) to arrive at the net price. In

the pricing procedure, the conditions types, gross value, and net value are stored in a field defined in the subtotal column. Gross price is stored in subtotal 1, Net Value is subtotal 2, and so on.



Billing Doc.	Item	H	Bill. qty	SU	Numerator	Denominat.	BUn	Scale qty	BillQtySKU	Req. qty	Net	Gross
\$000000001	1	1	EA	1	1	EA	0	1	1	2	3	

Group description	Cell Content
Division	10
Created by	SVEERARA
Created on	13.10.2010
Time	13:57:27
Update group (stats)	1
Cost	13.50
Subtotal 1	17.55
Subtotal 2	16.67
Subtotal 3	19.67
Subtotal 4	3.00

Figure 13.6 Price Simulation

Now that you understand how to execute standard pricing reports, let's examine how to create custom pricing reports.

13.2 Custom SD Pricing Reports

You can generate custom pricing reports with your SAP ERP system. Custom reports are used when the standard pricing reports cannot meet the business requirements. In this case, you can create your own reports. For example, you might want a report to list the pricing conditions for a customer and material for a specific sales organization, distribution channel, and division. This report is not available as a standard report, so a custom report has to be created.

To create a custom report, follow these steps:

1. Access the menu path via SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • MAINTAIN PRICING REPORT, or use Transaction V/LA.

In the screen that appears, input a report ID in the NAME OF LIST field and a description of the report in the TITLE field to create a new report, as shown in Figure 13.7.

Create Pricing Report	
Name of List	Z1
Title	Demo Pricing Report Creation

Figure 13.7 Pricing Report Creation

2. Click the arrow button, which creates a pricing report. Select your options from the list of fields that you need on the report, as shown in Figure 13.8. We have chosen the CUSTOMER and DIVISION fields.
3. This screen displays the fields that are available as part of the pricing list to choose from. You can select from these fields listed in Figure 13.8. After these fields are selected, you can select the list of tables that has these fields.

Create Pricing Report	
Name of list	Z1
Title	Test
Fld Selectn	
Fld name	Technical view
Accounting Indicator	BEMOT
Agreement	KNUMA
Bill-to party	KUNRE
CAP prod. group	MOGRU
Campaign ID	CMPGN_ID
City code	CITYC
Company Code	BUKRS
Condition Contract	COCO_NUM
Control code	STEUC
Country	ALAND
Country	LAND1
County code	COUNC
Cross-plant grouping	PWGGR
Customer	HIENR
Customer	KUNNR
Customer group	KDGRP
Customer group 2	KVGR2
Destination Country	LLAND
Distribution Channel	VTWEG
Division	SPART
Document Currency	WAERK
Document type	DOCTYP

Figure 13.8 Select Fields for Report

4. You can choose the AND icon or the OR icon. Selecting the AND icon results in selecting tables that have both the customer and material fields. Selecting the OR icon results in selecting the tables that have customer or material but not both. In our example, select the AND icon in Figure 13.8, and you'll get to the screen shown in Figure 13.9. Figure 13.9 displays the table with the key fields selected from the field selection, as shown previously in Figure 13.8.

Key combinations	
Ta	Short Description
005	Customer/Material
007	Division/Customer
030	Customer/Material Pricing Group
114	Tax Exemption: Customer
115	Ser.agnt/Dep.ctry/Dep.PC /Ship-to party
116	Tax Exemption - Customer/Tax Classification 2-Material
117	Tax Exemption - Customer/Material
145	Sales Deal - Customer/Material
152	Sales Org./Dist. Channel/Plant/Material/Sales Unit/Customer
153	Sales Org./Distribution Channel/Plant/Sales Unit/Customer
154	SalesOrg./Dist.Channel/PriceList/Material/SalesUnit/Customer
254	Customer or Goods Recipient/Equipment/Material
255	Customer/Loading Cost Relevance
256	Customer/Catalog Group 2/Material
264	Customer or Goods Recipient/Document Type
265	Standard Dummy Customer/Document Type/Material Grp/Material
266	Standard Dummy Customer/Material Group/Material Number
267	Customer or Goods Recipient/Equipment Type/Material
272	Equipment/Standard Dummy Customer/Document Type
273	Sales org./Distr. chl/Division/Material/Customer/Item
276	Agreement Data and status with agreement search

Figure 13.9 List of Tables Selected that Have Customer AND Division

Next you need to define whether it's a header or an item level positioning and whether it's optional (SELECT) or REQUIRED. There is a list of options for you to choose from for the display of scales, validity period, exclusion, condition marked deletion, and so on.

5. Select the tables and proceed by selecting the CONTINUE TO LIST STRUCTURE icon (icon with green arrow pointed inward) or by pressing **F5**.

6. The next screen shows the list of fields from the tables selected, namely "007" and "273". Select the required fields by selecting the CHECK button against each field. The field's condition type and VALIDITY PERIOD have a SELECT checkmark against the field. Now select the POSITIONING, SORT, and TEXT FIELDS for each of the fields as shown in Figure 13.10. For example, the "Sales Organization" field is positioned as the page header by selecting the POSITIONING as PAGE HEADER. Sales Organization is also sorted to appear first on the list by selecting "1" in SORT, and only the corresponding text is displayed when this report is run by selecting the ONLY CORRESPONDING TEXT in TEXT.

The screenshot shows a SAP report configuration screen. At the top, there are input fields for 'Name of list' (Z1) and 'Title' (Demo Pricing Report Creation). Below this is a table titled 'Field positioning' with columns: Field name, Positioning, Sort, Text, Select, and Require. The table lists several fields with their respective configurations. Below the table is a section for 'Default values for the selection screen' with several unchecked checkboxes.

Field name	Positioning	Sort	Text	Select	Require
Sales Organization	Page Header of 1	1	Only the correspc	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Distribution Channel	Group Header of 2	2	Only the correspc	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Division	Group Header of 3	3	Only the correspc	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Customer	Item Level of F 4	4	Only the correspc	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Material	Item Level of F 5	5	Only the correspc	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Item (SD)	Item Level of F 6	6	Only the correspc	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Condition Type	Item Level of F 7	7	Only the correspc	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Validity period	Item Level of F			<input checked="" type="checkbox"/>	<input type="checkbox"/>

Default values for the selection screen

- Display scales
- Display validity period
- Display additional condition fields (e.g. lower/upper limit)
- Conditions marked for deletion
- Exclusive

Figure 13.10 Define Sort, Text, and Positioning

7. Save the settings. The system generates the report Z1. The report is now available and ready for execution. You can execute the report using Transaction V/LD.

13.3 Standard Materials Management Pricing Reports

Several standard pricing reports are available in MM. These reports provide an easy way of reviewing the various pricing conditions for the MM functionality. These reports can be used to define pricing by contracts, material groups, PIRs, and so on. Understanding the reports in the MM functionality gives you a feel for the purchasing side of business, that is, how much is the cost of the purchased products, what freights were paid, and so on. Unlike with SD, there are no customizing pricing reports available in the MM functionality.

Reports can be run for PIRs, contracts, material groups, and so on. The menu path to access these reports is LOGISTICS • MATERIALS MANAGEMENT • PURCHASING • MASTER DATA • CONDITIONS • PRICES. Several standard reports are available under this menu path:

Purchasing Conditions	
Purchasing Organization	1000
Vendor	300000
Vendor Subrange	to
Condition Group	
Incoterms 1	
Invoicing Party	
Item Reference	
Material	H13
Material Group	
Purchasing Info Record	5300000003
Info Category	
Plant	1000
Material Type	

Figure 13.11 General Overview Pricing Report

► General overview pricing report

The general overview pricing report provides purchasing conditions by vendor, by material, and by contracts. This report is also identified by Transaction MEKA. Figure 13.11 identifies the input parameters for this transaction. The report can be executed by specifying the PURCHASING ORGANIZATION and VENDOR, or INCOTERMS 1, or by selecting fields in ITEM REFERENCE such as MATERIAL and

MATERIAL TYPE, or fields in contract reference, such as AGREEMENT or AGREEMENT ITEM. Depending on the field chosen, a condition type is chosen as well. For example, if a MATERIAL TYPE is chosen, then condition type RL01 is chosen. This report provides a way of identifying pricing by contracts, material groups, and PIRs.

When you execute this report, the system automatically suggests existing records. In the absence of any records, you can create new condition records. Figure 13.12 shows that there are existing records; executing the report based on the input parameters provided condition records for the given selection.

Conditions: General Overview				
PB00 Gross Price				
Vendor	Material	Purch. Org.	Plant	
300000	H13	1000	1000	
09.10.2009	31.12.9999			
PB00 Gross Price		1,235.00	USD	/ 100 EA

Figure 13.12 Condition Records PB00 Exist for the Selection

► **Conditions by contract report**

Provides the contract pricing conditions for a given purchasing organization, contract header, and line item. Transaction MEKB executes this report.

► **Conditions by info-record report**

Provides the info record pricing conditions for a given purchasing organization, material or material group, or info record category. Transaction MEKC executes this report.

► **Conditions by material group report**

Provides the material group pricing conditions for a given purchasing organization, material group, and plant. Transaction MEKD executes this report.

► **Conditions by market price report**

Provides the market price conditions for a given purchasing organization, material, or material group. Condition type MP01 is maintained using this report. Transaction MEKH executes this report.

Conditions can also be maintained for discounts and surcharges. The reports for discounts and surcharges can be accessed via LOGISTICS • Materials MANAGEMENT • PURCHASING • MASTER DATA • CONDITIONS • DISCOUNTS/SURCHARGES. Under this menu path, several reports are available:

► **Conditions by vendor report**

Gives a list of discounts or surcharges that exist for a vendor. Figure 13.13 provides the input parameters PURCHASING ORGANIZATION and VENDOR to execute this report.

Conditions by Vendor	
Purchasing Organization	1000
Vendor	300000
Scope of List	0001

Figure 13.13 Conditions by Vendor Report

This report allows you to run the condition report for a vendor within the purchasing organization.

For example, if KRYAA Computers is buying components from its suppliers to manufacture desktops and laptops, the suppliers are giving a discount to KRYAA based on the volume of business KRYAA provides to the suppliers. This report provides the list of all of the discounts provided by a given vendor. Figure 13.14 illustrates the discount provided by vendor 300000.

Conditions for Vendor						
RL01	Vendor Discount %					
	Purch.OrgVendor	1000	300000			
		13.10.2010	31.12.9999			
	RL01 Vendor Discount %					10.000- %

Figure 13.14 Discount Conditions by Vendor

- ▶ **Conditions by vendor subrange report**
Gives a list of discounts or surcharges that exist for a vendor or vendor subrange. Transaction MEKK executes this report.
- ▶ **Conditions by vendor report**
Provides the discount pricing conditions for a condition for a given purchasing organization and vendor. Discount pricing condition type RL01 is maintained in this manner. Transaction MEKE executes this report.
- ▶ **Conditions by material type report**
Provides the discount pricing conditions for a condition for a given purchasing organization and material type. Discount pricing condition type MAR1 is maintained in this manner. Transaction MEKE executes this report.
- ▶ **Conditions by material type report**
Provides the pricing conditions for a condition for a given purchasing organization and Incoterms. Pricing condition type GRWR is maintained in this manner. Transaction MEKI executes this report. This is used in exports, imports processing, and declarations to custom authorities.
- ▶ **Conditions by Intercom report**
Provides the discount pricing conditions for a condition group given purchasing organization and vendor. Group discount pricing condition type RGR0 is maintained using a condition group. Transaction MEKG executes this report.

In addition to these reports, there are list displays available by PIRs as well. The menu path is LOGISTICS • MATERIALS MANAGEMENT • PURCHASING • MASTER DATA • PURCHASE INFO RECORDS • LIST DISPLAYS.

The following reports can be executed:

- ▶ **Info records by vendor**
Provides all of the info records belonging to a vendor. The system not only lists the info records but also allows you to change the info records from the list.
- ▶ **Info records by materials**
Provides a list of all of the vendors supplying the materials. The system not only lists the info records but also allows you to change the info records from the list

► **Info records by materials groups**

Provides a list of all of the vendors supplying the material groups. The system not only lists the info records but also allows you to change the info records from the list

Next, let's discuss how to customize the MM pricing reports.

13.4 Customizing Materials Management Pricing Reports

Unlike with SD, there are no customized pricing reports available in the MM functionality, but you can configure the layout and sequencing of the standard pricing reports.

Example

Hi_Tech Computers is a company that assembles laptops and procures various parts from supplier Arrow. Hi-Tech Computers has negotiated a contract with Arrow for the supply of hard drives.

Hi_Tech wants the capability to update contract prices. Also, Arrow supplies other raw materials, so Hi_Tech wants the capability to maintain prices by raw materials by its vendors.

To update contract prices, you need to complete the steps given in the following subsections.

The menu path for this configuration is **SPRO • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • SCOPE OF LIST FOR CONDITIONS**.

13.4.1 Step 1: Define Sequence

First, specify the condition tables that should be taken into account in the list display of time-dependent conditions. Specify the sequence in which the data of a condition record should be displayed in the list.

For example, if you want to change condition types for a vendor, the tables shown in Figure 13.15 can be included. To do this, define the SQ ID (Z1), and define the sequence in which the tables can appear within that sequence. The sequence has been defined as shown in Figure 13.15.

Figure 13.15 displays the assignment of the access table condition to the list sequence. Now you have to define the scope of the list. This step defines the field sequences and where the fields are placed in the customs report. Placement defines the order in which the tables appear, for example, contract header and then line Item.

Sq	Plc	Tab	Short text
01	80	48	Incoterms (Plant-Specific)
01	81	50	Incoterms
01	90	51	Invoicing Party
01	91	52	Invoicing Party (Specific to Info Record)
Z1	1	19	Contract Header
Z1	2	16	Contract Item
Z1	39	43	Material Type
Z1	50	44	Vendor

Figure 13.15 Condition Type for Vendors as the List Sequence Assignment

13.4.2 Step 2: Define Scope of List Parameters

In the second step, define the scope of the list, and assign it to the sequence. In this step, create a scope of list "Z004", and assign the sequence "Z1" created in the previous step.

This step requires just the assignment of SCOPE OF LIST to the sequence. When a custom report is created and assigned a SCOPE OF LIST "Z004", all of the fields in the report are listed in the sequence defined in "Z1". So, in our example, the report will list in the following order: contract header, contract item, material type, and vendor.

Figure 13.16 displays the scope of the list extended condition for the custom list Z004. This custom layout is defined with the DETERMINATION KEY FIELDS and SCOPE OF CONDS., as shown in the figure. To do this, define the SEQUENCE ID (Z1), and define the sequence in which the tables can appear with in that sequence.

Following the definition of the scope of the list, you need to assign the list to the condition.

Change View "Scope of List for Extended Conditions"

New Entries [Print] [Save] [Cancel] [Help] [Refresh]

Scope of List: Z004 Custom Layout

Determine key fields

Derive

All plants

Scope of conds.

With Key Filled

Display Item

Inactive Item

All possible

Sorting

Sort type: A

Sequence: Z1

Figure 13.16 Scope of List Determination Field and Condition

13.4.3 Step 3: Assign Scope of List to Conditions

In the last step, assign the transaction to the scope of list that we created in the previous step (see Figure 13.17).

For example, Transaction MEKA is a general overview report for conditions. This report uses the SCOPE OF LIST "0001" to list the fields.

"0001" lists the fields in a particular order: condition type, purchasing organization, vendor, and so on. To change the layout, a new SCOPE OF LIST "Z004" has to be defined and assigned to Transaction MEKA in configuration. Select the NEW ENTRIES tab, and enter "MEKA" in the TCODE column in Figure 13.17.

The purpose of assigning "Z004" is that if you want to change the layout of the report being used by Transaction MEKA, then you can replace the SCOPE OF LIST MEKA has with "Z004". This is illustrated in Figure 13.18.

With the above assignment, the LIST OF SCOPE "Z004" will appear as a default when executing Transaction MEKA. When you execute the report MEKA as shown in Figure 13.18, the custom layout appears.

TCode	Transaction Text	LiSc	Description
MEKA	Conditions: General Overview	Z004	Custom Scope of List
MEKB	Conditions by Contract	0001	Standard (normal)
MEKC	Conditions by Info Record	0001	Standard (normal)
MEKD	Conditions for Material Group	0001	Standard (normal)
MEKE	Conditions for Vendor	Z001	Scope of List
MEKF	Conditions for Material Type	0001	Standard (normal)
MEKG	Conditions for Condition Group	0001	Standard (normal)
MEKH	Market Price	0001	Standard (normal)
MEKI	Conditions for Incoterms	0001	Standard (normal)
MEKJ	Conditions for Invoicing Party	0001	Standard (normal)

Figure 13.17 Assign Scope of List to the Condition Maintenance

Purchasing Conditions

Purchasing Organization: 1000

Vendor: 1060

Vendor Subrange: [] to []

Condition Group: []

Incoterms 1: []

Invoicing Party: []

Item Reference

Material: []

Material Group: []

Purchasing Info Record: []

Info Category: []

Plant: [] to []

Material Type: []

Contract Reference

Agreement: []

Agreement Item: []

Scope of List: Z004

Figure 13.18 Custom Layout for MEKA

When you click the EXECUTE icon, the output appears as shown in Figure 13.19. When executed, the output of the report will contain the conditions associated with the input vendor, as you can see in the screen.

Conditions: General Overview				
PB00 Gross Price				
Vendor	Material		Purch. Org.	Plant
300000	H13		1000	1000
09.10.2009	31.12.9999			
PB00 Gross Price		1,235.00	USD	/ 100 EA

Figure 13.19 Output Report for Customs Layout

Figure 13.19 displays the output of the custom report you defined for the vendor and material gross price for the entered quantity and condition type PB00.

13.5 Summary

In this chapter, we discussed how the various SD and MM pricing reports work. You learned that you can write your own custom SD pricing reports but in MM, you can only change the layout of existing reports. We showed how custom SD reports can be created and executed. We also showed how the scope of list can be customized for MM reports.

We reviewed the standard reports within SD and MM. You also looked at the custom reports that can be generated based on your specific business requirements.

In the next chapter, you'll learn about Internet pricing.

Pricing within SAP ERP is also available via the Internet for your customers to view prior to ordering, or to review the prices of your product. This chapter introduces the concept of Internet pricing and explains how pricing is available on the web.

14 Internet Pricing

In today's complex environment, business to business (B2B) customers, as well as business to consumer (B2C) customers use the web to make their purchases. SAP Customer Relationship Management (CRM) provides the functionality to support purchases made over the Internet for B2B as well as B2C. CRM enables pricing to be available over the Internet. Customers can order a company's products over the Internet when the company provides the correct pricing for the products online. This chapter introduces Internet pricing, along with the architecture for Internet pricing, master data, and necessary configuration. The pricing procedure determination for Internet pricing is set up the same way as Sales and Distribution (SD) pricing, which was covered in Chapters 2 and 3.

14.1 Introduction to Internet Pricing

To cater to the need for businesses to reach business customers and consumers, SAP ERP deployed Internet Sales. SAP CRM and SAP ERP integrate to provide Internet pricing functionality. Products and customer catalogs are defined in SAP ERP and then made available over the web through CRM. In other words, products and catalogs available over the web are tightly integrated. The Internet Sales solution provides the capability for customers to register, search for products, obtain pricing, place and track an order, and make payments with a business. In other words, it provides a complete end-to-end process from order-to-cash process and personalizes the customer's buying experience. This process not only empowers a business's customer but also helps reduce overhead costs from sales and customer service.

Figure 14.1 shows how this process works. As you can see, the customer can search for products with online product catalogs and can configure the product, price the product, track orders, and make payments.

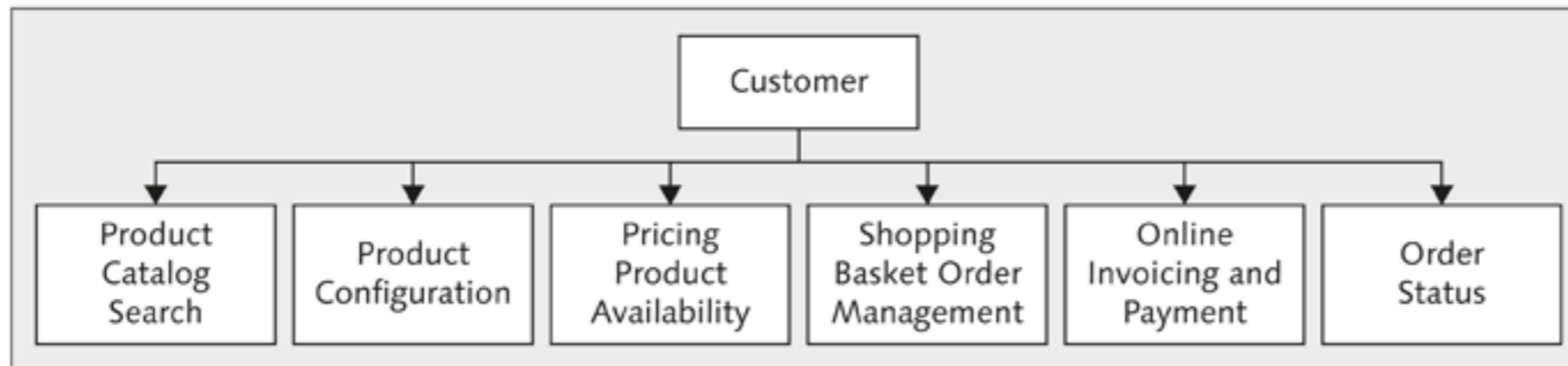


Figure 14.1 Internet Pricing Process Flow

Typically, customers use CRM Internet Sales when they want to leverage the power and ease of the Internet without having to implement a full-fledged customer relationship management solution.

Now let us move on to the architecture required to support Internet sales scenarios.

14.2 Internet Pricing Architecture

To understand the Internet pricing architecture, refer to Figure 14.2, which illustrates the setup for Internet Sales. The architecture effectively enables a complete end-to-end order-to-cash scenario.

The following sections briefly explain the layers and components of the architecture.

14.2.1 Business Execution Layer

The business execution layer includes the material master, product catalog, business partners, pricing, and variant configuration (if applicable), which are key components in the SAP R/3 system.

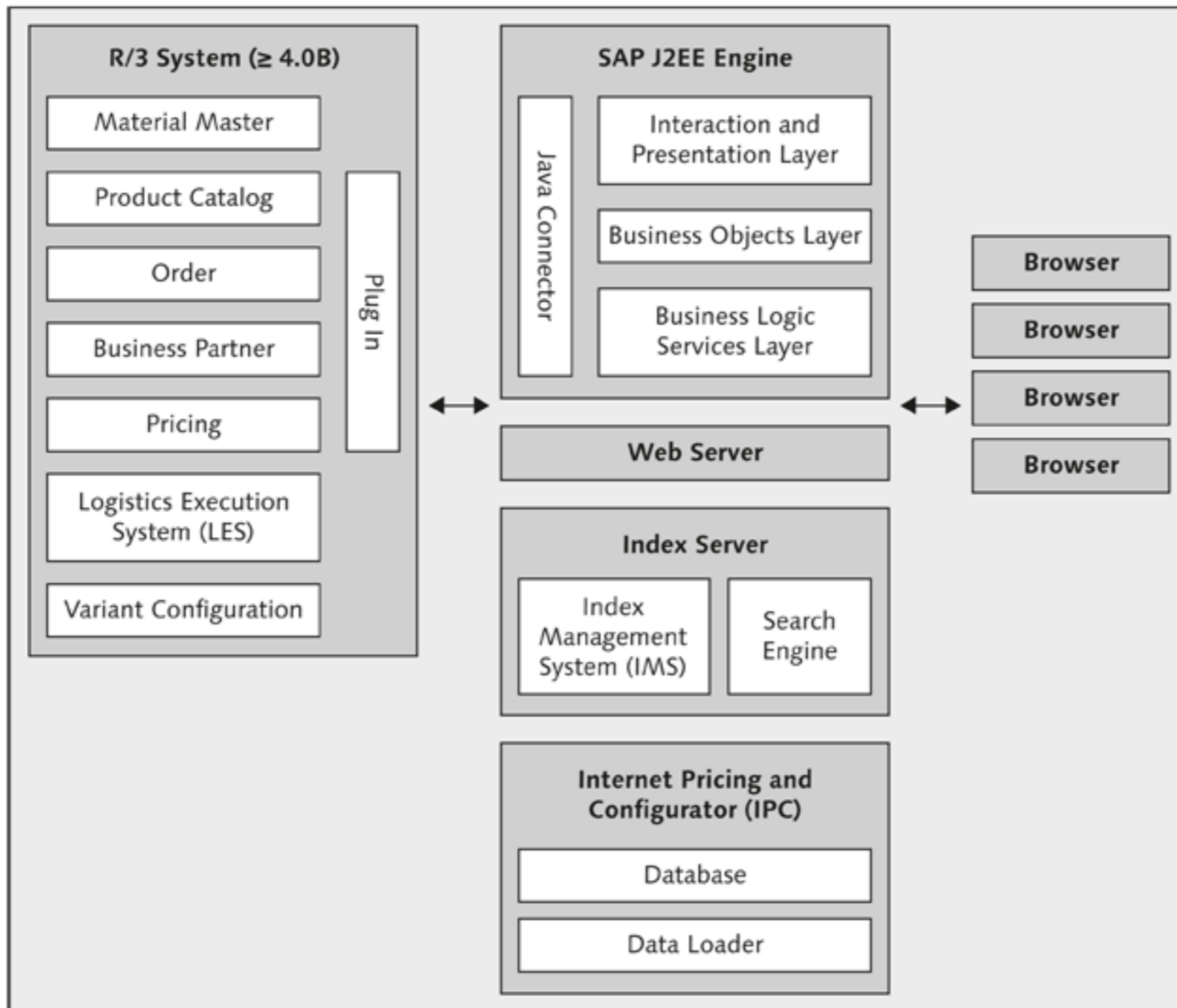


Figure 14.2 Internet Pricing Technical Architecture

14.2.2 Interaction Layer

The e-commerce platform is then enabled using the SAP J2EE Engine on the interaction layer. The engine provides an Internet-enabled platform for web orders through the web server. It uses the business data and processes that are already defined in your existing SAP R/3 SD implementation.

This platform also contains the Internet Pricing Configurator (IPC) as an option, which provides the capability to price products based on various options chosen on the sales order. It also contains the index layer where the product catalog data is replicated from R/3 on an index server.

14.2.3 Presentation Layer

On the presentation layer, these sales processes are extended or exposed to the Internet, so that web orders are incorporated into the standard fulfillment and financial processes.

14.2.4 B2B and B2C Scenarios

The same architecture can be used to support B2B or B2C scenarios. The key difference is that in a B2C scenario, the customers can self-register, but in the B2B scenarios, the already established processes are exposed to the web (in the B2B scenario, the customer has already been set up in SAP ERP). The customer is already ordering products through standard SAP ERP processes—that is, order creation—either by the customer calling in and providing the information to a sales representative or the sales order being created through Electronic Data Interchange (EDI).

With the web enablement, the B2B customer can now place the order over the web without calling a sales representative. When an order is placed through the web, the R/3 master data is called on the order as required and validated. In other words, the customer master data and product master data that are being used on the web sales order are validated by making a call to the data that has been set up in the SAP ERP backend.

The order is saved in real time in R/3 without delays. The J2EE architecture makes the user interface (UI) more flexible.

The product catalog is replicated from R/3 for B2B and B2C scenarios and replicated to the frontend. The pricing data is also read from R/3 and determined by using IPC. Variant configuration is possible only with IPC in the architecture.

Now, let's discuss the key setup from the master data point of view.

14.3 Internet Sales Master Data Set Up

The Internet sales setup involves master data. Master data for Internet pricing requires customer master, product master, and pricing data. This master data is set up in the SAP R/3 backend and then replicated to the web. Master data such as products, catalogs, and pricing have to be defined to support sales order processing. Without this setup, no customers, catalog, or pricing will be available.

The master data is required to enable the customer to enter the order over the web. This setup requires an understanding of the Web shop, the relationship between products and catalogs, customers, and business partners, which we'll explain in this section.

This data interacts with the Web shop setup, the customer master record, and user access for accessing the site. The associated product catalog displays the products that the customers can review and then place and order.

In this section, we'll specifically review the master data setup related to pricing.

14.3.1 Contact Persons and Customer Master (Sold-to, Bill-to, Ship-to)

Because the contact person of the customer is part of the business partner company, you need to enter contact person data in the respective customer master record. Follow these steps to set up the contact person:

1. Follow the menu path SAP MENU • LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • CONTACT PERSON. You can also use Transaction VAP1. Create a new contact person.
2. Assign the contact person to the customer master of the sold-to-party by following the menu path SAP MENU • LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • CUSTOMER • CHANGE • VD02-SALES AND DISTRIBUTION. You can also use Transaction VD02.
3. Enter as many contact persons as desired for each business partner. In the standard R/3 system, you can only enter the data for a contact person in the customer master record of the sold-to party because the system only proposes contact persons from this master record in the sales order.

Figure 14.3 shows the business partner relationship between a customer and contact person for the customer. The customers can be bill-to, sold-to, or ship-to customers. Each of these customers can have more than one contact person.

For a B2B scenario, the customer masters must be set up as Internet users and be provided with a user ID and password. This Internet user is valid only for web scenarios, where the business logic validates the customer number and password.

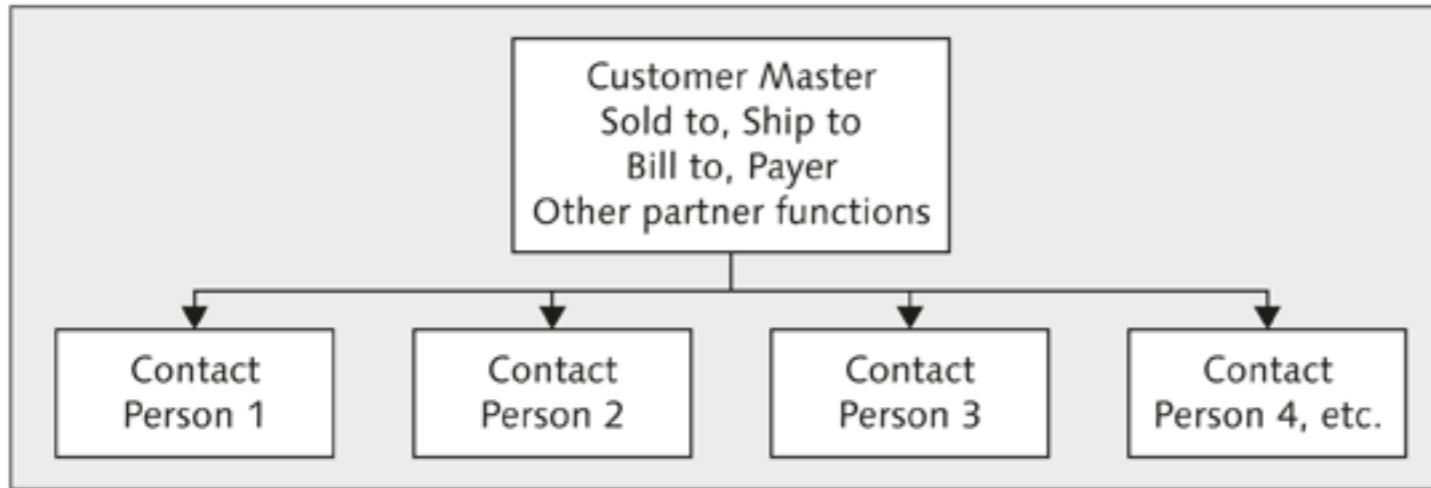


Figure 14.3 Business Partner Relationship

In B2C scenarios, the customers self-register through the Web shop. This creates a customer master record and a corresponding Internet user in R/3. In other words, the B2C scenario means that the users set up their master data, but in B2B scenarios, the master is created by your company.

B2B and B2C Setup

The only difference between the B2B and B2C scenarios is how the customer is set up. Everything else is pretty much the same for B2B and B2C.

From the customer master for the B2B scenario, the customer master pricing procedure, delivery plant, and payment terms are obtained, as shown in Figure 14.4. The menu path for maintaining a customer master is LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • CUSTOMER/CHANGE, or you can use Transaction XD02.

Customer	300197	Computer Systems	DENVER
<div style="display: flex; justify-content: space-between;"> Address Control Data Payment Transactions Marketing Export D </div>			
Contact Person			
Form of ...	Name	First name	Telephone1
	Freeman	John	

Figure 14.4 Customer Master with Contact Person

The customer master is maintained as an Internet user and provided with a user ID and password so that the customer can log in through the web.

Now that you understand how the customer master contact info is set up for the B2B and B2C scenarios, let's move on to product catalogs.

14.3.2 Product Catalog

The product catalog provides a way to present the business's products to customers over the Internet. Figure 14.5 shows what a product catalog looks like. With the catalog, customers can search for products, view multimedia and technical specifications, and obtain real-time pricing and product availability. The business is able to maintain customer-specific views of the products.

The screenshot shows a web page titled 'Complete systems'. Below the title is a descriptive paragraph: 'Complete systems An Easy Decision Would you like to know that all your requirements for a computer are fulfilled? Then, you should decide on a complete system. The name already gives it away: you can expect a completely outfitted computer from this system. From the mouse to the modem, from the monitor to the motherboard, it is as comfortable as a decent compact stereo system. In addition, it is available in different classes. P.S.: In case you are a specialist, look at our configurable systems.' Below the text is a navigation bar with 'Page:' and arrows. The main content is a table with columns for 'Overview', 'Image', 'Product', and 'Price'. The 'Overview' column contains a checkbox, a quantity input field (set to '1'), and a shopping cart icon. The 'Image' column contains a small image of a computer system. The 'Product' column contains the 'Product Number' and the 'Name' (with a link). The 'Price' column contains the price in USD.

Overview			Image	Product		Price
Quantity		Product Number		Name		
<input type="checkbox"/>	1			R-1000	Maxitec-R 375 Personal computer	994.00 USD
<input type="checkbox"/>	1			R-1001	Maxitec-R 3100 Personal computer	1,040.20 USD
<input type="checkbox"/>	1			R-1002	Maxitec R 3133 Personal computer	1,217.40 USD

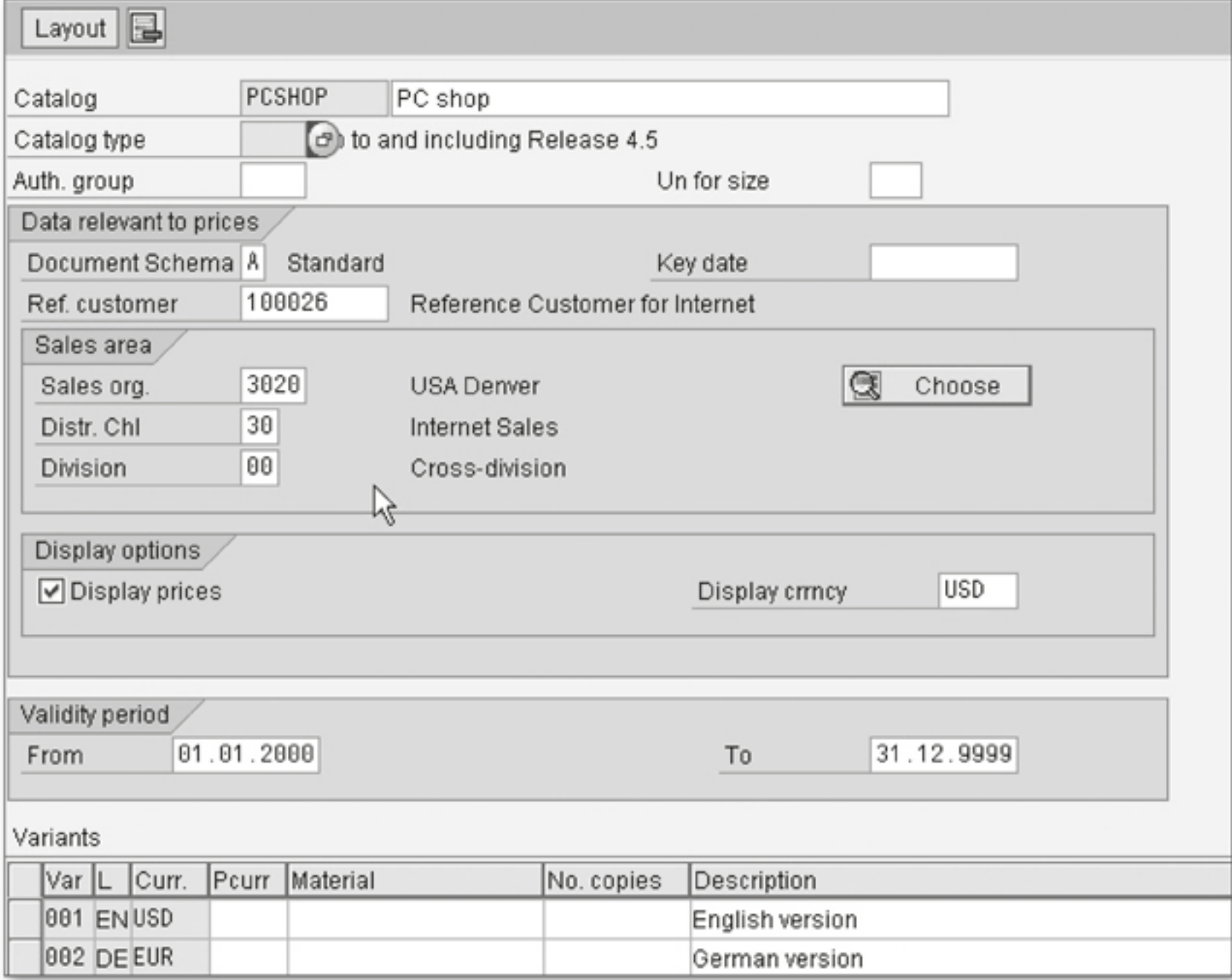
Figure 14.5 Product Catalog on the Internet

The data in the R/3 product catalog forms the basis for the SAP ERP Internet Sales R/3 edition. The catalog is used for storing the following information:

- ▶ Material data and material groupings
- ▶ Prices
- ▶ Multimedia objects (images, sounds, videos)
- ▶ Texts (entered in SAPScript)

This information is then stored in the web server's memory or replicated onto the index server. It can then be displayed on the web using the Internet Sales R/3 edition. Data in an R/3 product catalog can be passed on to external systems, in addition to the Internet Sales R/3 edition, that create print templates and multimedia templates for catalogs.

The menu path for maintaining the product catalog in R/3 is SAP MENU • LOGISTICS • MATERIALS MANAGEMENT • PRODUCT CATALOG • PRODUCT CATALOG • WWM1 CREATE, or you can use Transaction WWM1. The resulting screen shows the maintenance options for the product catalog; Figure 14.6 provides a view of the product catalog data maintenance.



Var	L	Curr.	Pcurr	Material	No. copies	Description
001	EN	USD				English version
002	DE	EUR				German version

Figure 14.6 Product Catalog Maintenance

Fill in the CATALOG name as "PCSHOP", DOCUMENT SCHEMA ("A" - STANDARD), SALES ORG. it's applicable to, and VALIDITY PERIOD dates, and then select the DISPLAY PRICES and DISPLAY CRRNCY checkboxes. The reference customer is used to list catalog prices. Also, the VARIANTS section of the product catalog shows the various versions in which the product catalog is displayed. Select the Save button to create a catalog PCSHOP. By selecting the options to display prices and display currency, the products displayed in this catalog will show the prices and the currency of the product.

Now that you understand how catalogs are set up, let's see how the catalogs link to the product master. The link between the product master and catalog is illustrated

in Figure 14.7. All of the products that belong to catalog PCSHOP are defined as a subset of catalog PCSHOP and display the prices and currency because the catalog PCSHOP has been set this way.

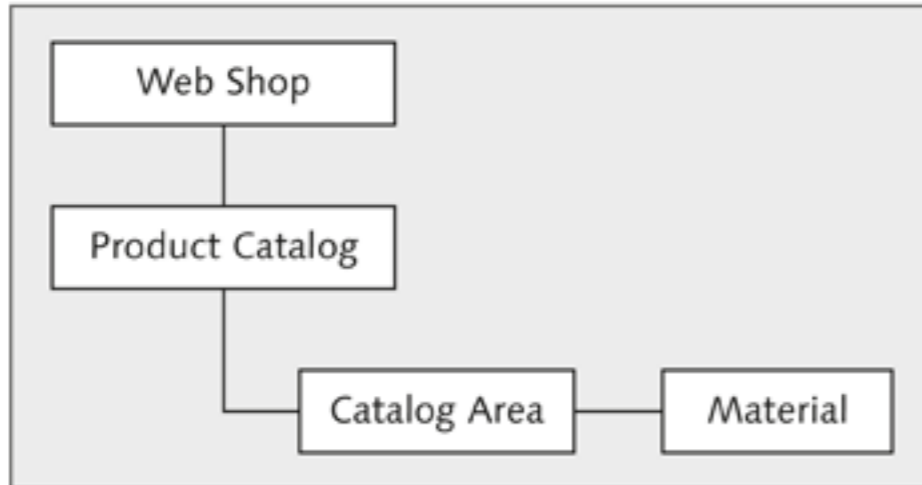


Figure 14.7 Product Catalog Material Master Relationship

The catalog is basically a collection of catalog areas. The catalog areas in turn have the materials that can be displayed on the web. The catalog provides a way of grouping catalog areas. For example, product catalog PCSHOP has the layout “Notebooks”. The layout “Notebooks” will be used to group all notebook products such as HT-1000, HT-1001, and so on.

Figure 14.8 displays the catalog layout and how a list of materials that needs to be displayed on the web is associated with the catalog. To access this screen, use the menu path SAP MENU • LOGISTICS • MATERIALS MANAGEMENT • PRODUCT CATALOG • PRODUCT CATALOG • WWM2 CHANGE and select LAYOUT.

Product Catalog: Display Base Layout Area

Documents Texts Var(gen.art)

Layout: 0000000005 PCSHOP Documents
 Area: 3 Notebooks Texts
 Auth. group:

Material	Un	Ct	D	T	Amount	Unit	Promotion amnt
HT-1000	PC		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	956,00	USD	956,00
HT-1001	PC		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.249,00	USD	1.249,00
HT-1010	PC		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.999,00	USD	1.999,00
HT-1011	PC		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	490,00	USD	490,00

Figure 14.8 Catalog Layout

Double click the layout area, and then enter the materials that are part of the notebooks layout. By adding the materials to this layout, when the customer is shopping

for the product, the various materials are displayed in this layout. In this example, the catalog layout AREA "3" is for notebooks, so the MATERIALS HT-1000 and HT-1001 represent the various notebook options the customer can see on the web.

Next, let's discuss the pricing and associated configurations.

14.4 Pricing and Configuration

Customers or Internet users can receive pricing directly from R/3. The advantage for customers is that customer-specific pricing is available on the catalog over the web by using the Internet Pricing Configurator (IPC). Note that using the IPC is optional. For example, if the customer wants to configure the various product options (e.g., laptops, desktops), then the IPC is used. The other option is that the product catalog can just be published on the Internet without the capability to configure products.

IPC has a pricing engine and a configuration engine. The configuration engine provides pricing for variant configuration. The variant configuration rules that are set up in R/3 are reused in the IPC.

Within the pricing catalog, either the prices can be read directly from R/3 or the prices can be replicated by using the IPC. The final price in the order is determined by the order type. It's possible to have more complex pricing procedures when accruals are used as well.

Now let's see how the pricing is determined in the following subsections. Web shops, customer pricing procedures, and document pricing procedures all determine the pricing procedure (also called the calculation schema) that is used to determine the pricing.

14.4.1 Web Shop

The Web shop, or online storefront, is where customers can access the product catalog through the Internet frontend. Through a web-based interface, you can configure the parameters you need to process and customize the shopping experience of the online customers. The product catalogs we defined in Section 14.3.2 can be used in more than one Web shop. In other words, a B2B Web shop and a B2C Web shop can be accessing the same catalog at the same time. A separate product catalog can also be defined for the Web shops as well.

To differentiate your Web shop from other orders or other channels, you can define a distribution channel to identify web orders by following these steps:

1. Follow menu path SPRO • ENTERPRISE STRUCTURE • DEFINITION • SALES & DISTRIBUTION • DEFINE DISTRIBUTION CHANNEL. Click NEW ENTRIES.
2. Define a distribution channel for the Web shop; for example, Distribution Channel "30" is a web distribution channel.
3. To set up the Web shop catalog, enter the SHOP ID and the DESCRIPTION above the GENERAL INFORMATION tab.
4. In the CATALOG tab, Enter the catalog name ("PCSHOP", which we maintained earlier), CURRENCY, and CATALOG VARIANT, and then select the CONTROLLING PRICE DETERMINATION IN THE CATALOG option (VIA IPC or LIST PRICES) by selecting the radio button.

The R/3 ORDER TYPE "ZTA", SALES ORGANIZATION "3020", HEADER TEXT ID "0001", ITEM TEXT ID "0002", and so on are associated with the Web shop PCSHOP_EN.

The next step is the pricing procedure determination.

14.4.2 Pricing Procedure Determination

The Web shop PCSHOP_EN is associated with a SALES ORGANIZATION "3020", DISTRIBUTION CHANNEL "30", and DIVISION "00". The pricing procedure is determined by linking the sales organization, distribution channel, division, document pricing procedure, and customer pricing procedure to a pricing procedure. This way, the Web shop PC_SHOP_EN will have a pricing procedure. This has been explained in Chapter 3 in detail.

The first step in determining the pricing procedure for the Web shop is to associate the document schema (document pricing procedure) with the sales order type.

Figure 14.9 illustrates how the document schema is associated with the order type. "ZTA" is assigned to document pricing procedure "A" as shown in Figure 14.9.

To configure the link between the sales document type and the document pricing procedure, follow the menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • ASSIGN DOCUMENT PRICING PROCEDURE TO SALES ORDER TYPES (see Figure 14.9).

Change View "Sales Document Types:			
	SaTy	Sales Document Type	Doc. pric. procedure
	ZTA	ZTA Internet Sales	Standard
	ZTM	Standard Order	Standard

Figure 14.9 Configuration Setup for Pricing Procedure Assignment to the Sales Document Type

The next step in determining the pricing procedure is the setup of the customer pricing procedure.

14.4.3 Customer Pricing Procedure

The customer pricing procedure is a two-digit code defined in configuration and then assigned to a customer. The customer pricing procedure is defined in configuration. To navigate to the customer pricing procedure customizing screen, follow menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • DEFINE CUSTOMER PRICING PROCEDURE.

Define CUST.PRIC.PROC. "1", and associate a description STANDARD with the customer pricing procedure.

After the customer pricing procedure is defined, the next step is to associate the customer pricing procedure with the customer master, as shown in Figure 14.10.

The menu path for assigning the customer master to the customer pricing procedure is LOGISTICS • SALES & DISTRIBUTION • MASTER DATA • BUSINESS PARTNER • CUSTOMER CHANGE, or you can use Transaction XD02.

Pricing/Statistics	
Price group	<input type="checkbox"/>
Cust.pric.proc.	1 Standard
Price List	<input type="checkbox"/>
Cust.Stats.Grp	<input type="checkbox"/>

Figure 14.10 Customer Pricing Procedure Associated with the Customer

Now that we've defined the customer pricing procedure, the next step is to assign the pricing procedure to the customer pricing procedure and document pricing procedure.

The pricing procedure is determined by a combination of customer pricing procedures, document pricing procedures, sales organization, distribution channel, and division as shown in Figure 14.11. (This was explained in detail in Chapter 3).

As shown in Figure 14.11, the sales organization "3020", distribution channel "30", division "00", customer pricing procedure "1", and document pricing procedure "A" together have a unique pricing procedure "RVCXUS".

Change View "Pricing Procedures: Determination in Sales"								
New Entries								
SOrg.	DChl	Dv	DoPr	Cu	PriPr.	Pricing procedure	CTyp	Condition type
3020	30	00	A	1	RVCXUS	Standard - USA /with J	PR00	Price
3020	30	00	A	E	YRVCXU	Standard - USA /w Jur.	PR00	Price

Figure 14.11 Pricing Procedure Determination Based on the Sales Organization

The pricing procedure RVCXUS in turn has the pricing conditions "PR00" and "KA00". The pricing conditions that are associated with the pricing procedures are set up in R/3 and then displayed on the web. Figure 14.12 displays the pricing procedure to the sales organization.

Procedure RVCXUS Standard - USA /with Jur. ext.													
Control													
Reference Step Overview													
Step	C...	C...	Description	F..	T.	M...	R..	S...	Su...	R...	Cal...	Bas...	Ac...
11	0	PR00	Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2			ERL
12	0	ZC01	Price Contract CRM			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2			ERL
12	1	Z200	Campaign Price CRM			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2			ERL
13	0	PB00	Price (Gross)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					ERL
15	0	EK01	Costs			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					ERL
20	0	VA00	Variants			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	2			ERL
21	0	ZA00	General variants			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	2			ERL
100	0		Gross			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	1			
101	0	KA00	Sales Promotion			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	2			ERS

Figure 14.12 Assignment of the Pricing Procedure to the Sales Organization

14.5 Summary

In this chapter, we explained how Internet pricing works. We gave an overview of Internet Sales and the basic architecture of the setup.

We then explained some of the key master data setup, such as the customer master, contact persons, product master, product catalogs, and how the products are associated with the product catalog. Finally, we explained some of the key settings that are required to enable pricing on the web from a pricing perspective, including the document schema, Web shop, and pricing procedure determination. You should now be able to set up your own Web shop, catalogs, catalog layouts, product master, and pricing.

Now that we've covered all of the topics associated with pricing, the next chapter concludes the book by summarizing what you've learned overall and getting an overview of how pricing works for various industries such as retail, AFS (Apparel and Footwear Sector), and high-tech.

This final chapter reviews the key concepts of pricing and sales and how they apply across functions and specific industries.

15 Key Function Review and Industry-Specific Scenarios

Industries such as retail, apparel and footwear, high-tech, banking, and aero-defense have business processes very unique to their industries. For example, retail products have articles being replenished from distribution centers to stores, and apparel and footwear industries have shoes, pants, and other wearable items that require dimensions such as length, width, and waist to identify a unique product. High-tech industries such as software companies work with software licensing and electronic shipping of products. These industries also have unique pricing requirements. SAP ERP provides industry-specific solutions to address these industry-specific needs.

Companies can decide either to use the SAP ERP standard pricing procedures or the industry-specific procedures when implementing the pricing procedure. If the customers don't plan to implement industry-specific pricing, then the pricing procedures work as described (i.e., pricing can be dependent on customers or pricing can be dependent on customer and material, etc.). The pricing conditions can be regular/gross prices such as PR00 or PB00, or they can be discounts such as KA00 or KB00, and freight conditions such as FA00 or FB00. There can also be header pricing, line item pricing, and so on.

If you want to apply the standard SAP ERP pricing procedure to the industry, you might need to use the standard with a modification that applies to the industry-specific solution, or you can implement the SAP ERP industry specific-solution. In this chapter, we'll discuss the pricing related to the industry-specific solutions for Apparel and Footwear Sector, Retail, and High-Tech to give you an idea of how all of these different industry pricing procedures form a business application.

For example, a company wants to implement SAP Retail and wants to maintain purchasing conditions, determining sales pricing, and planning on promotions.

The condition techniques are used to determine pricing in SAP Retail. This is based on conditions, which are described by condition types. Information is stored in condition records and conditions. Access sequences and calculation schemas are also a key part of this functionality. By reading this chapter, you'll understand the industry-specific nuances that need to be taken into consideration for pricing and apply them for your specific industry.

15.1 Purchase and Sales Price Condition

The principles covered in the previous chapters for Sales and Distribution (SD) and Materials Management (MM) are still applicable for industry-specific pricing with some variations.

Let's review what you've learned in the previous chapters and apply that to the sales and purchase pricing conditions, as it applies to a vendor purchase order (PO).

The different condition types that can apply in the pricing procedure are, for example, prices, markup/markdowns, freight, and cash discounts. The following customizing settings are determined during the setup of the control data, master data, and scale:

- ▶ Condition class
- ▶ Calculation type
- ▶ Condition category
- ▶ Group condition
- ▶ Group condition routine
- ▶ Amount/Percentages
- ▶ Validity dates
- ▶ Scale basis/type, scale formulas

As described in previous chapters, condition types are defined generally using the condition class and in detail using the condition category. The calculation type defines how the system calculates the condition value. A markup or markdown can be a percentage of the gross price, a fixed amount, or a quantity-dependent amount. The plus/minus sign indicates whether the condition is treated as a positive

or negative amount. Negative amounts are markdowns, and positive amounts are markups. Scale bases for scales are also dependent on the condition type. Scale can relate to a quantity or a value. An access sequence can be assigned to a condition type. The access sequence is a search strategy that defines the sequence in which the system searches through condition tables looking for relevant entries for a condition type. In standard sequence, an access sequence is not assigned to the condition types for surcharges and discounts (K005, K006, RA00, RA01, etc.) because they are maintained as supplementary for gross price (PB00, PR00, etc.).

Now that we've reviewed condition types let's understand how condition types are stored as condition records or values.

15.1.1 Condition Value

Conditions in pricing info records and PO conditions are time dependent. Time-dependent conditions can apply to specific sites or to all sites in a purchase organization. Time-dependent conditions are limited to a particular validity period. Item conditions relate to individual articles. The condition type can be applied to headers or items, which is defined in the customizing for the condition type. Automatic price determination is carried out for header conditions. As a result, you can't assign an access sequence to a header condition, unless it has been defined as an item condition and can't create condition records. A condition type can be defined as a group condition in customizing. A group condition relates to several items in a document.

Header conditions apply for all items in a document and are automatically applied to all document items. A header condition can be a percentage or a fixed amount. If you define a header condition as a percentage markup or markdown, the defined percentage applies automatically for all document items. If you define a header as a fixed amount, the condition value of the header condition can be assigned for each article or be split over all items. The condition value is split up proportionally over the document items if the condition type is defined as a group condition in customizing. If it's not defined as group, then the header condition can be applied to item conditions.

In customizing, you can define that a value is applied on the basis of the weight or volume of the individual items. The basis for applying conditions to items is defined in the BASIC FORMULA field in the calculation schema.

Group Conditions and Scales

A condition type can be defined as a group condition in customizing. A group condition relates to several items of a document. For a group condition, item values (price, order quantities, weight or volume) of the items in question are added together, and the results are used as the condition basis. As a result, when calculating scales, more advantageous values can be obtained than if the items were considered individually. The item values are not cumulated until the document is saved or checked. The scale amount is then determined on the basis of the cumulative item values.

On the header condition screen, you can explicitly trigger the determination of the scale amount based on the cumulated item values by activating the conditions. You can therefore determine the lowest scale value before saving the document by either activating the condition or checking the document.

Header versus Item

The pricing values for internal processing and the header information are stored in the fields of structure KOMK, and the values in this structure are valid for the whole document. Item values are stored in the structure KOMP, and item-specific values are stored in this table. The pricing component or condition types are either entered manually or calculated using specific condition values or formulas.

Conditions are stored in the system as condition records. Condition tables refer to condition records. Entries in the condition tables consist of the key and the data. Following are a few key conditions tables:

- ▶ **KONP:** Item condition table time-dependent.
- ▶ **KONH:** Header condition.
- ▶ **KONH:** Quantity scale.
- ▶ **KONW:** Value scale.

You can create your own condition table, but the name must be a number between 501 and 999. If you don't enter a name, the system automatically assigns a sequential number. Before you decide to create your own custom table, you should exhaust the options available with the SAP ERP standard tables. You can include any fields of the communication structure in the field catalog. You shouldn't change the

standard condition tables but rather define custom ones by modifying the layout of the condition maintenance screen using the fields LINE and TEXT. After you've made your modifications, you generate the condition table.

Pricing Procedure or Calculation Schema

SD uses the term *pricing procedure* and MM uses *calculation schema*, but both are used for price determination, which groups together all condition types that are involved in price calculation. The procedure defines which condition types are allowed, which can be adopted automatically or manually, the condition types that can be used for net price determination or statistical value, and the sequence in which the condition types are used when calculating net and effective prices. You can also define the condition type for determining the subtotals. Sub-totals are calculated based on the range of conditions that you want to be considered for calculation. You could also define a requirement routine with the rules to be met prior to considering a sub-total condition type.

Pricing procedures and schemas are assigned to the organization parameter for determination: sales organization for SD pricing and purchase organization for Purchasing.

A calculation schema for supplementary conditions must be assigned to condition type PB00 or another comparable condition type for the gross price. Condition types for this supplementary calculation schema are surcharges and discounts (RA00, RA01, etc.) and freight conditions (FRA1, FRB1, etc.), that applies to the specific article or product.

15.1.2 Access Sequences

An access sequence is not usually assigned to the condition types of the additional condition scheme because they are always maintained in connection with the gross price. An access sequence can be assigned to a condition type. The access sequence is the search strategy that defines the sequence in which the system goes through condition tables looking for relevant entries for the condition type. The sequence in which data is accessed is defined by the sequence of condition tables in the access sequence. The EXCLUSIVE indicator is used to define that the search for further valid entries in condition tables is terminated if the access was successful and a relevant

entry was found. The requirement routine controls the circumstances in which the system searches through certain condition tables for relevant entries.

An access sequence can't be assigned to the header condition. If you create a new access sequence or change an existing one, you must generate the new access so that the new or changed access sequence is available in the productive system.

Let's quickly review the steps involved in the prices determination for procurement:

- ▶ The schema assignment is used to determine the relevant calculation schema.
- ▶ The system searches for conditions for all of the condition types listed in the calculation schema, providing an access sequence is assigned to the condition type.
- ▶ The system searches for condition records in the order defined in the access sequence.
- ▶ The search is complete when the system has found a valid condition record.
- ▶ Material-specific surcharges and discounts are usually defined as supplementary conditions for the gross price (PB00).

Let's quickly review the steps involved in the prices determination for sales:

- ▶ The sales area, customer pricing procedure, and document pricing procedure are used to determine the relevant pricing procedure.
- ▶ The system searches for conditions for all of the condition types listed in the pricing procedure provided an access sequence is assigned to the condition type.
- ▶ The system searches for condition records in the order defined in the access sequence.
- ▶ The search is complete when the system has found a valid condition record.
- ▶ Material-specific surcharges and discounts are usually defined as supplementary conditions for the gross price (PR00).

Having reviewed the condition techniques in specific access sequence and pricing procedures, let's review the pricing reports, condition maintenance, and special conditions.

15.2 Pricing Reports, Condition Maintenance, and Special Conditions

To provide an overview of existing condition records, you can generate a list of conditions for analysis. These reports can address some of the inquiries on customer-specific agreements that are made within a specific period and create price lists with a scale.

New records can be created with reference to existing condition records. This function provides an efficient way to update the condition records, where you want to copy with reference and make necessary changes to data such as validity dates, rates, and so on.

15.2.1 Pricing Reports and Condition Maintenance

The layout of the lists and the condition records reported are set within customizing. When creating a new program for pricing reports, you first decide the views in which you want to analyze the condition records. Depending on fields that are selected, the system generates a list of tables, which contains at least one selected field. From the list of tables, you can select specific tables that appear in the report. The list layout is specified by positioning and sorting the fields, which appear in the selected tables in one of the three report sections:

- ▶ **Page header:** A page break occurs when a value changes.
- ▶ **Group header:** A new headings is generated for each table analyzed.
- ▶ **Items:** Detail records information is provided.

Maintaining condition records has two interfaces, User Interfaces with associated program, one by specific application and other by use of condition records. For example, if you want to maintain a customer discount, you would go to a transaction that allows you to maintain the customer discount or the other method is to call the condition (customer discount) directly through the condition maintenance transaction. The newer interface allows mass maintenance of conditions based on characteristics (e.g., vendor, customer, and so on). This means that condition records can now be maintained across all condition types and condition tables. The traditional condition value maintenance uses the condition type, which means that only

condition records of the type chosen can be maintained through this interface. The newer condition maintenance function can be configured using area menus. The standard area menu for condition maintenance is COND_AV. A user-specific area menu can be assigned by choosing ENVIRONMENT • ASSIGNMENT AREA MENU.

The user-specific area menus can be created using Transaction SE43, for example, by copying the user menu, COND_AV, and changing it to meet specific requirements.

When copying condition records, you can select from a range of copying rules. Copying rules are maintained under customizing; and you can also create your own copying rules.

Long Text

You can maintain long texts in the conditions records for pricing and agreements, such as rebates, sales deals, and promotions. These long texts provide information on condition maintenance, validity, and so on. If required, long texts in the rebate agreement can be copied to the documents. For example, long texts can be copied to the credit memo request for rebate payments and then to the rebate credit memo. Text is not copied over when you create condition records with reference.

Net Price List

The net price list provides an option to create price information for a customer on a selected quantity of materials. The list is displayed using an ABAP list viewer. The net prices are determined by simulating a billing document.

15.2.2 Special Condition

This section reviews a few special condition type, for example, the hierarchy, application of condition indices, manual pricing, minimum pricing, discounts, surcharges, statistical, and customer expected prices. Hierarchy accesses optimize pricing for hierarchy data structures, such as a product hierarchy. To define a condition table key for a hierarchy such as this, you need to include partial quantities for a predefined quantity of characteristics. Without hierarchy accesses, you need to create a condition table for each combination and assign all of the accesses to these tables in an access sequence. This requires a lot of maintenance and reduces

system performance, which is a disadvantage associated with hierarchy data such as products or customers.

You may create a minimum value for each order using condition type AMIW. If the value in the order header is less than this minimum order value during pricing, the system uses the minimum as the net order value automatically. With regards to the application of condition indices, the system can use condition indices only when the condition is activated.

You can either enter the customer expected price manually in the order or retrieve the price from the incoming IDoc in an EDI environment.

Condition Indices

You can create and use condition indices to search for condition records that were created for a variety of condition types and condition tables. The activation function displays a list of all of the available condition indices and indicates which are active. If you can create your own condition indices, the system automatically activates each new index when you generate it. In addition, you must specify an update requirement for each condition index.

Calculation Type

The calculation type for a condition type is defined in customizing. This calculation type determines how prices or discounts and surcharges are calculated for a condition. When creating new condition records, you can select a calculation type that differs from the one set in customizing.

Hierarchy Pricing

The functions in hierarchy accesses enable you to solve problems using one access to a condition table. When you create the access sequence to use this condition table, you need to define at the field level whether or not each field is a fixed component of the key or is optional. During pricing, the system sorts the record found with this single access according to priority and uses the record with the highest priority. Hierarchy accesses also provide clear and easy master data maintenance because the different condition records for a condition type can be created together in the quick entry screen for maintaining conditions.

Customer Hierarchy Pricing

Customer hierarchies are available in sales order management so that you can create flexible hierarchies to reflect the structure of customer organization. For example, if your customer base includes multilevel buying groups, cooperatives, or retail outlets, you can create hierarchies to reflect the structure of these groups. Use customer hierarchies during sales order processing and billing to determine pricing and running statistics. With customer hierarchies, you can assign price or rebate agreements to a higher-level node. The agreements are then valid for customers at all subordinate levels of this node. You can create pricing condition records for each node indicated as relevant for pricing. If one or more nodes in the hierarchy path of a sales order contain pricing information, the system takes these nodes into account automatically during pricing according to the underlying access sequence.

Manual Pricing

The header manual condition type HM00 allows you to enter the order value manually. The new order value is then distributed proportionally between items, taking in account the previous net item value. The PN00 condition in the standard systems allows you to specify the net price for an item manually.

Minimum Price Value

The minimum order value is a statistical condition. Condition type AMIW is a group condition that is divided among the different items according to value. Calculation formula 13 is assigned to condition type AMIZ in the pricing procedure. This formula calculates the minimum value surcharges based on the net item value, as calculated from the minimum order value, condition type AMIW. You can create a minimum price for a material using condition type PMIN. If the minimum price is not met during pricing, the system determines the difference using condition type PMIN.

Discounts and Surcharges

Let's consider pallet discounts to use an example. A pallet discount grants the customer a discount for whole units of measure only, such as a complete pallet. This is controlled by basic formula 22 in the pricing procedure, which only takes the number of complete pallets into account. For an incomplete pallet, the customer pays a surcharge. This is controlled in basic formula 24 in the pricing procedure,

which tests the quantity for a fractional portion. The mixed pallet discount accumulates the quantities of the individual items and calculates the discount for complete pallets only. This is controlled by condition type KP02 (group condition = X; unit of measure = PAL) and the corresponding condition record. The mixed pallet surcharge accumulates the quantities of the individual items and calculates the surcharge on any fractional portion of the total quantity. This is controlled by condition type KP03 (group condition), unit of measure PAL, and scale formula 23, which calculates the fractional proportion of the total quantity.

Rounding Difference

Rounding differences are calculated. You can maintain a rounding unit in table T001R for each company code and currency. If the final amount in the order header differs from the rounding unit, the system rounds the amount up or down as specified. Condition DIFF determines the difference amount. Condition type DIFF is a group condition and is distributed among the different items according to value.

Statistical Condition Types

In the standard version, the statistical condition type VPRS is used to retrieve the standard cost of the material. The price procedure uses this condition type as a statistical value. Using condition category G, VPRS accesses the valuation segment of the material master locating either standard cost or the moving average cost, as specified in the material master. Condition category S always accesses the standard cost, whereas condition category T always accesses average cost. The profit margin is calculated using formula 11 in the pricing procedure. This formula subtracts the cost from the net value.

Cash Discounts

In the standard system, condition type cash discount, SKTO, is used to retrieve the cash discount rate. The pricing procedure uses this condition type as a statistical value. Table T052 is accessed using condition category E, and an amount is calculated from the first percentage rate of the item payment terms.

EDI Customer Expected Price

EDI customer expected prices are condition types within your pricing procedure. You can use condition type EDI1 to compare the net price for each item. You can use condition type EDI2 to compare the overall item value, which is obtained by

multiplying the net price and quantity. Calculation formula 9 is assigned to condition type EDI1 in the pricing procedure. This formula tests for a maximum deviation of 0.05 currency units. Calculation formula 8 is assigned to condition type EDI2 in the pricing procedure. This formula tests for a maximum deviation of 1.0 currency units. If the customer expected price differs from the automatically determined price or value by more than the maximum difference allowed, the system considers this order as incomplete when the order is saved.

In this section, we reviewed the pricing report, condition maintenance, and special conditions. Let's take up another industry application of pricing, starting with AFS in the next section.

15.3 Apparel and Footwear Sector-Specific Pricing

Note

To follow the menu path described in the following sections, the industry-specific solution must be installed. So if, for example, you want to use AFS (Apparel and Footwear Sector) pricing, the AFS-specific industry solution should be installed. Similarly for high-tech, the High-Tech industry-specific solution must be installed.

In some industries, such as AFS, pricing is not just dependent on a product. Before we launch into the details of AFS pricing, we need to understand what is different about the apparel and footwear industry, as compared to other industries.

This industry-specific solution covers various retail products such as shoes, shirts, and jeans. In addition to a product number, all of these products have additional characteristics to uniquely identify them. For example, if we consider a pants product, pants are not only characterized by a product number but also by waist and length size. Because of this unique nature of the product, just defining the price by product size is not sufficient. More specific product details are needed as well.

To accommodate this requirement, SAP ERP introduced the AFS industry-specific solution. AFS uses the concept of *grids*, which is a unique representation of an AFS product. In the AFS industry, dimensions have to be set up using characteristics to specify a grid value for a product. See Figure 15.1 for an example screen of a material grid. The menu path for defining the price in an AFS client is SAP MENU • SALES & DISTRIBUTION • AFS MASTER DATA • MATERIAL GRID • CREATE/CHANGE.

The screenshot shows the SAP Grid control data MM interface. It has two tabs: 'Grid control data SD' and 'Grid control data MM'. The 'Grid Values' tab is active. The 'Attributes' section includes:

- Mat.grid type: M
- Val.-from date: 27.07.2009
- Mat.grid no.: ZF_APPAREL
- Apparel WLC

 The 'Dimensions' section contains a table with the following data:

		Sort	Axis	Conv	Len	All
1st characteristic	ZF_S_APWI	1	Z	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>
2nd characteristic	ZF_S_APL	2	X	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>
3rd characteristic	ZF_S_APC	3	Y	<input checked="" type="checkbox"/>	3	<input checked="" type="checkbox"/>

Figure 15.1 Attributes of a Material Grid

For the pants product example, the dimensions are waist and length. After the dimensions are set up, the values are assigned using grids. The grid is then assigned to the product master. When this is complete, a price can be defined with the following formula:

$$\text{Price} = \text{Product} + \text{Dimension Size}$$

The material grid in Figure 15.1 has three dimensions: length (ZF_S_APC), length (ZF_S_APL), and inseams (ZF_S_APWI). When you select the grid values, the screen shows the three-dimensional aspects of the product: width, length, and color. Width, length, and color are represented by ZF_S_APWI, ZF_S_APL and ZF_S_APC) respectively in Figure 15.1.

Next the characteristics color, length, and waist are assigned values. For example, if the product is pants, then the various possible colors and sizes of the pants are represented as shown in Figure 15.2. This is done by defining a grid number, ZF_APPAREL, and assigning values to the characteristics as shown in Figure 15.2. The menu path for defining the price in an AFS client is SAP MENU • SALES & DISTRIBUTION • AFS MASTER DATA • MATERIAL GRID • CREATE/CHANGE • SELECT GRID VALUES.

The grid is now assigned to a material, as shown in Figure 15.3, and is correct in the material master. The menu path is LOGISTICS • MATERIALS MANAGEMENT • PURCHASING • CHANGE • IMMEDIATELY. Input the MATERIAL number, and select AFS BASIC DATA tab, as shown in Figure 15.3.

Attributes | Grid Values

Mat.grid type: M | Val.-from: 27.07.2009

Mat.grid no.: ZF_APPAREL Apparel WLC

1: (ZF_S_APWI)DMAR Ap Width

Dim.value: 27 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36

Valid Grid Values

3: (ZF_S_APC)DMAR Ap Color

2: (ZF_S_APL)DMAR Ap Length

	28	30	32	34	36	38						
BLK	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WHT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLU	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GRN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BRW	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 15.2 Grid Values for Apparel

Change Material AFS_MATERIAL1 (Apparel (seasonal))

Additional data | Organizational levels | Check screen data | <Base values>

Basic data 2 | AFS Basic Data

Material: AFS_MATERIAL1 | AFS Example Material

General Data | Seasons | Retail Data

Basic Data

Master Grid: ZF_APPAREL Apparel WLC

Grid det. proc. SD: SD0001 | Grid Control Data SD

Grid det. Proc. MM: MM0001 | Grid Control Data MM

AFS Status

Cat. Structure: I

Coverage Strategy

Mat.Conv. ID

Base Unit: EA

No grid

Figure 15.3 Assign Grid to AFS Material

Note that the AFS material has been assigned SD and MM grid determination procedures (GRID DET.PROC. SD and GRID DET.PROC. MM in Figure 15.3). This is an important setting in the AFS solution because it controls which grid values appear within the sales order or PO document. It uses the grid procedure to determine the grid conditions and accesses and works very much like a pricing condition technique. The sales grids and purchase grids will always be a subset of the master grid.

The pricing is then determined on the sales orders for these grid values. From a pricing procedure perspective, the pricing is dependent on the grid values. There are special AFS condition types to meet these requirements. These pricing conditions need to be specified as dimension dependent. The menu path to make this setting is SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL • DEFINE AFS-SPECIFIC CONDITION TYPES (see Figure 15.4).

CType	Name	Dim.condition	Two Date Cond.
J3A2	Price (2D)&SZ	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
J3A3	Factor (2D)&SZ	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
J3AB	Charge code&SZ	<input checked="" type="checkbox"/>	<input type="checkbox"/>
J3AC	Charge code&SZ	<input checked="" type="checkbox"/>	<input type="checkbox"/>
J3AD	disc. Size&SZ	<input checked="" type="checkbox"/>	<input type="checkbox"/>
J3AF	Factor Dim.&SZ	<input checked="" type="checkbox"/>	<input type="checkbox"/>
J3AM	Man.Disc. & Dim	<input checked="" type="checkbox"/>	<input type="checkbox"/>
J3AP	Price &SZ	<input checked="" type="checkbox"/>	<input type="checkbox"/>
J3AQ	MSO Pricing Indicat.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Figure 15.4 Dimension-Dependent Pricing Conditions

In this configuration, note that the dimension-dependent pricing conditions are checked. Also, the conditions can be defined as date dependent as well in the second checkbox column. This means that the pricing conditions J3A2 and J3A3 can be maintained at the dimension level. For example, the pricing can be maintained by size 32X32, 33X33 for pants.

You then define the AFS condition types in the same way as regular condition types.

The pricing procedures are determined the same way as regular pricing, which is based on a combination of sales area, document pricing procedure, and customer pricing procedure. The standard AFS pricing procedure (J_3A01) has the AFS pricing conditions, as shown in Figure 15.5.

Control data														
Reference Step Overview														
Step	Co	CType	Description	Fro	To	Ma	R	Stat	P	SuTot	Reqt	CaITy	BasTy	Acck
8	0	EK01	Equal Costs			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						ERL
9	0	PR00	Price			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			470			ERL
10	0	J3AP	Price &SZ			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			475			ERL
11	0	J3A2	Price (2D)&SZ			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			472			ERL
12	0	J3AF	Factor Dim.&SZ	10	11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			474			ERL
13	0	J3A3	Factor (2D)&SZ	10	11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			472			ERL
20	0	J3AB	Charge code&SZ	10	13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						ERL
30	0	J3AC	Charge code&SZ			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						ERL

Figure 15.5 AFS Pricing Procedure J_3A01

To navigate to the screen shown earlier in Figure 15.5 to define the pricing, follow the menu path SPRO • SALES & DISTRIBUTION • BASIC FUNCTIONS • PRICING • PRICING CONTROL • PRICING PROCEDURE • DEFINE PRICING PROCEDURE.

In this screen, define the pricing condition types required such as J3AP, J3A2, and so on; that is, define the gross price, discounts, and so on, just the way you defined pricing in Chapter 3.

The AFS pricing conditions can then be determined on the sales order, just like for regular conditions types. The AFS pricing conditions on the PO are determined the same way as regular condition types, as well.

The AFS pricing procedure is one of the SAP ERP provided pricing solutions for the AFS industry package. Now that we've gone through this industry-specific scenario, let's see how pricing applies to another industry: high-tech.

15.4 SAP High-Tech Pricing

High-tech industry is characterized by products that go through rapid innovation as well as constant price dropping for older products. The high-tech industry has

different segmentations, including High-Tech Software, Fabless and Semiconductor Manufacturing, and DRM (Distributor Reseller Management).

The software companies sell software products and have to manage software licenses, including creation of licenses, managing versions, software maintenance, and pricing. Microsoft is an example of a company that sells a variety of Microsoft suite products.

Semiconductor manufacturing companies, such as Intel and AMD, manufacture semiconductor chips. Microprocessor chips that are manufactured by the semiconductor industries have constantly increasing chips speeds and constantly dropping prices.

Distributor Reseller Management (DRM) is designed to enable an enterprise to successfully meet business challenges associated with the distribution and resale of high-tech products such as computer systems, semiconductors, networks, peripherals, software, and other electronic devices. These products reach end users through a chain of intermediaries that share complex relationships with manufacturers and suppliers.

An important concept in high-tech industries is price protection as discussed next.

Note

The features described in these sections are only available in the High-Tech industry solution so the High-Tech solution needs to be installed.

15.4.1 Price Protection

Price protection is a prevalent concept in high-tech industries, such as electronics goods and gadgets, where the customer is guaranteed a price for a certain period even if the price increases during the time frame. In the high-tech software industry, this can be achieved by using contracts. If a price agreement exists for a contract item, and a sales order item and its subsequent invoice reference the contract, then the price contained in the price agreement is awarded to the customer, regardless of other price protection rules.

Pricing procedure GRVPP1 and pricing condition type PPGG are used for this purpose. When the sales order is created with reference to this contract, the condition type PPGG EXCLUSIONS indicator will prevent other conditions from being applied to the sales order.

15.4.2 Distributor Reseller Management (DRM)

AS explained in the introductory section, DRM is designed to enable companies to successfully meet business challenges associated with the distribution and resale of high-tech products such as computer systems, semiconductors, networks, peripherals, software, and other electronic devices. These products reach end users through a chain of intermediaries that share complex relationships with manufacturers and suppliers. The key difference in the way pricing is calculated in the DRM process is that lot management is used.

DRM defines buying from a manufacturer/supplier as *sell-in*. In other words, the quantities bought from a manufacturer or supplier are managed in *lots*. The lots are characterized either as a normal buy or a special buy. A normal lot holds material quantities that you purchase from the manufacturer/supplier at the regular (book) price, without reference to end customers. A special buy lot holds material quantities that you purchase from the manufacturer/supplier at a special price, generally for resale to particular end customers.

From a pricing perspective, the pricing conditions for a normal lot are characterized by pricing condition type PB00 on the PO. On the other hand, the special buy uses pricing condition type JBOB, which results in the quantity being purchased and the creation of a special buy DRM lot with the special price defined in JBOB.

DRM defines selling to an end customer as *sell-through*. This process enables you to sell goods purchased from your manufacturer/supplier to your end customer and then update DRM lots. If it's a normal sell-through, available quantity in the oldest normal lot(s) for the material is decreased by the sell-through quantity by the system. If it's a special buy sell-through, available quantity in the oldest special buy DRM lot(s) for the material with matching end customer is decreased by the system when a delivery document is created. If no such lot with sufficient available quantity is found, then available quantity in the oldest special buy DRM lots with no reference to end customer is decreased by the system. Pricing condition type JDR4 is used for special buy sell-through.

This industry also uses price protection and provides capabilities for price protection simulation.

Now that we have discussed the way pricing operates in AFS and high-tech pricing, let's discuss retail pricing.

15.5 SAP Retail Pricing

Note

The features described in these sections are only available in the Retail industry solution so the Retail solution needs to be installed.

To understand pricing in retail, it's important to understand the *article master* in the retail industry. The article master is the way a product is described in a retail environment. Each article in the company is assigned to one merchandise category. See Figure 15.6 for an example setup of an article master.

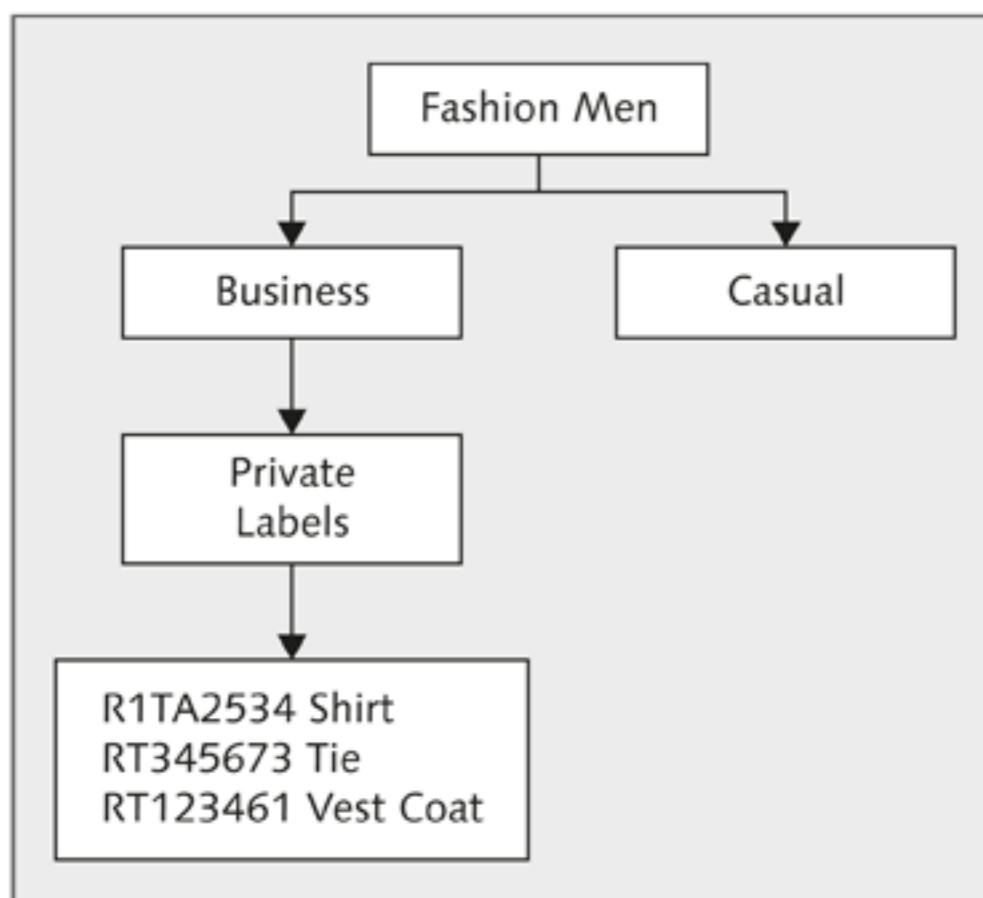


Figure 15.6 Article Master in Retail Setup

Merchandise categories can be grouped on merchandise category hierarchy levels. These, in turn, can be assigned to higher hierarchy levels. These assignments give rise to a merchandise category hierarchy.

Figure 15.7 illustrates how merchandise categories are grouped.

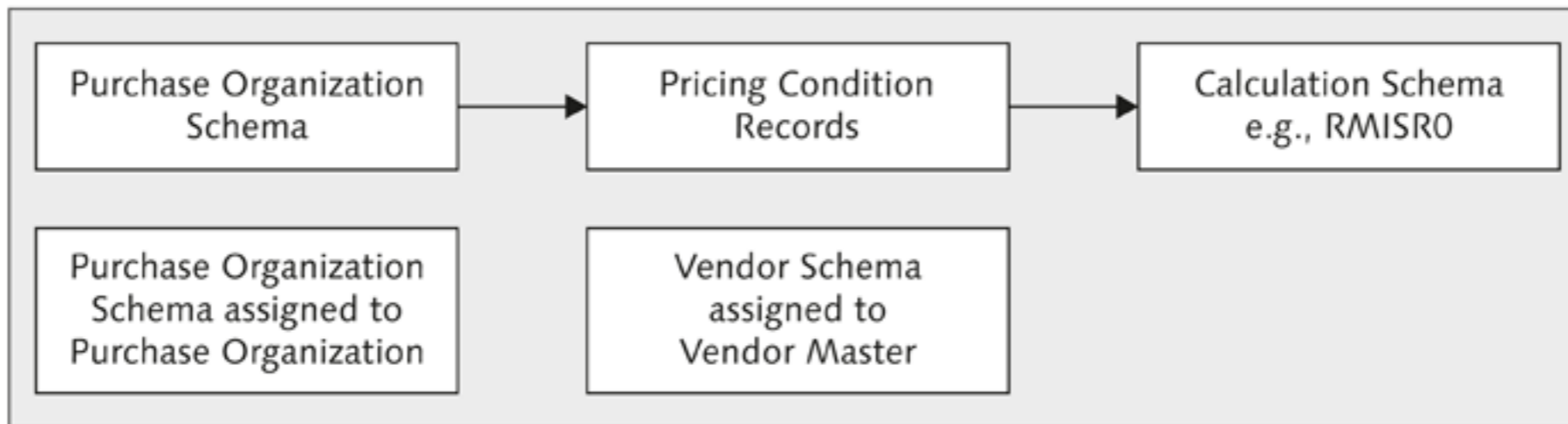


Figure 15.7 Merchandize Categories Hierarchy

15.5.1 Merchandise Category Hierarchy

The merchandise category hierarchy simplifies monitoring and control within the company, as well as data maintenance (e.g., conditions). The merchandise category hierarchy is also used to pass on descriptive and variant-creating characteristics (such as color and size) from higher to lower levels. A merchandise category references articles to every merchandise category. It can then be used as a reference when creating articles.

15.5.2 Reference Article

A reference article can be assigned to different merchandise categories and is an existing article master record. A merchandise category values the article for every merchandise category. This enables you to use inventory management on a value basis at the merchandise category level. The value-only article for your merchandise category can be used at point of sale (POS) for transactions at the merchandise category level. A merchandise category value-only article can also be defined for each hierarchy level. This enables you to use inventory management on a value basis at the merchandise category hierarchy level.

15.5.3 Characteristics

Characteristics can be assigned to hierarchy levels, as well as to merchandise categories. The lower hierarchy levels inherit the characteristics that are assigned to the higher hierarchy levels.

Characteristic inheritance occurs when a characteristic and its values are passed on to all of the lower classes in a class hierarchy, for example, to all of the lower levels in the merchandise category hierarchy or the merchandise category itself.

A characteristic can be for information purposes only or can be flagged as variant. When creating a generic article as well, the variant can be used. Characteristics specific to the articles are used for creating variants specific to the generic article.

After the article master is maintained, the pricing conditions in SD and MM use the condition technique, just as in the other industries we have discussed. In other words, pricing is based on conditions that are described by condition types. Calculation schemas are used in purchasing, and pricing procedures are used in sales.

15.5.4 Purchasing Pricing

The calculation schema is used in pricing determination in purchasing. The calculation schema in purchasing is determined by a combination of schemas that are defined for the purchasing organization and also by schemas that are defined for the vendor. Also, the vendor's master data is assigned the vendor's calculation schema. Figure 15.8 shows how the pricing procedure is determined. The menu path for the transaction is SPRO • LOGISTICS • MATERIALS MANAGEMENT • PURCHASING • CONDITIONS • DEFINE PRICE DETERMINATION PROCESS • DEFINE SCHEMA DETERMINATION.

Step	Co...	CTyp	Description
1	1	PB00	Gross Price
5	1	GAU1	Orignl Price of Gold
10	1	RB00	Absolute Discount
10	2	ZB00	Surcharge (Value)
10	3	RA00	Discount % on Net
10	4	ZA00	Surcharge % on Net
10	5	RA01	Discount % on Gross
10	6	ZA01	Surcharge % on Gross
10	7	RC00	Discount/Quantity
10	8	ZC00	Surcharge/Quantity
10	9	MM00	Minimum Qty (Amount)
10	10	MM01	Minimum Quantity (%)

Figure 15.8 Calculation Schema Determination for Purchasing

The standard pricing procedure is RMISR0. In addition to the calculation schemas, you can also assign supplementary conditions to pricing conditions. For example, you can assign pricing condition PB00 to pricing schema RM0002. (Assigning

pricing conditions to pricing calculation schema was explained in detail in Chapter 3.) In turn, this schema has its own pricing conditions; for example, condition types RA01 and RA00, as shown in Figure 15.8, display the pricing procedure definition with the key conditions.

Let's move on to see how this procedure applies to a retail industry sales pricing.

15.5.5 Sales Pricing

In the retail industry, sales pricing works in that we can define a markup for the purchase pricing. Figure 15.9 shows a representation of sales price calculations and the basics of calculation for sales.

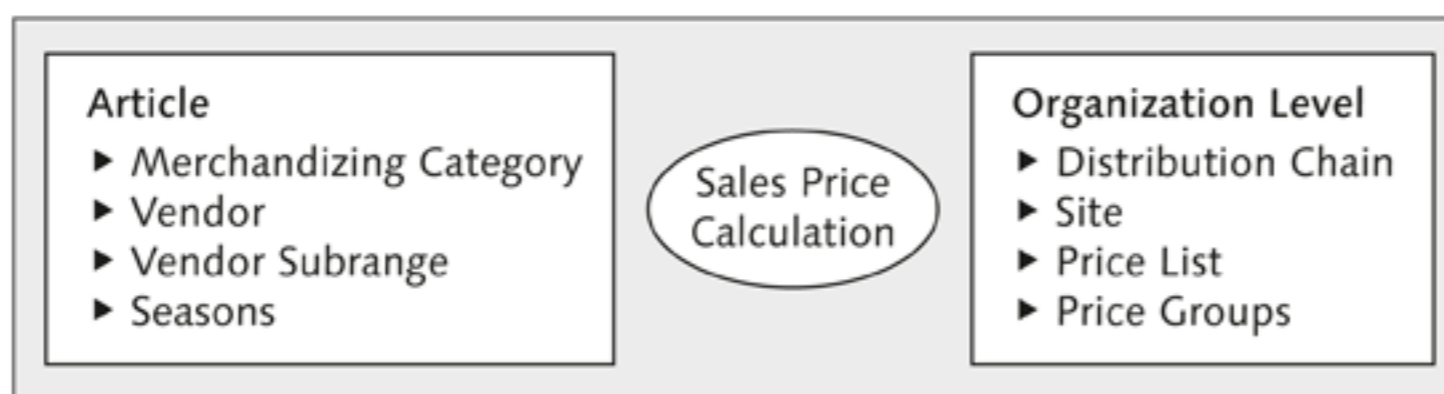


Figure 15.9 Supplemental Pricing Procedure for PB00 Condition Type

As Figure 15.9 illustrates, any combination of merchandise, vendor, vendor sub-range, or seasons can be used to maintain the purchase pricing and markups. They become the basis for the sales price calculations. The sales price can then be maintained for a store or group of stores.

The pricing type NO, which is part of the sales price calculation, is a key parameter that is used to determine the sales prices for different distribution chains. It also controls whether pricing documents are created, the currencies used, whether the sales price/markup remains the same, if the purchase price is changed, or if the conversion rate is to be used.

From this illustration, you can see how the sales price calculation is performed within a retail scenario. In a retail scenario, the vendor delivers the product to the distribution center. The products are then moved to the stores from the distribution center. Retail pricing calculates the sales price by adding a markup of the price from the vendor.

The following list details the key elements within the sales price calculation for retail, as detailed in Figure 15.10. Sales pricing procedure WWS001 is delivered as standard SAP Retail.

- ▶ Condition Type EKNN provides the purchase price. This represents the price the vendor has charged to deliver the products to the store. In the figure, this price is 9.00 USD, so the gross price for 100 PCs is 900 USD
- ▶ The actual markup is in condition type AUFS. The markup in this case is 10%, so the markup value is 90 USD for 100 PCs.
- ▶ If rounding to price points is defined, the sales prices are rounded as well. In this example, the prices are rounded up to 9.99, so the net price is 999 USD for 100 pcs. Because of the rounding to price points, the markup is adjusted.

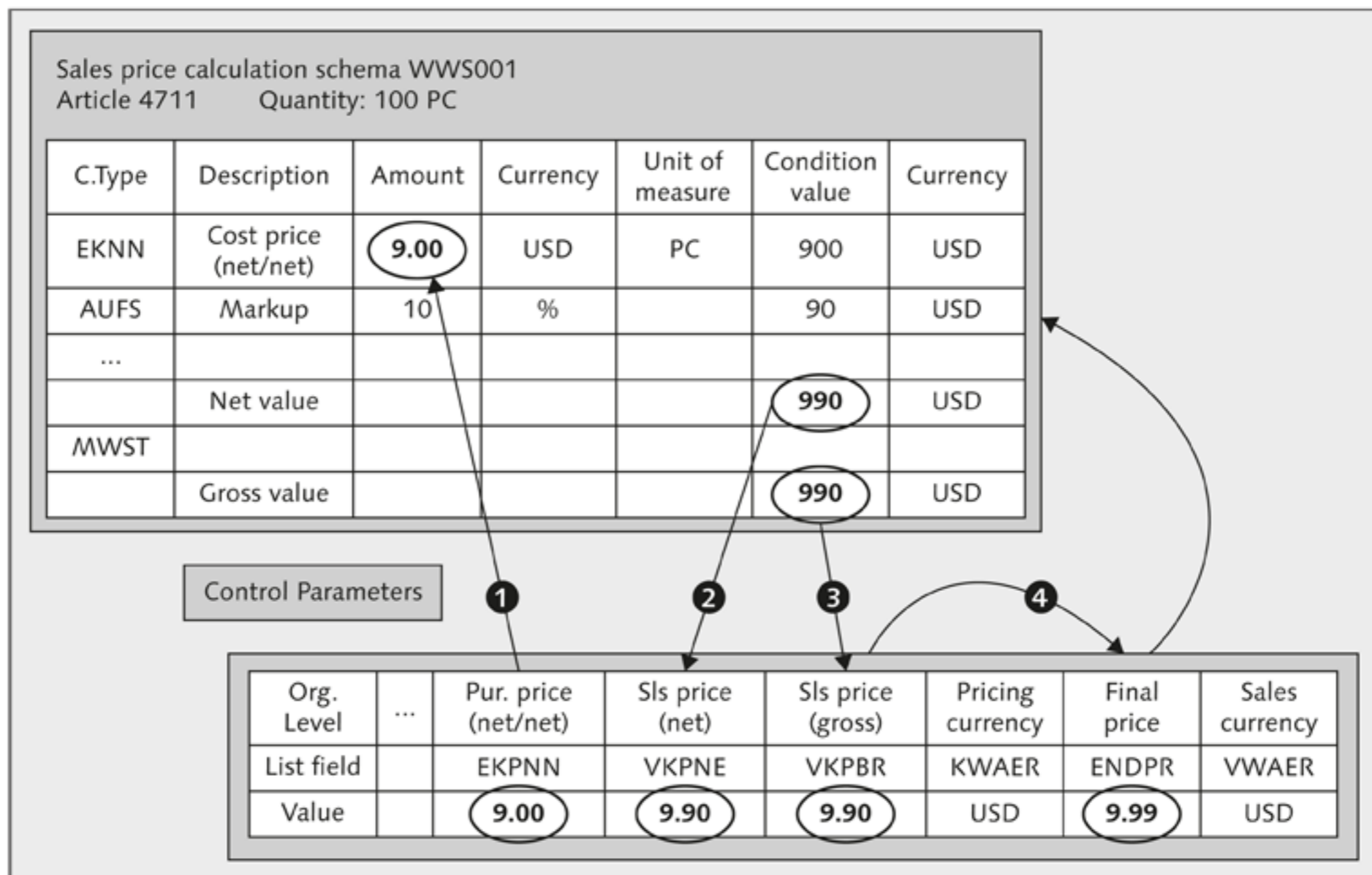


Figure 15.10 Sales Price Calculation

With sales pricing, there are two methods to carry out the sales price calculation: one-step pricing and two-step pricing.

One-Step Calculation

If the stores are directly supplied by vendors, then the one-step sales pricing approach is used, as illustrated in Figure 15.11. The sales price at the stores is based on the purchase price of the vendors. As an example, the vendor could be shipping products directly to the stores at \$.90 USD/PC. The stores then mark up this price and sell it to the end customer at \$1.90 USD/PC.

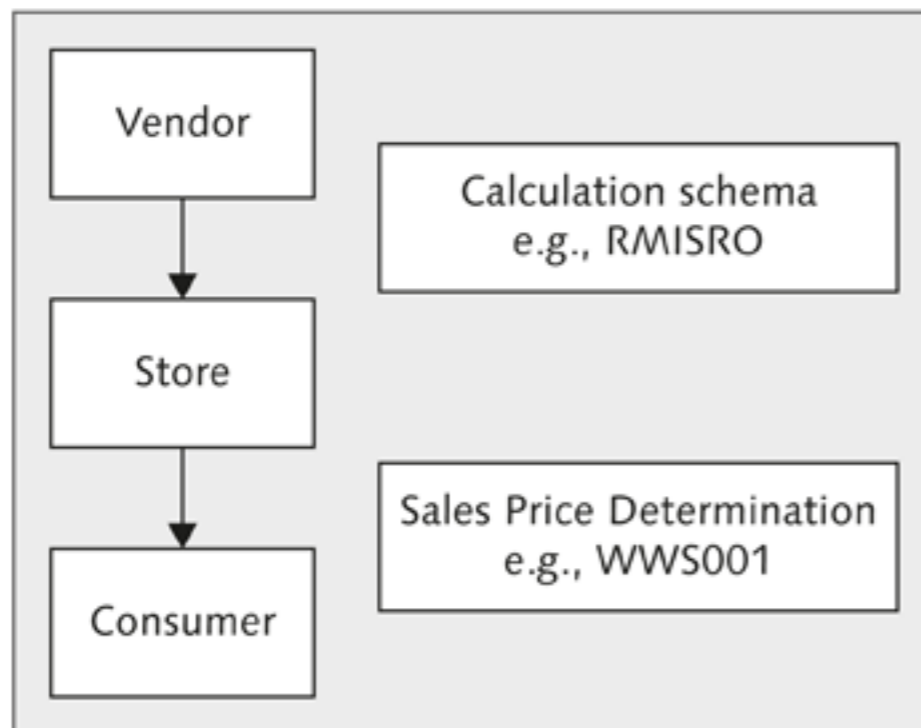


Figure 15.11 One-Step Pricing

In this illustration, you can see the flow of one-step pricing calculation with the vendor purchase to the store and finally to the end consumer.

Two-Step Calculation

You should use the two-step calculation approach when the supplier ships the product to a distribution center, and then the articles are pushed from the distribution center to the consumer.

The main difference here is that because the products are shipped to the distribution center and then the product is moved to a store, there is an internal transfer price associated with moving the product from the distribution center to the store.

For example, when a supplier ships the product to the distribution center, the price might be \$.90 USD/PC. Now the product has to be transferred to the distribution center, so there is a transfer price associated with it. The price at the store could be \$1 USD/PC. Finally, when the store is selling to the customer, there is a markup on the transfer price, so the sale price is \$1.99 USD/PC.

An illustration of this calculation is shown in Figure 15.12.



Figure 15.12 Two-Step Calculation for Pricing

15.6 Chapter Summary

In this chapter, we discussed how pricing works in industries such as AFS and high-tech. We gave an overview to how pricing works in the AFS industry not only based on the product but also on the dimensions of product. Also, we learned that AFS products can have sales and material determination procedures that can further control the grids that are available.

We also discussed pricing in the high-tech industry, where price protection is a common requirement. We reviewed an overview of how pricing works for high-tech industries, including Distribution Reseller Management (DRM).

Finally, we discussed retail pricing and explained the significance of the article master, as well as how purchasing and sales pricing procedures are determined in retail industries.

15.7 Book Conclusion

With this chapter, we come to the conclusion of the book. Let's review the summary content of the chapters covered in this book. We start the book with a discussion with pricing as a general business process, and how it fits within the SAP ERP environment. You learned the organizational elements of pricing, such as sales organization, purchasing organization, and so on. By learning the foundational organizational structures, you can model the organizational structure of the client and company you are working for. You can now set up the sales organization

division, distribution channel on the sales sides, and the purchasing organization and purchasing groups on the purchasing side.

From there, we moved on to Chapter 2, which covered pricing in an SD document. Here you learned how pricing procedures work in SD documents, like sales orders, contracts, and schedule agreements. By learning this information, you can apply it to setting up different pricing procedures for different sales documents. In this chapter, you also learned about customer hierarchy pricing and now you can model this for your company or client. Chapter 3 addresses the condition techniques in SD, which is the mechanism SAP uses to calculate SD pricing. By learning the condition technique you can, not only set up your own pricing condition types (i.e., gross price, discounts, taxes for your own client), but you can also set up your own access sequences and condition tables.

With Chapter 4, we moved on to the special pricing topics within SD, such as promotions and deals, EDI pricing, and rebate agreements. This helps you understand how to set up EDI pricing, promotional pricing, and free goods pricing.

Chapter 5 addressed a very important aspect of pricing design. This chapter covers how the performance can be improved by optimized access, minimizing tables per access, and other tips. You also became familiar with user exits used in SD and MM, and how they can be applied in situations where standard SAP ERP isn't sufficient to meet the requirements.

In Chapter 6, you learned about how pricing data is migrated from legacy applications to SAP ERP, as well as how to cut over from legacy to SAP. You learned some of the best known methods in data migration.

Chapter 7 covered the fundamentals of MM pricing: pricing in MM documents. By learning this information you can now apply it to setting up different pricing procedures for different purchasing documents.

With the foundation, we moved to more complex topic of condition technique in MM in Chapter 8. You learned how condition technique needs to be set up and what the important aspects are. With this chapter you can now model pricing condition types, access sequences, condition tables, and much more for your company or client.

Similar to the special condition types with SD, we covered the special pricing topics in MM in Chapter 9. This included pricing topics, such as delivery costs and foreign currency. Similar to the SD special pricing procedure you learned about in Chapter

4, we explained other topics such as Planned Delivery Costs, Foreign Currency, Weight Volume Dependent Pricing, and other pricing applications.

In Chapter 10 you learned about the application of pricing with variant configuration. You learned how pricing can be set up for products which have configurable options such as cars and computers. Now you can use variant configuration to model products which have various configuration options within your company or client.

In Chapter 11, you learned about the financial accounting aspects of pricing, such as how the General Ledger accounts are determined. You can now segregate list price, the discount offered, and taxes from a financial perspective.

In Chapter 12 you learned the impact of the financial accounting aspects with Materials Management pricing. You learned that list price, discounts offered, and taxes can be segregated.

With Chapter 13, we went over the tips and tricks to writing custom reports in pricing. We discussed how business users can set up and lay out their own pricing reports in SD and MM and run these reports.

With Chapter 14, we discussed the internet pricing, and this chapter taught you to setup web pricing, the customers Business to Business, or the Business to Consumers can order through the web. You can now set up Internet pricing for your own company.

Chapter 15 concludes the book with review of the key elements of pricing and takes the opportunity to explain the pricing as it applies to different industries such as AFS, Hi-Tech, and Retail. The concepts you learned in this chapter can be applied to set up pricing in specific industries such as Retail and AFS.

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