Master Data

Outstanding Features:

❑ Detailed master data on customers and other partners facilitates sales processing.
❑ Flexible data structures create powerful capabilities for extensive sales tax calculations and pricing.
❑ Create and maintain master data using views most useful to you, such as

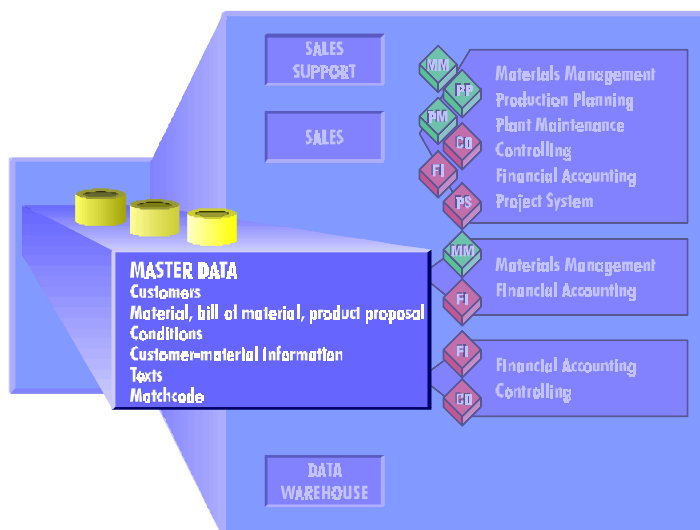sales or financial accounting views of customer master data.

Fig. 10-1: Overview of Master Data

Changes in Sales Data

The nature of sales has changed and with it the nature of sales data. Sales is less adversarial and more collaborative.

The R/3 System's approach to business data is based on the more thoughtful, relationship approach that is the basis for most successful sales efforts today. In fact, all entities and individuals with whom you do business in the R/3 System are called business partners. This includes all customers and

vendors. The system maintains data on each of these and on your company's personnel in a master record.

Master Data in R/3 SD

Master data maintained in the R/3 System's central database forms the basis for all business transactions in SD. Master data includes information about:

❑   business partners   ❑   products and services

❑   prices, surcharges, and discounts   ❑   taxes

❑   customer/product information records ❑   product proposals

Note that in the R/3 System, the word "material" can refer to either materials or products. In the system, for example, "customer/product information record" is called "customer/material information record."

Central Database

While the R/3 System's architecture is a three-tiered, real-time client/server implementation, the system stores data centrally. Master data is a particularly important part of this central database. Each piece of master data resides in a master record and is assigned a unique number. This data is available to various parts of the R/3 System as needed for processing.

Single Data Source

This central, real-time database is a key part of R/3 SD functionality. While three-tiered client/server architecture provides speed and flexibility, a great deal of system efficiency comes from the use of a central repository for all data. Maintaining these records centrally means that different applications have access to the same data. This avoids needless replication of information. It also avoids the opportunities for error created by multiple data sources in a single system.

Processing Master Records

You create, change and display master records using a variety of functions. For example, you can speed up the process of creating new master records using R/3 SD's copying function.

Matchcodes for Master Records

Search terms called matchcodes help you locate records even when you do not know the number of the master record you need. For example, you can enter a customer name as a search term if you want to find that customer's customer number. You might also use a product description as a search term to find a material number.

Change Records

To ensure that you can always trace the source of your data, the system keeps a record of any changes made to master data.

R/3 Classification System

The R/3 Classification System is a generic facility for classifying virtually any data object. It implements classification and search criteria for products, customers, suppliers, etc. You can allocate to different classes

with different characteristics; or you can allocate different types of objects to one class. The R/3 Classification System is also used for configured products to specify features and options.

Business Partners

As noted, business partners in R/3 SD are any entities with which you do business. These include:

❑ customers, who order goods or services

❑ vendors, including carriers, freight forwarders, consolidators, expediters and others who transport goods; as well as suppliers, who provide goods and materials to your operations

❑ personnel, who execute some portion of your business transactions

Customers

Both the accounting and sales departments rely on customer data. Both of these areas access the same master record of customer data in the central database.
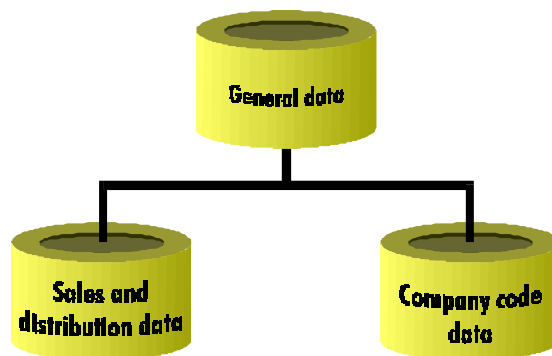

Fig. 10-2: Structure of a Customer Master Record

You store three different types of data in the customer master record:

❑ General data includes customer address and communication data.

❑ Company code data includes banking and payment data that is only important for accounting functions.

❑ Sales and distribution data includes information such as pricing, deliveries and output. This information is specific to one sales area and is therefore dependent on sales structure.

Generic Master Record

You do not have to create a master record for each customer. For occasional customers, you can use a generic master record to process a transaction.

Account Groups

SD's account groups ensure that the R/3 System displays only the appropriate data entry screens for a given customer. This capability allows you to be very precise about sales to large and complex customers. A customer may have several production facilities, all of which require deliveries from your company. But the customer may also require that you send a single invoice to a central location. SD differentiates between particular types of customer functions, including:

- ❑ sold-to party
- ❑ payer
- ❑ ship-to party
- ❑ bill-to party

Different data is relevant for each of these functions. Shipping data is relevant for the ship-to party, while billing schedules and banking details are relevant for the payer. SD account groups distinguish between these customer functions.

Contact people

SD also stores information about your contact people at customer locations in the customer master record. This includes name, telephone number and department as well as other data that may be important for getting in touch with the customer. Data on contact people is particularly important in sales support. For example, this data can include information on:

- ❑ business address
- ❑ home address
- ❑ business hours
- ❑ visit frequency
- ❑ other information stored as texts

Customers as suppliers

A given organization can function in more than one of these categories at a time. A company can be both a customer and a supplier, for example. The R/3 System maintains records on business partners who are vendors in the Materials Management (MM) module and in the Financial Accounting (FI) module. You can also define this data in SD. The system establishes this integration between modules, for example, if you enter a supplier number in the appropriate customer master record for a company.

Personnel

The R/3 System manages employee data in the personnel master record. Each employee has a unique personnel number in the system. Your personnel department creates master records for employees in your own company using the R/3 HR module. The R/3 System maintains personnel master rec

ords for employees such as sales representatives or administrative staff. You can identify employees by their personnel numbers during processing. For sales employees, for example, this might link completion of a sale with HR and FI to ensure commission payments.

Customer Hierarchies

Customer Organizational Structure

SD customer hierarchies help you structure your records to reflect the structure of customer organizations. If your customer base includes multi-level buying groups, cooperatives or retail chains, you create hierarchies to reflect these groups. Use customer hierarchies during sales order processing and billing for determining pricing, including rebates.
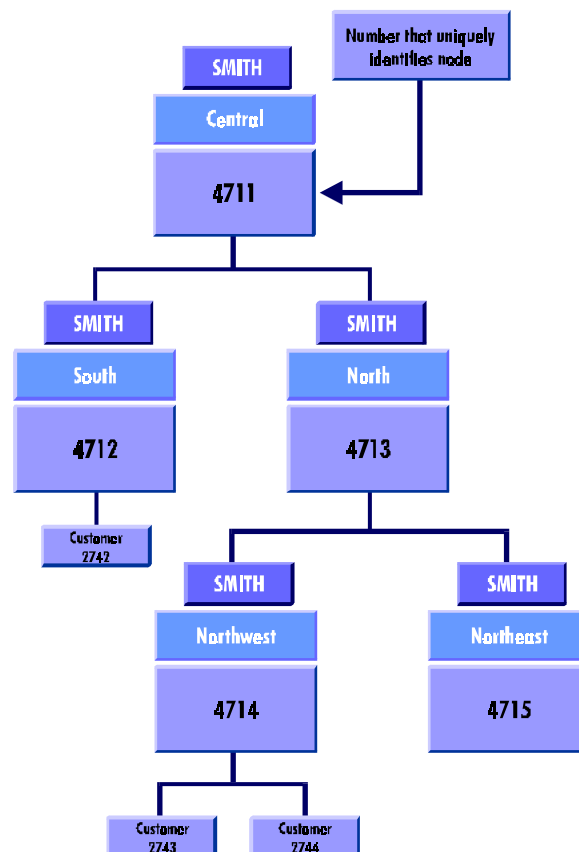

Fig. 10-3: Customer Hierarchies

Changing Customer Structures

Once you create a hierarchy, you can change it as customer organizations change over time. You can move or change hierarchy elements (called nodes). The system automatically moves customers along with a node. When you add a new customer to an existing hierarchy, the new node "inherits" the traits of the existing hierarchy. These features all mean less effort to maintain customer data.

Products and Services = Material

Material Master Record Data

R/3 SD refers to products and services with the term material. R/3 SD maintains information necessary for the management of material stocks as well as for sales in the material master record.

Like the customer master records, material master records must meet the needs of many users. The system constantly uses these records as one of the basic resources for sales processing. SD uses the material master record during processing for inquiries, quotations, sales orders, shipping and billing. The information needed in each case may vary. You can maintain material master records centrally or by application area.

Data Structures

R/3 SD stores different types of material data in Sales and Distribution material master records:

General Data

General data contains the material number for each material, a material description, units of measure, cost, weight, volume and similar data. Because general data defines a specific material, it does not change for any location or portion of an organization, although this may change over time if the material itself changes.

Sales and Distribution Data

Sales and Distribution data includes the delivering plant, assignment to a sales group, grouping terms for price agreements as well as descriptive text. All are typical SD entries in a material master record. This data is specific to a sales organization and distribution channel and may change from one facility to another in an organization. Linking a material to a distribution channel allows you to sell the material under different conditions through various distribution channels. Material data is divided into sales organization and plant data:

❑   Sales organization/distribution channel data includes the delivering plant, sales unit and minimum order and delivery quantities.

❑   Plant data includes MRP data such as safety stock quantity, reorder level and shipping processing time.

For example, a computer sold by sales organizations A and B can have the same material number, and its description, weight and volume do not change from one sales organization to the other: this is general data. Because it is sold by different sales organizations, sales area data such as the delivering plant will differ, but the general data remains identical in the system.

Fig. 10-4: Structure of a Material Master Record

Material Types

Material types in R/3 SD include trading goods, semi-finished products, finished products and services. Grouping these into material types helps define screen sequences in processing, define selection functions and determine number assignments, for example. Master data differs from one of these to another. Examples of material types include:

Trading Goods

Trading goods, which are goods bought and resold by your company, rather than manufactured. Trading goods include consumption goods and durable goods. The material master record for these always includes purchasing and sales data.

Non-Stock Material

Non-stock material, including materials not managed as inventory. This includes small parts such as nails.

Services

Services, which are different from other materials in that their production and consumption are simultaneous. Services are non-transportable and are not stocked. Services include commercial, transport, banking and insurance services, goods from cultural organizations, media materials as well as health and education services.

Packaging Material

Packaging material, including cartons, boxes and other materials needed for packaging.

Other Materials

You can also create new material types to meet your specific needs, or categorize occasional materials that do not fit into your predefined categories as "other materials."

Units of Measure

You define whatever units of measure you require for materials in SD. The system carries out inventory management using the base unit of measure you define for each material, but will convert to alternative units of measure as you require.
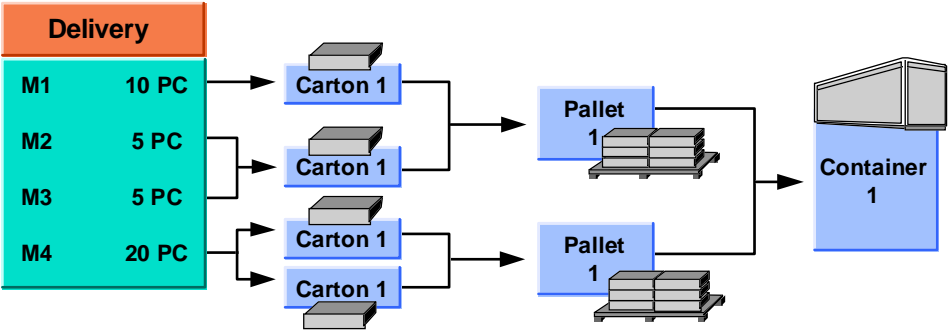

Fig. 10-5: Units of Measure

You define minimum order and delivery quantities for each sales area. During order entry, the system warns the person processing the order if quantities fall below specified minimums.

Bills of Material

A bill of material (BOM) details the components that comprise a product. You define closely related products that differ in only a few components with variant BOMs. Bills of material are defined in R/3 PP (Production Planning). SD accesses BOM information during sales processing. SD explodes single or multi-level BOMs in the sales order. The system represents the completed product as the main item, and components as sub-items. You can carry out pricing and determine inventory at either the main or sub-item level.

Configurable or standard product BOMs consist of a number of variable components you can combine into a final product. Depending on your final product, some components may be mandatory, and others optional. For example, the engine in an automobile is mandatory, while a cassette tape player may be optional.

In the sales order, you can configure an item according to the customer's selected options. You can also define interdependencies between two or more options where all must be present for them to function, as is the case with an automobile radio and its antenna.

For sales documents, you can combine variants for a standard product using a configuration editor screen. The system automatically calls up the configuration editor when you enter a configurable product in, for

example, a sales order. If you are configuring an automobile, for example, you might specify engine size, body and interior colors and accessories. You can also manually call up the configuration editor in delivery and billing documents, although in these cases you can only display configuration data, not change it.

Grouping Materials

You group materials according to company-specific criteria, by features designed to provide easier materials management and simpler materials evaluation for your organization.

Material Groups

Material groups include materials with similar features. For example, you might place all nails in one material group. You use this group primarily for materials management analyses.

Material Pricing Groups

Material pricing groups gather materials into categories of similar pricing.

Product Hierarchies

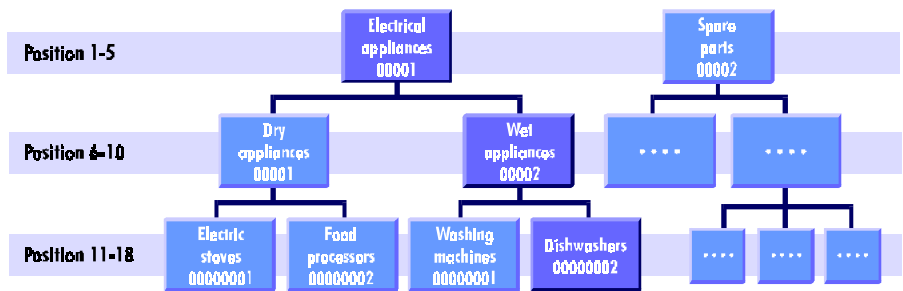Product hierarchies categorize related materials by features for analysis and pricing.

Fig. 10-6: Product Hierarchy

Product Status

You define permissible sales transactions for a material using the material status indicator. If, for example, a product has technical faults, you can block it to prevent sales orders for that material, while still allowing inquiries. In this case, creating an inquiry would trigger a warning from the system that you cannot order the material. You might define a material status for products about to be discontinued. Here you would allow existing orders to be filled, while blocking new orders.

Product Proposals

You store frequently occurring material combinations and common delivery quantities as product proposals. Referring to a product proposal

during order entry causes the system to propose the item list. A product proposal can include materials of different material types.

Product proposals can increase the efficiency of order entry and reduce errors. Items proposed in a product proposal can be changed in the sales order.

Stocks

SD uses current inventory data as the basis for availability checks. This data resides in the Materials Management (MM) module. MM inventory management updates quantities and values necessary for determining operating profits. You can branch to various materials inventory overviews that inform you of current and projected inventory situations.

By summing up stocks in various storage locations you get an overview of quantities on hand. You can look at unrestricted-use inventory, reserved inventory or inventory in quality inspection to gain availability information that may be important to SD processing.

Summing Stocks

If managing inventory at plant and storage locations is not sufficient for your materials needs, you can further differentiate inventory and manage it as special inventory. This includes managing lots, consignment inventory, returnable packaging stock and inventory assigned to individual customer orders.

Special Inventory

Batch Management in SD

A batch is a quantity of a particular material produced in one specific standardized manufacturing process, and thus represents one unit with unique specifications. Batch management is mainly used in the chemical, pharmaceutical and food industries. Batches can also be different delivery lots or quality grades of a material.

In SAP R/3, batch management allows integrated processing of batches thoughout all logistics functions and modules. It enables you to describe subsets of materials through specifications and manage these subsets separately in stock. The full integration of batch processing allows you to use the R/3 Classification system to store your batch specifications and to classify batches.

Full Integration

When you manage a material in batches, you indicate this in the material master record. You can maintain master data for individual batches if you wish, specifying such information as expiration date, valuation type, country of origin.

Batches can be determined as early as the sales order stage. Or, to reduce material or capital lockup you may wait and carry out batch determination in the delivery or transfer order. Batch processing allows you to store

Batch Determination

flexible search strategies for automatically selecting batches. It is thus possible to select batches according to your customer's requirements (such as expiration date, quality and viscosity). Batch determination includes:

❑ selecting the batches

❑ determining existing batches for the plant

❑ sorting the chosen batches

❑ availability check

❑ quantity proposal (batch split)

Batch Split

Batch split describes the situation when you want to specify quantities from more than one batch for a particular delivery item. The SD batch split function in the delivery includes a batch selection screen and an availability check. R/3 batch processing thus offers you maximum flexibility.

Customer-Material Information Records

Storing customer sales and delivery data in customer-material information records allows you to fulfill customer requirements more efficiently. Customer-material information records include:

❑ customer material number and description

❑ special delivery data and delivery tolerances

❑ long text

Fig. 10-7: Customer-Material Information Record

Customer-material information record data takes precedence over data from customer or material master records. When you enter a sales order for a customer for whom you maintain a customer-material information record, the system automatically proposes appropriate data from this record in the sales order into individual items. You can change this data for each transaction.

Material Determination and Substitution

Material determination and substitution support sales order processing in SD by simplifying the process of replacing one product with another in an order. For example, during a sales promotion, the system can automatically substitute a material (product) that has promotional packaging. You might substitute holiday packaging during the Christmas season. Using material determination, the system only makes this substitution during a specified time period.

You might also use material determination to substitute:

❑   your own product numbers in place of customer-specific product numbers

❑   your own product numbers in place of International Article Numbers (EANs)

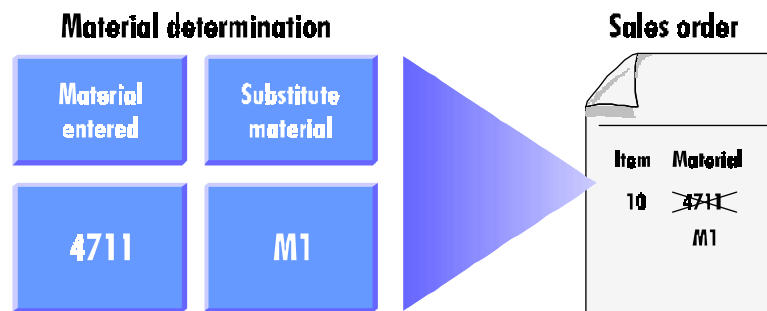❑   newer models or products in place of discontinued products

Fig. 10-8: Material Determination

Product Selection

You can process orders for products sold in a number of different forms by using product selection. Product selection may take into account different customer preferences for packaging, such as soft drink packaging that might be offered in a standard version, a holiday version and a coupon version.

You can make product selection either manual or automatic. You can:

❑   present order entry workers with a selection of alternative products from which to choose, or

❑   set up SD to automatically select products according to availability and priority

You create master data material determination records to control product selection capabilities.

Material Listing and Exclusion

You control which products particular customers may buy using the SD sales restriction functions: material listing and exclusion. For example, if you create a material listing of products for a customer, the customer may only buy products on that list. If you specify material exclusion for a particular customer, the customer may not order the excluded products from you. You can specify a period during which a material listing or exclusion function is valid. If you do not specifically activate material listing or exclusion, then all materials are available for order.

While these sales restrictions depend on customer and product criteria, you can add additional criteria to represent other requirements.
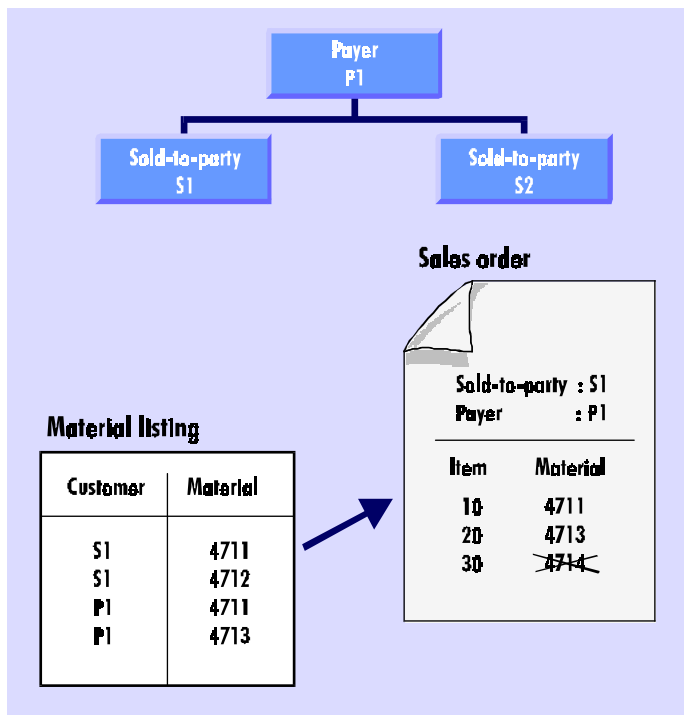
Fig. 10-9: Material Listing and Exclusion

Pricing in Master Data

SD's pricing system can deal with both basic pricing structures as well as complex and interrelated pricing components. R/3 SD can handle discounts and surcharges of many varieties.

R/3 SD calculates pricing based on a matrix of predefined pricing components. These are variables that tailor SD pricing to meet the needs of your organization. You use a wide variety of factors to define these pricing components. Some of the more common kinds of prices you can create and maintain in the system include:

Pricing Components

❑   price list   ❑   product price   ❑   customer-specific price

You can define many more according to your needs. Surcharges and discounts are dependent on customer, product, customer or product pricing groups, and other factors or combinations of factors.

PRICING

Prices
- Price list
- Material price
- Customer-specific price
- ....

Discounts/Surcharges
- By customer
- By material
- By price group
- By material group
- By customer/material group
- By customer/material
- By price group/material group
- ....

Fig. 10-10: Pricing Factors

Pricing Process

R/3 SD calculates the gross price for a material or product, then includes discounts and surcharges to determine the net price. The system also includes sales tax, GST/PST and/or VAT. Prices in the system can come from a price list, from an agreement with a customer or may be dependent on materials. Surcharges and discounts can be customer-specific or may depend on the material group. R/3 can support cost-plus pricing, where the cost is calculated, and discounts and surcharges are added on to determine the net price.

Pricing Example

For example, if customer number 24 sends in an order for product 4044, and if the USD is defined as the currency for this transaction, the system automatically uses the order quantity and pricing factors and finds the appropriate price in the condition record. In this example, the variables are product, currency, customer and quantity.

Pricing Flexibility

There are many other ways to create pricing components or condition records to meet your needs. For example, you can create one that is dependent on a product pricing group and a country.

Fig. 10-11: Sample Condition Record

Price Increase/Decrease

When factors change in your pricing components, for instance, rising by some percentage or amount, you can update your pricing components using background processing.

Validity Period

Pricing factors are functional, or valid, for a specified period of time. In R/3 SD this is called the validity period. You may change price lists once each year, so they have a one-year validity period. Similarly, price reductions may be defined for the duration of a sales promotion campaign.

You define these pricing components and store them in the system before they take effect. You can store price lists for the next year and discounts for upcoming promotions. Once these new pricing components reach their active dates, the system applies the new prices or discounts.

Pricing rules in R/3 SD maintain a full audit trail of prices, discounts, and surcharges.

Price Agreements

Predefined price agreements are a common pricing element in R/3 SD. Price agreements depend on the sales organization and distribution channel. Typical price agreements cover:

❑ product

❑ customer

❑ combination of product and customer

❑ combination of customer and product hierarchy

❑ combination of customer group and product

❑ combination of customer group and product hierarchy

You can also specify individual price agreements that are more narrowly defined. Individual pricing agreements specify particular fields affected by the pricing agreement.

Promotional (Rebate) Price Agreements

You can create and maintain groups of condition records for promotional pricing agreements (rebates). This is particularly useful in the consumer goods marketplace, for managing marketing programs with extensive discount structures. There are two types of promotional price agreements:

❑ Promotions provide high-level marketing for particular products or product lines. For example, for a range of products during a specific sales cycle. If your promotion covers a range of product lines, you can create separate sales deals for each product line.

❑ Sales deals are more specific provisions that are often part of a larger promotion. For example, you might offer customer-specific discounts in some cases, and product-specific discounts in other cases. You can create condition records linked to the sales deal, or assign existing condition records. If you link a sales deal to a promotion, the sales deal includes the number of the promotion, so you can later effectively analyze the results of your promotion.

Payment Terms

You can include payment terms as part of your promotional strategy. When you create master data for promotions or sales deals, you can specify special values for terms of payment which apply to that promotion or sales deal. If you create a sales deal as part of a promotion, the system automatically copies any payment terms from the promotion into the sales deal. If you create condition records as part of a sales deal, the system automatically copies any existing payment terms from the sales deal into the condition record.

Pricing Scales

Pricing scales allow you to set a price per unit for one order of a product based on the amount customers buy. A pricing scale defines the points at which price per unit changes. With a normal pricing scale, there is one unit price for one order. For example, you can create a pricing scale based on quantity that reduces the price per unit for your product by 1% for each 100 units purchased.

Graduated Pricing Scales

You can also create pricing scales that provide different pricing for each unit of a product within an order, offering greater discounts on higher units within an order. With graduated pricing scales, multiple prices can appear on the pricing screen for an individual item.

For example, assume our pricing is:

up to 20 pc	20 USD each
more than 20 pc	19 USD each
more than 100 pc	18 USD each

Using a normal scale, a customer who buys 20 pieces pays 20 USD for each piece, for a total price of 400 USD. A customer who buys 21 pieces pays 19 USD each for all 21 pieces, for a total price of 399 USD, paying less total money for buying more product.

Using graduated pricing, the total price for 20 pieces is also 400 USD. When a customer buys 21 pieces, however, the system charges 20 USD for the first 20 pieces, and 19 USD for only the last piece, for a total price of 419 USD.

You can create as many pricing scales as your organization requires. Typical pricing scales are based on:

❑ quantity   ❑ gross weight

❑ net weight   ❑ volume

❑ order value

You can also create a custom pricing scale formula. You can use weight or volume pricing scales for freight surcharges. In the case of sales promotions, the order value can become the basis of the scale.

Best Price

Frequently, more than one condition record applies to a particular item at any one time. You can define exclusion groups that enable the system to determine the best price for your customer by selecting some condition records and ignoring others. You can apply the best price function not only to prices, but also, for example, to discounts and freight charges. Best price overrides the normal pricing priorities of the system.

Customer Expected Price

Disputes with customers who did not receive the price they expected on their bills cost time, money, and good will, particularly in the consumer goods industry. During order entry, R/3 allows you to manually enter the customer expected price into the sales order. The customer expected price is then automatically compared to the system calculated price. If it is outside of a predefined tolerance, the order can be automatically blocked for approval. This is particularly valuable on EDI orders and helps avoid costly disputes later on.

Minimum Order Value

You can specify a minimum order value for sales order processing. If an order net value (after discounts and freight) falls below your stated minimum order value, the system calculates a minimum order surcharge to reach your stated minimum order value and adjusts the net order value.

Condition Record Maximums

You can place limits on condition record functions for particular pricing situations. This allows you to set limits such as maximum value, maximum order quantity, and maximum number of orders:

❑ Maximum value places a limit on, for example, the maximum discount value a customer receives. Once the cumulative discount value reaches the limit you specify, the system automatically deactivates the discount.

❑ Maximum quantity applies the same concept to set a cumulative quantity limit. You might, for example, offer a 1% discount on an item up to a cumulative order quantity of 5,000 cases. The system stores the cumulative order quantity, and automatically deactivates the discount once the customer orders exceed 5,000 cases.

❑ Maximum number of orders again uses the condition record to set a maximum number of orders. For example, you establish an introductory discount for a new product using condition records, setting the limit at two orders. The system tracks the orders, and once a customer has placed an initial order and one replenishment order, the system automatically deactivates the discount.

Manual Pricing Changes

Manual changes to prices, surcharges and discounts are sometimes necessary. You define for each pricing component whether, and under what circumstances an employee may manually change a pricing component. You can set upper and lower limits as amounts or percentages.

For example, you encourage your sales staff to offer incentive discounts within an allowed range when customers place orders. Based on master data, the system proposes a 7% discount, but your salesperson closes a deal for a larger order by offering a 10% discount. The system accepts this data because up to a 12% discount is allowed as a manual pricing change.

Complex Discounts

In some cases, pricing component use can become complex. For example, you define two discounts for a particular customer and product. A second discount comes into effect immediately after the first discount ends. SD calculates the discount as a percentage of the item value. A lower limit was defined for making manual changes to the price determined by the system in the sales order. According to this limit, the discount cannot be more than five percent of the item value. You might also have rebates in effect, and maintain all of this in the system while making mass price changes through the entire product line.

Fig. 10-12: Sample Discount Condition Record

Sales Taxes

Sales taxes are in fact a surcharge. Pricing components in R/3 SD also represent sales taxes. The system defines a broad range of taxes for numerous countries. There are pricing components for:

Tax Types

❑   state tax

❑   county tax

❑   city sales tax

❑   jurisdiction tax (particularly important in the US)

❑   Goods and Services Tax (GST) and Provincial Sales Tax (PST) in Canada

❑   European value-added tax (VAT)

SD's automatic sales tax calculation takes into account:

Automatic Sales Tax Calculation

❑   whether the business transaction is domestic or foreign (R/3 SD typically includes stored sales taxes for the US, Canada and Australia, for instance)

❑   tax classification of the ship-to party (some non-profits are tax exempt)

❑   tax classification of the product (some may not be taxed, or taxed at a reduced rate)

You can add other sales taxes not already defined by R/3 SD. The system determines the tax rate per item in the sales order.

Tax License Numbers

You can include in master data the license numbers for customers subject to specific tax types which are valid for specific periods. You will require these licenses when dealing with customers such as those in Italy or North America.