Chapter 3

Basic Data

Basic Data Stored in Master Records

The processes of materials management are based on various types of basic data. This can be data about vendors or data about materials and services. Vendor data includes addresses, agreements, conditions of delivery, and terms of payment. Examples of material or service data are descriptions, vendor identifications, and technical specification. This basic data is stored in master records. When processing business events and transactions, the system accesses master records and the data stored in them.

Basic Data Stored in Purchasing Info Records

Another type of basic data is purchasing information stored in purchasing info records. These create a link between the vendor and the material or service. For example, the vendor's pricing for material, including discounts and delivery costs, are stored in a purchasing info record.

Bills of Materials

Bills of materials are another type of basic data. You can access these in production planning, purchasing, sales and distribution, or in the materials withdrawal process.

Data Entry Tools

Data entry is facilitated by the ability to create a master record by referencing an existing master record.

History

The system documents all changes to master records. In this way, you can see what changes were made to which master record, when and by whom.

Texts

Master records can contain many textual descriptions related to a material. You can also store text in several languages as well as reference a standard text. In this way, the master record acts as a central depository for text. Business documents reference text in the master record (for example, a part description in a purchase order). This process is defined by a set of modifiable rules.

Matchcodes

You can find a master record by entering either its number or one of a number of search terms, known as matchcodes. You can find a vendor number through the name of that vendor, or a material number through the material description.

Vendors

The same vendor record is maintained for both materials management and accounts payable. MM references the vendor master record to control communication with the vendor in purchasing instruments used in bidding, ordering, and invoicing. The same vendor records are also maintained for financial accounting which addresses entry, verification, and payment of invoices. Consequently, the requirements and interdependencies of these two applications can be accommodated without data redundancy. All vendor data is stored in a vendor master record. Each of these master records is identified by a unique number. The system accesses vendor master records when processing business transactions.

One-time vendors

It is not necessary to create a separate master record for every vendor. For example, you may only need to order from a vendor once, and therefore do not need to maintain a vendor master record. For this reason, a master record containing data on all "one-time" vendors is available. This master record is accessed if business relations are established with particular vendors on a non-recurring basis.

Structure of the Vendor Master

The structure of the vendor master record reflects the organizational structure of a company. Purchasing data, for example, is maintained at the purchasing organization level.

- General data includes details of the address and information facilitating communication with the vendor.
- Purchasing data includes information on pricing and delivery. It enables each purchasing organization to follow its own purchasing strategy concerning a certain vendor.
- Accounting data is managed at the company code level. This data includes details of the vendor's bank and information on payment transactions.

In purchasing and invoice verification, the vendor can assume a variety of roles. The term may apply to the actual supplier of the goods or to the parent company that may invoice the buying company for the goods supplied by its subsidiary. The various roles of a vendor — actual supplier of goods, invoicing party, head office, or payee — can all be reproduced in MM.

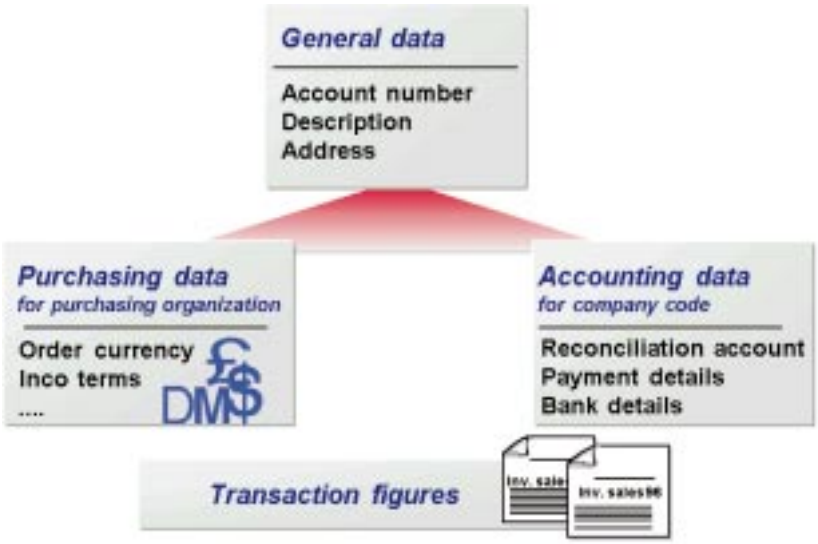


Fig. 3-1: Structure of a Vendor Master Record

Maintenance

Vendor master records can be maintained either centrally or by each department. For example, the purchasing department can maintain the vendor address and accounts payable can maintain the vendor's bank account number for automatic payments. Functions for creating, changing, and displaying vendor master records are also available.

Because the vendor master record contains sensitive information, the R/3 System performs stringent authorization checks.

A vendor is an external source from which materials and/or services are procured.

What are the features for vendors in the R/3 System?

- ❑ Common data basis for materials management and financial accounting
- ❑ Centralized and decentralized maintenance functions
- ❑ Different views for organization-specific data

Material

The material master is a central repository containing information on all the materials that a company procures, produces, stores, and sells. It is the company's central source for retrieving material-specific data. The material master is used by all the components in the SAP Logistics System.

The integration of all material data in a single database object eliminates redundant data storage. Areas such as Purchasing, Inventory Management, Material Requirements Planning (MRP), Invoice Verification, and so on, can all use the same data.

Configuration

Material Master

The material master may contain huge numbers of different types of materials that are maintained by users in several different industry sectors. For this reason, you can configure the dialog for maintaining material master records according to the following criteria:

- ❑ User (s)
- ❑ Material type
- ❑ Industry sector

When configuring the material master, you can determine whether certain fields require an entry to be made or whether an entry is optional, or whether the field appears at all. You can do this not only for each plant, but also, for example, for each material type.

This allows you to model the material master very closely around your company´s requirements and around the requirements of users or groups of users at your company.

Data Structure

The SAP R/3 System meets your individual requirements by allowing you to shape its organizational structure to reflect your own company's structure. In the data structure of the material master, this flexibility is provided through the ability to assign data to different organizational levels. Some typical organizational levels are listed below:

- ❑ **Company code:** You maintain general data that applies to the whole company, such as material number, multilingual description, and classification data, at company code level.
- ❑ **Plant:** You maintain MRP and purchasing data at plant level.
- ❑ **Storage location:** You maintain stock data at storage location level.

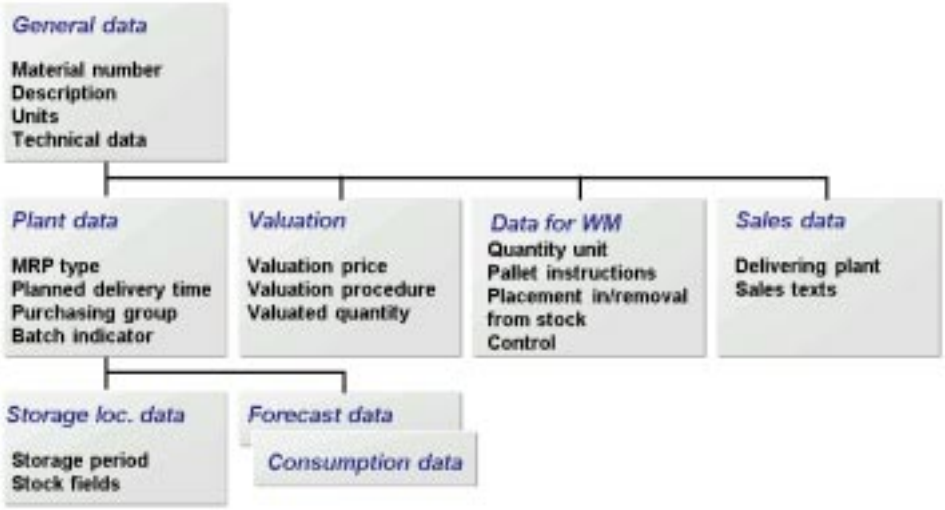


Fig. 3-2: Data Structure of a Material Master Record

Material Number

Each material master record is uniquely identified by a material number. You can set the length and store a template of the material number in Customizing.

User Departments

Since different departments in a company need different information on the same material, the data in a material master record is stored according to business function (for example, Purchasing or MRP).

Processing Selected Records

The system allows you to select those materials whose data has not yet been maintained by specific departments.

Material Types

Each material is assigned to a material type by its use in the company. For example, you can define a material as a raw material, a semifinished product, a finished product, or a service.

Control Functions

The material type is an influencing factor in configuring the material master and has the following control functions:

- ❑ Determines which user departments can maintain the material.
- ❑ Determines the procurement type.
- ❑ Helps determine automatic account determination. The stock account in financial accounting is derived with reference to the material type.
- ❑ Determines the inventory management type in the relevant plants. For example, you can define material types for which quantities are updated, but not values.

Widely used material types are predefined in the system. However, you can also add your own company-specific settings.

Industry Sector

By assigning a material to an industry sector, you can take industry-specific factors into account. The industry sector is an influencing factor in configuring the material master.

Processing

You maintain material master data for each user department.

Changes to material master records are recorded in change documents. You can make such changes with or without reference to a change number.

A change number identifies a change master record in engineering change management. This has the advantage that changes to different objects (material, bill of material, routing, document, and so on) can be grouped together under this number.

Furthermore, you can make changes to material master records immediately or schedule them for a particular date in the future. Here too, you can make such changes with or without reference to a change number.

Access Authorization

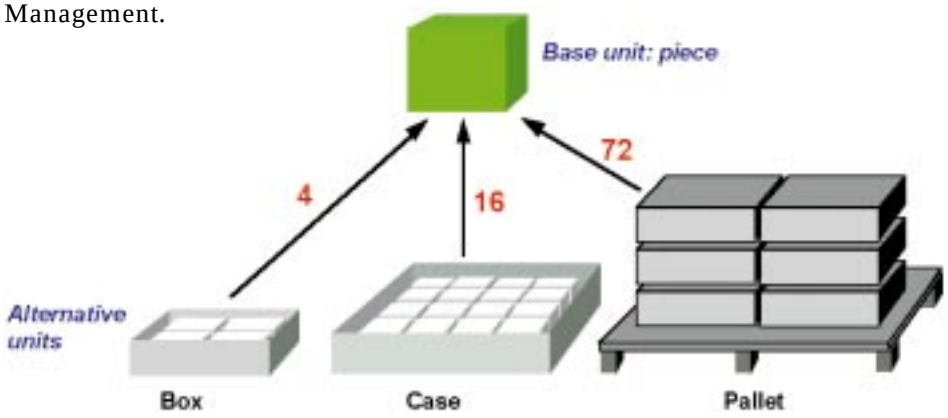
Several authorization levels protect material master data against unauthorized access. As an example, authorizations can be assigned for each user for the following objects:

- Each organizational level and activity (create, change, display)
- Each user department and activity
- Each material type, material group, and activity

Units of measure

Besides the base unit of measure, in which the system manages stocks and performs all calculation, user departments can use separate units of measure. For example, Purchasing can use a different unit of measure than Sales or Warehouse Management.

Batches



Change History

Fig. 3-3: Units of Measure

Alternative Units of Measure

In the SAP R/3 System, all units of measure other than the base unit are grouped together under the generic term “alternative unit of measure.”

Batches and Special Stocks

Material stock is managed at storage location level. Additionally, you can sub-divide this into special stocks and/or batches.

A batch is a quantity of a material managed separately from other quantities of the same material (for example, production lots and delivery lots). Moreover, it can be identified through the batch number or characteristics.

Special Stocks

You can assign special stocks to the following categories:

- ❑ Vendor special stocks (such as consignment material from the vendor)
- ❑ Customer special stocks (such as empty containers with the customer)
- ❑ Event-related special stocks (such as custom-ordered goods)

Batches

Batch Management is a component of the R/3 System. It is integrated with all areas of logistics and can be used by all types of industries. However, it is mainly used by the chemical, pharmaceutical, food, cosmetic, and hygiene industries to manage subsets of stocks. A batch is the quantity of a material produced in one production process, a quantity that thus represents a unit with certain definite specifications.

Fundamental Principles of Batch Management

Every batch features certain definite physical, technical, and chemical properties that can be used to describe it (for instance, pH value, viscosity, opacity). These batch specifications form the basis of batch management and are stored as characteristics in the R/3 classification system. The integration of the classification system with master data maintenance enables you to enhance master records according to your requirements. Apart from the above properties, you can also store as characteristics information such as the shelf life expiration date or usability.

Batch Management Functions

Batch management provides the following functions:

- ❑ Unique number assignment
- ❑ Batch determination
- ❑ Status management
- ❑ Tracking

Batch Determination

Batch determination helps you locate a specific batch that meet certain criteria. You can use batch determination to find batches for goods issues in inventory management as well as for transport orders in warehouse management. If the batches were already specified in a prior business process (for instance, during

creation of a customer order, delivery or a process or production order), they cannot be changed in inventory or warehouse management.

Search strategies are the basis of batch determination. Search strategies contain information on the selection criteria for locating batches as well as on the continued use of the batches that the system finds (for instance, information on the maximum number of batches that can be used to cover the required quantity). You can define a strategy for every individual business process.

Batch Status Management

A batch is either usable or unusable. In the R/3 System, these conditions are represented by the status types “restricted” and “unrestricted.” Like all other batch specifications, you can also store the status of a batch as a characteristic value in the classification system and thus use it as selection criteria in batch determination.

Batch Tracking

Batch management uses the batch log and batch where-used list to track batches. A batch log contains all data on the production process of a batch. The batch where-used list traces the path of every batch from procurement through production, right to final delivery to your customer. Using the batch where-used list, you can display all steps in a production process in which a certain batch of a material was used (bottom-up analysis). The ability to display all materials and batches used to manufacture a batch already delivered to a customer (top-down analysis) is an important feature for sales and distribution. It enables you to quickly react to material allegations with a callback.

On what is batch management based?

- ❑ On the management of batch specifications
  What are the main functions of batch management?
- ❑ Number assignment
- ❑ Status management
- ❑ Tracking using the batch where-used list and the batch log
- ❑ Determination

Purchasing Info Records

The purchasing info record is a source of information for purchasing. It represents the relationship between a vendor and a material or service. It enables the buyer to determine which materials a certain vendor has supplied or which vendors have supplied a certain material to date.

Additional information that you can access with purchasing info records includes the following:

- ❑ Current and future prices and conditions
- ❑ Number of the last purchase order
- ❑ Descriptive text on the material which is printed in the purchase order

- ❑ Ordering statistics on a material (for example, how much has been ordered from a vendor to date)
- ❑ Price history of a material in relation to different vendors

Fig. 3-4: Creating and Updating Info Records

Net Price Simulation

Buyers can use the purchasing info record to compare prices and conditions of various vendors for a material or material group or obtain an overview of a vendor's prices for all materials supplied by the vendor. The net price simulation permits analysis of hypothetical price scenarios.

Furthermore, buyers can simulate vendors' netprices regarding any order quantities and order data. Based on quantity and date, the system determines the vendor with the most favorable price.

The net price simulation can make allowance for any incidental costs of delivery incurred and applicable cash (prompt-payment) discounts when generating the simulated price. It can also consider any applicable price breaks based on price / quantity scales and the validity periods.

The purchasing information record represents the most important source of information on a certain material-vendor relationship.

What are the potential uses of purchasing info records?

- ❑ Representation of vendor-material relationships
- ❑ Analysis of sources
- ❑ Price simulations

Bill of Material

Bills of material (BOMs) provide a convenient way of allowing you to describe product structures. BOMs, in their various forms, are used in all situations where finished products are manufactured from a number of component parts or substances. (Depending on the industry in which they are used, a BOM may also be referred to as a recipe or list of ingredients.)

BOM Categories

BOMs describe different types of objects (such as materials or documents), for which object-specific data is managed. BOMs for materials (material BOMs) or sales order items (sales order BOMs) are especially relevant to Materials Management. Business transactions, such as ordering, may only reference the BOM if it is currently valid.

Validity Checking

You define an area of validity and a validity period for each BOM. For example, you can create a material BOM in a specific plant and extend its area of validity by allocating the BOM to additional plants. However, you can also create a group BOM that is not valid for a specific plant. In this case, there is no plant-specific system check for the materials.

The valid-from date and valid-to date determine the period in which the BOM is valid.

You can use the engineering change management functionality to control changes to objects and record a change history. When you make changes with reference to a change master record, the header or item data you change is duplicated. You can then display the BOM both before and after the change.

Technical Types of BOMs

When you first create a material BOM, you create a simple BOM for the material.

If only a few of the components of your products are different, you can easily extend the existing BOM:

- Variant BOM

  One BOM describes several similar materials.

- Multiple BOM

  One BOM describes one material that is made up of different components or component quantities, depending on the manufacturing process used.

BOM Usage

Different business functions within a company (for example, production and MRP) require data that is specific to their activities. If these areas only want to see the data that is relevant to their work in the BOM explosion result, it is useful to maintain separate BOMs in different areas for one material. Each BOM represents a different view of the product.

You use the BOM usage to define to which area of the company the BOM is relevant. You maintain the item data required for the BOM usage concerned.

Structure of a BOM

BOM data is maintained on the following levels:

- BOM header

  Here, you maintain the data that is relevant to the entire BOM. For example, you allocate the BOM to a plant or group, and define whether the BOM is released for production in its current form.

- BOM item

  Here, you describe a component of the assembly. Different item categories are defined to allow you to enter specialized data that is relevant to the individual component.

The following item categories are relevant to Materials Management:

- Stock item

  Items of this category are kept in stock.

- Non-stock item

  Items of this category are procured directly and not kept in stock.

- Variable-size item

  This item category allows you to enter sizes, which are used for calculating the required quantity of a variable-size component.

- Sub-item

  A sub-item is a part quantity of an item that has a different installation point to the other part quantities of the item. Sub-items have no control functions in BOM maintenance.

You can easily extend the BOM header and BOM item by adding fields specific to your company.

BOM Reporting Functions

The different requirements of specific areas within a company are fulfilled by the flexible reporting functionality for BOMs.

The following reporting functions are supported by the R/3 System:

- BOM explosion

  The “top-down” explosion of a BOM determines all the components on all levels of the BOM. You can use a range of selection criteria to define precisely which additional information is included or restrict what is displayed in the list.

These are some of the materials management applications where BOMs are exploded automatically:

- Creating a subcontract order

  “Material provision” items are created automatically.

- Fast entry of reservations

  Reservation items are displayed automatically.

- Where-used list

  You use this function to find in which BOMs an object (material, document, or class) is used.

- BOM comparison

  You use this function to compare two BOMs.

- Change documents

  Changes that are made without reference to a change master are logged in change documents. You can display the old and new field values.

A product is referred to as an assembly. An assembly contains one or more components, and each component may also be an assembly. Accordingly, a product is represented in the SAP R/3 System through a hierarchy which uses single-level bills of material as a basis. This avoids data redundancy, since you can reproduce the data stored in this basic structure in other forms. This includes a multi-level bill of material (showing the structure of a product), or a summarized bill of material (showing the quantities of materials used).

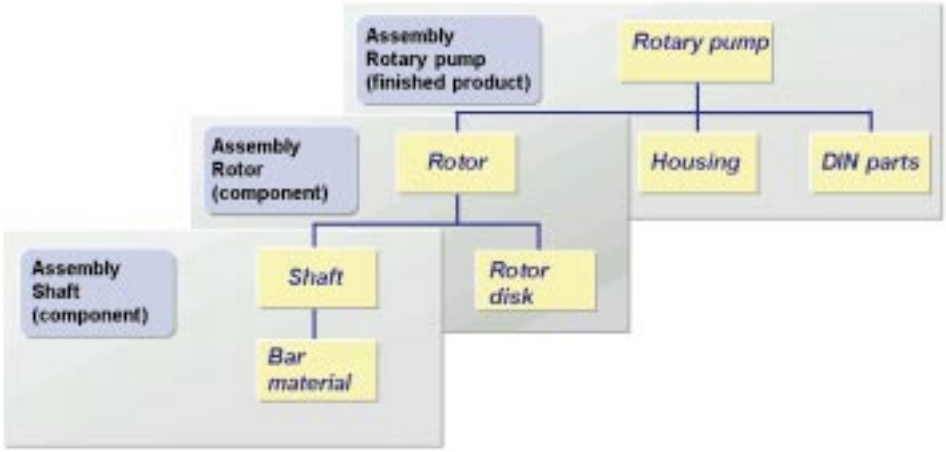


Fig. 3-5: Multi-Level Bill of Material

For more detailed information on bills of material functions, see the brochure PP Production Planning.

Classification

R/3 classification allows you to categorize any type of master data records in the R/3 System. You can classify materials, routings and documents, as well as customers, vendors and batches.

In MM, classification helps the design engineer find similar parts. This reduces the range of parts used and minimizes redundancy of materials. In this way, the classification of materials helps to reduce both warehouse stocks and administrative tasks.

Materials

Classes and Characteristics

Classes can either be created on one level or in multi-level class hierarchies. You can assign catchwords to each class to make it easier to find suitable classes.

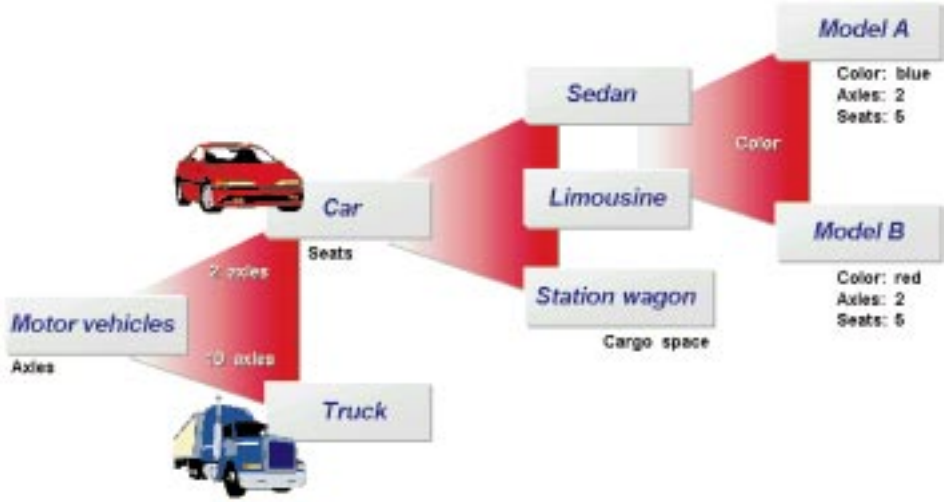


Fig. 3-6: Class Hierarchy

Characteristics are used to describe the features of classifiable objects. They are defined by you and can be assigned to classes. The classification process is made easier by assigning user-defined formats and valid value sets to characteristics.

The characteristics in a class hierarchy can be inherited across multiple levels of the hierarchy. This allows you to restrict valid value sets of a characteristic from level to level within the hierarchy.

Multi-Lingual Functionality

Both texts and values for characteristics can be maintained in several languages. You can search for objects using any of the languages defined.

Reference Characteristics

Master records often contain a wide range of descriptive information that can be used for classification. Consequently, you can define a field in an object master record as a reference characteristic. The value of the characteristic is copied from the master record when you classify the object.

Classifying Objects

You can classify objects either by maintaining the master record or by using the allocation functions of the classification system. The system uses the characteristics in a class for automatically generating a screen on which you can enter values for the characteristics.

When you classify an object, you can allocate it to one or more classes.

Finding Objects in Classes

Finding Classes

The purpose of classification is to let you find a particular master record quickly. To locate the master record, you need to find the class to which the object you require is allocated. You can search for a class:

- Using the class name
- Using a matchcode
- By exploding a BOM hierarchy
- Using characteristics
- Using classes without a superior class

Finding Objects

Organizational Areas

Once you have found the class, you find the object using characteristics. You can use individual values and value ranges to do this. To streamline the search, you can define sets of characteristics which are specific to individual departments. This means that you only see and assign values to the characteristics which are relevant to your organizational area.

Reporting

A complete range of reporting functions allows you to systematically analyze classification data.

How is classification used?

- R/3 classification lets you categorize master data, such as material master records, in a hierarchy, so you can find information faster.

Conditions

As used in the SAP system, the term “conditions“ relates to prices, surcharges, and discounts. The condition technique is a flexible pricing instrument for purchasing, allowing the processing of both simple price structures and more complex interrelationships.

Conditions can be defined at a variety of levels. The levels most commonly encountered are pre-defined in the standard version of MM for determining prices, discounts, and surcharges (see Figure 3-7). Conditions can be stored for one or all the materials supplied by a vendor.

Fig. 3-7: Conditions

The pricing conditions pre-defined in the standard system covers discounts and surcharges (percentage or absolute amount), delivery costs, cash (prompt-payment) discount, and taxes. However, the standard version can be easily extended to support specific requirements for determining pricing automatically.

Price Determination

Conditions are applied in a certain sequence for determination purposes, according to a user-defined procedure. Price determination (sometimes referred to simply as pricing) means the automatic calculation of the final price of an order reflecting any quantity discounts, taxes, and so forth. Manual changes and additions are possible.

Purchasing can specify one procedure for each vendor or purchasing organization. The benefit of this feature is to allow for different vendor pricing between plants or subsidiaries.

Master Conditions

Master conditions are conditions that are of prime significance for purchase orders. The process of price determination is carried out using master conditions.

The conditions set out in info records are master conditions that apply to all POs for a material issued to a vendor. Master conditions are also stored in contracts.

However, master conditions can also depend on combinations of different criteria, such as:

- ❑ Purchasing organization
- ❑ Vendor or invoicing party (if the invoicing party differs from the actual supplier of the goods)
- ❑ Item-specific criteria such as material, material group, plant, or material type
- ❑ A specific contract item

Central Maintenance of Master Conditions

Purchasing can maintain master conditions centrally, without having to change the conditions in each purchasing info record or contract relating to the vendor. Using this function, purchasing can quickly check a vendor's pricing strategy and quickly change prices and discount rates.

You can determine a vendor's discounts and surcharges on a global basis. In this way, purchasing can define a global discount if the vendor grants a percentage or absolute discount on all POs placed with him.

Validity Period

Conditions are valid for a certain period. For example, a vendor's conditions can be defined for a specific year.

You can define conditions in advance. For example, you can store a vendor's price list for the next year in the system immediately. When the beginning of the validity period is reached, the new prices, discounts, and surcharges are automatically used in purchase price determination.

Upper and Lower Limits

For each condition, you can specify whether and to what extent manual changes to the price, discount, or surcharge that has been determined are permitted. Limits can be set in both percentages and absolute amounts.

Subsequent Settlement with Respect to Conditions

A vendor's price can be recalculated after the PO is invoiced. For this reason, a distinction is made between conditions that are effective immediately upon receipt of the invoice and conditions effective at a later date. For example, volume rebates can be calculated at the end of a month or year – long after the invoice has been paid. Invoices for POs can also be settled retroactively (subject to the total purchase volume)..

Settlement regarding the conditions can be performed periodically (for example, monthly), as a once-only final settlement (for example, at the end of the year), or as a combination of periodic and final settlement. The validity period of a rebate arrangement and the planned settlement dates are stored in a calendar. Existing rebate arrangements can easily be extended at any time.

If you are working with periodic settlement, the purchase volume to which conditions relate can be cumulated towards the end of the arrangement validity period. With the aid of this information, you can determine whether the next level of a rebate scale can be reached before the rebate arrangement expires, whether you should order more to get a higher rebate.

With MM Invoice Verification, a check is made to ensure that the vendor invoices you only for those articles that you ordered and were actually delivered. The verified invoices are released to the Accounts Department for payment and are the basis for updating the vendor business volumes as a precondition for final settlement.

At the end of the validity period of a rebate arrangement, the buyer and seller can compare their respective business volumes based on the total quantity and value maintained in the R/3 System. The R/3 System calculates the rebate amount and debits the vendor account automatically.

The features of the volume rebate arrangement include the following:

- ❑ They can be maintained as a form.
- ❑ They can apply to materials (that is, to all materials, a sub-range, a material group, or a certain material).
- ❑ They can apply to organizational units of an enterprise (for example, plant or warehouse/stores).
- ❑ They can be entered as a fixed amount (for example, in dollars), or as a percentage of business volume.
- ❑ Other indices, such as points totals, can also serve as the basis for settlement.
- ❑ You can specify a separate currency for each condition within a rebate arrangement. This is translated into the settlement currency on the due date.
- ❑ If a certain condition is to apply to different materials, the materials can be combined as one settlement group.