

Article Master Data of ERP Retail - Deep Dive into Some Secrets



Applies to:

SAP ERP Retail – all releases. For more information, visit the [Enterprise Resource Planning homepage](#).

Summary

This document will give you a short introduction into the overall 'Integrated Article Master'. It will not be another kind of help documentation, but more a deep dive into the architecture, process flow and influence factors. It will show you the idea behind mass data processing, reference handling, inherit- and copy handling, performance influence factors and some best practices to avoid critical situation.

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Author Bio



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What is a ERP Retail System from a Master Data Perspective

Retailers have lot of demands regarding their article master data, which the standard material master cannot fulfill. For instance:

- Instead of only a few production plants there are lots of stores, so a 'normal' data maintenance by the classical material master transactions does not make sense
- Deliveries are not going directly to the stores in most cases, but are shipped first to distribution centers, and in a second step being distributed to the stores.
- The articles are not being sold to only some customers, but to many customers. This leads to a requirement for special POS (Point-of-sale)-data, instead of only the normal SD data.
- There are great amounts of different articles, which partly are similar and only distinguishable by certain characteristics. For example, shirts in fashion retailing have generally the same data; they only distinguish by their size and color.
- There are also special types of articles, like pre-packs, display articles, purchasing and sales sets or full products with empties with special requirements.

To fulfill all these requirements of trading companies, the integrated article master data maintenance was developed in the framework of the industry solution 'SAP Retail'.

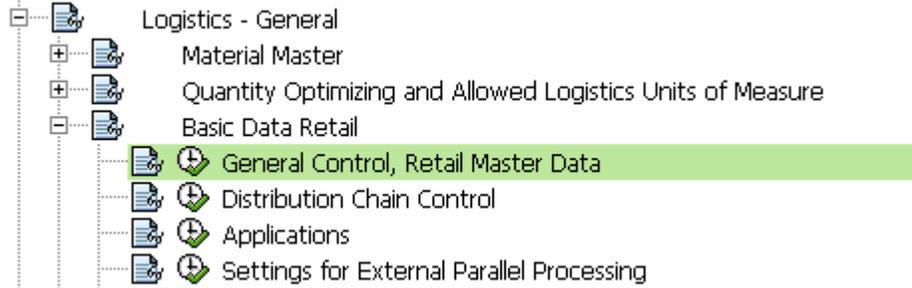
What does 'Integrated' mean? This is the first big difference compared to the material master. In a SAP ERP system, the business object 'material' is more or less a standalone object. Depending data like info records, sales conditions, etc. is maintained by individual transactions. Because retailers will not spend too much time in maintenance, they need an integrated view on article master data including all depending data. The integrated article master combines different views on article under one transaction. The main integrated additional business objects are listing, sales conditions, purchasing conditions, purchasing info records, layout modules, additional, POS data, replenishment parameters, images, article hierarchy, bill of material, family pricing, vendor specific GTINs and much more.

The second difference is the complex copy handling of the article master. In material master, in most cases a template is used to make the master data maintenance easier. In article master a reference article has much more impact on the master data. A change on defined organization level will lead to mass changes in depending master data segments. Details will follow later.

The third difference is an obligatory classification of all articles based on an internal class type '026'. All articles will have an assignment to a merchandise category. This classification is used for assignment and to enable the article master to support characteristics and characteristic values.

The fourth difference is the support of more complex article types like generic articles with variants, sets, displays and some more.

The customizing of the article master is done mainly in the customizing of the standard material master. Special customizing transactions for retail are:



For the integrated article master, the entry “General Control, Retail Master Data” (transaction WSS1) is very important. Here you define the basic system behavior of an ERP Retail system.



Article master data is the most important data for a retailer. It controls most of the processes and bad performance or badly maintained data can lead to critical situations.

Creating Expectations – Getting Value

In the next chapters we will give you a rough overview about the most used standard situations of master data in a retail environment. The influence factors and the differences compared to a standard SAP ERP system will give you a different view on things. Please note that all the following tips and tricks can be helpful to optimize your system or to setup a clear master data strategy, but every customer has different requirements and there exists no unique ‘best practice’ at all.

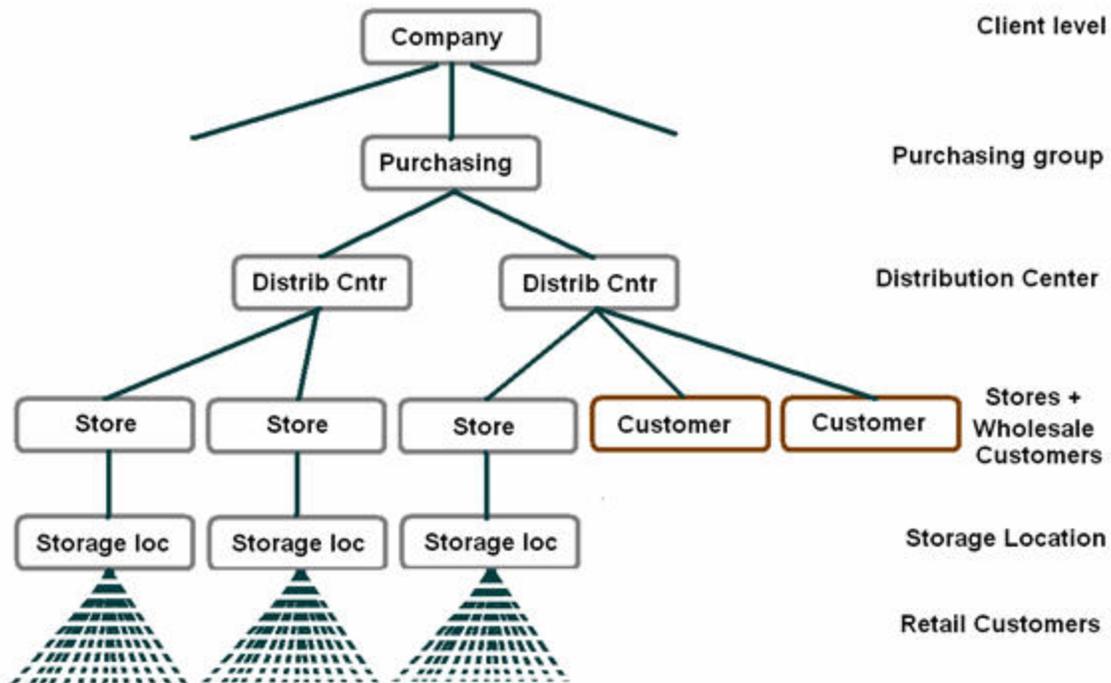
For basic information about SAP ERP Retail and the topic of Master Detail, we recommend the customer training IRT310 which contains article master, among others. Also the training PLM110 (Basic Data 1) and PLM112 (Customizing Mater Data) can give you some basic information.

Before we start, please remember that ERP Retail Master Data cannot be compared with the ERP PLM Master Data. They look similar only using partly the same database tables or maintenance view but the differences are hidden in the depth of functionality.

Organizational Levels

In contrast to the organizational structure of a manufacturing company, in trading companies there is an additional organizational unit: the distribution centers.

They are placed in the organizational structure between purchasing and the stores.



Technically, distribution centers as well as stores look like plants stored in table T001W. They can be distinguished by the flag 'Plant category'. Possible values are:

- A Stores
- B Distribution Centers
- Initial Industry Plant

Stores and distribution centers are maintained by retail transactions WB01, WB02, WB03. Site profiles are maintained in Customizing at

,Logistics-General' - ,Plant Master' – 'Control Data' - 'Site Profiles'.

Within the currently available release of SAP ERP, we also added the capability to model department stores and their related shops (Department-Shop concept).

In this case, we added further indicators to standard T001W table. To ensure the logic link to a standard SAP R/3 system, the shops and the department stores look like normal SAP stores, but with help of special store types, the Retail logic will control different processes. E.g., every department store knows its own shops, but a purchase order can be delivered to either a Shop in Shop or the shop itself. From process view, there is no difference comparing to a standard store.

A big difference between a Standard ERP system and ERP retail system is the fact, that a site is not a simple database entry in table T001W. The retail site is a combination of different master data objects. Every distribution center is vendor and customer at the same time. For store, you will have a corresponding customer entry to enable a 2-level distribution of goods.

The term 'organization level' has also a deeper impact on the article master data. Up to now, we have seen that the standard plant is enhanced with some retail business functionalities to cover a broader set of sites. The site in ERP retail or better the Stores and Distribution Centers (DC) play a central role in retail processes. The most important role of a site is the reference site.

Reference Sites

A reference site is not a pure template. It is an organization maintenance level for master data. The sophisticated copy and reference handling is completely hidden. But let's start with the simple things. As you can see in transaction WSS1, there are two fields called 'Reference site for DCs' and 'Reference site for stores'

Control parameters for article master	
Retail industry sector	1
Reference site for DCs	RFDC
Reference site for stores	RFST
Vendor default data	<input type="checkbox"/>

In these fields, we strictly recommend to enter at least a value in DC field and in the Store field, if you define your reference level globally for store. There exists a deeper level of reference definition for stores on distribution chain level.

However, before you can enter here something, check your business and define a clear vision of your master data future. Then create a reference site with the know transactions, give it meaningful name and of course a virtual physical address.

Yes, this is correct. We are creating a virtual site and not a real one, because in ERP Retail, it is recommended to use these sites as copy references. In the future, the behavior of the reference sites can change. And a very important thing - these sites should not be used as productive sites keeping stocks or have accounting data.

For example, generic articles are maintained on such reference sites only, because they do not have stock. The article master is maintained in the logistic views on these reference sites. You can identify this because the site field in the logistic view is empty. That means an empty site field represents the reference store level. (Just select a logistic view in article master without an entered site value)

In a following chapter we will see, how a field value on a reference site level is inherited to depending sites. The assignment is done automatically. All Sites from type DC are assigned to the reference DC and all stores to the reference store. Depending on a distribution chain level, you can have additional lower reference store.

In the upper view, you will see also a field called 'Vendor default data'. This is a setting for specialists. In chapter reference handling we will have a deeper look on it. Important to know in a 2 level distribution

between vendor to DC and DC to site, the determination of a source of supply will have impact on logistic master data of article master. Depending on this setting, some logistic parameters will be taken from the vendor level. Changes on vendor data e.g. planned delivery time will change article master data in a mass update run.

Merchandise Categories

In ERP Retail, the role of material groups is covered by merchandise categories (MC), with strongly enhanced functionality, however.

Merchandising categories are maintained by the following transactions:

- WG21 - create MC
- WG22 - change MC
- WG23 - delete MC
- WG24 - display MC

The following functionalities are implemented for merchandise categories:

- The merchandise category characterizes a logical grouping for the articles.
- It is possible to build up hierarchies of MC's, with inheritance of properties.
- It is possible to deposit templates (reference articles) in the MC. By doing so, values are proposed for all articles created on basis of this MC.
- It is possible to deposit a 'value only article'. Thus, inventory management does not have to count exactly on article level, but on value only article level is sufficient. This means, not '5 oranges for 70 Cent each and one lemon for 50 Cent' are booked, but only 'tropical fruits for 4 Euro'.
- It is possible to deposit, just like in a class, characteristics in the MC. In addition, there is a 'relevance indicator' deciding whether the characteristics are only informative, just like characteristics in classification, or if they are relevant for the creation of variants. We will talk about this special topic later.
- If, for some articles in the MC, different characteristics are necessary, it is possible to deposit them in a characteristic profile which can be applied if needed (optional).
- An overview on all articles assigned to this MC is possible.

For maintenance of MC hierarchies, the following transactions are available:

- CLWM - create hierarchy level
- CLWN - change hierarchy level
- CLWP - delete hierarchy level
- CLWO - display hierarchy level
- CLW1 - maintain hierarchy assignment
- CLW2 - display hierarchy assignment
- CL6C - graphical hierarchy display
- WGUS - use of material groups

From the technical point of view, a MC is at the same time a material group (as in material master) and a class of internal class type 026 (as in classification). For this reason, the MC data is stored redundantly in two different tables.

For the standard material master, MC's are stored in customizing table T023, just like the 'standard' material group. Here, all material specific data, like reference article or value only article, is being stored. The descriptions in different languages are stored in table T023T.

This means here we have a combination of a classical customizing table T023 and a transactional classification assignment.

That's also the reason why a transport of merchandise categories between systems is not possible in ERP retail. This is a very common support situation. Consultants know the standard functionality only and mess up the retail system. Based on this situation, we removed the possibility to maintain merchandise categories directly from customizing and referred to the retail area menu WWG1.

A summary about FAQs about merchandise categories can be found in note 359940.

Let us focus on technical details.

For the classification, MC's are stored in the node table KLAH, just like a 'standard' class. Hierarchy levels and characteristic profiles are also deposit there. The different objects are distinguished from each other by the flag KLAH-WWSKZ. The following values are possible:

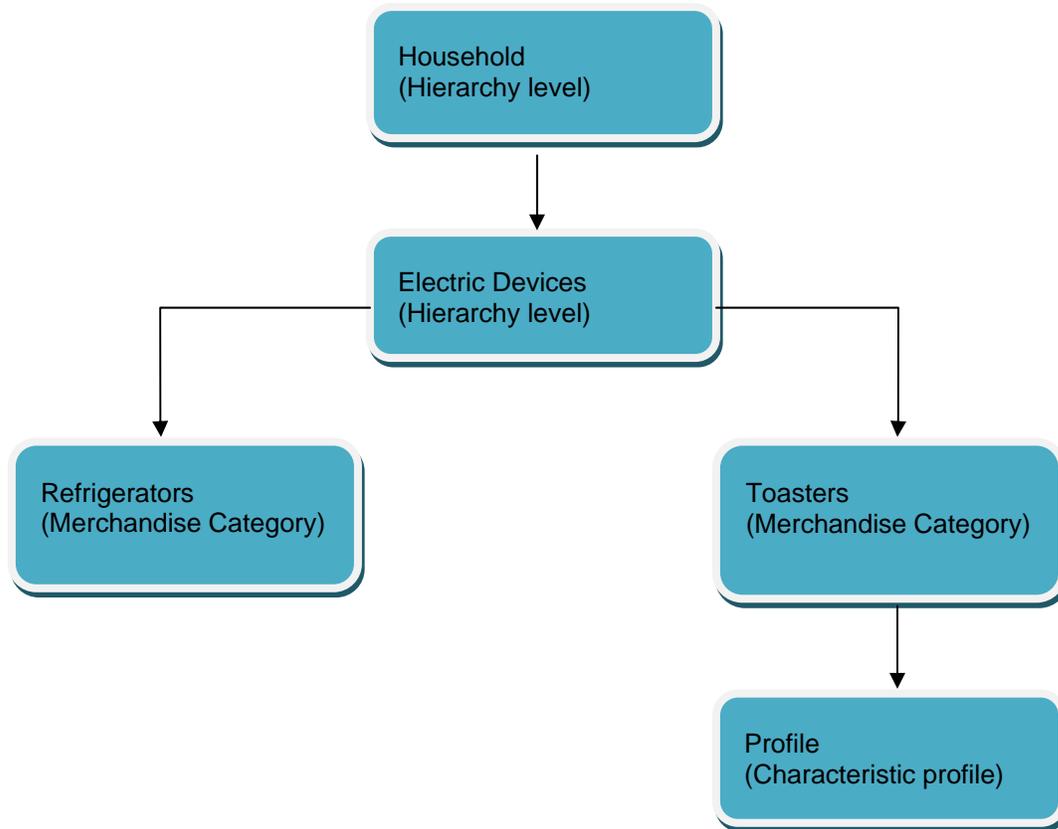
- KLAH-WWSKZ = 0 Hierarchy Level
- KLAH-WWSKZ = 1 Merchandising Category
- KLAH-WWSKZ = 2 Characteristic Profile
- KLAH-WWSKZ = 3 Generic Article
- KLAH-WWSKZ = initial ,Standard' Class

That means in ERP retail, we use the standard classification system for creating classes, but give them an own semantic. With the help of the WWSKZ field we distinguish the usage. Some of you will remark here a very special of the classes, the so called 'generic article'. In one of the following chapters we will focus on that.

The descriptions are stored in table SWOR as keywords as well as in table T023T.

Hierarchy assignments are being stored the same way as in a class hierarchy, in "edge" table KSSK. The assigned objects are not identified by the name of the MC or the hierarchy level, but by the internal class number (KLAH-CLINT) and Characteristic profiles as well. The flag MAFID on table KSSK indicates that the assignment is not a classified object, but a classified class. (K for class assignment and O for object assignment).

Since this is rather complicated, here a small example how a MC-hierarchy is stored in the database:



Base Merchandise Categories

Table T023: MATKL WGBEZ

```

-----
REFRIDGE Refrigerator
TOASTERS Toaster
    
```

The nodes of a classification tree

Table KLAH: CLINT KLART CLASS WWSKZ

```

-----
0000010813 026 HOUSEHOLD 0
0000010812 026 ELECTRICDEV 0
0000010811 026 TOASTERS 1
0000010810 026 REFRIDGE 1
0000010815 026 PROFILE 2
    
```

The edges of the classification tree

Table KSSK: OBJEK MAFID KLART CLINT

```

-----
0000010812 K 026 0000010813
0000010811 K 026 0000010812
0000010810 K 026 0000010812
0000010815 K 026 0000010811

```

The idea behind the business is to find a possibility to group articles to merchandise categories. Combine the merchandise categories to hierarchy levels and combine them until you will reach the needed number of levels representing your business.



Merchandise categories combine similar objects

In our example, the hierarchy is very flat and contains only a few elements. There is also the special type of classes called 'Characteristic profile'. Under normal circumstances, it is fine to assign characteristics directly to merchandise categories. You can create such a characteristic with the transaction CT04.

At this point, you have to make your first decision. What is the correct data type of my characteristic? In ERP Retail we recommend to use a pure 'CHAR' type to ensure easy handling and evaluations. Of course it is possible to use also all other types, but for a retail article valuation, characters are fine in 99% of all cases.

The next decision must be made for the assigned characteristic values. This is the most critical situation. Do not think about the current situation of existing values, think about the future.

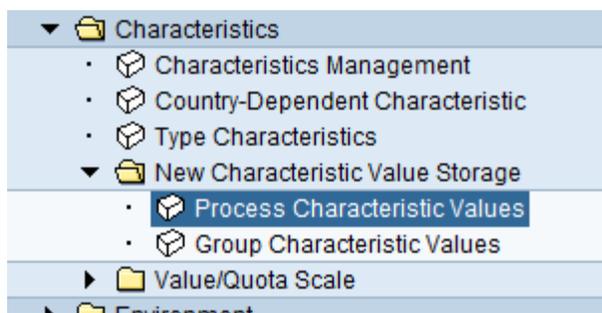
Here's a small example to think about.

Under the view 'Values' you are able to assign the characteristic values. In case of a fashion size characteristic, the range of possible values is very restricted (XS, S, M, L, XL, XXL).

But think about a characteristic like color. Of course, it looks like that at the moment we have around 100 used color values. Of course, in the next few years the fashion industry will give us some more new summer colors. Of course, there are still 899 value positions remaining. Let us hope it will suffice for the next 2-3 years!

The biggest problem is that it is a big effort to migrate a fixed assigned characteristic to an open value assigned characteristic. An open value characteristic will be activated in the characteristic maintenance in view 'values' by selecting the checkbox 'additional values allowed'.

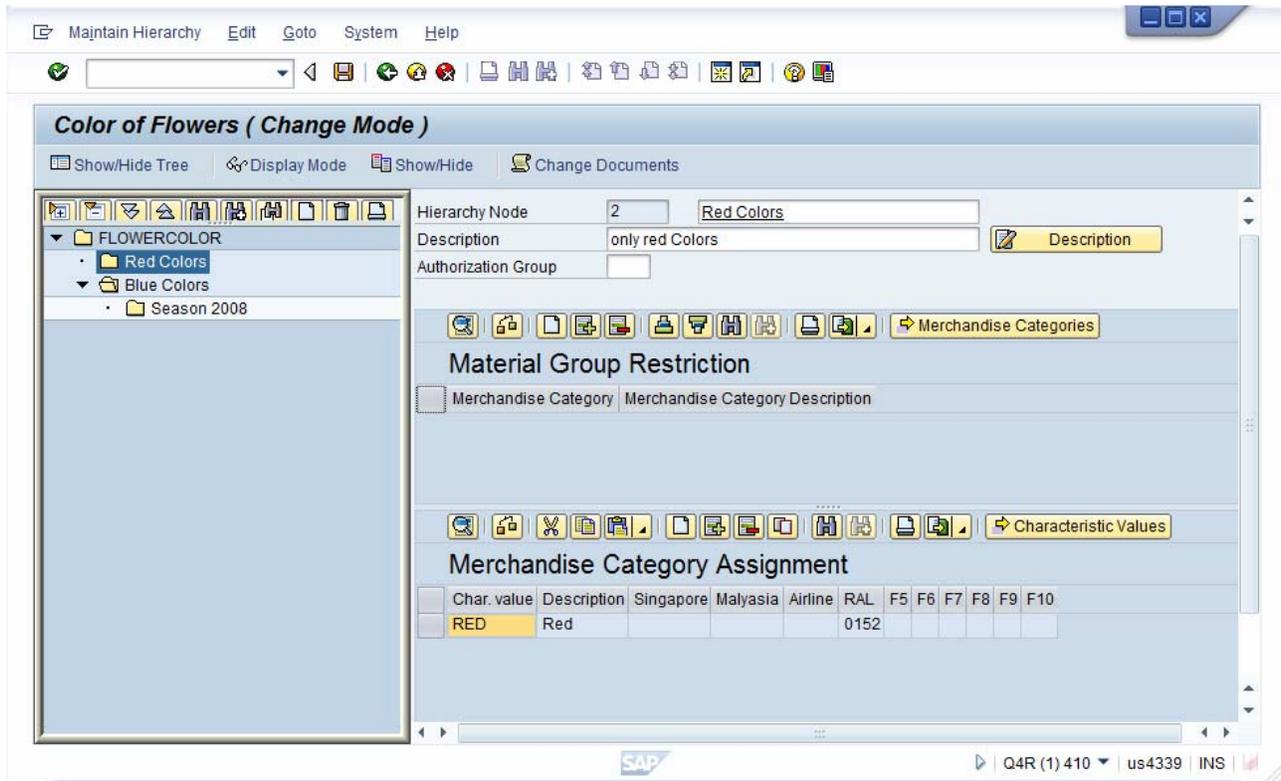
To avoid such a situation, be aware of the future usage of this characteristic before you use it. We recommend in such a situation a customer check table or the usage of the new retail characteristic values storage. You can maintain this in view 'values' under the button 'Other value check'. Use the function module to check functionality and assign the function module 'WRF_CHECK_CHAR_VAL'. Maintenance will be done in the transaction WRFCHVAL.



An impressive feature here is the possibility to define a type assignment as a Color or Size. If you select such an option, the article master will receive a value assignment in the basic data to enable fast search and evaluation on color or sizes specific reports.

Char.	FLOWERCOLOR	Color of Flowers		
Char. Type	Color Characteristic			
Check Opt.	No Check of Characteristic Values in Material Maintenance			
Frames				
<input type="checkbox"/>	Characteristic Value	Description	Sort	Si
<input type="checkbox"/>	RED	Red	1	
<input type="checkbox"/>	BLUE	Blue	2	

The big benefit of the new characteristic storage is the unlimited value assignment and the possibility to create a hierarchical grouping of values (WRFCHVALGRP) to have an easy navigation to a large number of characteristic values to select single values.



The real big benefit of the new characteristic storage is the possibility to have a nearly unlimited number of values for a characteristic and the possibility to group values to logical hierarchy groups. A single value can be assigned to different groups at the same time. In the article creation, this value hierarchy can be used to select a group of values to be used as basis for the variant matrix.

A real performance 'killer' in this area is the hasty usage of hierarchy levels.

We recommend limiting the number of hierarchy levels to 9. Why? The only reason is gaining more speed in article master data maintenance. As soon as you enter an article, the system will climb the hierarchy up to the root, and go down again collecting all assigned characteristics.

Yes, it is possible to inherit characteristic assignments. That can be very helpful to assign a characteristic on a highest level of a hierarchy and automatically all depending assignments will inherit this characteristic.

Think about the complete final structure. Assign the characteristics at the lowest possible level, best case the merchandise categories or profiles and look at the note 367332 for details.

Characteristic profiles contain one or more characteristics. Such a profile can be assigned to several merchandise categories at the same time. A good example is a profile with different size characteristics for US or European market. We create a profile with a US Size characteristic and a profile with a European Size characteristic. Furthermore, we create a common "Color" characteristic using our new characteristic storage. Finally, we create a new merchandise category and assign the 'Color' characteristic but no sizes. The sizes will be assigned by the profiles. As soon as you create a new article, the system asks for a range of colors and an option selection of one characteristic profile. Therefore, you are able to create article with colors only or either with US sizes or European sizes in combination with a color.

Limitation of assigned characteristic values is also a performance booster. Sometime customers need a lot of additional customer specific master data fields. Some consultants have the great idea to cover this with the easy solution to use characteristics. I have seen customers with 20 characteristics in the article master. The performance was horrible, because the system will climb the hierarchy, collecting the characteristics, reading the possible values, doing some pre checks etc. This logic is very complex and works dynamically.

Dynamically means loss of performance.

We do not recommend assigning characteristics on high hierarchy levels and using the characteristic restrictions on lower assigned levels. Furthermore, we do not recommend restriction of inherited characteristics in a characteristic profile.

In all cases, a very experienced retail consultant is recommended. To avoid such a characteristic accident, we recommend to transfer the customer specific fields to real customer specific append fields on database as additional master data fields. This makes sense, if a characteristic will be needed for most of the articles. The first impression looks like, this is a modification of the system. However, the article master is prepared for such a situation. Please refer to note 44410.

In opposite to class hierarchies, branchings and objects cannot be mixed in MC's, every hierarchy level contains either only MC's or only other hierarchy levels. This shows us that the hierarchy is strict but not balanced.

The transportation of merchandizing categories between systems is possible via ALE (transaction WGSE) using the message types CHRMAS, CLSMAS and CLFMAS from classification and W_MATGRP from material group side.

Remark for the article master: It is not possible to use standard classification and retail classification at the same time. That's the reason why in retail is no extra classification screen available. The material master has a special view called 'classification' In the article master there is a build-in approach used and the retail classification is a hard coded part of basic data.

Summary the best practices in merchandise category area:

- Limit the level of hierarchy
- Limit the number of characteristics
- Use the new characteristic storage
- Assign characteristics on the lowest level
- Every customer needs it's own best fitting model

Retail Article Master

In retail, articles are the equivalent to the material master in standard. For article maintenance, there are the following transactions:

- MM41 – create new article
- MM42 – change existing article
- MM43 – display article
- MM44 – display change documents
- MM46 – mass maintenance retail

Looking at the transaction codes, we will see a big difference compared to the material master. In ERP retail, the MM41 will be used only once as soon as you create a new article.

MM42 will be used in all cases you make a change on article even if there is data new created for a special view or organizational level. MM01 in material master will be used for all types of view enhancements. This is a small difference but worth to know.

Going deep into the functional areas, we see another difference. The UI looks nearly the same, the customizing to define customer own screen sequences uses the same framework. But behind the scenes, there exists a completely different logic. Reasons are the different requirements like mass creation and update processing, reference handling and integration of external objects (article related data).

Essentially, the article master data maintenance transactions look similar to the material master transactions but with screen sequence 23. The screens are part of function group SAPLMGD2, in opposite to standard material master, which is SAPLMGD1. Since the logic of both function groups is different, they may not be mixed; thus in retail no subscreens of standard material master can be used.

For our techy friends, let us do a trip to the coding level.

For maintaining article data, there is the remote function module BAPI_MATERIAL_MAINTAINDATA_RT. This function module has the same interface as the retail IDOC type ARTMAS. The article master is divided into 2 pieces.

The 'dialog' piece will do all the additional screen processing field checks and copy handling and the 'background task' piece will do the mass update, copy logic and database updates.

The BAPI will do only mere master data updates and has not the possibility to modify integrated objects like inforecord or sales conditions. The dialog mode 'MM42' has a much higher complexity and provide the functionality to change article related masterdata too.

Within the current SAP ERP Retail release, a new remote function module to maintain the complete article inclusive the related data (WRF_MATERIAL_MAINTAINDATA_RT) is provided.

The main update function is the MATERIAL_MAINTAIN_DARK_RETAIL. This function is used either in dialog mode or in ALE mode to update the retail article master data. The interface should not be used by own programs, because it is very complex. The function module MATERIAL_UPDATE_ALL_RETAIL is the

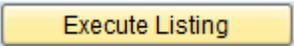
key component. Here you will find the reference handling. As soon as all data are updated and adjusted in memory, the system will call the MATERIAL_UPDATE_ALL_RETAIL doing some preparation steps and the MATERIAL_ARRAY_UPDATE_RETAIL_2 updating the databases.

We do not recommend to modify any of the function modules without feedback from SAP Support. Any unexperienced changes will lead to an unplanned functional behavior and possible data inconsistencies. For ALE, there is message type ARTMAS. Essentially, this is similar to MATMAS with some retail specialties and included classification data. Single ARTMAS-Messages are sent by transaction BD10. For the creation of IDOC from change pointers, for performance reasons the report RBDMIDOC_RETAIL should be used instead of using RBDMIDOC.

The data of the article master is stored in the same database tables as for material master: Table MARA on client-level, table MARC on site level, and table MARD on storage location level. In addition to table MARA, on client level there is also retail specific master data in table MAW1.

In contrast to material master, in article maintenance no administrative data (Tables MSTA and MOFF) are written. Due to the huge amount of data, this would not make any sense.

In a ,standard' article master with screen sequence '23', there are seven different main views:

- **Basic data:** This view is essentially the basic data view of material master, added by some special retail data on client level. With the current ERP release you will have the possibility to integrate picture data of your articles. Looks great!
- **Listing:** Since retail customers normally have a huge number of stores, logistic views are not created store by store, but by a mass process called 'Listing'.
The listing process is very special in ERP Retail. The logic behind is more or less simple. Which article will be sold in which store, when and how long.
Listing process can be started from different points, depending on your business. The easiest starting point is the integrated listing in article master. Based on the dates and setting, select the button  in the listing view, a listing process will be started.
What happens in the background?
Assuming we will list all available stores, we have to create a lot of logistic data. In this case we use the reference handling, maintain only the reference sites in the logistic view and the reference handling will duplicate the data to for all needed stores.
- **Purchasing:** This view essentially is the integrated view on a purchasing info record. Beside the regular purchasing price condition maintenance it also includes the possibility to use the variant price matrix for generic articles.
- **Sales:** Distribution channel specific data (Table MVKE) and sales price conditions. For generic articles you will have the possibility to maintain variant specific sales conditions via matrix maintenance.

- **Logistics DC:** Logistic data for distribution centers as well as access buttons to MRP data, Forecasting data, QM data etc.
- **Logistics Store:** Logistic data for stores as well as access buttons to other stores specific areas.
- **POS:** Point-of-Sale-Data, mainly till receipt texts.
- **Additional data:** Besides the additional data already known from material master and the already mentioned vendor specific EANs, there are also Layout Modules (Grouping of materials for the purpose of assortment management, normally embodying the shelf in the store).

Data Model of Article Master

Now let us start another excursion into the deeps of the article master. We will focus us on the update process and try to understand what is going on.

At the end of this document, you will find a list of the main master data tables used in article master. To ensure best performance and data consistency, we designed an interesting data model and called it 'flat process' handling.

What is a 'flat process'?

In a following chapter, we will talk about the reference handling and dependencies. Inheritance of data from higher level to lower level is very complex. So it is necessary to have always full control about data.

If you look at the master data tables, we will have basic data (MARA), retail basic data (MAW1), some sales data (MVKE) logistic data (MARC) and much more.

Assuming we work with a simple single article, we have to combine all elements reduce looping over data and avoid unnecessary check routines. Assuming we have maintained an article in 2 distribution chains, we can determine a number of elements to be checked.

MARA	MAW1	MAKT	MVKE	MARC	MARD
ART1	ART1	ART1	R300 R1	RFDC	RFDC 0001	
			R300 R2	RFST	RFST 0001	

The figure above represents the current situation in memory. We will have a lot of different organizational levels where data is available. Assuming we try to list the article in 100 stores, the memory will not contain more data as you can see now. Only the data a time before saving are available.

A flat process is like a row in this table. Collecting one entry from every column, combining a processing will be called a 'flat process'.

Assuming you have 50 sales data entries, you can imagine that update process needs a little bit longer, because there is more data to be checked.

Summarized we can say, the column with the most entries will define the maximum of flat processes and therefore the processing time. So it is very important to restrict the number of flat processes. Negative

influence factors of flat processes are a huge number of variant of a generic article (increasing the MARA table), a huge number of maintained distribution chains or deviations on logistic (MARC) level if the article is listed for many stores.

Try to get a feeling. If you select the 'SAVE' button in article master and the time between pressing and returning to the entry mask is too long, there must be something wrong. In this case, go to your user parameters and add the parameter ART_SAVING_INFO with value X. As a result, you will see the flat processing. We recommend this only for test purposes, because the status information needs a lot of performance. If you find out, that processing time for saving an article is too long, check first and do a root cause analyze.

A well maintained article master should spent not more than 1-2 seconds until the entry mask will come back after saving. Of course, background update process will need some more time to duplicate the data doing some checks and mass updates on database.

Summary:

- Long processing time is based on flat processes
- User parameter can help for analyze for flat processes
- Deviations or distribution chains will have impact on flat processes

Article Categories

Shift one gear back to a simple topic. ERP Retail supports more than one category of material. You can identify the article category by the table field MARA-ATTYP.

Essentially the following values are possible:

- **Single material (industry)** (MARA-ATTYP initial): ,Standard'-materials of non-Retail systems, created for instance by MM01.
- **Single article (MARA-ATTYP = 00)**: Individually created articles similar to standard-materials.
- **Generic article (MARA-ATTYP = 01)**: Generic articles do not exist physically and are not sold but exist as a data reference for variants. Generic articles exist in systems but have no inventory management.
- **Variants (MARA-ATTYP = 02)**: Article of the kind of the generic article (child), but with special characteristic values assignment. For the generic article 'shirt' for example, one can have the variant: shirt, white, size XL'. More about generic articles and variants will follow later.
- **Sales Set (MARA-ATTYP = 10)**: A set is a combination of several articles which are bought individually and sold together, for example a bottle of wine together with two wineglasses. The components are been deposit in the basic data view at the button 'components'. Technically, a set is handled like a Bill of material (BOM) and stored in BOM database tables. You should never maintain a set by BOM transactions, however because it can lead to data inconsistencies.
- **Prepack (MARA-ATTYP = 11)**: A lot is a collection of different articles that are bought together and sold individually, thus more or less the opposite of a set. Shoes would be a good example: They are bought as a collection of shoes with different sizes (for example one of size 39 three of

size 40 ... two of size 45 etc.). Prepack allocation plans are maintained in transaction WSTN11. From the technical point of view, prepacks are also BOMs. Prepacks use variants of one generic article only.

- **Display (MARA-ATTYP = 12):** A Display is a collection of articles which are, similar to the prepack, bought together and sold individually, including special packaging. An example would be at Christmas time the paper figure of Santa Claus, holding different types of chocolate: the manufacturer delivers the whole figure; the store sells the individual chocolates. Again, this is technically a BOM. As components, you can use either single articles or variants of generic articles.
- **Article group article (MARA-ATTYP = 20):** Normally used for stock counting to combine several articles. It represents a value only article for the merchandise category.
- **Hierarchy article (MARA-ATTYP = 21)**
Also used as value article to do stock counting value based on a hierarchy level
- **Material group reference article (MARA-ATTYP = 30)**
Very important article that represents the template article assigned to a merchandise category. As soon as you create a new or enhance an existing article, the reference article will be used as template.



Generic Articles and Variants

Variants are similar articles that are only distinguishable by certain, well-defined characteristics. For example, shirts are only distinguished by the characteristics size, color and possibly by the length of the arm. The used characteristics are deposited either in the merchandise category or a characteristic profile.

Before we can create a generic article with variants, we have to fulfill some preconditions. At least we need a merchandise category with an assigned characteristic. Important is here that the characteristics are marked as 'relevant for variants' (Relevancy indicator KSLM-RELEV = 2). The effect of a relevancy indicator 'For info only' (KSLM-RELEV=1) would be that the characteristic works just as a 'normal' characteristic in classification. In addition, there is the relevancy indicator 3 (Logistics Unit of Measure). This is a very special type of a characteristic usage. A generic article will be used as a header article and the depending variants represent stock keeping units based on the unit of measure. Example: A drink can have a logistic variant 'piece' but combined in a box of six (six pack) there is a different stock keeping unit. In the logistic process chain, the different variants will be handled as unique articles.

Chars							
Char.	Description	Data ...	Num...	D...	Unit	E...	R...I...
SUMMERCOLOR	Summer Colors	CHAR	10	0		<input type="checkbox"/>	2 <input type="checkbox"/>
US_SIZES	US Sizes	CHAR	10	0		<input type="checkbox"/>	2 <input type="checkbox"/>

The view to maintain this can be found in the merchandise category maintenance or in the hierarchy maintenance.

To ensure you can create a generic article, there must be an assignment of characteristics and the relevancy indicator '2'. This leads automatically to an obligatory entry for the characteristic. Creating a single article will use these characteristics as normal informative characteristics. So the planning of the merchandise categories is very important.

When we create a new generic article based on the merchandise category with 2 variant creating characteristics, we can expect that the system will show us a valuation screen.

Characteristic Value Assignment

Insert Row

Merchandise category: SHIRTS1 Shirts Type 1

Cross-site CM: 5249 00000000000005249

Explanation

Characteristic value assignment	
Characteristic Description	Value
Summer Colors	
US Sizes	

The first screen is not a valuation screen to define variants it is the 'restriction' screen. It will be used either to restrict the columns and rows of the upcoming matrix or it will be used to define the rows and columns in case you use the new characteristic storage. You are also able to restrict informative characteristics.

Variants for ge	
Characteristic	Summer Colors / US Sizes
Ch.val.	M XXL XL L S
Iceblue	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Denim	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Arizona Red	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Yellow Sun	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Basic White	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Basic Black	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Light Grey	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Continue to the next input screen, you are able to define the variants of the generic article by selecting the checkboxes.

Article numbering of variants will be done in background. There exists a user exist to influence numbering. The standard procedure is creating new variant article numbers by concatenating the generic article number and an increasing 3 digit number.

Now let us think about a best practice. Do you think restricting values makes sense? Sometimes I have the feeling consultants don't love their users. If you do not restrict the columns and rows, it is possible to have more than 1000 values on x-axis and many, many values on y-axis. I can feel the pain of end users using such a matrix. And the performance to build the dynamic screen is also very poor.

In practice, a generic article has only 10-50 variants so do a pre-selection of the characteristic values covered by the planned variants.

So please restrict the values on the axis to gain a best working area. The second influence factor is the number of variant creating characteristics. Of course, we are able to support n-dimensional matrix. That means selecting some fixed values for one characteristic you are able to span the matrix for the remaining two characteristics. We are still not able to display a rotating cube with deep dive maintenance. Our display is still 2 dimensional.

We recommend limiting the number of characteristics to create variants on 2. Based on special business requirements more than 2 can make sense. Ensure the users understand the matrix, because it is reused in price maintenance or GTIN maintenance in article master but also in the purchase order creation order sales functionality.

Another important point is the number of possible variants assigned to a generic article. There are no limitations! From a technical point of view, it is possible to assign thousands of variants to one generic article. Trust me, I have seen it already! But it makes no sense. From a logical point of view a number of 50-80 variants for one generic article are a usual value. If your business requires more than 200 variants for a generic article, you should think about a practicable splitting logic.

- Using a generic article for a weekly newspaper and creating a new variant for every week sounds good. As long as you start a new generic article for every year.
- Creating contact lenses as variants with full sizes and colors and material in a full span matrix will lead to thousands of variants. Very difficult to handle!
- Using 3 characteristics to define bras. Also a good idea, but note which strange inhuman variants you are able to create. Collect usual value combinations for an axis value.

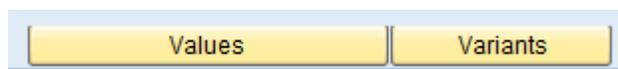
Only a few ideas to see the complexity of article master data and the possibility to fall into a trap.

Continue with some functionality:

After storing, not only the generic article but also its variants are created at the same step. If you remember the chapter of 'flat processes' you will see the reason of longer processing time. The variants will be handled as normal articles with own flat processes.

Sometimes I hear that article master is very slow. But if you understand the logic behind it, you will see that maintaining one field in a generic article will update e.g. 50 variant articles at the same time. That's like maintaining 50 single materials step by step.

As soon as you have created a generic article, it is always possible to add new variants. When changing in transaction MM42, the functionalities of restricting values and choosing variants are accessible by the buttons 'Values' and 'Variants' on the basic data screen.



It is only possible to create new variants. Deletion is not possible in MM42 and if we think about it, we will see that deletion of a variant is a regular delisting process.

For the technical guys, here some database related information.

These restrictions of characteristic values and valuations of variants are stored on database as follows:

On table MARA, the 'Example'-Article is stored with MARA-MATNR='EXAMPLE', the variants are stored as 'EXAMPLE001', 'EXAMPLE002' etc. The assignment between generic articles and variants is done via field 'MARA-SATNR', which contains the name of the generic article in each variant.

Characteristic values are stored in a way that first the MATNR of the generic article is identified in the class table KLAH with an internal class number, and then the allowed characteristic values are stored in table AUSP:

MARA-MATNR=KLAH-CLASS -> KLAH-CLINT (int. class number)

KLAH-CLINT=AUSP-OBJEK -> AUSP-ATWRT or AUSP-ATFLV

Whether ATWRT or ATFLV is taken depends on whether the characteristic is a character- or numeric one. Remember we recommend using characters only.

The characteristic values of the variants are also stored on table AUSP. Here, the name of the variant is identified via table INOB:

MARA-MATNR=INOB-OBJEK -> INOB-CUOBJ (int. Object number)

INOB-CUOBJ= AUSE-OBJEK -> AUSE-ATWRT or AUSE-ATFLV.



Inconsistencies in Variants may lead to strange effects

Reference Handling

Like in material master, in article master you can enter a template whose data are copied when a new article segment is created. In contrast to the material master, from release 46A on there is also the possibility that also changes of the reference are copied.

But customers requested possibilities to maintain the logic individually. So we designed a copy and reference handling to be controlled by customizing settings.

In the customizing transaction OMSR you are able to control the copy and reference handling on field level.

The image shows two screenshots of the OMSR customizing transaction. The first screenshot, titled 'Field attributes (retail only)', shows a dropdown menu for 'Restrict artl cat.' set to 'Default for all article categories', and two checkboxes: 'Copy field content' (checked) and 'Incl. initial values' (unchecked). The second screenshot, titled 'Field attributes (industry and retail)', shows a checked 'Propose field cont.' checkbox, and two input fields: 'Maint. status' with the value 'EDVKALBQPSZXCFG' and 'ALE field group' with the value 'GR_GLOB'.

For every field you can decide how it reacts in reference handling of article master.

The option 'Propose field content' will influence the situation, that this field content will be proposed from used reference article or the merchandise category reference article. In addition, it controls the setting, if a new variant will receive the field value from a generic article. That means the value of the generic article will be copied to the corresponding variant as soon as the variant will be new created. We have here a different level of proposals. The generic article or all other articles except variants will receive template data from a reference article. A variant itself belongs to their own generic article so the reference article has no more influence and the generic article itself is the reference article for the variant.

Switching to a logistic view level, we can control if the field on reference store level will be used in listing process to fill up the field for the new listed store.

This can be very helpful, if the field is obligatory and with this technique, data is maintained automatically.

The second important option is 'Copy field content'. This is a big difference to propose field content. Of course, copy field content makes no sense if it will not be proposed. The idea behind is, if such a field is activated for 'copy field content' it leads to the situation, that a change on a higher level will be inherited to depending levels.

Example: In the basic data view of a generic article, we have a field named BRAND. If we create a fresh new variant, the brand field will be filled automatically by the value from the generic article.

The value from the generic article was proposed maybe by a reference article, but overwritten in generic article. Now all variants and generic article have the same brand value.

In a next step, the user decides to change the brand for all variants. Not a good idea to go through all variants and change the values! Good luck, if the copy handling is activated. Go to the generic article level, change the value and save. Based on the customizing, the brand value will be inherited to all depending variants automatically.

I hear your question. Is it possible to change variant individually?

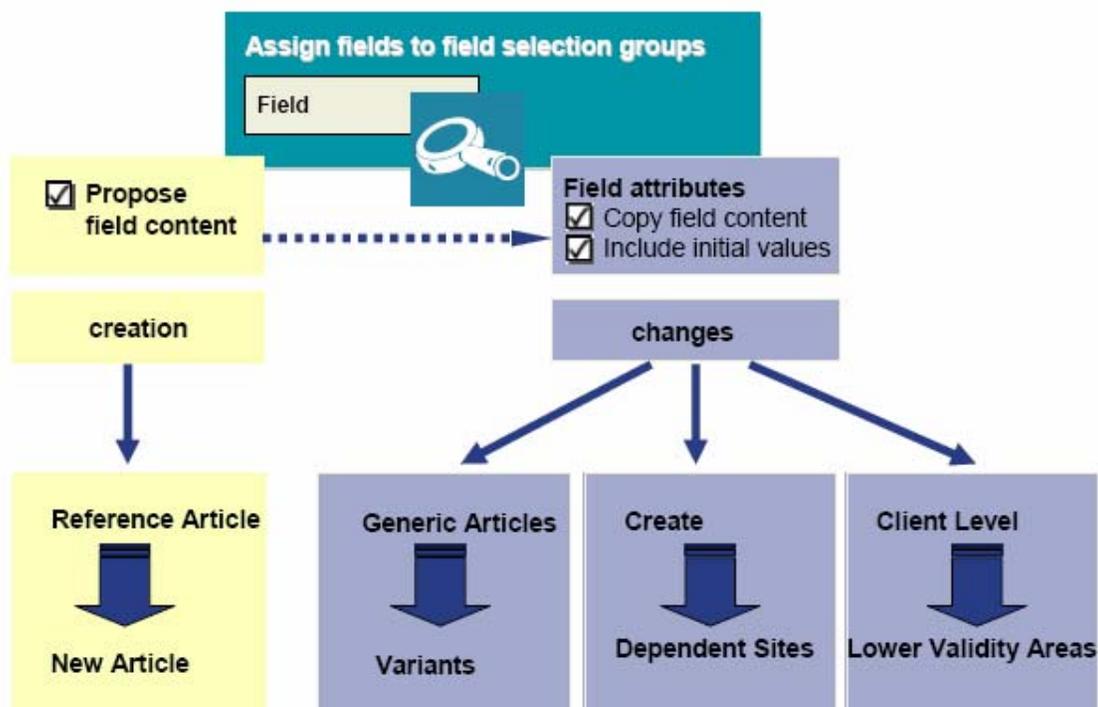
Yes, that's possible. As soon as you change to a variant level and change the brand value to a different value compared to generic article level, you will receive a deviation entry. That means from now on this field will not be overwritten by changes on generic article level as long as the field content is different.

We see this behavior for all level of fields between all areas of validity. As a result, we will create deviations.

So combination of correct customizing and wished mass data processing will lead to a perfect article master.

This is possible in the following cases:

- From generic articles to variants
- From reference site to the dependent sites
- From client level to lower validity areas of the article (e.g. DC, store, distribution chain)



If, for example, in a generic article a field is changed, this change will be copied to all variants. If on the other hand a variant is changed, all the other variants and the generic article remain unchanged. In this case, an entry in table MABW (Differently Maintained Material Data in Retail) will be written.

Subsequently, this variant will not follow the reference handling for the changed field anymore, so the change will be protected. If for this variant the value of this field is changed back to the same value as the generic article has, the MABW-Entry will be deleted, and the variant will be following the reference handling again.

The existing deviations can be seen on the basic data screen of the generic article by pressing the button 'Different areas of validity'. A too large number of MABW-entries will lead to bad performance. In the next chapter, we will focus on deviations and how to resolve them.

Technically the reference handling is done in function group MGWL, in subroutines REFERENZ_BEFORE, REFERENZ, this calls REFERENZ_XXXX (XXXX is the name of the respective table), and REFERENZ_AFTER. From release 47 on there is a BAdI called BADI_ARTICLE_REF_RT for intruding in the reference handling. The BADI has methods REFERENZ_BEFORE, REFERENZ and REFERENZ_AFTER which are called at the end of the respective subroutines.

This was the technical view and why it is designed by that way. The reference handling works with a kind of event handling. At event 'BEFORE' we do a reference for fields with a kind of fixed default values and without the logic to be proposed from a reference article. Good examples here are field like validity data or purchasing status that depends on used article type.

At event 'Referenz_**' where the '**' represents a special master data table, the field content will be proposed using a reference data and merging depending on customizing settings. This happens on structure or field level. Of course proposed values from 'before' event can be overwritten.

Finally the event 'AFTER' will do a kind of adjustment depending on the previous event in combination with maintained field values. E.g., Seasonal data will influence the listing date, but can be referenced only in case a season was maintained for article.



In reference handling, a change of the properties of the collective article causes a similar change of the variants.

Because of the complex logic of reference handling, there is some material master functionality which will not be supported in article master any more:

- Plant specific field references (Transaction OMSA) is not supported, since this interferes with the logic of the reference sites. And it makes no sense. We are in a kind of mass data handling, so why we should start control the fields by sites levels? Sometime customers ask for this feature. But there is no business benefit to support this functionality

Deviation Handling

In the previous chapters, we learned a lot about deviations, how they are created and what the influence factors are for the article master. Under normal circumstances the negative impact of deviations will influence your overall system performance if it is too late. It is very difficult to do proactive steps to avoid deviations. It requires a good understanding of article master data, business processes and future outlook.

Identification of Deviations

The easiest way to check for deviations is counting the number of entries in table MABW. You either look via SE16 or use the report GET_MABW_STATISTIC.

Running this evaluation report, you will get the following result:

Create Statistics on Differences (MABW)			1
Deviation entries in table MABW:		67.117	
<hr/>			
Basis data view deviations:	2.999	(MARA, MAW1, MARM, ...)	
Site specific deviations:	46.440	(MARC, MPOP, MPGD, ...)	
Storage location specific deviations:	424	(MARD)	
Valuation area specific deviations:	110	(MBEW)	
Warehouse number specific deviations:	19	(MLGN)	
Storage type specific deviations:	23	(MLGT)	
Distribution chain specific deviations:	17.102	(MVKE, WLK2)	
<hr/>			
Sum of all deviations:		67.117	
<hr/>			
Number of articles with the same number of deviations:			
Number of deviations	Number of articles		
0	19.909		1
1	2.074		2
2	809		3
3	352		4
4	2.299		5
5	2.230		6
6	120		7
7	76		8
8	131		9
9	21		10
10	271		11
11	85		12
12	411		13

Analyze of Deviations

In the given example, you can see that there are 67117 MABW entries available.

2999 are based on basic data. The reason could be differences in basic data fields or difference characteristics, different unit of measures. Such a deviation can exist only between a generic article and its variants.

From a performance aspect, this is not very critical because such a deviation will not increase the runtime of the flat processes. The disadvantage is more the fact that changes from generic article will not be copied to the variant.

A more critical deviation is the 'Site specific deviation'. This is a difference between a reference site and a depending site. In most cases, such a deviation is based on wrong maintenance of field content or based on missing reference data. A very common example is the field main storage location.

We learned in a previous chapter, that a reference site should not be used as productive site. In this case, no storage location will be maintained. This is a maintenance error, because in listing process, the system tries to generate the storage location data with reference to the reference site. If it is missing, the deviation will be created and decoupled for this field in this site.

Let's continue with the given example. You will also see the number of articles with the same number of deviations. This is only a statistical value to show the fitness of the master data. If the number of articles without deviations is small and you have a huge number of articles with more than e.g. 20 deviations, then there is something wrong.

In the next step, we try to find the reason.

Note 161875 describe the steps to analyze deviations on logistic data level. Run the report

ANALYSEMABW. Because this report needs a long time for analyze, we recommend to start it as background task when no master data activities are available.

Another good point to start is the transaction SE16 and table MABW. Select all entries where the ZHLER field has an entry >20. In a second selection, select single article numbers to do a detailed analyze.

Table: MABW
 Displayed Fields: 11 of 11 Fixed Columns: 3 List Width 0250

	MANDT	MATNR	ZHLER	WERKS	LGORT	LGNUM	LGTYP	VKORG	VTWEG	BWKEY	BWTAR
<input type="checkbox"/>	410	000000000000001100	00000001	KI51							
<input type="checkbox"/>	410	000000000000001100	00000002	KI61							
<input type="checkbox"/>	410	000000000000001100	00000003	KI71							
<input type="checkbox"/>	410	000000000000001100	00000004	KVK1							
<input type="checkbox"/>	410	000000000000001100	00000005	WK41							
<input type="checkbox"/>	410	000000000000001100	00000006	KI01							
<input type="checkbox"/>	410	000000000000001100	00000007	KI02							
<input type="checkbox"/>	410	000000000000001100	00000008	KI21							
<input type="checkbox"/>	410	000000000000001100	00000009	KI22							
<input type="checkbox"/>	410	000000000000001100	00000010	KI31							
<input type="checkbox"/>	410	000000000000001100	00000011	KI32							
<input type="checkbox"/>	410	000000000000001100	00000012	KI50							
<input type="checkbox"/>	410	000000000000001100	00000013	KI55							
<input type="checkbox"/>	410	000000000000001100	00000014	KI56							
<input type="checkbox"/>	410	000000000000001100	00000015	KI57							

You can see in the result list, that the same article has a deviation for the sites.

If you find an entry, pick one MATNR field and start the MM43 with this article number. Go to the logistic views and select the button.

Different Areas of Validity

As a result, you will see a list of different maintained fields with reference to the reference site.

Diff.Maintained Validity Areas		
Differences for the material for the Logistics Store view:		
Material	00000000000000001100	Prepack for generic article 1099
General ref. store	RFST	Reference store
Different stores	Name 1	
Differing Fields	Ref. Value	Different Value
KI01	Warenhaus 01	
Stor. loc. EP	0001	
KI02	Warenhaus 02	
Stor. loc. EP	0001	
KI21	Shop Munich	
Stor. loc. EP	0001	

What does it mean now?

In the given example, you can see that the article 1100 has a deviation between the reference store RFST and the store KI01 in field 'Storage Location'

If we look at the logistic data screen you will find an empty field entry for the storage location.

Storage data	
Stor. Location	<input type="text"/>

For the site KI01, but on reference level there is a value 0001 maintained.

The reason for such a deviation can be difficult. In this special case, it can depend on wrong customizing.

Solution: The site KI01 has no allowed value for storage location 0001. Looks like a classical missing customizing.

In other cases, the reference value is empty and no reference data can be used. In addition, here the customizing is wrong.

Of course, it is also possible, that a deviation makes sense. This can happen on distribution chain levels, if the sales dates in a defined sales channel are different and cannot be proposed by the article basic data.

Analyzing the table MABW and determine regular patterns will show critical issues.

Solving of Unexpected Deviations

There exists two different ways to avoid deviations or clean up deviations.

Find out what are the reasons of a deviation. Adjust the article master and maintain the right values or adjust the corresponding customizing. This is a huge effort and need detailed knowledge about the business processes. The most critical issue here is to distinguish between real, wished deviations and unexpected deviations.

The second possibility is adjusting the customizing of reference handling on field level.

As soon as you deactivate the 'copy' flag for a field, the content will not be inherited to lower depending levels. Existing entries in table MABW will be cleared automatically by article master as soon as you do the

next change. This sounds to be a great idea, but be careful. There must be a good reason to deactivate such a field from reference handling, because it is nearly impossible to reactivate the flag without data loss.

As soon as you deactivate the copy flag, content will be proposed only when a new data segment is created, but changes on reference level will not be copied to depending levels anymore.

In such a case, mass maintenance can be very time consuming. To update fields with a deactivated copy flag, we provide special performance optimized mass update functionalities like MASS_MARC. For site specific (logistic data) fields which are not removed from copy handling we recommend to change the field on reference site level.

So before you change such setting, we strictly recommend getting in contact with a SAP retail consultant with master data experience or SAPPING support on component IS-R-BD-ART.

Best Practices

Roll-out of a new business process – avoid deviations

Let's talk about a very common situation that can happen in your business. You have around 1000 stores, thousands of articles and a perfect maintained article master with a very limited number of real deviations. Now you plan to roll out a new business process. You decide handle a huge number of articles but activate the process store by store. That means not one article will be activated for all stores at the same time but only one store by article. Doesn't sound so bad! The problem depends on the required master data fields to be changed and the settings of the reference handling.

An easy example to make it clearer: If you combine a SAP ERP system with a SAP F&R (Forecasting and Replenishment) system, one key process is preparing the master data and transferring them to the F&R system. Such a preparation will be done by changing the replenishment parameter to an F&R relevant type. In this case, you change a field 'MRP Type' in the logistic view (MARC-DISMM). As default setting, this field has an activated copy handling. As we learned some chapters before, changes of content in a site will lead to a deviation and to a lower master data performance. If the roll-out strategy to activate F&R for an article will be handled store by store, then we can expect that the article master will become slower and slower. You will not have this feeling at the beginning for the first 20-30 stores, but if you reach a number of 300 stores, then somebody from ERP will ask you. The only possible solution here is roll-out the F&R process for all stores at the same time, but for article groups only. Or you deactivate the copy handling for this field in OMSR and accept the situation that changes on the reference store will not inherit anymore to depending sites. But if you think about it, if you plan such a type of roll-out, a copy handling makes absolutely no sense. We can see here, a small change in ERP master data customizing can have a massive impact on F&R project and in most cases they do not know each other.

Migration strategy from a legacy systems – the advantage of a different point of view

Another common idea to migrate master data from a legacy system to an ERP retail system is the idea to migrate the different views of article step by step. We start with the basic data, followed by the purchasing view, continue with the logistic views and finally list the article in 1000 stores.

From a project plan perspective very well. But from a Retail article master data view, this is a nightmare. Every enhancement of the article leads to unnecessary checks and tests and decreases the migration performance.

We recommend migrating always a complete article with all available data. If you know already, that this article will be listed in 1000 stores, then use “site key lists” to generate the needed article segments in creation mode. The listing process itself will be very fast, because the needed article segments are available already. It doesn't matter if you create 10 or 300 master data segments for one article. The runtime is nearly the same. But changes on article step by step including also in worst case some deviations will not make the situation better.

Less is more - Generic articles with characteristic restrictions

We have seen in a previous chapter, that it makes sense to restrict variant creating characteristic values. The benefit here was a reduced processing time and a better overview in the matrix display. Of course, the article can have also some pure informative characteristics. If you do not restrict the possible values for this characteristic, the F4 value help will display a long list of entries. As long as you create you articles manually, this is not a real problem. But in a data migration from a legacy system, it will be not possible to send a restriction for a characteristic on generic article level and sending a valuation at the same time. The issue here the A USP segment cannot distinguish between a restriction and a valuation. To solve this issue, please look at note 367970 for details. Sending a '!' symbol concatenated with the original characteristic name will lead to a restriction. Sending the segment without a '!' leads to a normal valuation.

Take over control - Profit Center Defaulting

The field profit center in the logistic view will be proposed in most cases by the reference store value. Also it can happen that this field is activated in reference handling to be copied. Customers often have the wish that the name or number of profit center is the same as the store name. In such a case you have to influence the reference handling. As a first step, deactivate the field from reference handling with transaction OMSR. In a second step do a BAdI Implementation for BADI_ARTICLE_REF_RT implementing method REFERENZ like note 335267 without the disadvantages of a modification:

```

IF BADI_TBNAM = 'MARC'
AND BADI_FLG_REFERENZTYP = '1'.
  BADI_MARC-PRCTR = BADI_MARC -WERKS.
  CALL FUNCTION 'CONVERSION_EXIT_ALPHA_INPUT'
    EXPORTING
      INPUT = BADI_MARC -PRCTR
    IMPORTING
      OUTPUT = BADI_MARC -PRCTR
  EXCEPTIONS
    OTHERS = 1.
ENDIF.

```

Time to archive - Delisting of articles

Retailers have a lot of data. They have a lot of articles and the assortment will change very often. So we recommend to start very early with a discontinuation project to ensure small databases and a fast article master. In the past, this discontinuation process worked like the material deletion process sometimes combined with some pain to find all depending article data like listing, bill of materials etc.

To make it a little bit easier, we implemented the 'Discontinuation Workbench' to be called with transaction code WRF_DIS_SEL. This is an integrated discontinuation workbench fitting on all Retailers requirements. E.g. delisting by merchandise categories or delisting by season etc. Another benefit is mass processing in parallel modes and automatic processing of follow-up processes. It is like a one-click discontinuation functionality doing all needed steps in no-error case by themselves.

Furthermore, there exists a kind of work package monitor WRF_DIS_MON to control the processing jobs.

Grouping your articles – merchandise categories at a glance

As mentioned in a previous chapter we recommend the limitation of the used number of hierarchies. A reason is either the limitation of evaluation in CO-PA modules or the restriction of a BI system.

Below the hierarchies, you are able to create merchandise categories. The structuring depends on your business. We recommend to create an own merchandise category, if they contains more than 30 articles. The main influence factor of a merchandise category is the assignments of characteristics and their depending articles. If a merchandise category is very common, you should use characteristic profiles to separate characteristic groups. If a merchandise category contains both single articles and generic articles at the same time, you should use characteristic profiles to ensure the possibility, that the single article has no characteristic valuation.

Info records for variant articles

As we know from the standard material, every material needs its own info record data to enable the purchasing process. In ERP retail exists a kind of fall through logic for variant articles. As soon as you try to purchase a variant article, the system will try to find the corresponding info record. If it will not be available, the system will take the info record from the generic article. So we recommend maintaining never info record for variants only in the case that the variant info record is completely different from the generic article info record.

Reclassification

Because of the twofold structure of the MC-assignment (as well material group as class hierarchy), merchandise categories, changes in class hierarchy have to be done in a process named 'reclassification'.

Reclassification is possible for:

- Material groups
- Material group hierarchy nodes
- Characteristics profiles
- Single articles
- Generic articles
- Displays
- Sales sets

Reclassification is done by transactions WRC1 to WRC4 (create reclassification, display reclassification, change reclassification, delete reclassification) and WRCV (execute reclassification). Please read FAQ-note 314490 on how to proceed. Technically, the reclassification is mainly done by function module `WWG2_RECLAS_BOOKED_DB`.

From release 46C on there is the easier method, to reclassify single articles by transaction WRCR. This is done by function module `ARTICLE_RECLASSIFY_LITE_RETAIL`.

Performance of Article Master Data

How I can identify that I have an issue?

As mentioned before, watch your master data update processes. If they need too much time, there must be a reason. In most cases based on deviations, intensive usage of characteristics or a higher number of distribution chains.

Steps to Analyze a Performance Issue in Master Data

Please follow the hints and tips in the previous chapters. If you need support or assistance, please do not hesitate to contact the SAP Support on IS-R-BD-ART component.

Appendix

Transactions

W10T	Area MenueArea Menue Retail
WSS1	General settings for Assortments
OMSR	C MM-BD Field Groups
WB01	Create plant
WB02	Change plant
WB03	Display plant
WG21	Create material groups
WG22	Change material groups
WG23	Delete material groups
WG24	Display material groups
WGSE	Sending material group hierarchy (Since 46C)
WGUS	Where-used list MG hierarchy
CLWM	Create MMS Material Group Hierarchy
CLWN	Change MMS Material Group Hierarchy
CLWP	Delete MMS Material Group Hierarchy
CLWO	Display MMS Material Group Hierarchy
CLW1	Allocate Material Group Hierarchy
CLW2	Display Material Group Hierarchy
CL6C	Class Hierarchy (graphical display)
MM41	Create Article
MM42	Change Article
MM43	Display Article
MM44	Display Change Documents
MM46	Mass Maintenance: Retail Matl Master
BD10	Send Article
WSTN11	Maintain prepack allocation planning
WSTN12	
WSTN13	
WSTN14	

WRC1	Delete MG reclassification
WRC2	Display MG reclassification
WRC3	Change MG reclassification
WRC4	Create MG reclassification
WRCV	Update MG reclassification
WRCR	Retail Reclassification
WSE1	Group-Wide Discontinuation
CT04	Maintain Characteristics
WRF_DIS_SEL	Article Discontinuation Workbench
WRF_DIS_MON	Article Discontinuation Monitor

Tables

T023	Material Groups
T023T	Material Group Descriptions
MARA	General Material Data
MAW1	Material Master: Default Fields and Special Retail Fields
MARC	Plant Data for Material
MARD	Storage Location Data for Material
MVKE	Sales Data for Material
MEAN	International Article Numbers (EANs) for Material
MLEA	Vendor-Specific EANs
MLAN	Tax data for article
MABW	Differently Maintained Material Data in Retail
TCLA	Class Types
CABN	Characteristic
CAWN	Characteristic values
KLAH	Class Header Data
SWOR	Classification System: Keywords
KSSK	Assignment Table: Object to Class/Class to Class
KSML	Characteristics of a Class
AUSP	Class/Object valuation

INOB	Link between Internal Number and Object
WLK1	Listing data
WLK2	POS data

Function Modules and Reports

Function modules

BAPI_MATERIAL_MAINTAINDATA_RT	Create and Change Material Master Data (Retail)
MATERIAL_MAINTAIN_DARK_RETAIL	Create and Change Articles without Dialog
MATERIAL_ARRAY_UPDATE_RETAIL_2	Update Retail Data
OKCODE_LISTUNG	Interface to Listing
ME_MAINTAIN_INFORECORD	Maintenance of purchasing info record
CLHI_STRUCTURE_CLASSES	Explosion of Class Hierarchy Structure
WWG2_RECLAS_BOOKED_DB	Category Management/Reclassification
ARTICLE_RECLASSIFY_LITE_RETAIL	Simple reclassification

Reports

RBDMIDOC_RETAIL	Article Master Data Distribution (Packet Processing) (instead of RBDMIDOC)
RWWATRAT	Transport of Material Group Hierarchy Data into Other Clients/Systems (till 46C)
ARTCLASSCHECK	Check Consistency of Classification Data in the Material Master

Customer Exits and BADIs

BADI_ARTICLE_REF_RT

Reference handling

BADI_ARTMAS_DATA_REDUCE

IDoc Filtering at Time of Data Import for ARTMAS (Note 598078)

BADI_MATERIAL_CHECK

Enhanced checks for material master table

BADI_MATRIX_SORT

Sorting of Matrix Axis Population

BADI_ARTICLE_MASS_RT

Customer-Specific Article Master Data Enhance. in Mass Main.

BADI_SCREEN_LOGIC_RT

Exit for Customer's Own Control of Screen Sequence/Validity

MGW00002 Material Master (Retail): Number Assignment

EXIT_SAPLMG72_001 Internal Material Number Assignment (Retail)

EXIT_SAPLMG72_002 External Material Number Assignment (Retail)

EXIT_SAPLMGNK_003 Variant Number Assignment

Recommended for Further Reading:

Training Content ,SAP Retail Master Data' IRT310, PLM110 and PLM112

Reclassification-FAQ Note 314490

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