Material Number Ranges and Formatting

Technical Solution Guide

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Material Number Ranges and Formatting

Material Numbers in R/3

The material number in R/3 is technically defined as an eighteen byte, character field. The logic that formats material numbers is contained in a conversion exit and is controlled by configuration tables, number range objects and standard R/3 customer functions. This document first explains how material number ranges are defined and then details a few methods for enhancing the standard functionality. The examples in this document are from a 4.6c system.

Relevant OSS Notes

The following OSS notes may be useful in understanding this process:

72286	Lexicographical / non-lexicographical material number
78093	Display of alternative material identifiers

Material Number Range Object

R/3 uses Number Range Objects to assign numbers to almost everything within the system. For materials, the number range object used is MATERIALNR. Number range objects can be viewed and maintained using transaction SNRO.

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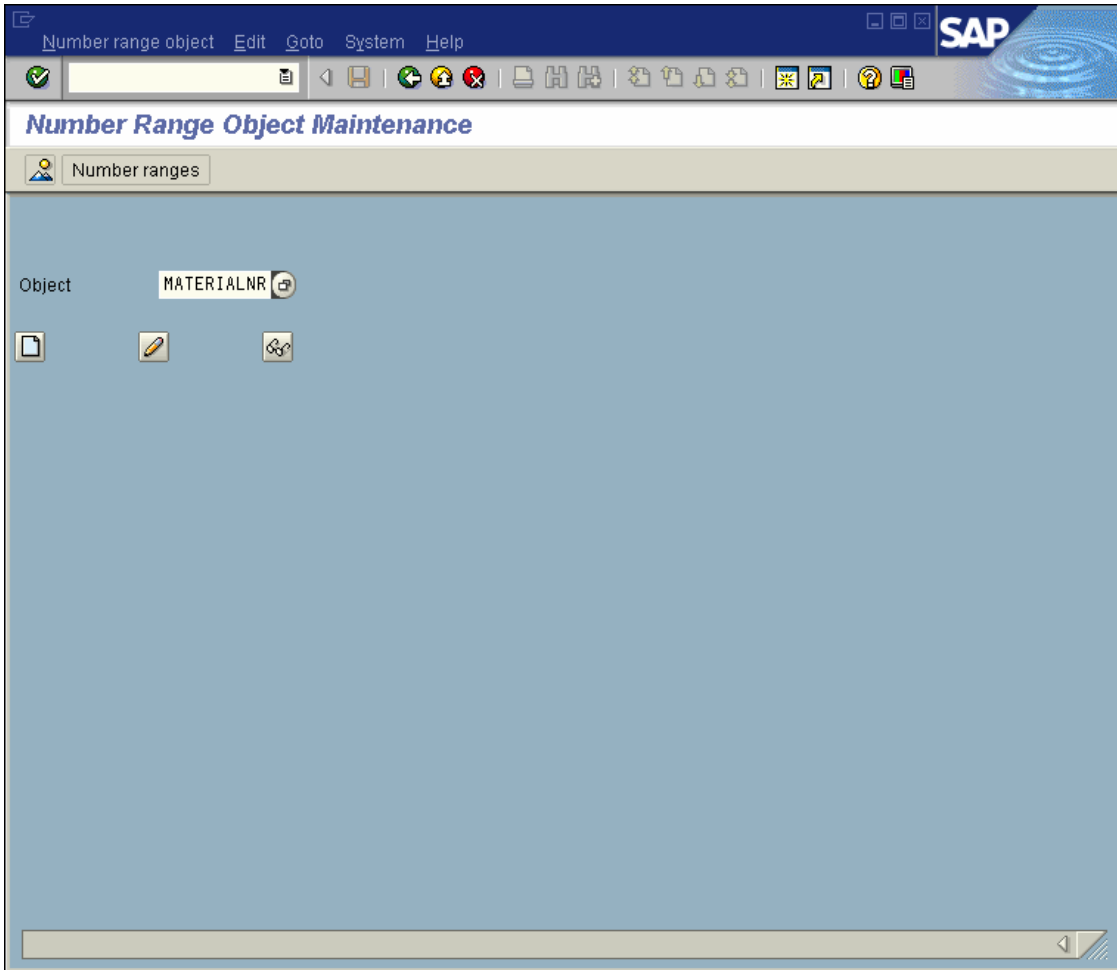
Material Number Ranges and Formatting

The configuration for the number range object specifies a transaction (MMNR) for maintaining the intervals. The group section specifies that intervals will be assigned using groups. In this case, the group is the material type (MTART). Table T134 is the configuration table that defines material types. NUMKI and NUMKE are the fields in table T134 that contain the internal and external number range intervals.

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Assigning Intervals to Material Types

Transaction MMNR

Transaction MMNR is used to create and assign intervals to the material types.

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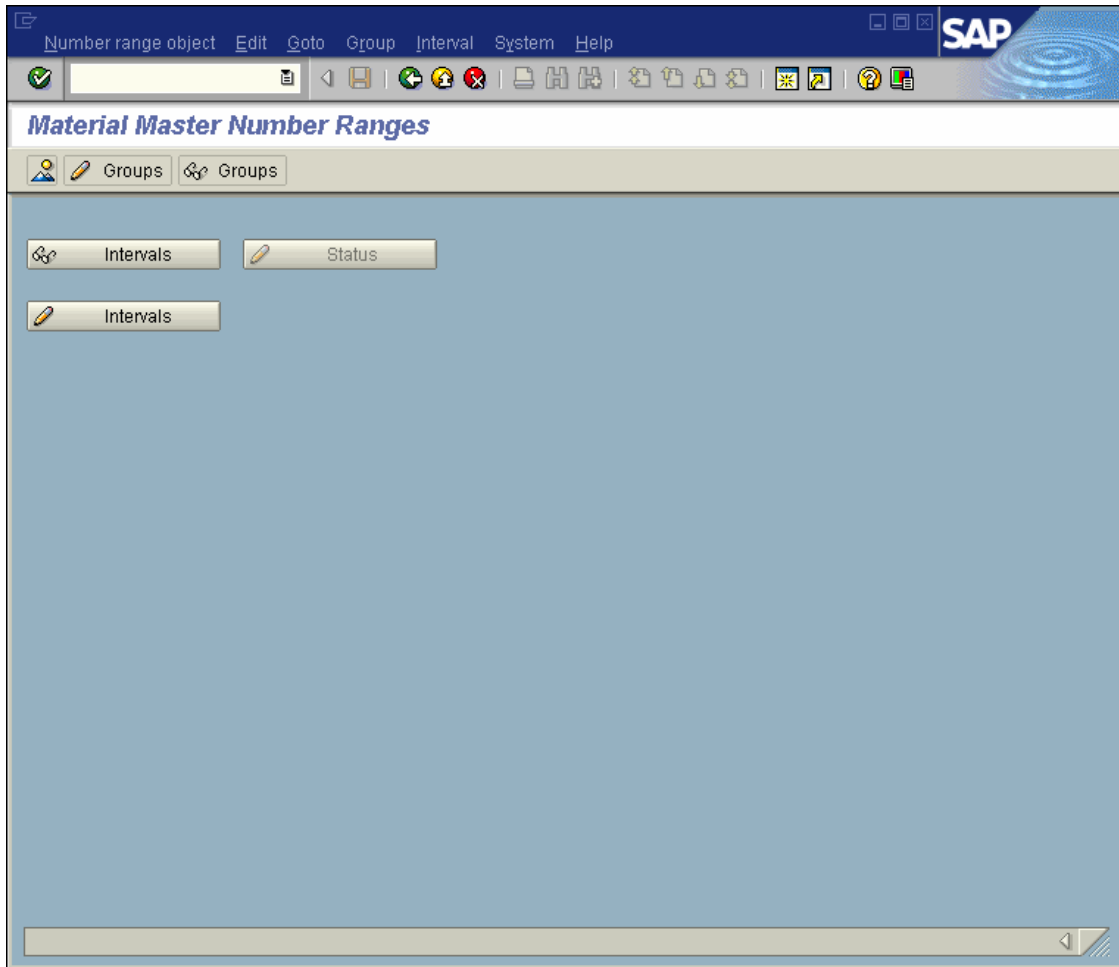
Material Number Ranges and Formatting

Each group is displayed with the material types assigned. In this case, a group corresponds to an interval.

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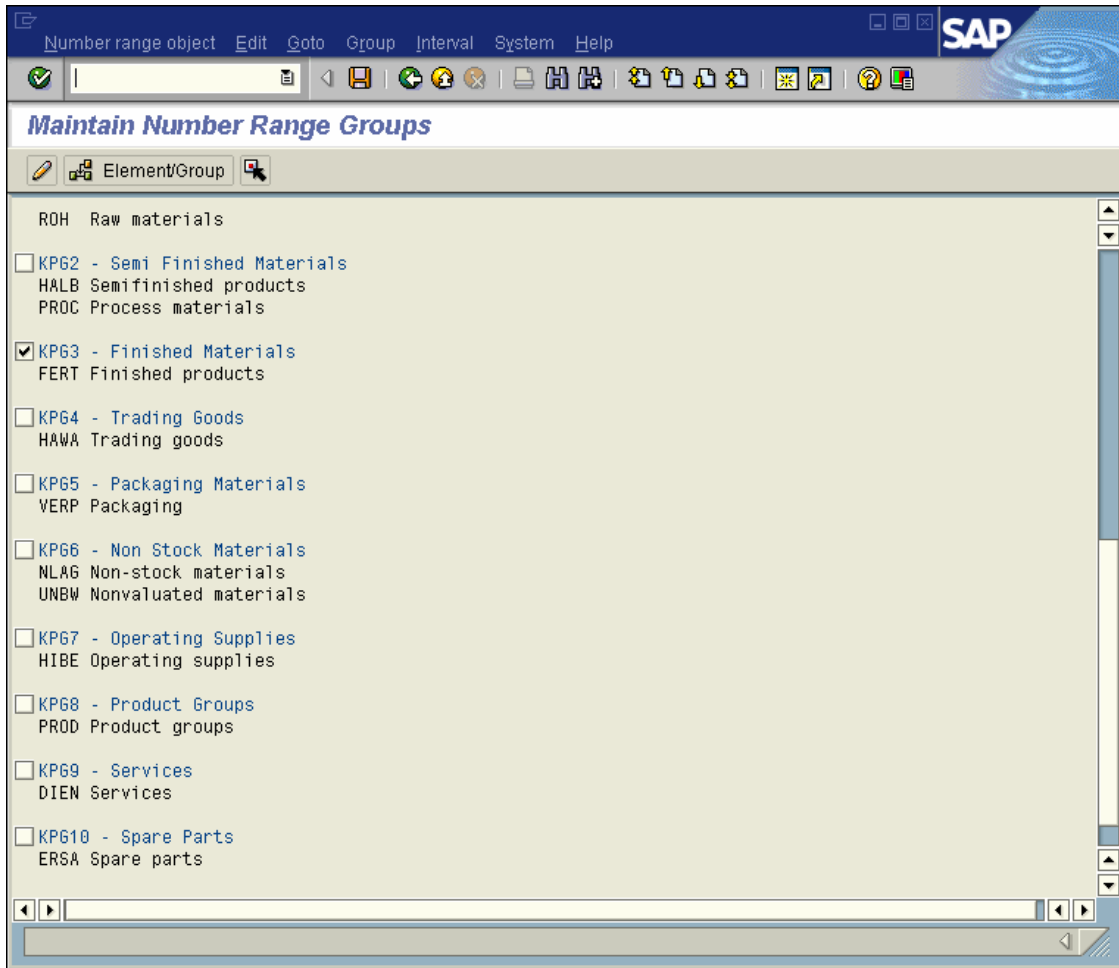
Material Number Ranges and Formatting

The interval for material type FERT is displayed when the maintain button is pressed from the previous screen.
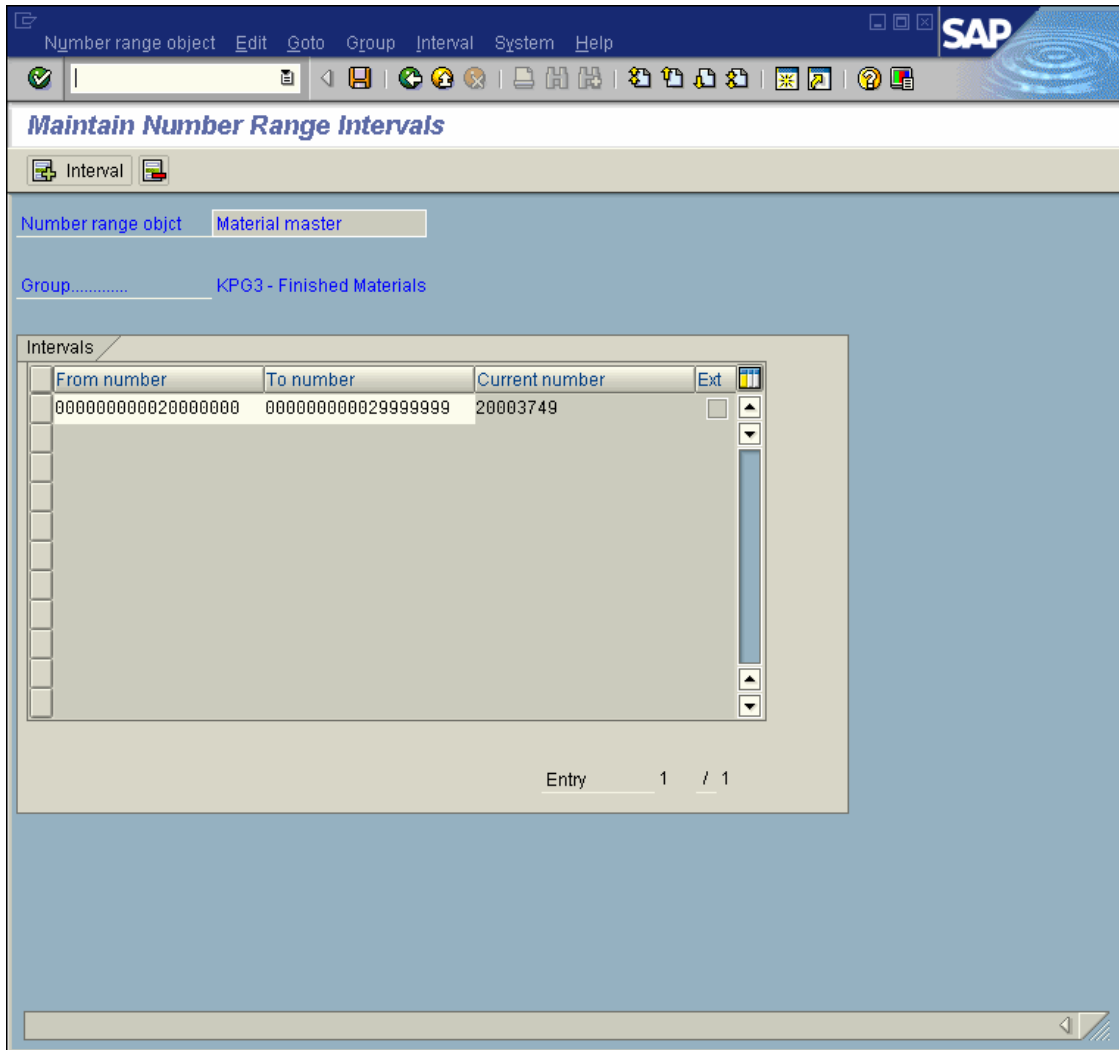
Notice that the interval range contains leading zeros. This explains why zero filled material numbers exist even though the MATNR domain is defined as a character type.

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Material Number Ranges and Formatting

Configuration Tables

When transaction MMNR is processed, the configuration tables in the following sections are referenced/updated.

Table TNRGT Number Range Groups

```
┌─────────────────────────────────────────────────────────────────────────────┐
│ Table entry  Edit  Goto  Settings  Utilities  Environment  System  Help   SAP │
│ ⊘              ▣  ◁ 🖫 | ❤ ❤ ❤ | 🖶 🖩 🖩 | 🔁 🔁 🔁 🔁 | 🖩 🖩 | ❓ 🖪       │
│ Data Browser: Table TNRGT Select Entries      12                              │
│ ✂ 🔍 🖶 ▼ 🖩 🖩 🔁 🛈  Check table...                                         │
└─────────────────────────────────────────────────────────────────────────────┘
```

Object name	No. range no.	No. range no.	Group text
MATERIALNR		04	KPG11 - Kodak Trade Goods
MATERIALNR	01	02	Group 1
MATERIALNR	03		KPG1 - Raw Materials
MATERIALNR	05		KPG2 - Semi Finished Materials
MATERIALNR	07		KPG3 - Finished Materials
MATERIALNR	09		KPG4 - Trading Goods
MATERIALNR	11		KPG5 - Packaging Materials
MATERIALNR	12		KPG6 - Non Stock Materials
MATERIALNR	13		KPG7 - Operating Supplies
MATERIALNR	15		KPG8 - Product Groups
MATERIALNR	17		KPG9 - Services
MATERIALNR	18		KPG10 - Spare Parts

Table : TNRGT
Displayed fields: 4 of 4 Fixed columns: 4 List width 0250

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Table T134 Material Type Master

Table T134 is the configuration table that contains the material type parameters. The fields listed below are the subset related to material number ranges.
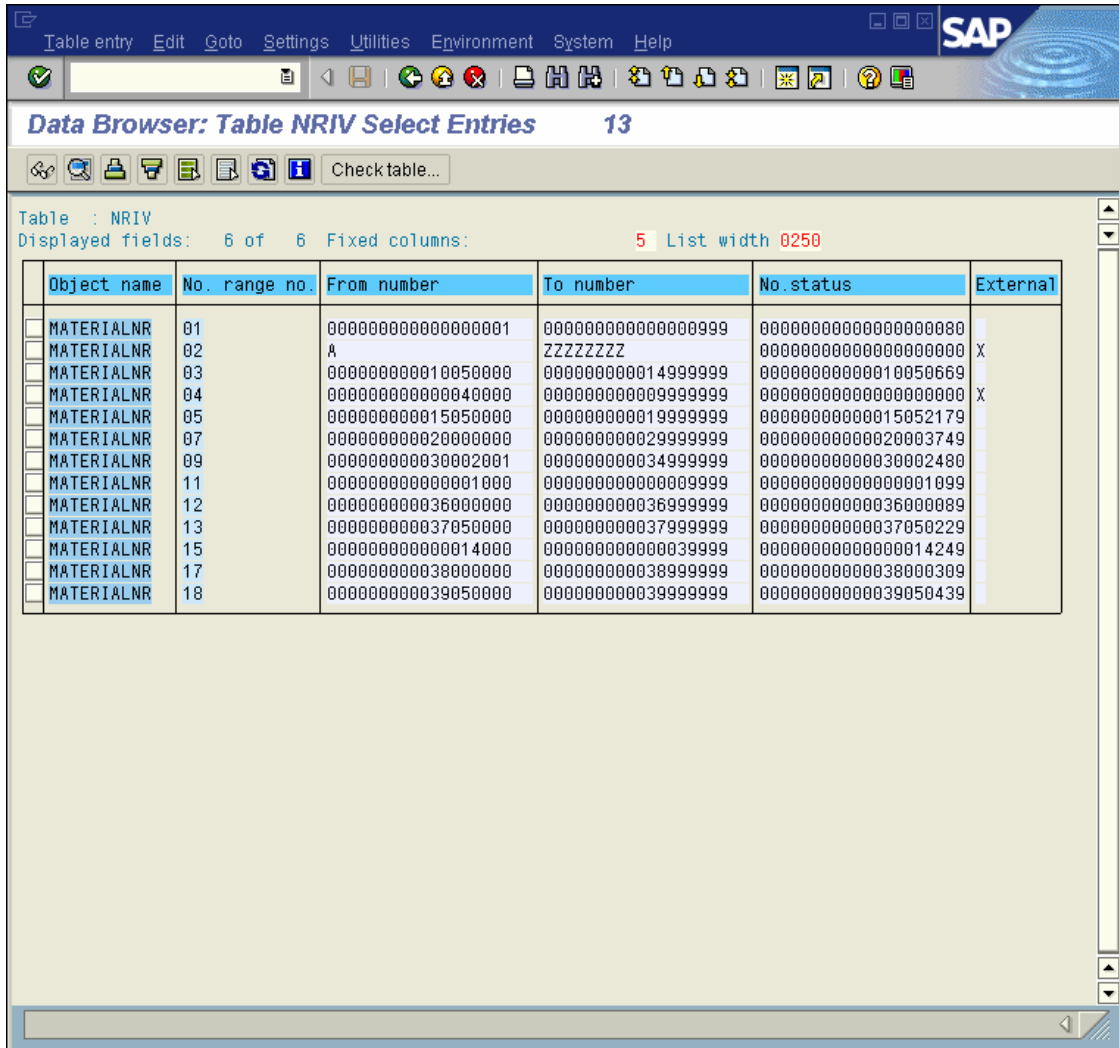
Material type	Number range	Number range	Ext. NA w/o ck	Mat.type descr.
ZTRD		04		Kodak Trading Goods
MODE	01	02	X	Apparel (seasonal)
LGUT	01	02		Empties (retail)
LEIH	01	02	X	Returnable packaging
LEER	01	02		Empties
KMAT	01	02		Configurable materials
INTR	01	02		Intra materials
NOF1	01	02	X	Nonfoods
WETT	01	02		Competitor products
WERT	01	02	X	Value-only materials
WERB	01	02	X	Product catalogs
VOLL	01	02		Full products
VKHM	01	02	X	Additionals
PIPE	01	02		Pipeline materials
FHMI	01	02		Prod. resources/tools
FOOD	01	02	X	Foods (excl. perishables)
FRIP	01	02	X	Perishables
FGTR	01	02	X	Beverages
COUP	01	02	X	Coupons
HERS	01	02	X	Manufacturer parts
IBAU	01	02		Maintenance assemblies
CONT	01	02	X	Kanban containers
ROH	03			Raw materials
PROC	05			Process materials
HALB	05			Semifinished products
FERT	07			Finished products
HAWA	09			Trading goods
VERP	11			Packaging
NLAG	12			Non-stock materials

Material Number Ranges and Formatting

Table NRIV Number Range Intervals

Table NRIV contains the actual number range intervals

```
Data Browser: Table NRIV Select Entries    13

Table  : NRIV
Displayed fields:   6 of   6  Fixed columns:        5  List width 0250
```

Object name	No. range no.	From number	To number	No.status	External
MATERIALNR	01	000000000000000001	000000000000000999	000000000000000080	
MATERIALNR	02	A	ZZZZZZZZ	000000000000000000	X
MATERIALNR	03	000000000010050000	000000000014999999	000000000010050669	
MATERIALNR	04	000000000000040000	000000000009999999	000000000000000000	X
MATERIALNR	05	000000000015050000	000000000019999999	000000000015052179	
MATERIALNR	07	000000000020000000	000000000029999999	000000000020003749	
MATERIALNR	09	000000000030002001	000000000034999999	000000000030002480	
MATERIALNR	11	000000000000001000	000000000000009999	000000000000001099	
MATERIALNR	12	000000000036000000	000000000036999999	000000000036000089	
MATERIALNR	13	000000000037050000	000000000037999999	000000000037050229	
MATERIALNR	15	000000000000014000	000000000000039999	000000000000014249	
MATERIALNR	17	000000000038000000	000000000038999999	000000000038000309	
MATERIALNR	18	000000000039050000	000000000039999999	000000000039050439	

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Controlling the Format

Transaction OMSL   Material Number Format

Transaction OMSL is used to access table TMCNV, which is the configuration table that contains control settings for formatting the material number.

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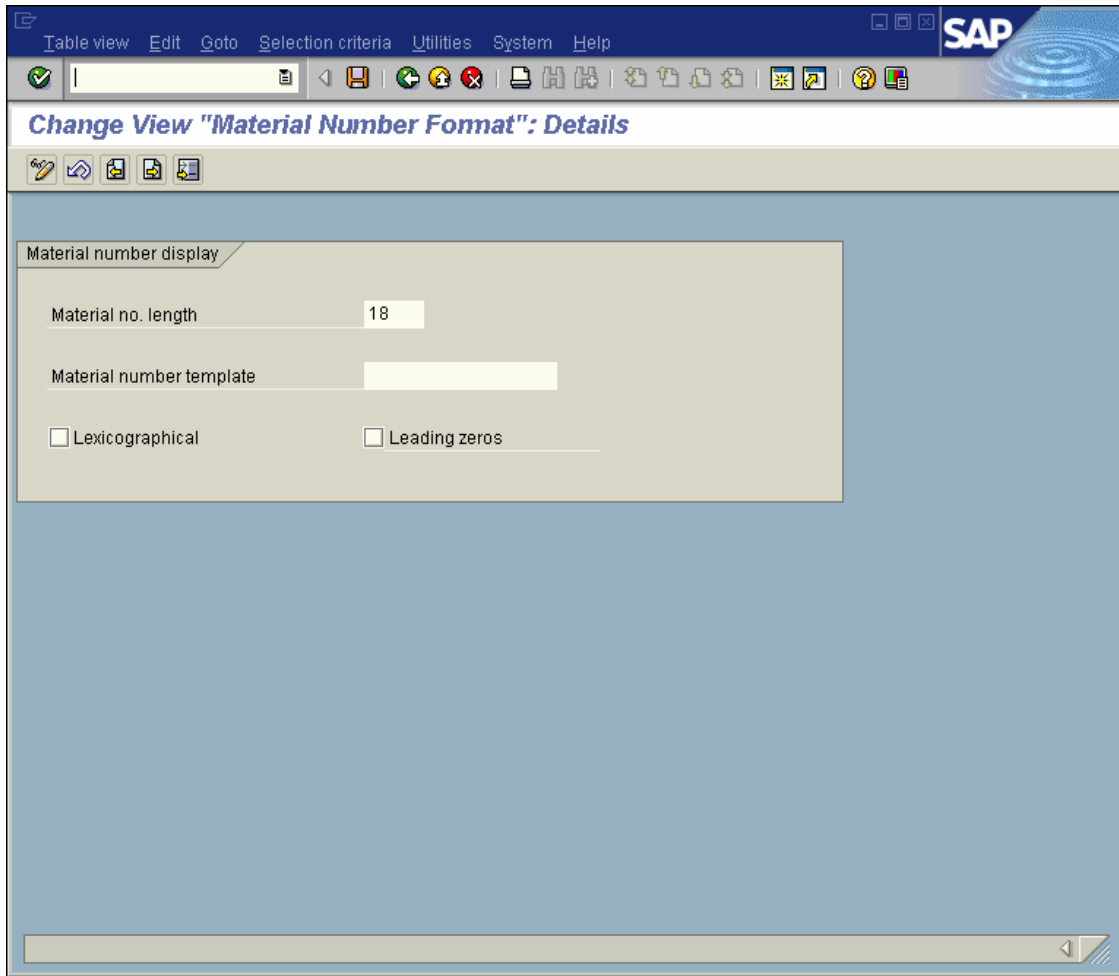
Material Number Ranges and Formatting

Table TMCNV

Below is the SE16 view of the TMCNV table.

Material Number Domain

Conversion exits are assigned at the domain level within the data dictionary. The following screen displays the material number domain (MATNR). The standard R/3 conversion routine is specified (MATN1)

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Material Number Ranges and Formatting

Function Group OMCV

The material number conversion exit function modules are contained in function group OMCV. For each conversion exit defined, there are two function modules. One function is for input and, the other is for output. SAP has a standard naming convention for these functions that must be followed. It consists of a prefix, the conversion routine name and a suffix as follows:

'CONVERION_EXIT_' + Conversion routine name + '_INPUT'
'CONVERION_EXIT_' + Conversion routine name + '_OUTPUT'
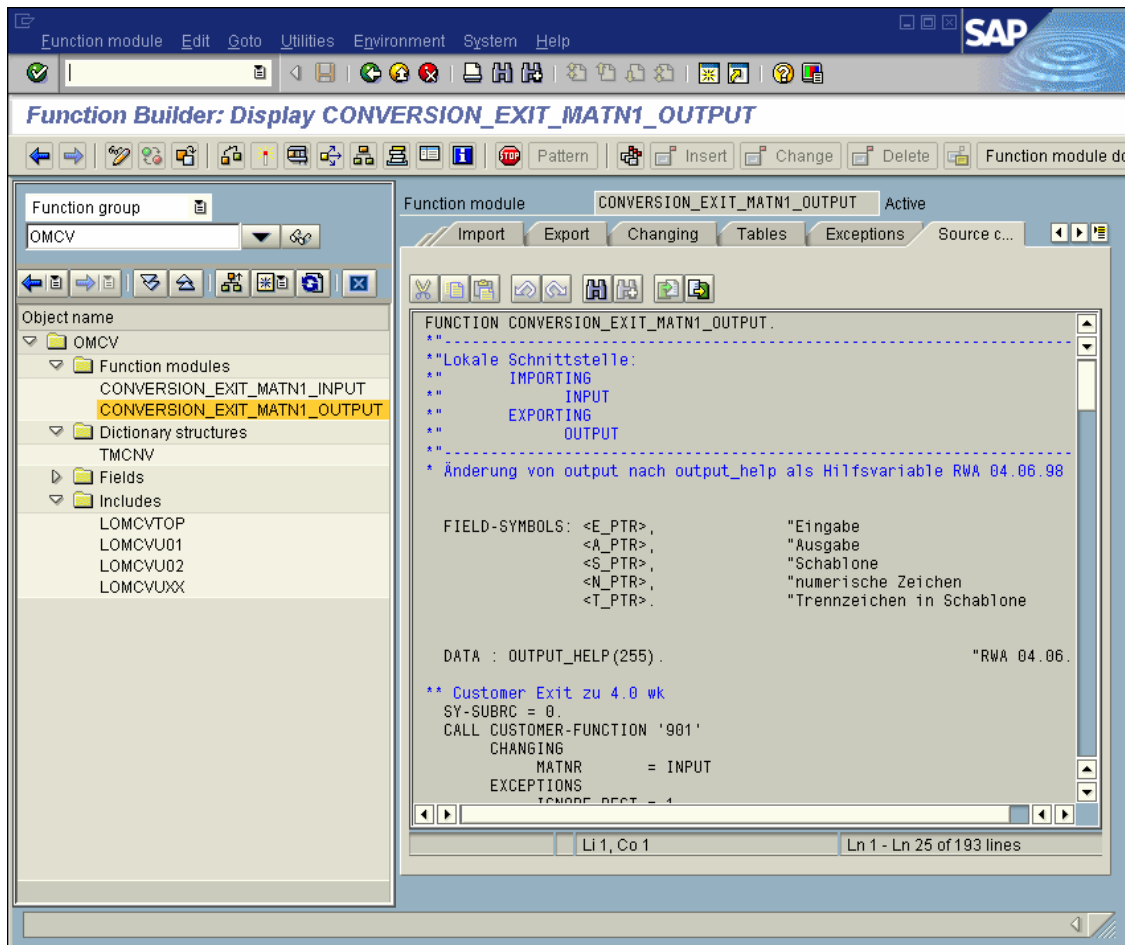
Material Number Ranges and Formatting

Function CONVERSION_EXIT_MATN1_INPUT

Converts the internal material number to the output format. The logic flow is as follows:

- Calls customer function 001 if it exists.
- Reads table TMCNV and formats the number based on the settings in the table.
- Calls customer function 002 if it exists.

Function CONVERSION_EXIT_MATN1_OUTPUT

Converts the external material number to the internal format. The logic flow is as follows:

- Calls customer function 901 if it exists.
- Reads table TMCNV and formats the number based on the settings in the table.
- Calls customer function 902 if it exists.

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Custom Output Format Example 1

The following example demonstrates how to format the material number output using an edit mask.

Business Requirement

The customer wants to display the material using the format xxxx-xxx-xx.

Solution

To solve this problem, standard configuration will be used to add an edit mask to the material number.

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Material Number Ranges and Formatting

Step 1   Define the Edit Mask via TMCNV Configuration

Using transaction OMSL, the edit mask is specified in the material number template field.

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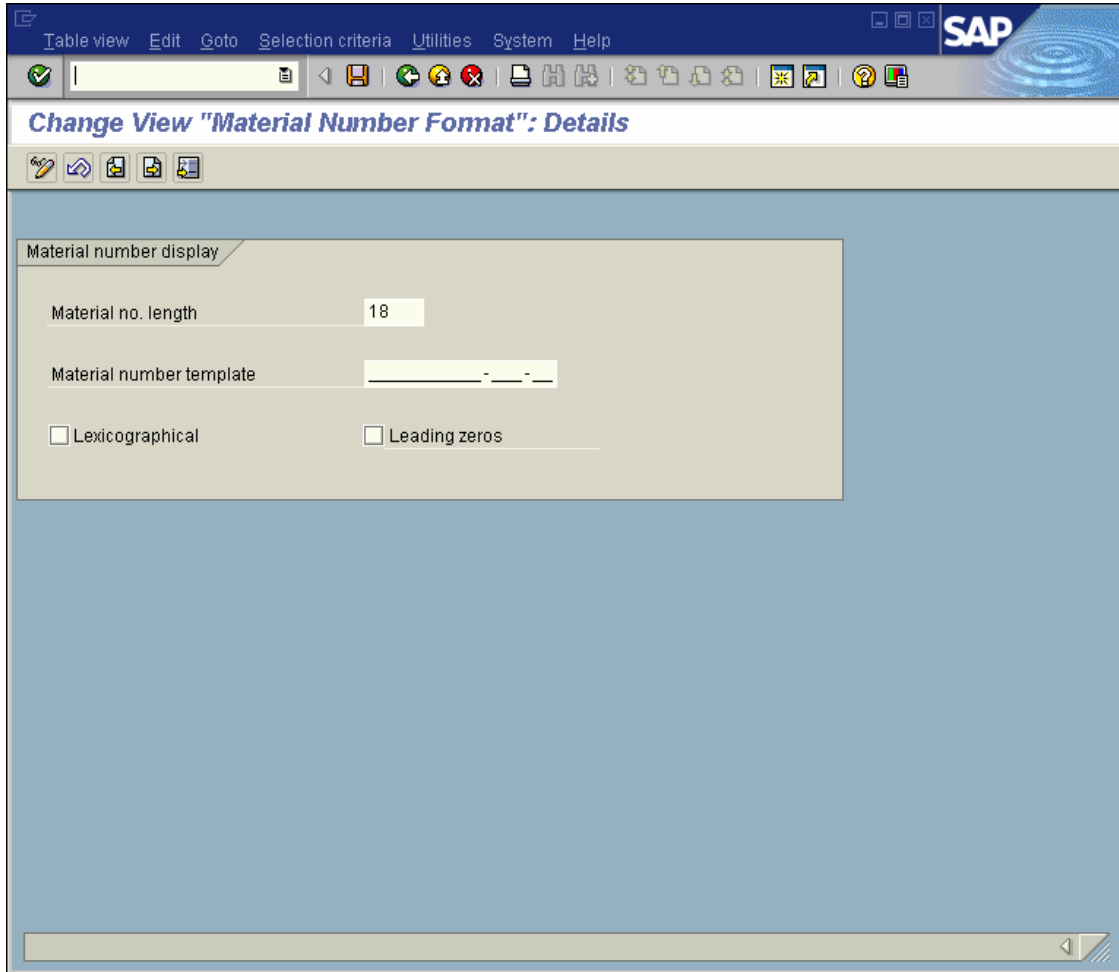
Material Number Ranges and Formatting

Once the configuration is complete, table TMCNV contains the edit mask. Several other fields related to the edit mask are also present. These fields are used by the standard logic in the conversion exit to apply the mask to the number.
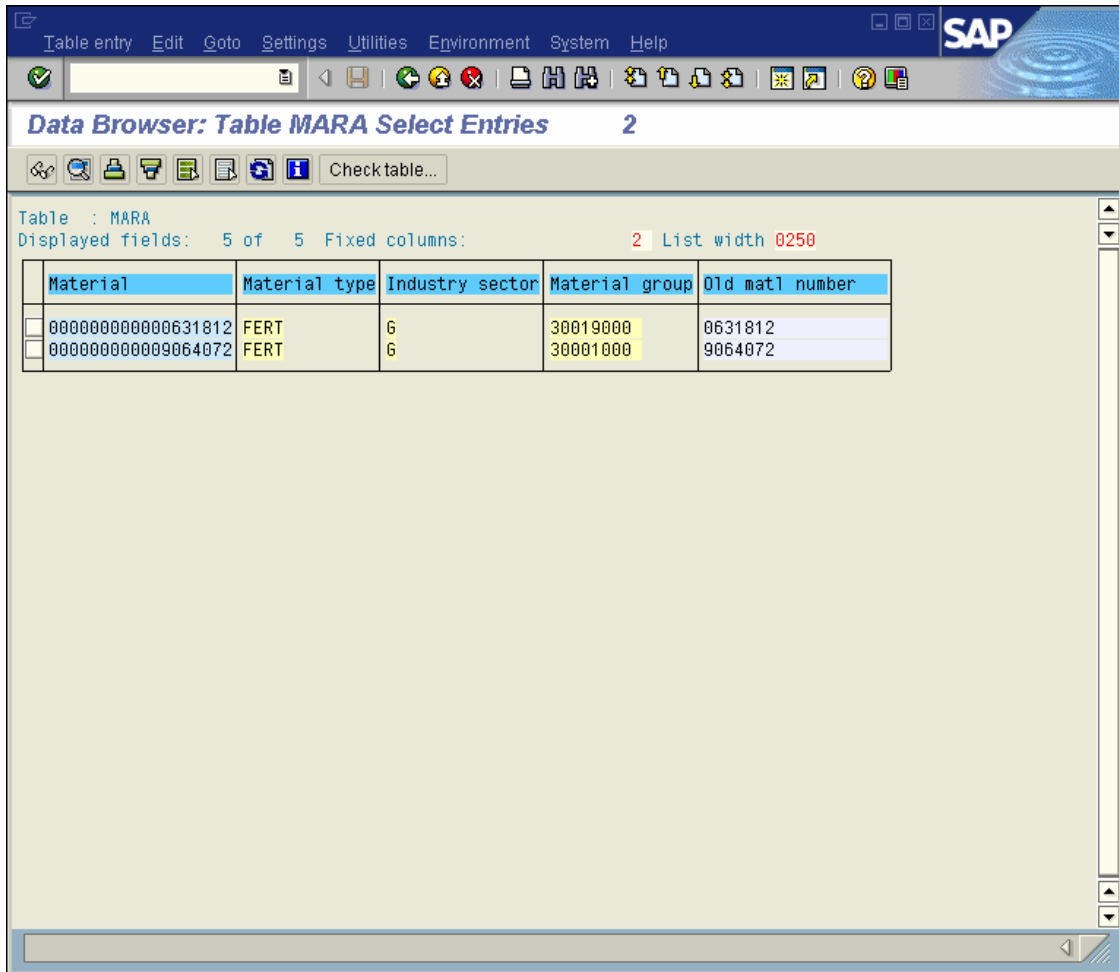
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Material Number Ranges and Formatting

Step 2   Test the Configuration Change

Using transaction SE16, two MARA records are displayed. The conversion exit does not execute until the record detail is displayed. The material number internal format has not changed. It is still eighteen bytes, zero filled.
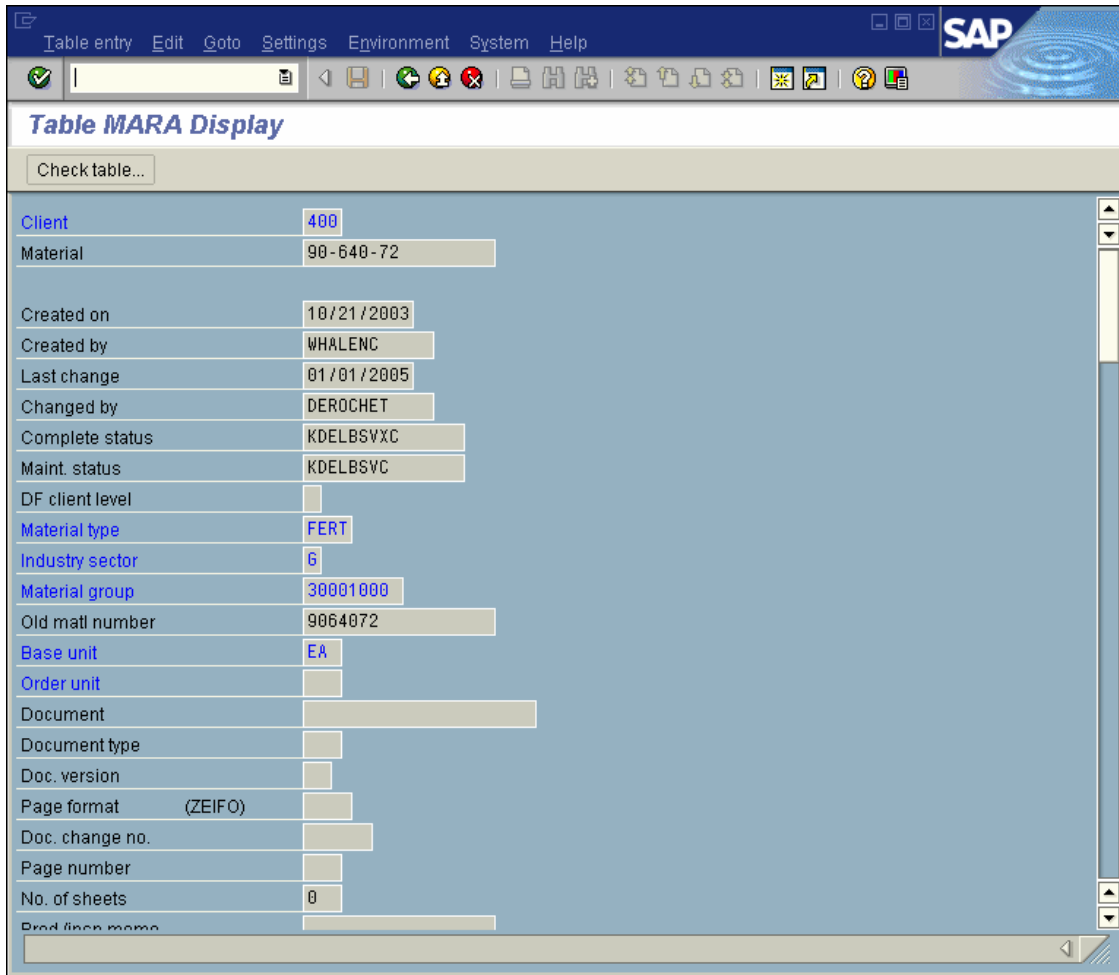
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Material Number Ranges and Formatting

Once the record detail is displayed, the conversion exit logic applies the masking logic based on the TMCNV record.

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Custom Output Format Example 2

The following example demonstrates how to implement a custom material number output routine.

Business Requirement

The customer uses material numbers that are either six or seven bytes long. They always want seven bytes displayed, even if the actual number is six bytes long. For numbers that are six bytes long, they want a leading zero to display.

Solution

To solve this problem, we will add logic to zero fill six byte numbers (to seven bytes) when outputting the material number. This logic will be added to customer function 902 in the output conversion exit of the material number (CONVERSION_EXIT_MATN1_OUTPUT).

It is assumed that the reader understands the CMOD/SMOD enhancement concept.

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Material Number Ranges and Formatting

Step 1   Identify the Standard Customer Function

The output conversion exit for material numbers contains two customer function calls. Function 901 is called at the beginning of the logic and function 902 is called at the end, just before the exit. For this project, we will use function 902.
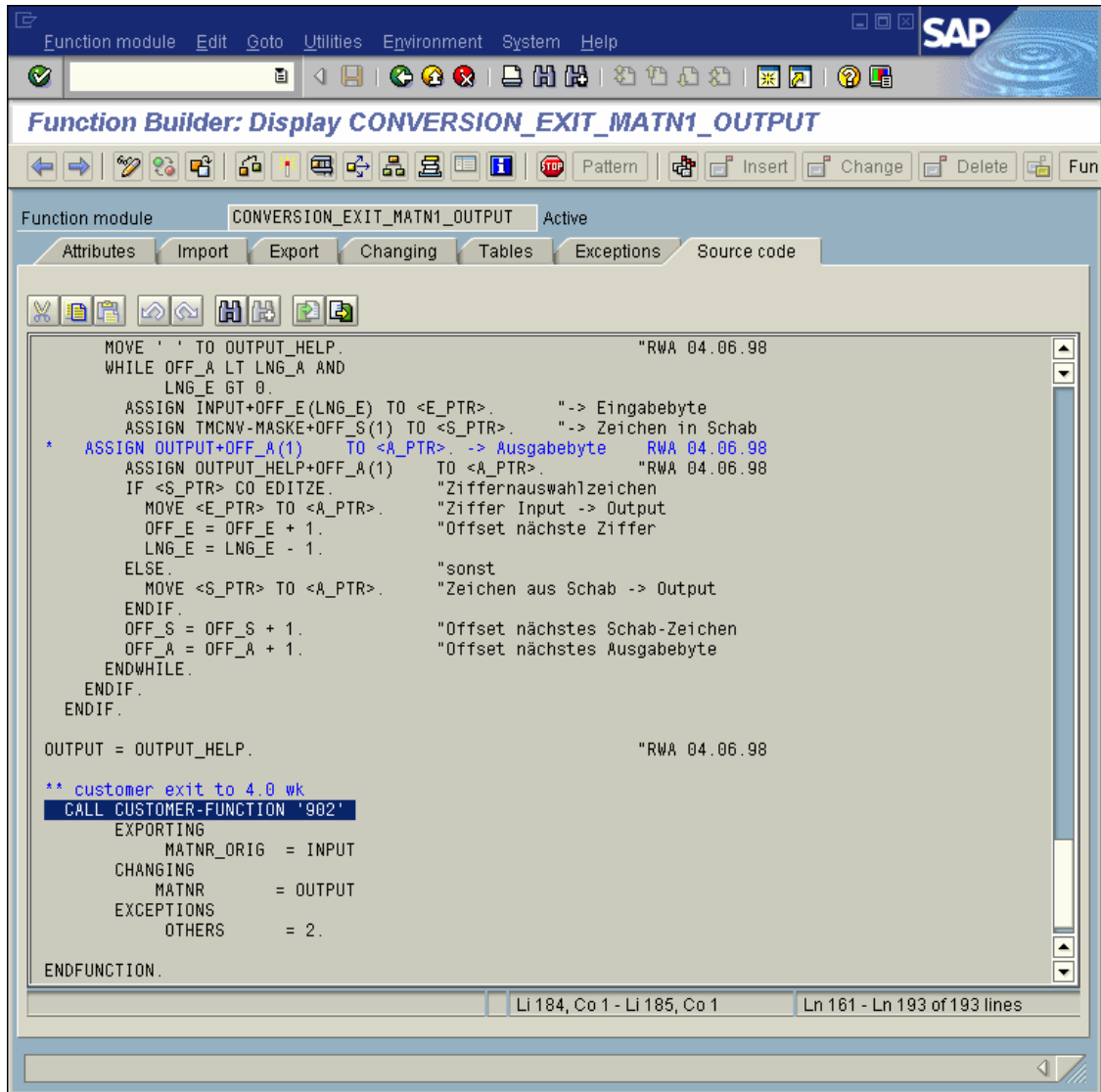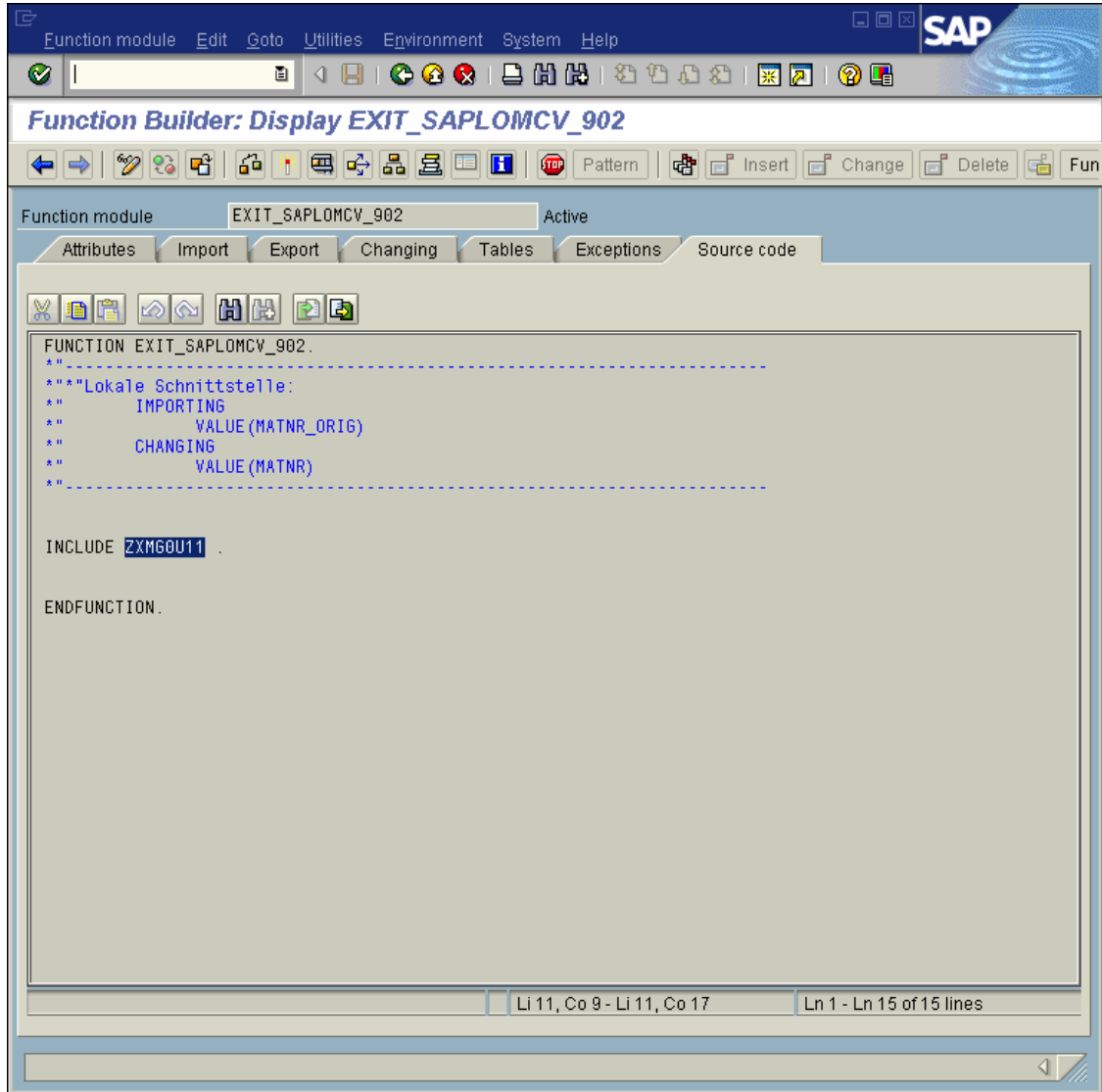

To navigate into the customer function, double click on the function name '902'.

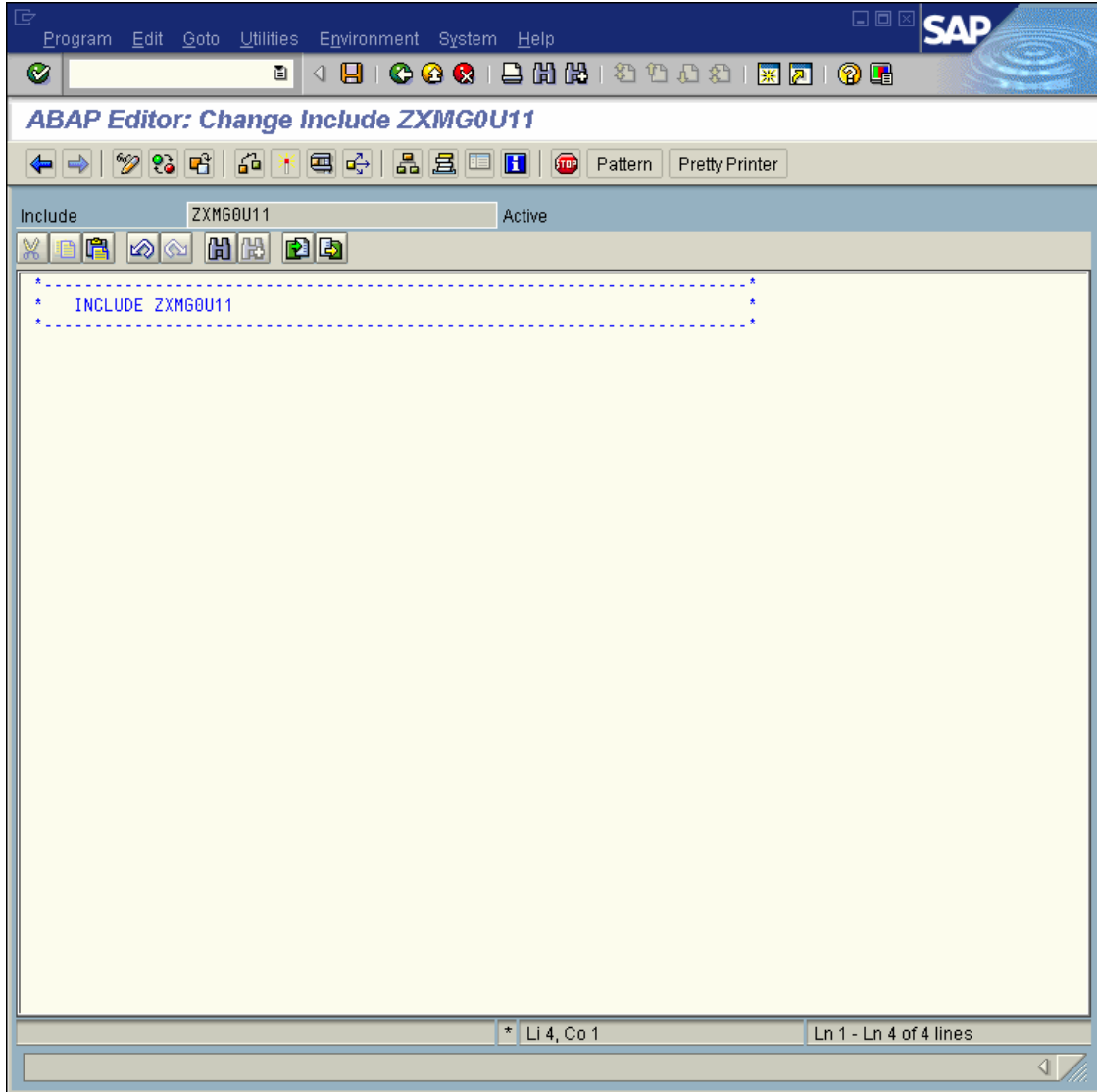## Step 2 Create the Customer Function INCLUDE

The customer function does not contain any code, only an INCLUDE. The actual code will be added to the INCLUDE.

Double click on the include name ZXMG0U11. The system will respond with 'Include ZXMG0U11 does not exist, Do you wish to create it'. You need to go thru the normal steps to create the INCLUDE, assign a transport request, etc.
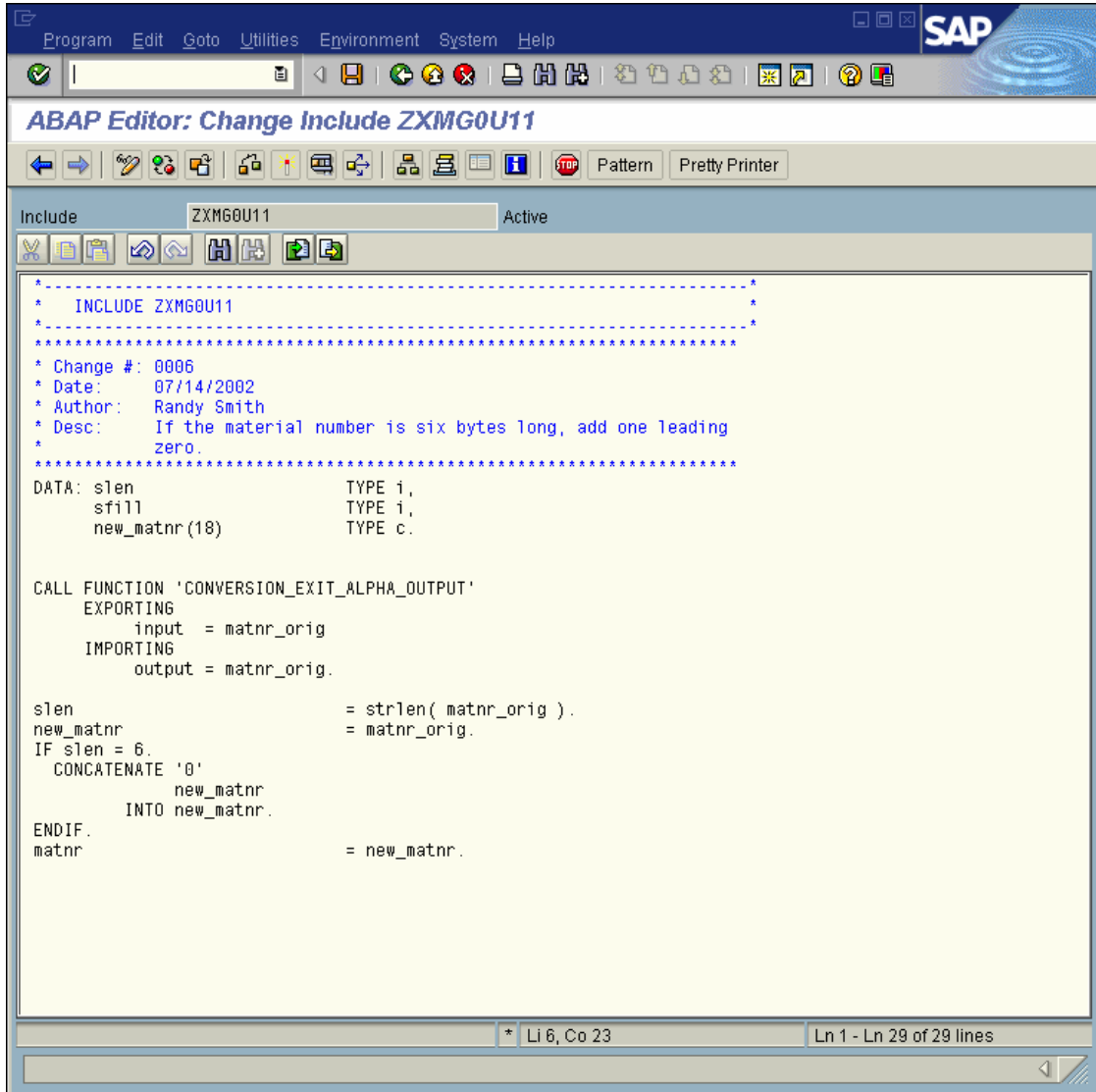
Material Number Ranges and Formatting

The system will create an empty include to which we will add our logic.

```
*--------------------------------------------------------------*
*     INCLUDE ZXMG0U11                                         *
*--------------------------------------------------------------*
```

Material Number Ranges and Formatting

Step 3   Code the Logic

The logic is added into the INCLUDE. This logic is quite simple. We check the length of the material number. If it is six bytes long, a single leading zero is added.

```
*-----------------------------------------------------------------------*
*    INCLUDE ZXMG0U11                                                   *
*-----------------------------------------------------------------------*
*************************************************************************
* Change #: 0006
* Date:     07/14/2002
* Author:   Randy Smith
* Desc:     If the material number is six bytes long, add one leading
*           zero.
*************************************************************************
DATA: slen                    TYPE i,
      sfill                   TYPE i,
      new_matnr(18)           TYPE c.


CALL FUNCTION 'CONVERSION_EXIT_ALPHA_OUTPUT'
      EXPORTING
          input  = matnr_orig
      IMPORTING
          output = matnr_orig.

slen                      = strlen( matnr_orig ).
new_matnr                 = matnr_orig.
IF slen = 6.
  CONCATENATE '0'
              new_matnr
          INTO new_matnr.
ENDIF.
matnr                     = new_matnr.
```
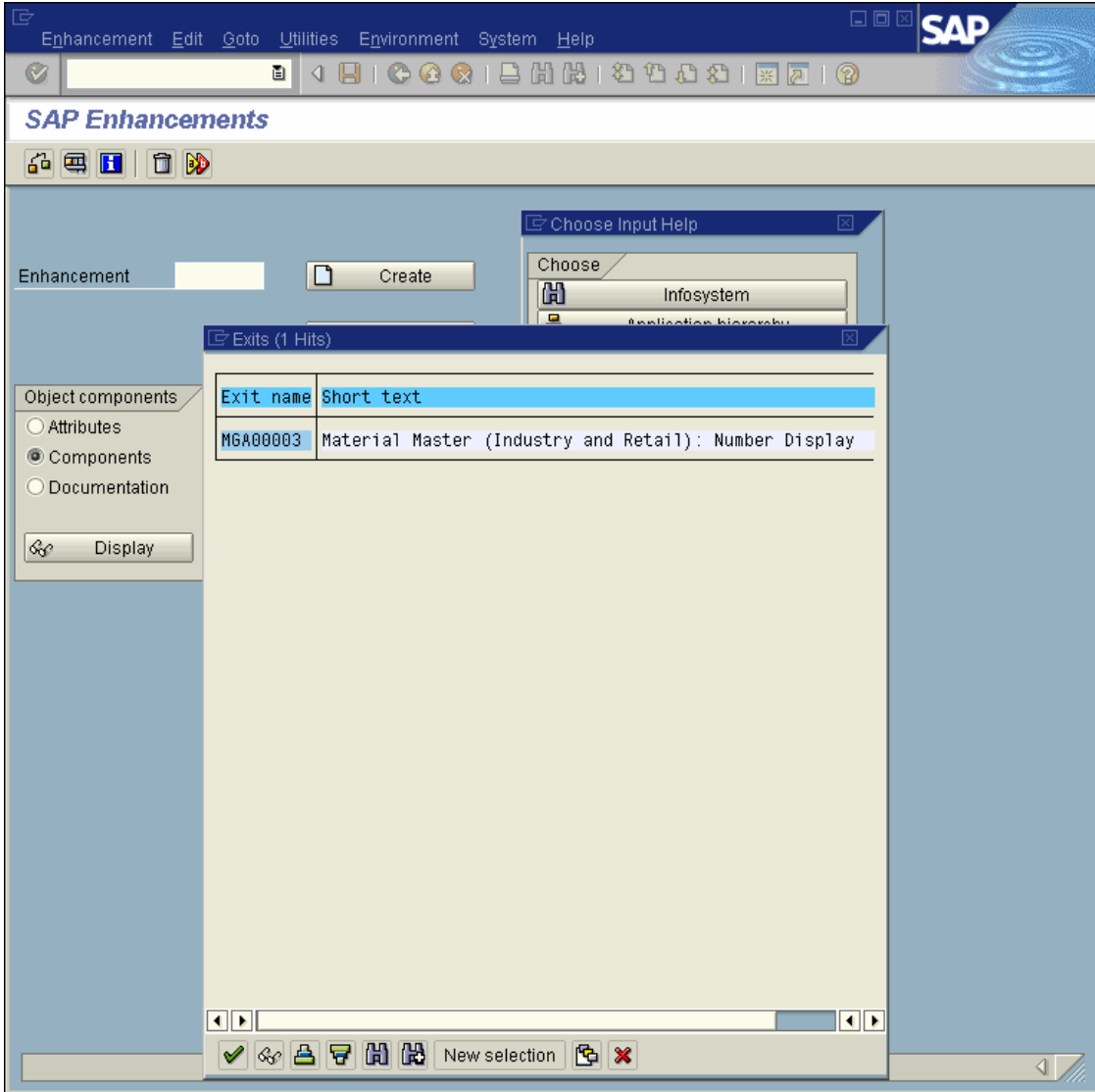
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Step 4 Find the Standard Enhancement (SMOD)

For standard customer functions, there will be an existing enhancement. It can be found using the search tool in transaction SMOD.

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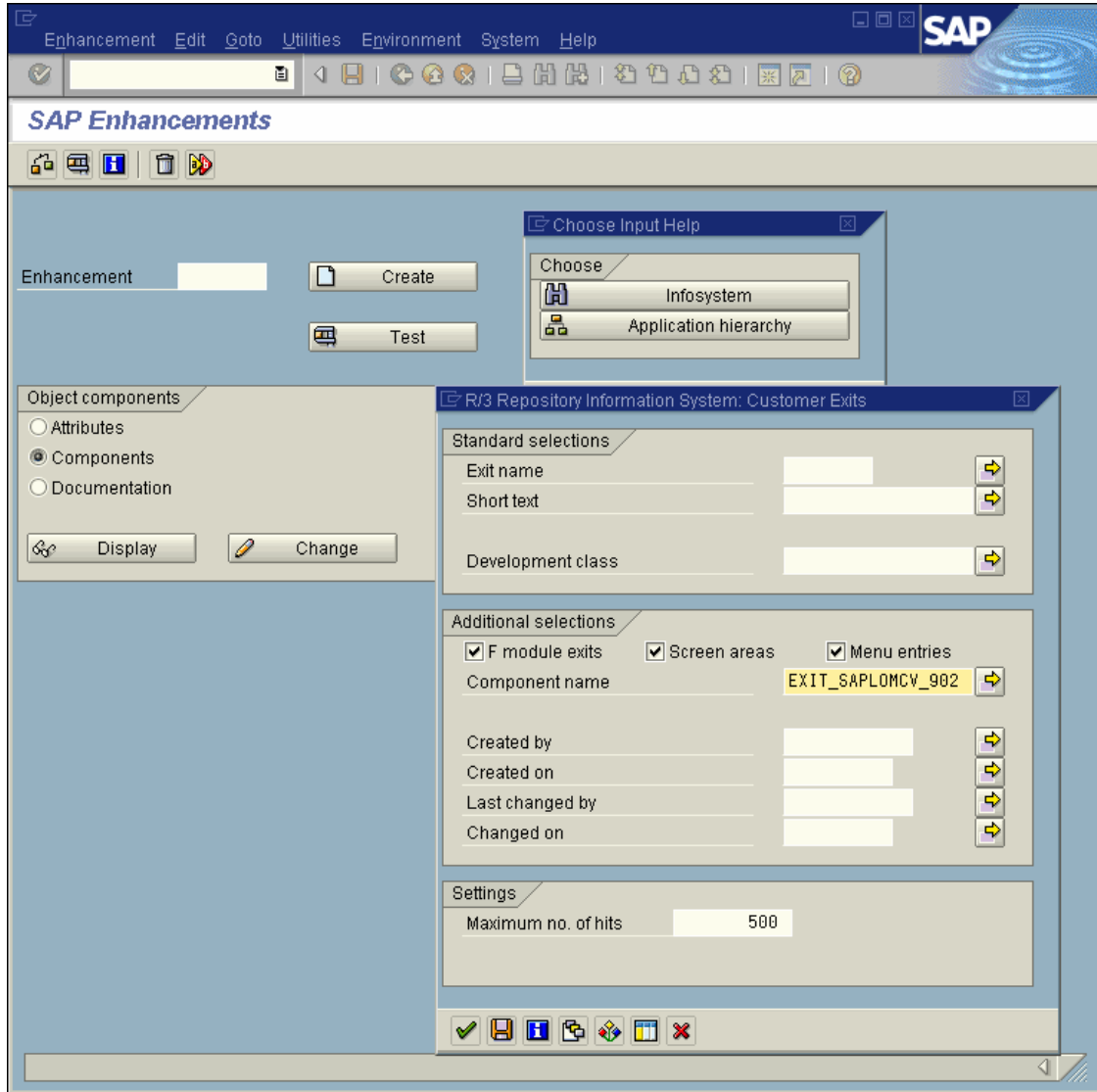
Material Number Ranges and Formatting

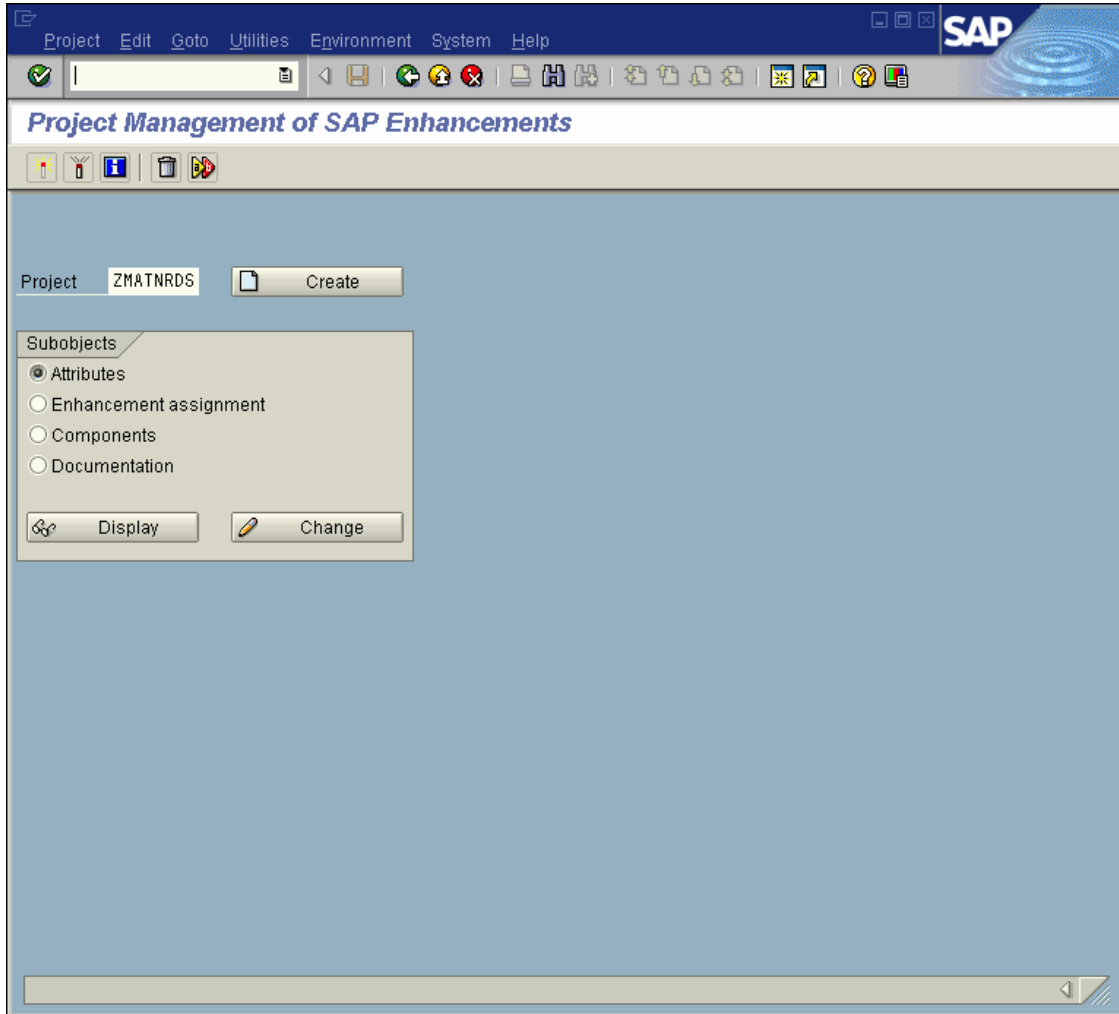The standard enhancement for material number customer functions is MGA00003.

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Material Number Ranges and Formatting

The standard enhancement contains all four of the customer functions contained in the conversion exits. It does not matter that we aren't using the others. Alternatively, we could create a custom enhancement that contains only the customer function we are using.

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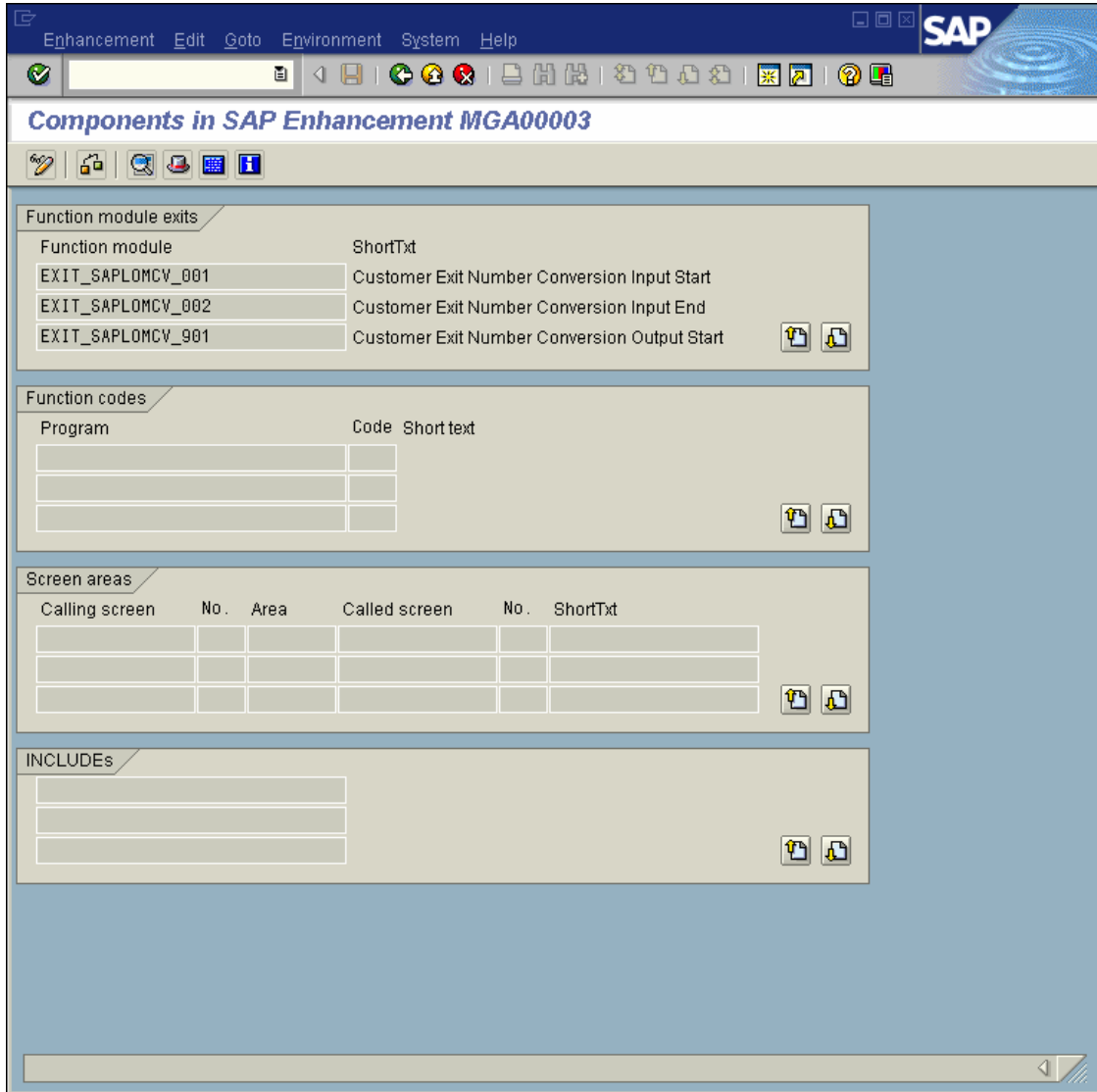
Material Number Ranges and Formatting

Step 5   Create a Project (CMOD)

Using transaction CMOD, create a customer specific project. Customer specific projects must begin with the letter 'Z'.

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Step 6 Assign the Enhancement to the Project

One or more enhancements (SMOD) can be assigned to a project. In this case, we will assign the standard material number enhancement.

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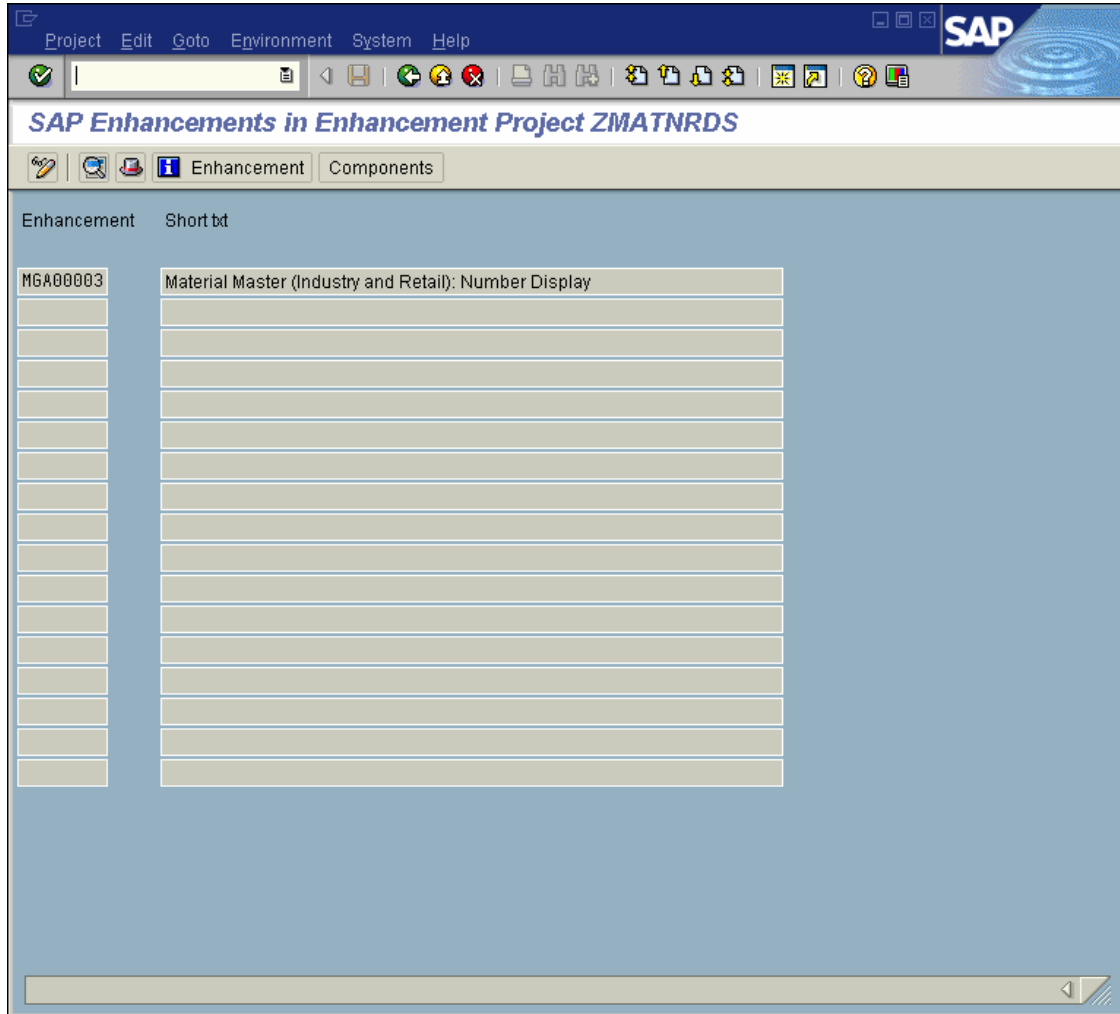
Step 7   Activate the Project
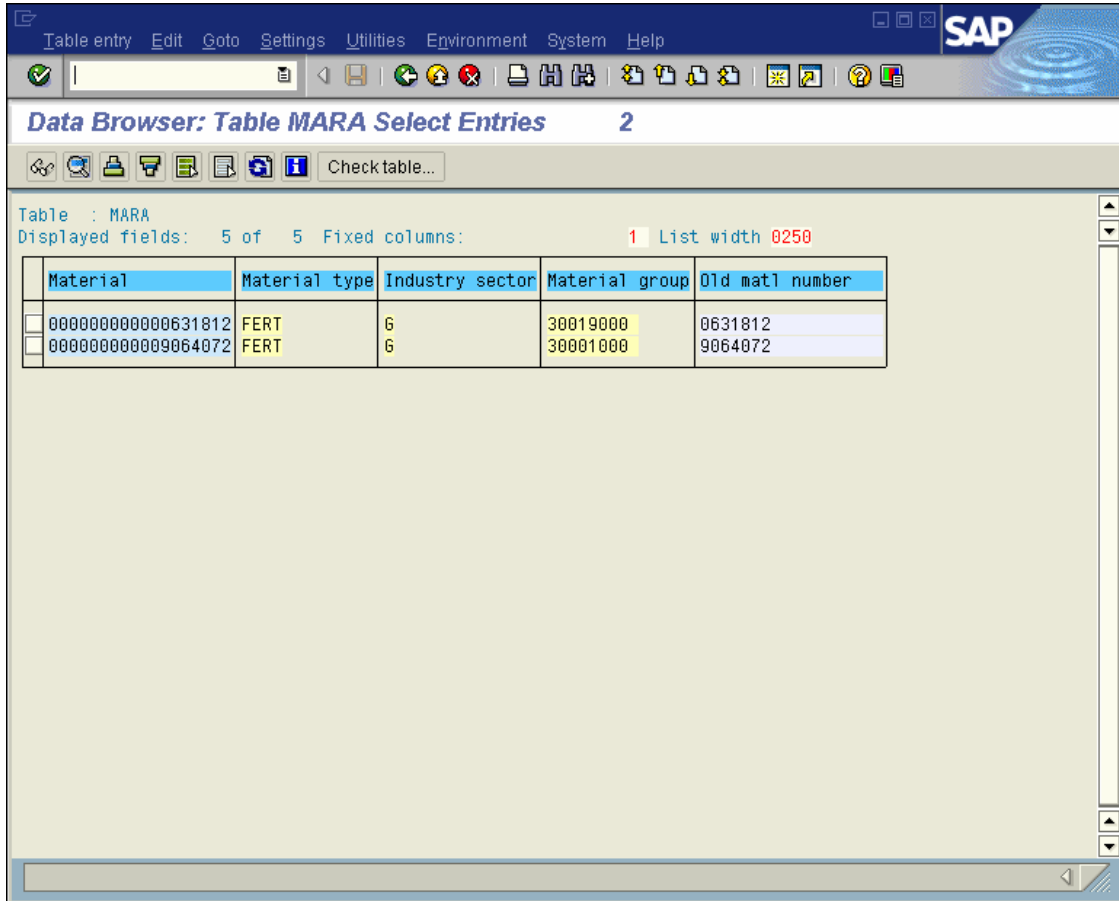
On the main screen of transaction CMOD are the activate/deactivate buttons. The project must be activated from this screen.

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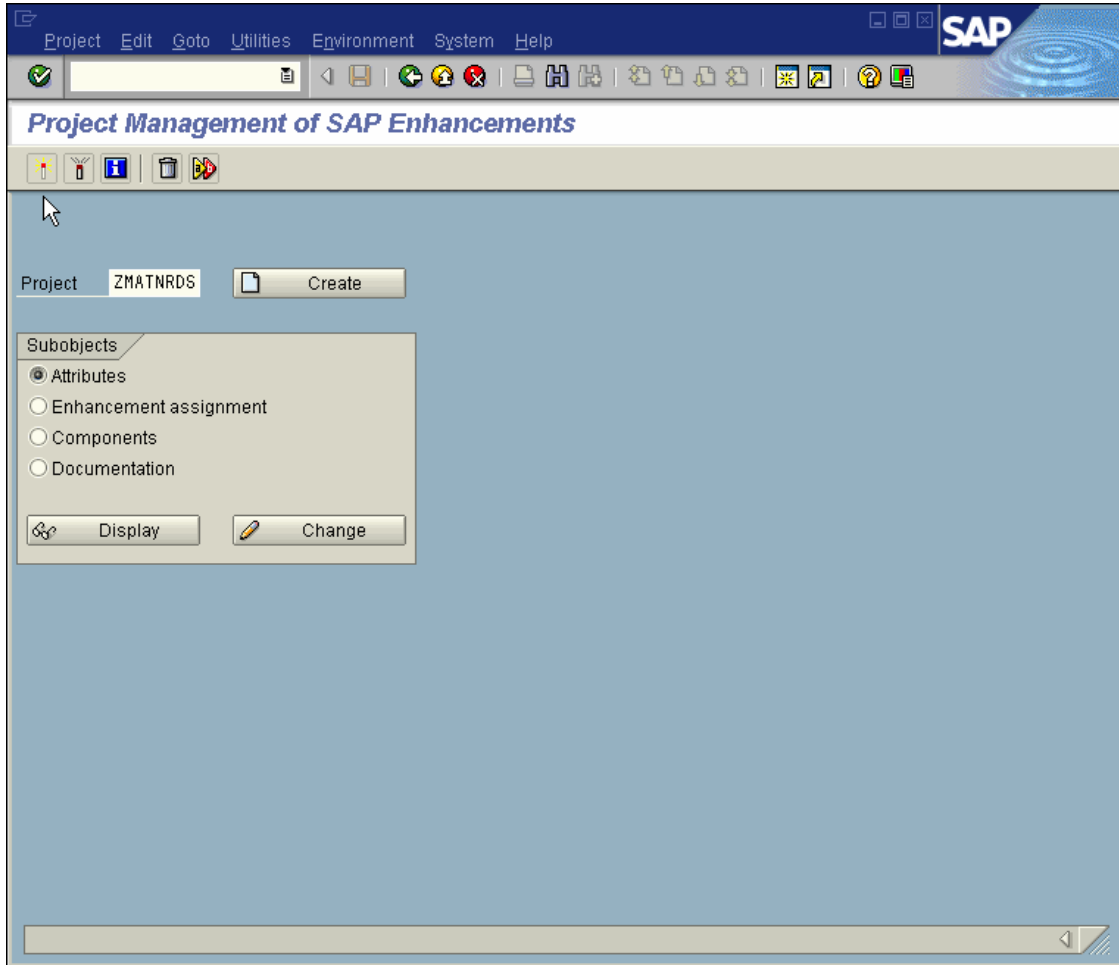
Step 8   Test the New Logic

Using transaction SE16, two MARA records are displayed. The conversion exit does not execute until the record detail is displayed. The material number internal format has not changed. It is still eighteen bytes, zero filled.

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Material Number Ranges and Formatting

Below is the detail view of the record containing the six byte material number. The logic added one leading zero to the number for output.

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Material Number Ranges and Formatting

Below is the detail view of the record containing the seven byte material number. The logic was not applied to this number.

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