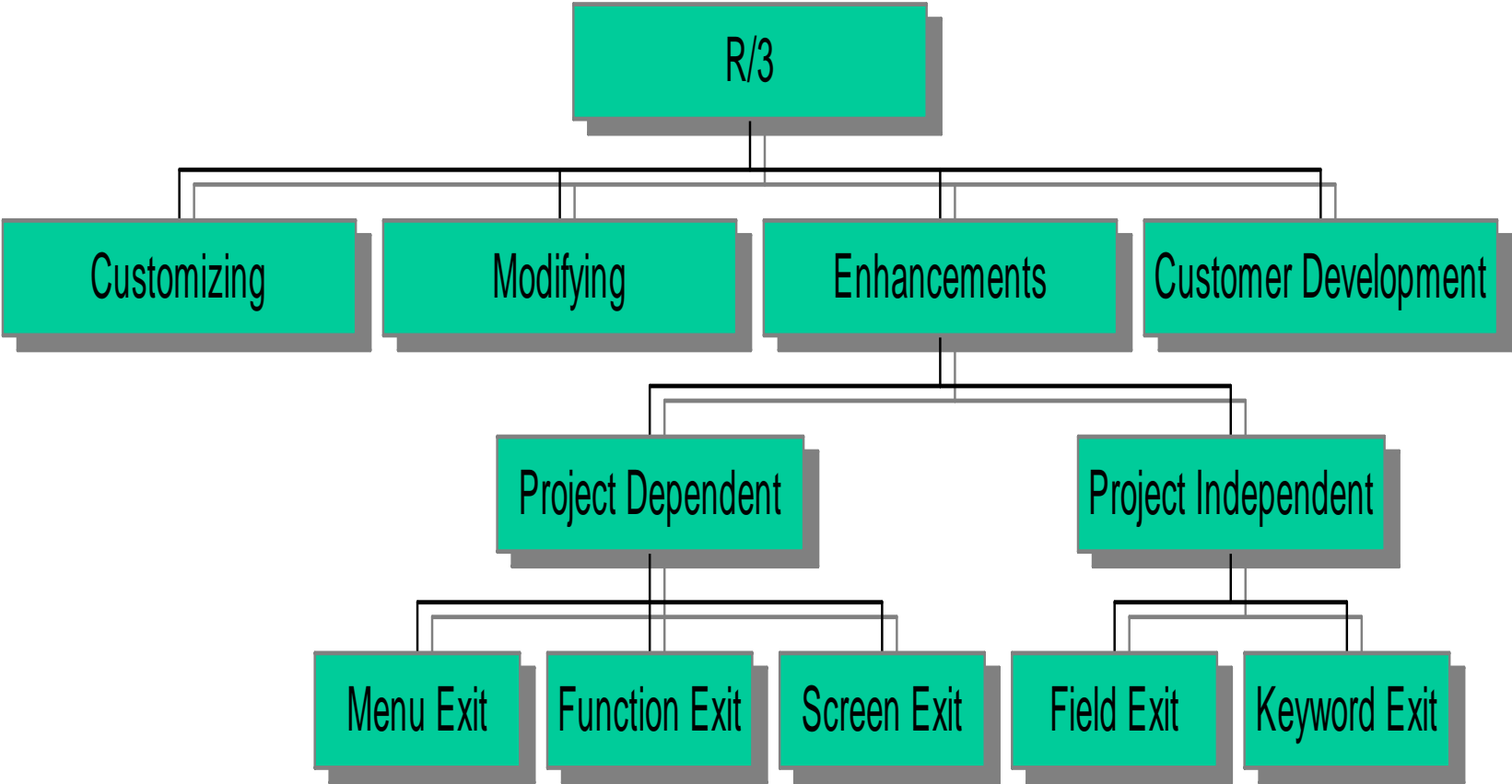


Enhancements to SAP Objects

- **SAP has developed various modules with standards, but the requirements of customers differ from place to place. In this scenario it becomes imperative to modify SAP objects to suit the customers need.**
- **The R/3 enhancement concept allows you to add your own functionality to SAP 's standard business applications without having to modify the original applications. SAP creates customer exits for specific programs, screens, and menus within standard R/3 applications.**

ADAPTABILITY OF SAP



There are four different ways of adapting the SAP system to fit your needs :

- **Customizing : Configuration of system parameters via a special user interface, the possible changes are preplanned and organized. Customizing is required during implementation of the system.**
- **Modification : Alteration of SAP Repository objects in the form of custom changes when SAP changes occur, the customer version and the new SAP version must be reconciled manually.**
- **Enhancement concept : Changing of SAP Repository objects by the customer without modification.**
- **Custom development : Creation of custom objects within the customer name range.**

Modification and Customer development involve high maintenance and costs. Hence use these only when customer requirements are not met by customizing or by user exits.

Advantages of Enhancements

- **There are two main reasons why you should use exits rather than modifying SAP software yourself.**

Add-ons attached to exits have the advantage that:

- **They do not affect standard SAP source code.**
- **They do not affect software updates.**

Enhancements can be achieved by Exits.

There are three types of exits:

- **Menu Exits**
- **Screen Exits**
- **Function module Exits**

Locating Applications that Have Exits

- SAP organizes its exits in packages are called SAP enhancements. Each SAP enhancement can contain many individual exits.
-

Choose *utilities -->Enhancements --> Project Management* from the ABAP Workbench menu.

From here, choose *utilities --> SAP enhancements* to call a selection screen that lets you look for the exits available in the standard applications. To list all the enhancements in the entire system, choose the *Execute* function without specifying any selection criteria.

Searching in the Application Hierarchy

Application Hierarchy can be accessed by choosing
ABAP Workbench --> Overview --> Application hierarchy.

For a particular application area, for example exits associated with Material Management, proceed as follows:

- Place the cursor on the *material management* branch of the application tree and choose *sel / dsel --> repository infosys*.
- Expand the *Environment* sub-tree in the repository information system.
- Expand the *Exit Techniques* sub-tree. Choose either Enhancements or Projects.
- Choose *Execute*.

MENU EXITS

- **Menu exits allow you to attach your own processes to action menu items. For this, the SAP applications programmer reserves certain menu entries in the GUI interface.**
- **The Menu exit entries have function codes that begin with + (Plus sign).**
- **Once you activate the menu exits, they become visible in the application. When the menu item is selected, either the functionality provided by the SAP applications programmer or your own functionality implemented in the program exit is processed.**

Step-by-step process of creating Menu Exits

- **Evoke the Transaction code CMOD or alternatively you can use the path *tools --> ABAP workbench --> utilities --> Enhancements --> Project Management.***
- **Specify a Project name in the Enhancement Text box.**
- **Click on the create icon on the screen. For example let us create an enhancement project say zuser.**



Project Management of SAP Enhancements



Project **ZUSER**   Create

Subobjects

- Attributes
- Enhancement assignment
- Components
- Documentation

 Display  Change

- In the next screen enter the description of the project.
- Save the changes made so far in the development class.

The screenshot shows the SAP 'Attributes of Enhancement Project' screen for project ZUSER. The 'Short text' field is highlighted with the value 'Creating MenuExits'. Below this are two sections: 'Administration data' and 'Activation', each containing a table of project details.

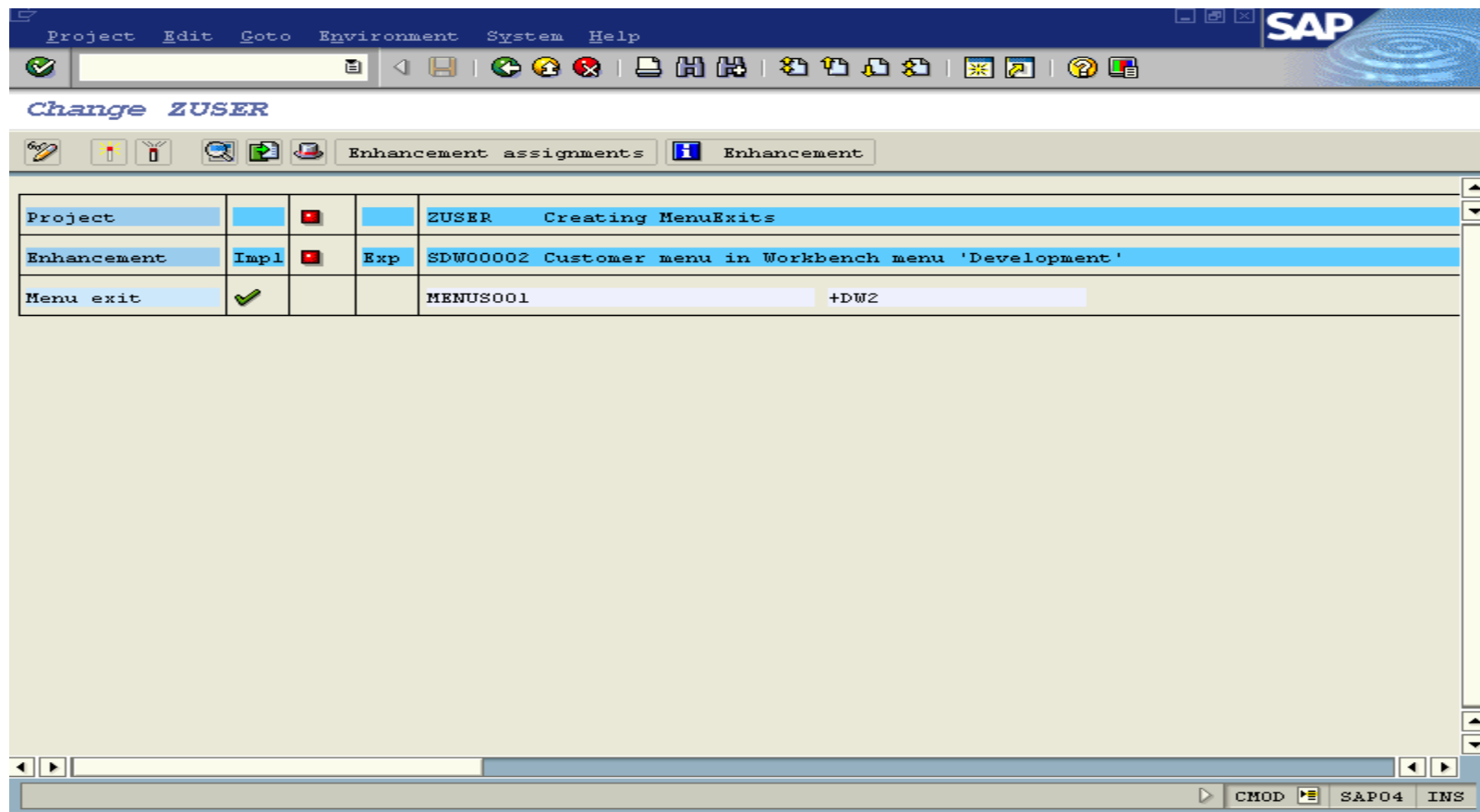
Administration data			
Development class	ZVIS		
Original language	EN		
Created by	DEVELOP		07.01.2002
Last changed on/by	DEVELOP		10.01.2002

Activation			
Status of project	Inactive		
Changed	DEVELOP		10.01.2002

At the bottom right of the screen, the status bar shows 'CMOD', 'SAP04', and 'INS'.

Choose *Edit component*.

The system displays technical information about the menu entry. It also displays two input fields where you can specify a language and the text you want your menu item to have.



The screenshot shows the SAP menu configuration interface. The title bar reads "Change ZUSER". Below the title bar is a toolbar with various icons. The main area contains a table with the following data:

Project		<input type="checkbox"/>		ZUSER	Creating MenuExits
Enhancement	Impl	<input type="checkbox"/>	Exp	SDW00002	Customer menu in Workbench menu 'Development'
Menu exit	<input checked="" type="checkbox"/>			MENUS001	+DW2

The bottom status bar shows "CMOD" and "SAP04 INS".

Enter the name of your menu function (such as *test menu*) in the field *New text*.

- **Choose *Save text*.**

Your special menu function will not appear in the pulldown menu of the corresponding standard transaction until you activate your enhancement project.

Change ZUSER

Enhancement assignments **Enhancement**

Project				ZUSER Creating MenuExits
Enhancement	Impl		Exp	SDW00002 Customer menu in Workbench menu 'Development'
Menu exit				MENUS001 +DW2

Change ZUSER

Function code

Language

Function text

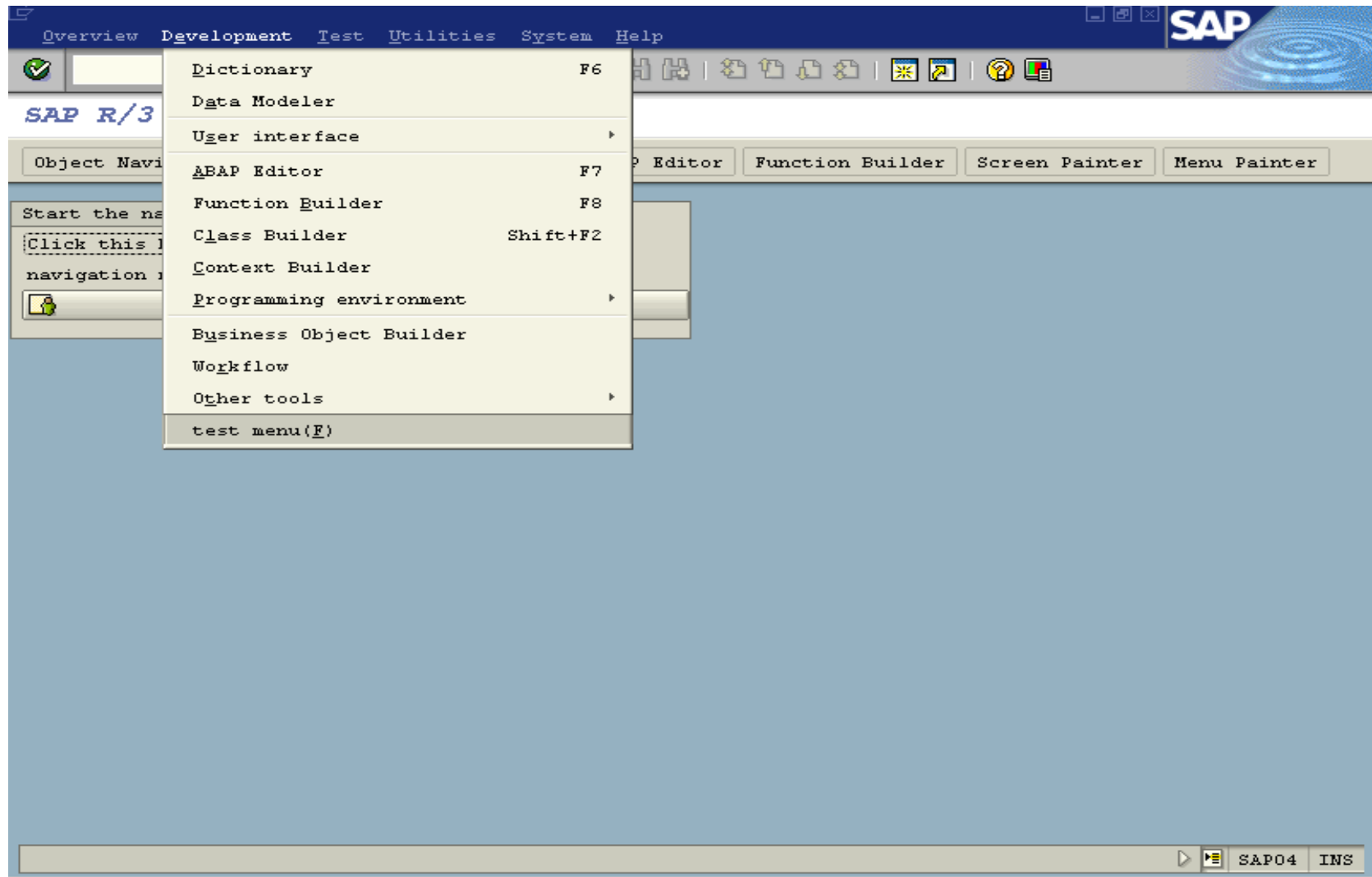
Icon

Icontext

Info. text

Copy Other language

- After activation the menu will be visible on the standard menu for the transaction S001.



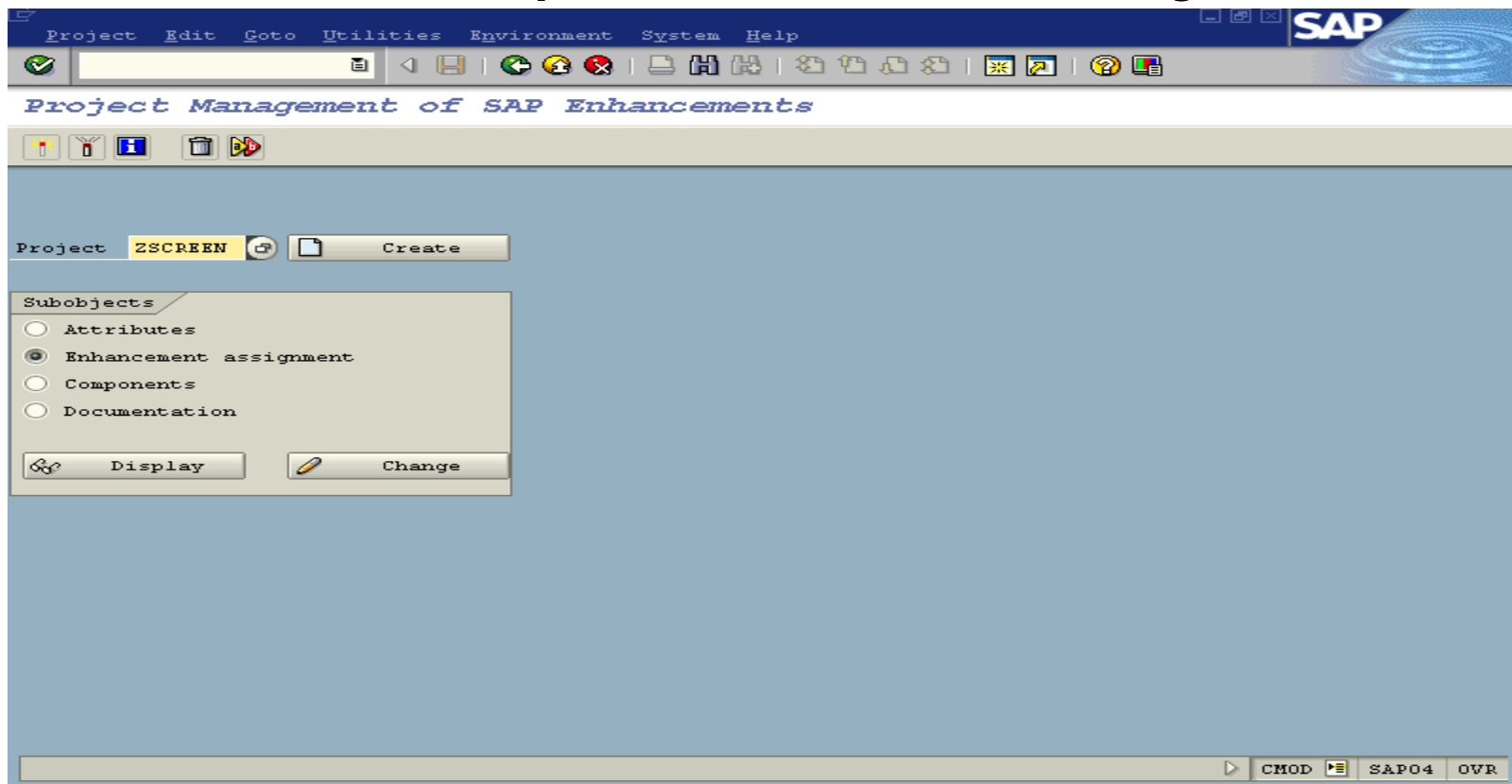
Screen Exits

- **Screen exits add fields to screens in R/3 applications. SAP creates screen exits by placing special subscreen areas on a standard R/3 screen and calling a customer subscreen from the standard screen's flow logic.**

Step-by-step process of creating Screen Exits

From the main screen of the *Project management* transaction, proceed as follows:

- Select *Enhancement components* and choose *Change*.



Project Edit Goto Environment System Help

Change ZSCREEN

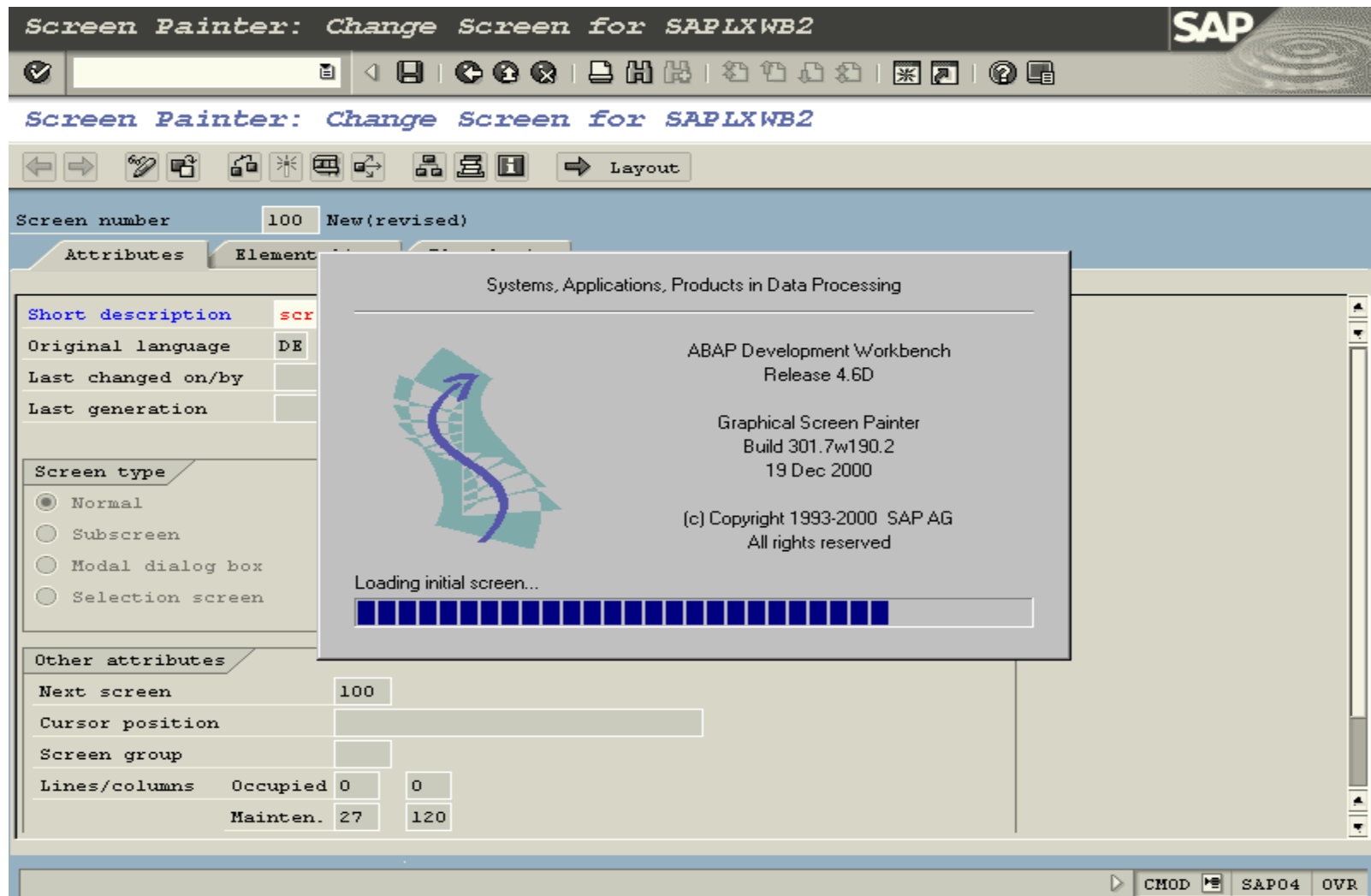
Enhancement assignments Enhancement

Project			ZSCREEN screen exits
Enhancement	Impl	Exp	MM06E005 Customer fields in purchasing document
Function exit	✓	●	EXIT_SAPMM06E_006
	✓	●	EXIT_SAPMM06E_007
		●	EXIT_SAPMM06E_008
		●	EXIT_SAPMM06E_009
		●	EXIT_SAPMM06E_012
		●	EXIT_SAPMM06E_013
		●	EXIT_SAPMM06E_014
		●	EXIT_SAPMM06E_016
		●	EXIT_SAPMM06E_017
		●	EXIT_SAPMM06E_018
Screen exit	✓	●	SAPMM06E 0101 CUSTSCR1 SAPLXM06 0101
	✓	●	SAPMM06E 0111 CUSTSCR1 SAPLXM06 0111
	✓	●	SAPMM06E 0201 CUSTSCR1 SAPLXM06 0201
	✓	●	SAPMM06E 0211 CUSTSCR1 SAPLXM06 0211
	✓	●	SAPMM06E 0301 CUSTSCR1 SAPLXM06 0301
	✓	●	SAPMM06E 0311 CUSTSCR1 SAPLXM06 0311
Include tables	✓		CI_EKKODE
			CI_EKPODE

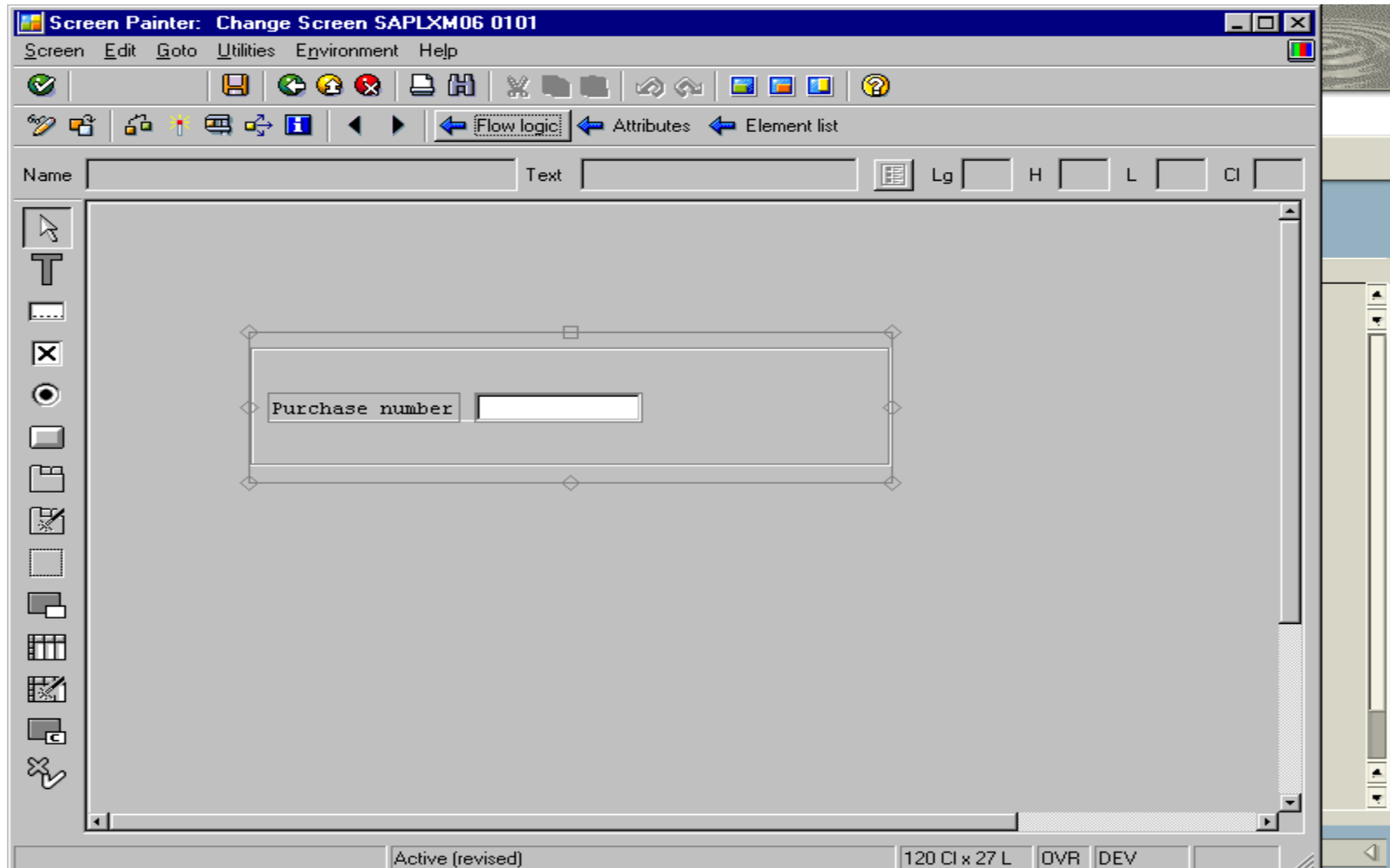
Components of ZSCREEN saved

- Choose the screen exit and double click on it

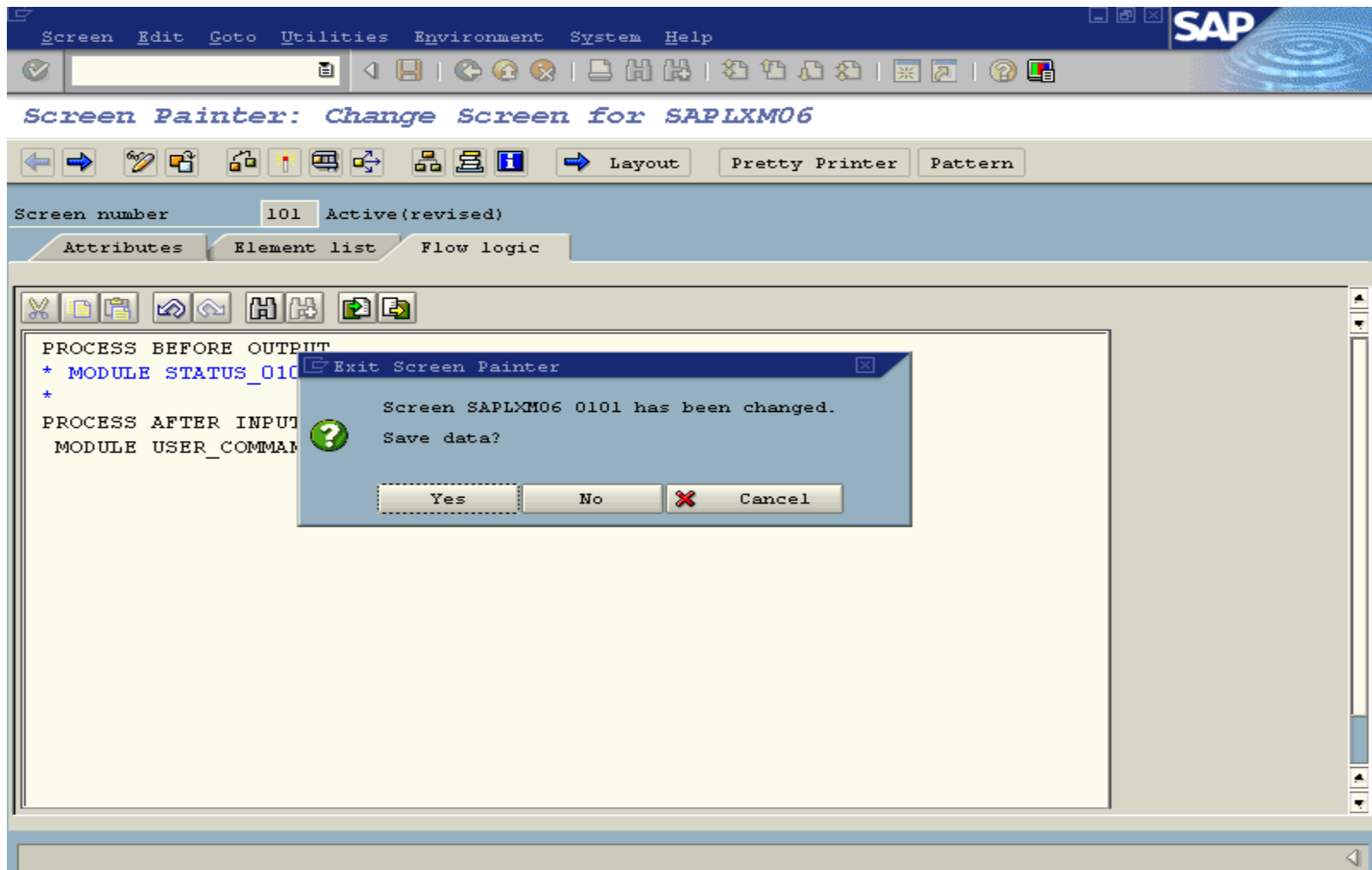
- Create your subscreen using the Screen Painter.



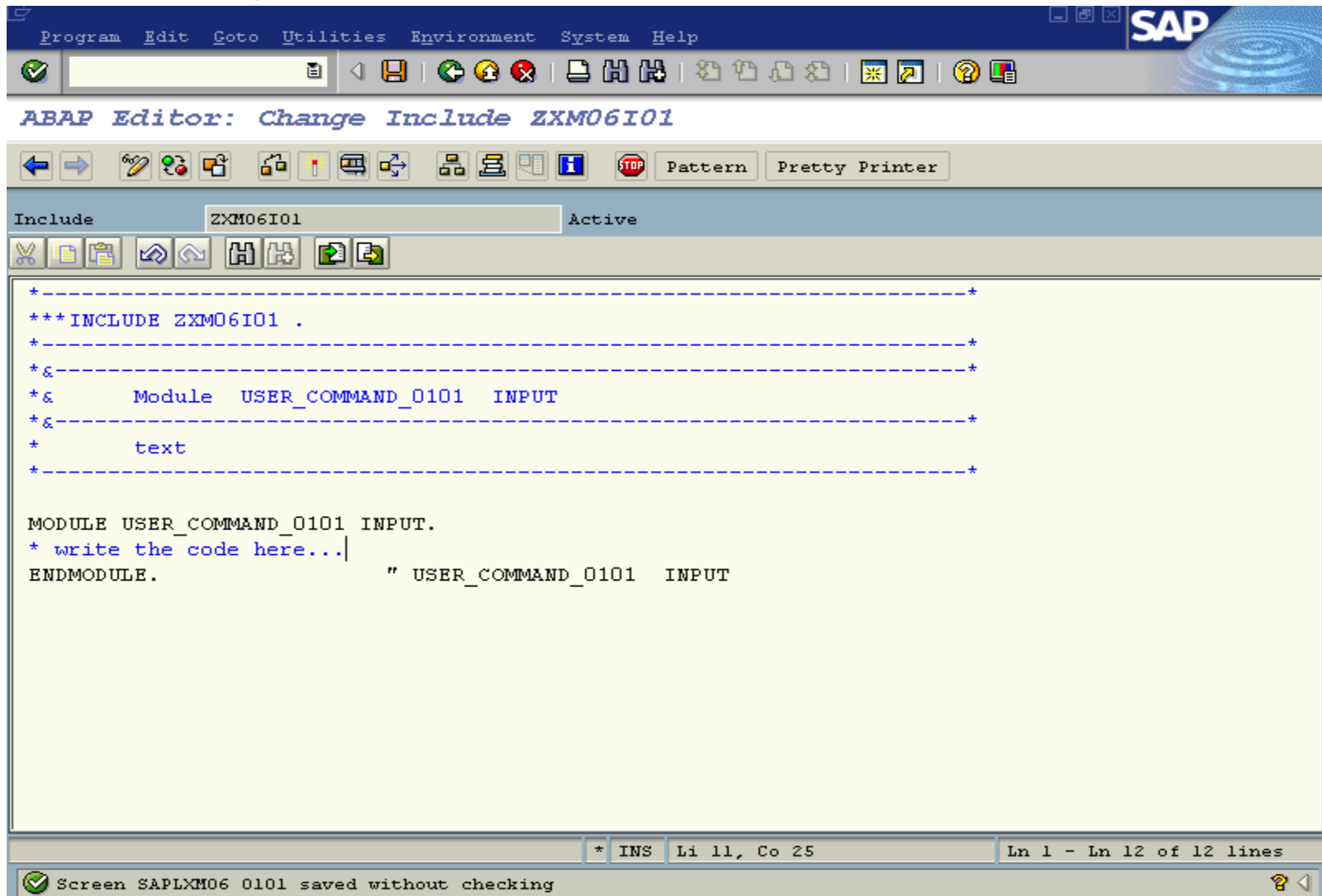
- Design your screen to be added to the standard screen and activate the particular screen and return back to the flow logic .



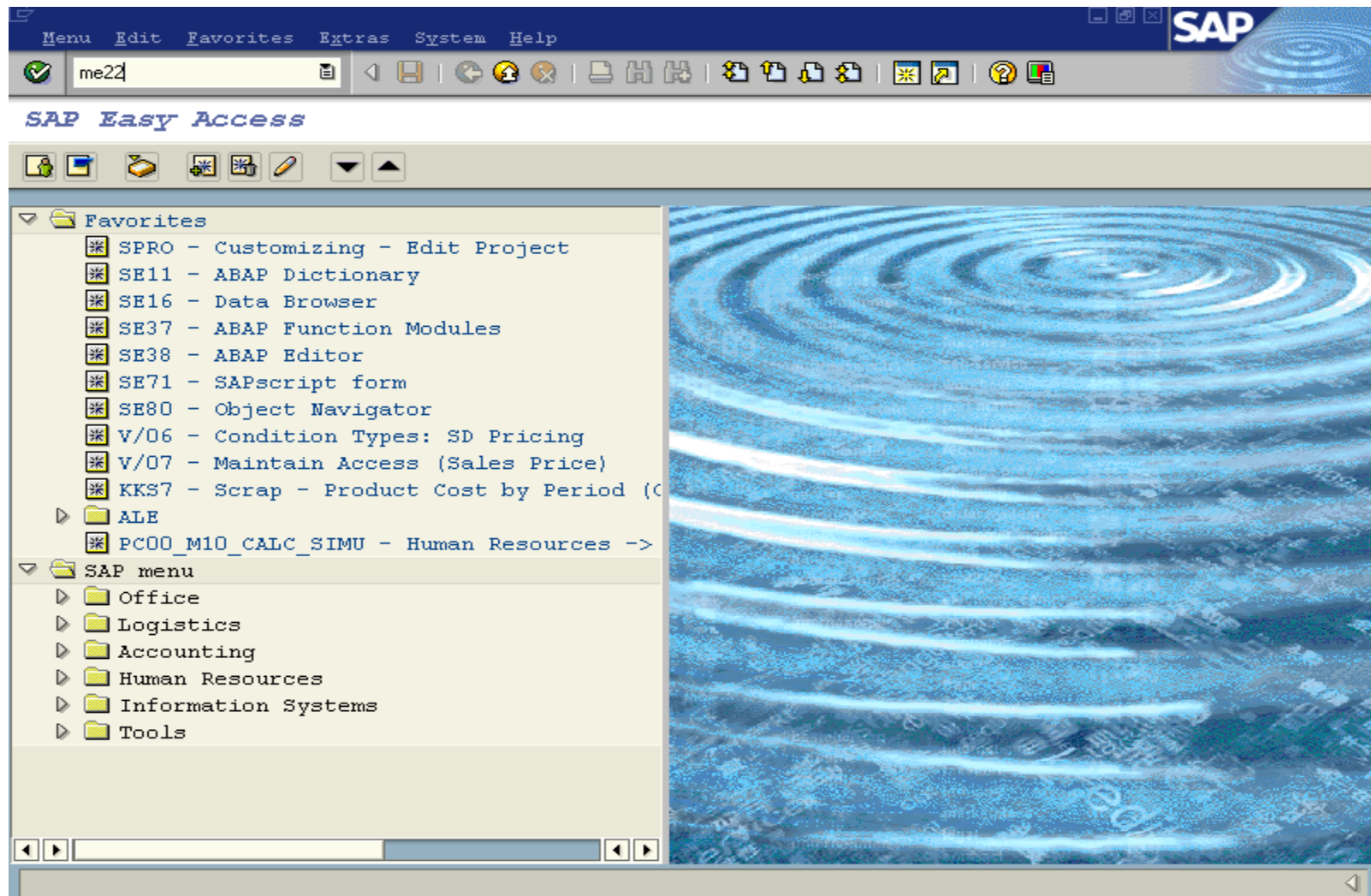
Choose the PAI and PBO to write down the logic.



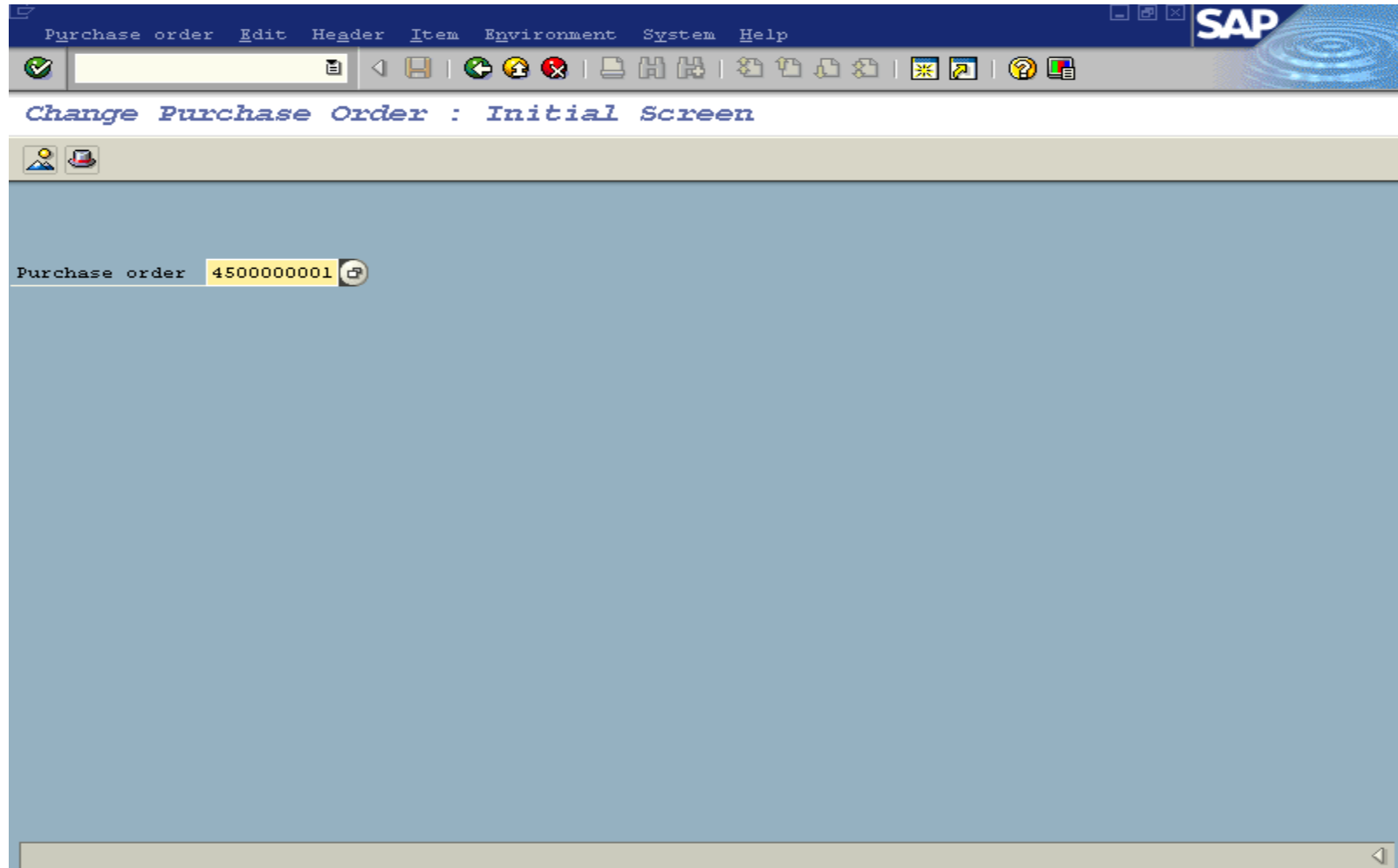
- Generate your screen and choose **Back** (the green arrow) to return to the *Project management* transaction.



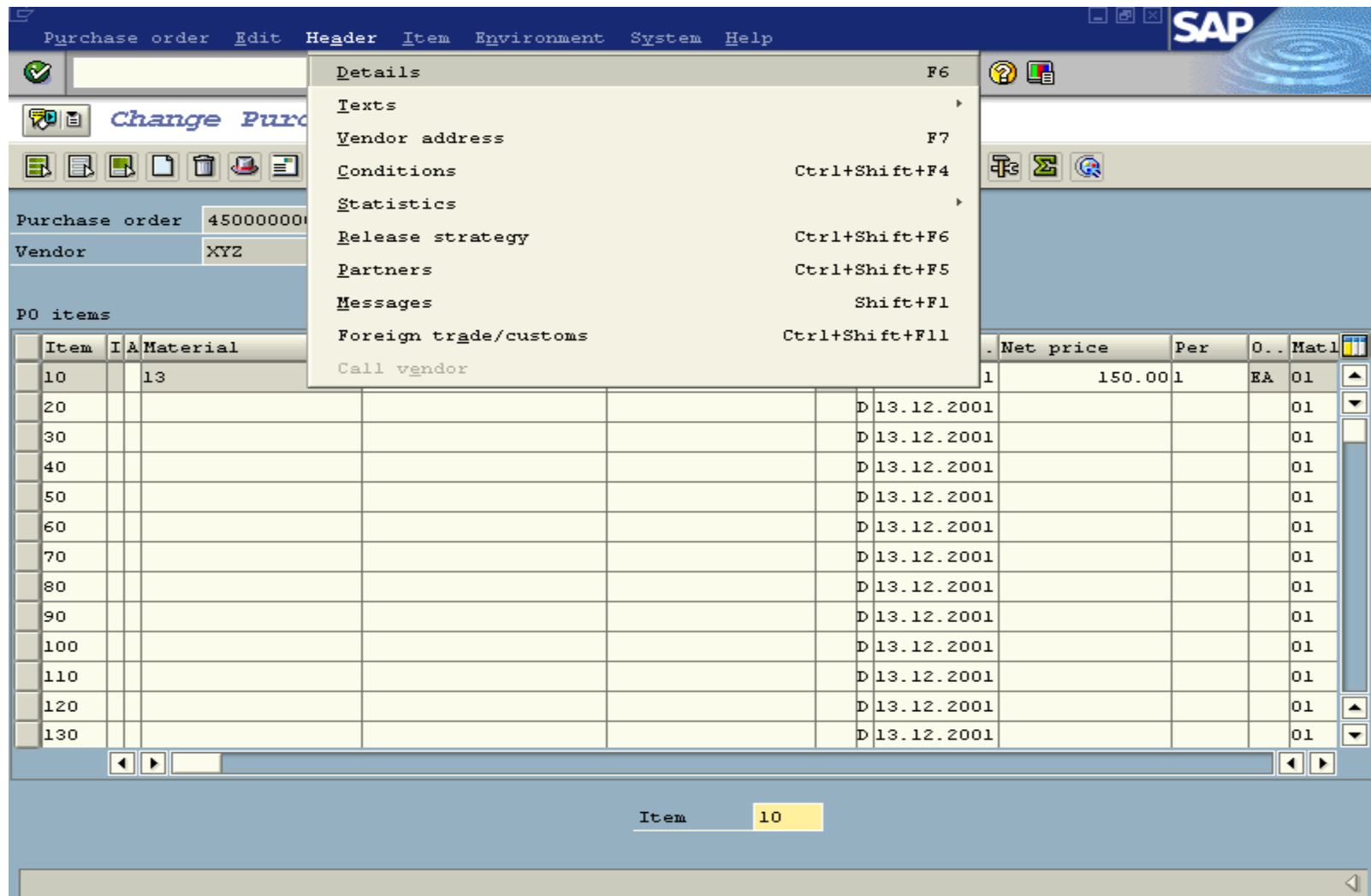
- Go to the transaction ME22 to view the customer defined screen exit.



- Enter the purchase order number and press Enter.



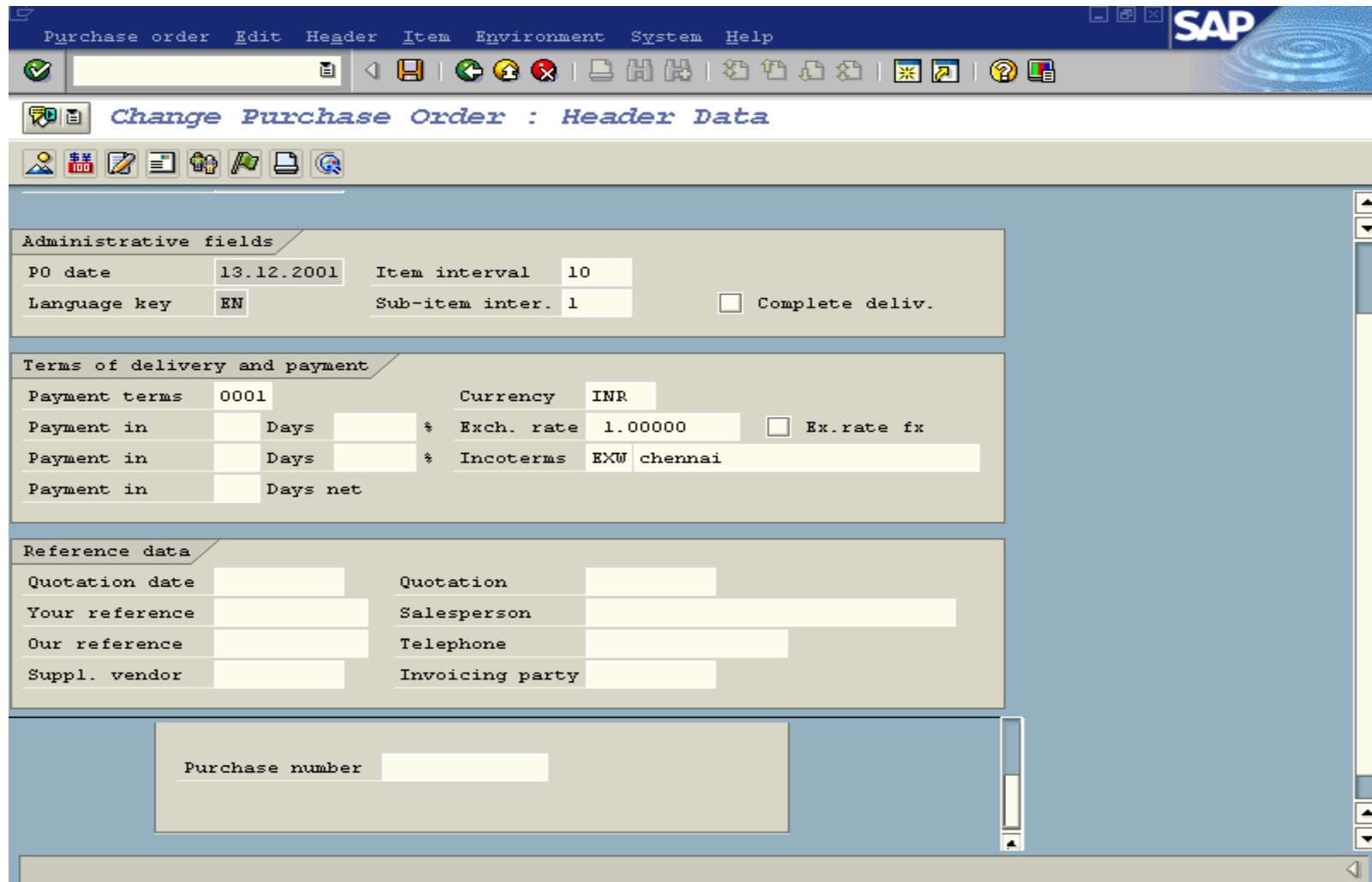
Go to the menu header --> Details.



The screenshot shows the SAP Purchase Order (PO) details screen. The menu 'Details' is open, showing options such as 'Details', 'Texts', 'Vendor address', 'Conditions', 'Statistics', 'Release strategy', 'Partners', 'Messages', 'Foreign trade/customs', and 'Call vendor'. The main table displays PO items with columns for Item, I, A, Material, and Date. The first row shows Item 10, Material 13, and a date of 13.12.2001. The 'Net price' column shows 150.00 for Item 10. The 'Per' column shows 1, and the 'O..' column shows EA. The 'Matl' column shows 01. The status bar at the bottom indicates 'Item 10'.

Item	I	A	Material	Date	Net price	Per	O..	Matl
10			13		150.00	1	EA	01
20				D 13.12.2001				01
30				D 13.12.2001				01
40				D 13.12.2001				01
50				D 13.12.2001				01
60				D 13.12.2001				01
70				D 13.12.2001				01
80				D 13.12.2001				01
90				D 13.12.2001				01
100				D 13.12.2001				01
110				D 13.12.2001				01
120				D 13.12.2001				01
130				D 13.12.2001				01

- Purchase number is visible on the standard screen.



The screenshot shows the SAP 'Change Purchase Order : Header Data' screen. The title bar includes 'Purchase order Edit Header Item Environment System Help' and the SAP logo. The main content area is divided into several sections:

- Administrative fields:**
 - PO date: 13.12.2001
 - Item interval: 10
 - Language key: EN
 - Sub-item inter.: 1
 - Complete deliv.
- Terms of delivery and payment:**
 - Payment terms: 0001
 - Currency: INR
 - Payment in: Days, Exch. rate: 1.00000, Ex.rate fx
 - Payment in: Days, Incoterms: EXW chennai
 - Payment in: Days net
- Reference data:**
 - Quotation date: []
 - Quotation: []
 - Your reference: []
 - Salesperson: []
 - Our reference: []
 - Telephone: []
 - Suppl. vendor: []
 - Invoicing party: []
- Purchase number:** []

Function module Exits

- **Function module exits allow you, as customer, to implement additional logic in an application function. The SAP applications programmer defines where in the application function the function module exits are placed and which data is to be transferred. The programmer also creates the related function modules with short text, interface, and documentation and describes the intended functionality of the function module exit in the SAP documentation.**
- **You code the function modules, and if needed the screens, text elements, and your own Includes for the function group.**
- **After you activate the enhancement project that contains the function module as component the ABAP/4 code will be processed. Before that, the program exits have no effect.**

Step-by-step process of creating Functional module Exits.

From the main screen of the *Project management* transaction, or transaction CMOD proceed as follows:

- **Select *Enhancement components* and choose *Change*.**

Project Edit Goto Utilities Environment System Help

SAP



Project Management of SAP Enhancements

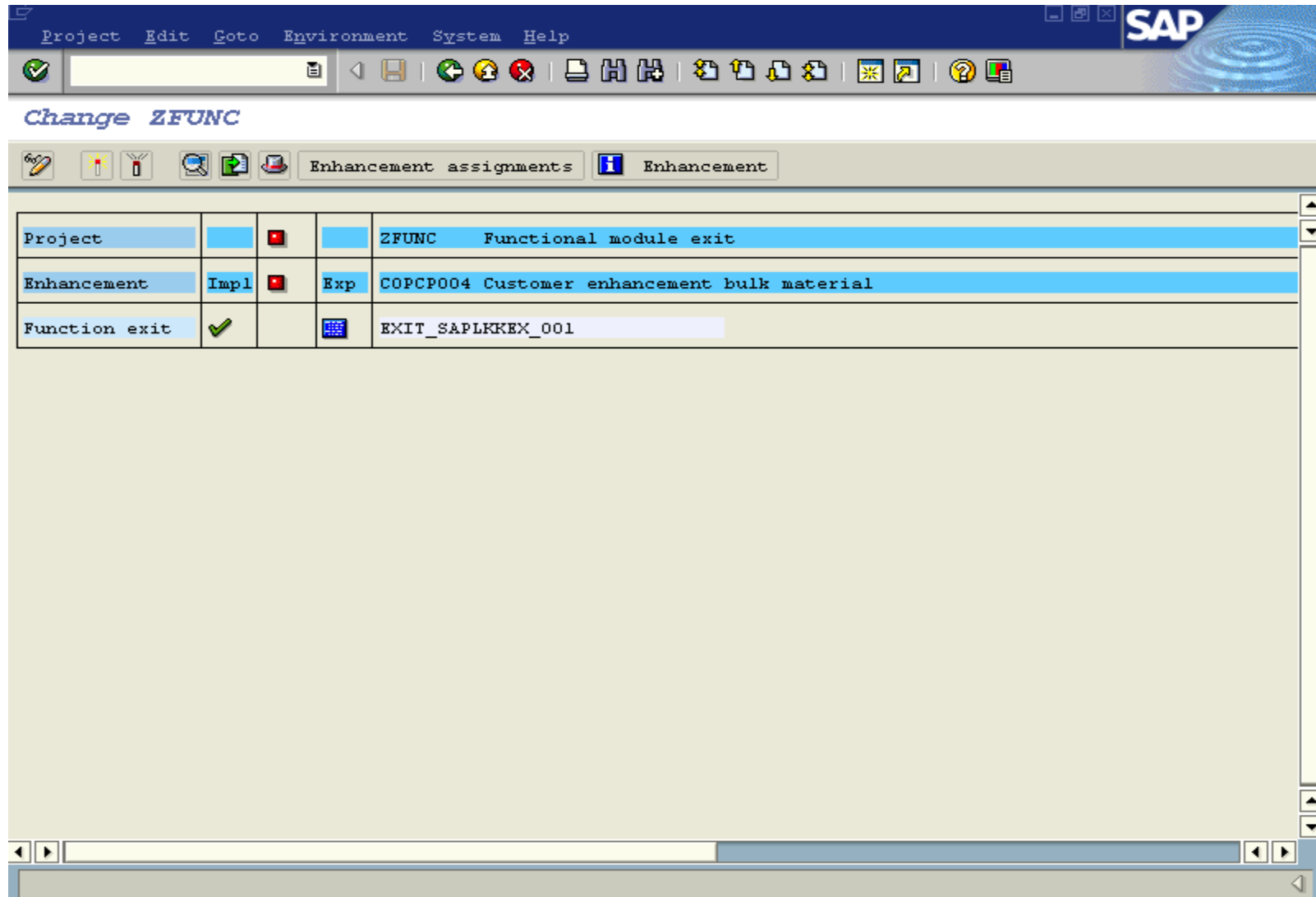


Project

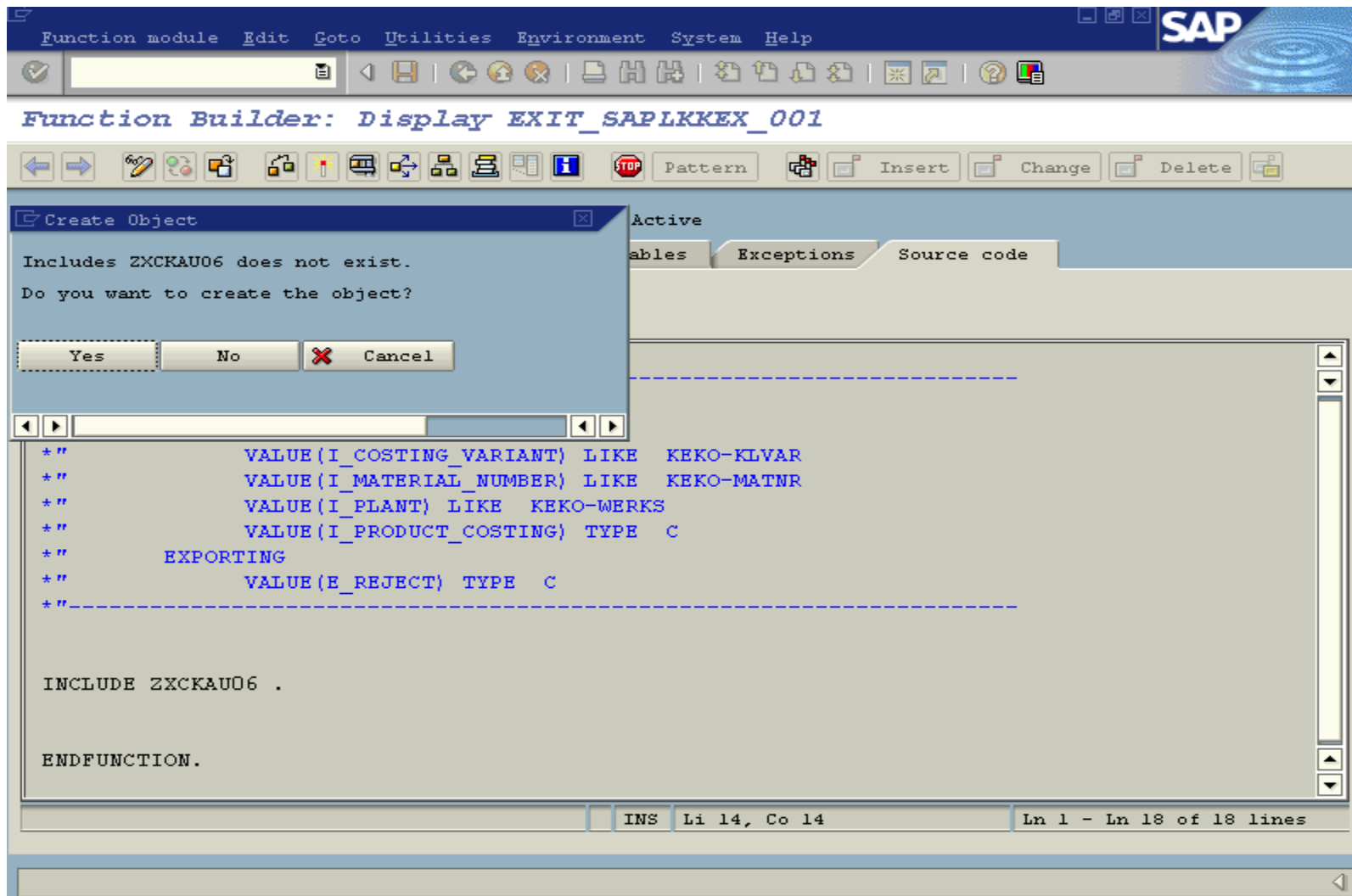
Subobjects

- Attributes
- Enhancement assignment
- Components
- Documentation

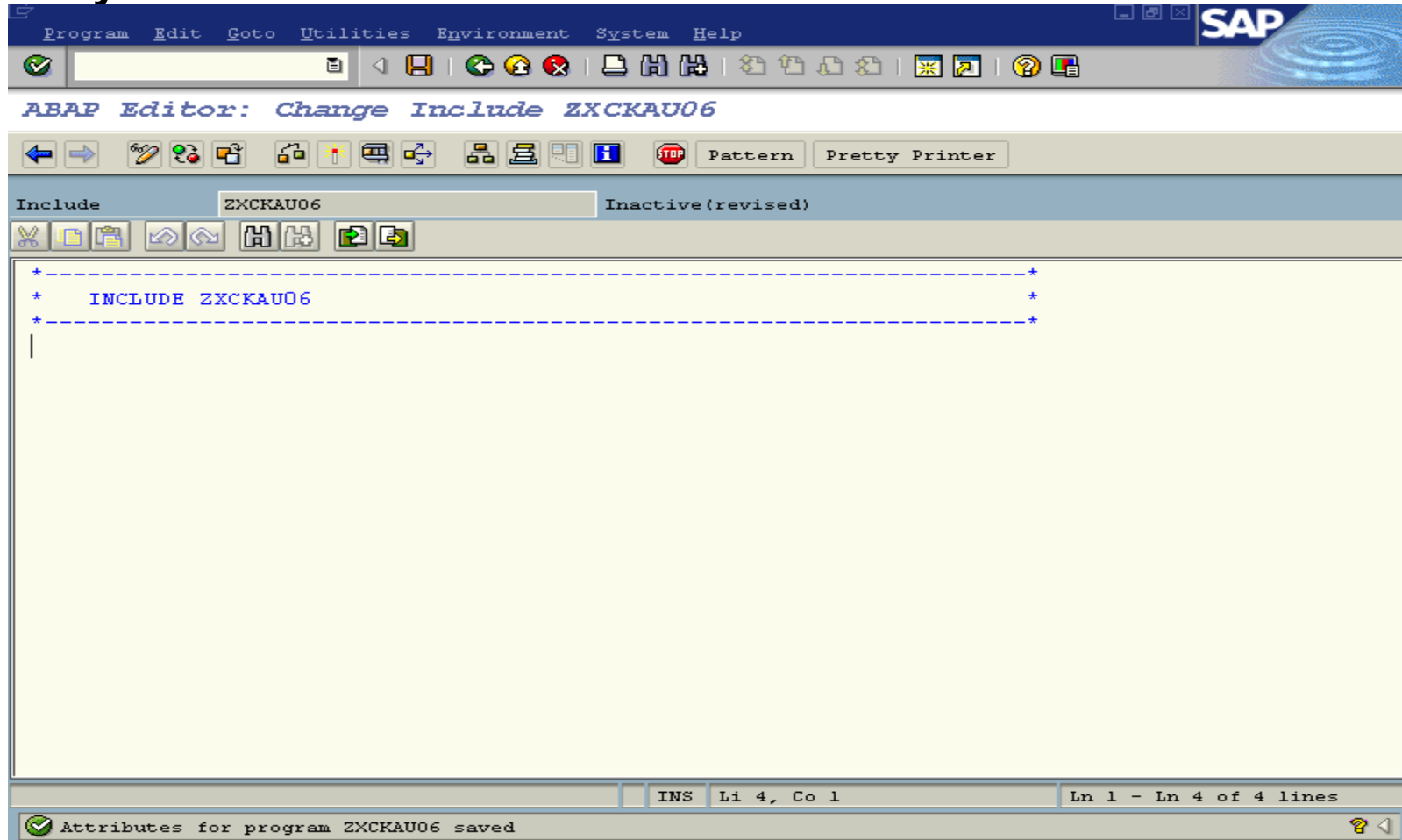
- Call the function module's include program by double-clicking on it.



- Confirm that you want to create the include program.



- Enter your function's source code in the editor.



- Save and Activate your include program.

Registering the Modification in SSCR

- **A registered development user registers changes in SAP sources and manual changes of SAP Data Dictionary objects. Exceptions to such registration are matchcodes, database indices, buffer settings, customer objects, patches and objects whose changes are based on automatic generation. If the same user changes the object again at a later time, no new query is made for the registration key. Once an object is registered, the related key is locally stored and copied automatically for later changes, regardless of which registered user is making the change.**

How do you benefit from SSCR (SAP Software Change Registration)?

- **Quick error resolution and therefore high availability of modified systems**

All the changed objects are logged by SAP. Based on this information, SAP' s First Level Customer Service can quickly localize and remove the causes of problems. This increases the availability of your R/3 system.

- **Dependable Operation**

The necessity to register will likely prevent unintended modifications. This in turn promises the dependable operation of your R/3 system.

- **Simplification of upgrades**

Upgrades and release changes become considerably easier because of fewer modifications.

Procedure for a Registered Modification

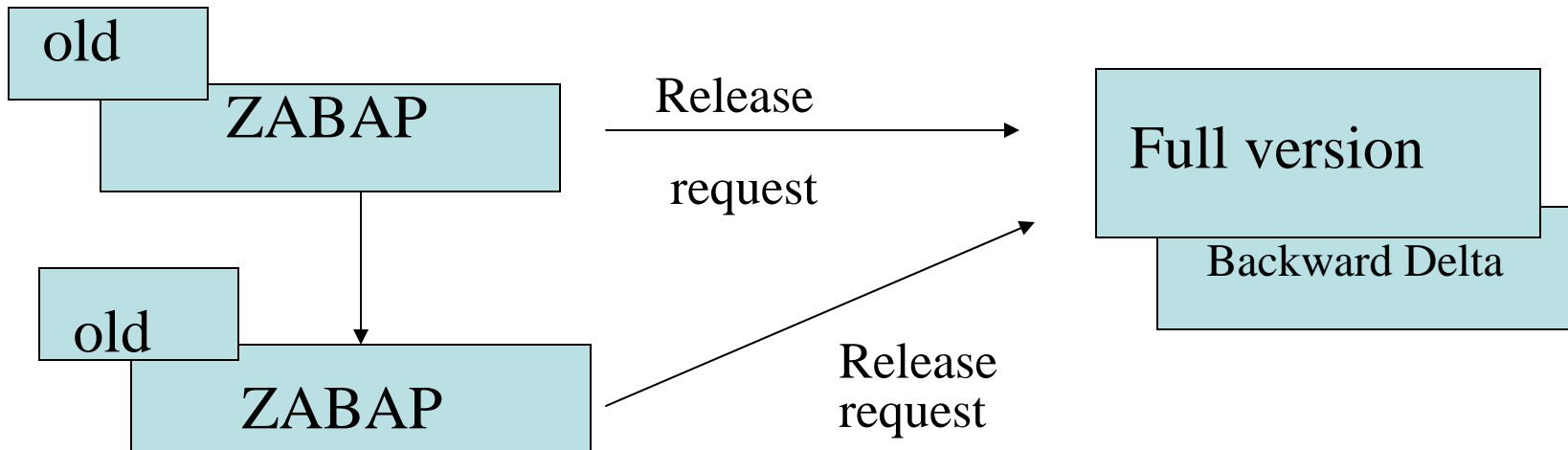
If you change one of the SAP's Repository objects, the Workbench Organizer will require a change request, same as if you were creating your own object.. The object is automatically added to a repair task.

- Once the development is completed, the Programmer releases the task. The objects and the object locks are transferred from the task to the change request..**
- Once the project is completed, you release the change request. This will remove the object locks of the change request.**
- Change request may be transportable or local. The WBO will automatically classify the change request depending upon the development class. Only transportable change request will be transferred to the transport system after their release.**
 - Immediately after the export a test import will check if all objects can be imported into the target system.**

- **Repository objects are exported to the central transport directory.**
- **The result of export and test import are recorded in the transport log of the change request to be verified by the programmer.**
- **The import into the target system is not automatic, rather it is initiated by the system administrator of the transport control program tp at the operating system level.**

Modification Adjustment at Release Change

- **The modifications must be adjusted to the new standard during release change.**
- **The same is true for maintenance upgrades.**
- **Procedure : Determination of overlap and manual adjustment.**



- When you release a change request, a complete version of all objects contained in the changes request is written to the versions database.
- If you later edit a Repository object again, the current object becomes the complete copy and the differences between the old and the new object are stored in the versions database as backward delta.
- When you assign a Repository object to a task, the system checks whether the current version agrees with the complete copy in the versions database. If not, a complete copy is created. This takes place the first time you change an object.

- **The versions of a Repository object are the basis for the modification adjustment .To support this adjustments,information on whether the version was created by SAP or by the customer is also stored**

Objects of the Modification Adjustment

- **Dictionary objects**
 - **Tables, Data Elements, Domains, Matchcodes, Views**
- **ABAP/4 Programs**
 - **Reports, Module Pools, Function groups**
- **Screens**
- **Menus**
- **Enterprise Data Models**

The object listed above are managed by version ,therefore they are included in the modification adjustment.

Modification Adjustment

- **The modification adjustment for Dictionary objects is done during the release change. Other Repository objects are adjusted after the release change.**
- **A Dictionary adjustment after the release change would result in the loss of new custom fields.**
- **The Dictionary adjustment is done with transaction SPDD, the adjustment of the remaining Repository objects with transaction SPAU.**

Rules for Modifications

- **Use the following rules when modifying or adjusting:**
 - **Try to concentrate the changes in one place (possibly by using Includes within the customer name range).**
 - **The workbench Organizer does not allow modifications by DDIC and SAP*.**
 - **Release open repairs and open requests containing repair objects prior to the release change. Such repairs and requests will be pointed out to your during the upgrade.**
 - **Never create custom programs within the SAP name range. You will find the customer name range in the SAP Style Guide.**
 - **Avoid modification adjustments by avoiding modifications.**

Avoiding the Adjustments

- **Try to avoid changing SAP objects to prevent the necessity for modification adjustments.**
- **By using program enhancements and appends for SAP tables you can enhance SAP object without having these changes overwritten by SAP during an upgrade.**
- **To avoid manual patches ,SAP offers online correction services in release 3.0 which allow automatic implementation and deimplementation of hot packages and patches**