PUBLIC

How To: Replace Enterprise Search for Material with Database Search or an Alternative Search Provider

Applicable Releases:

From MDG 6.1 and from SAP S/4HANA 1511

Version 2.0

May 2023

Document History

Document Version	Description
1.0	First official release of this guide
1.1	Adjustment for MDG7.0 (chapter 3.2.2 Example Coding)
1.2	Adjustment for MDG7.0 (chapter 5. Step by Step Explanation for MDG 7.0)
1.3	Chapter 3: Additional functional restriction
1.4	Small updates
1.5	Including SAP HANA-based search
1.6	Small updates
1.7	SAP note 2281401
2.0	Layout Update

1 Business Scenario

SAP Master Data Governance for Material (MDG-M) provides business processes to find, create, change, and mark material master data for deletion. It supports the governance of material master data on a central hub and the distribution of material master data to connected operational and business intelligence systems.

The processes are workflow-driven and can include several approval and revision phases, including collaboration between all users participating in master data maintenance.

For the standard delivery scope, MDG-M originally requires a fully configured Enterprise Search. This guide describes how to adapt MDG-M so that another search provider can be used. As of MDG 7.0 SP02 it is also possible to use SAP HANA-based search as alternative search provider. In S/4HANA the SAP HANA-based search is the default.

The example focuses on integrating a database search and SAP HANA-based search, but other search providers can be supported in a similar way.

Function in Detail: Material Processes
Search Options in SAP Master Data Governance

The following options are delivered:

You can use **SAP HANA-based search**.
- You can use it in a side-by-side approach or fully embedded if MDG itself runs on an SAP HANA database.
- Follow the Configuration Guide which is available on SAP Help.
- With SAP HANA-based search for MDG, the federated search is not supported. If you require search capabilities across systems and beyond the MDG system, Enterprise Search can still be used.

You can use **Enterprise Search.**
- You have installed and connected Enterprise Search either in embedded or federated form.

The following option is not delivered:

You can use **Database Search** in exceptional cases if the two delivered options are not feasible.
- Database Search is not released to be used in the context of master data governance for material for live systems – it is only intended to be used as a temporary workaround for POC/Test purposes.
- Please follow the extension guide Replace Enterprise Search by DB or alternative search provider which also lists the limited capabilities.

2 Background Information For Database Search Provider

An example database search implementation MDG_BS_MAT_PP_SEARCH_DB of BAdI BADI_SDQ_PP_SEARCH is provided in the standard MDG-M delivery content.

This example implementation supports direct database search for materials with the following search criteria:
- MATNR (material ID)
- MATKL (material group)
- TXTMI (material description in logon language).

In addition, this guide provides an example how to implement enhancements to the standard SAP coding to:
- Replace the enterprise search with the database search provider
- Ensure that only the search criteria support by the BAdI implementation are offered in the search UI

- Restrict the search operators to those supported by the database search provider

3 Functional Restrictions

Enterprise Search is still required for the MDG-M content in:

- Data Replication Framework DRF (if you have MDG 7.0 SP02 or higher, there is a solution described in chapter 7.3.)

Enterprise Search or SAP HANA-based search is still required for the MDG-M content in:

- Duplicate check (does not work with database search)
- Data Import Framework (DIF)

Functional Restrictions for DB search

The proposed implementation does not support the following:

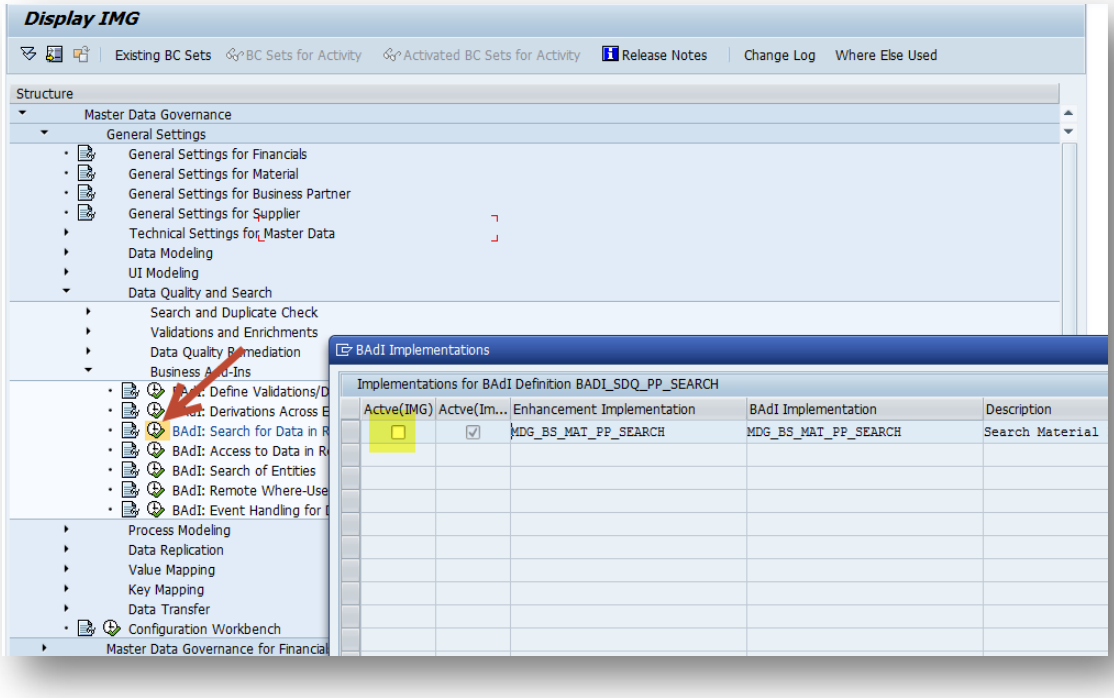
- Fuzzy search or text search
- Ranking
- Classification search
- Authorization checks on search results

4 Step-by-Step Explanation for MDG 6.1

4.1 Create new search BAdI implementation

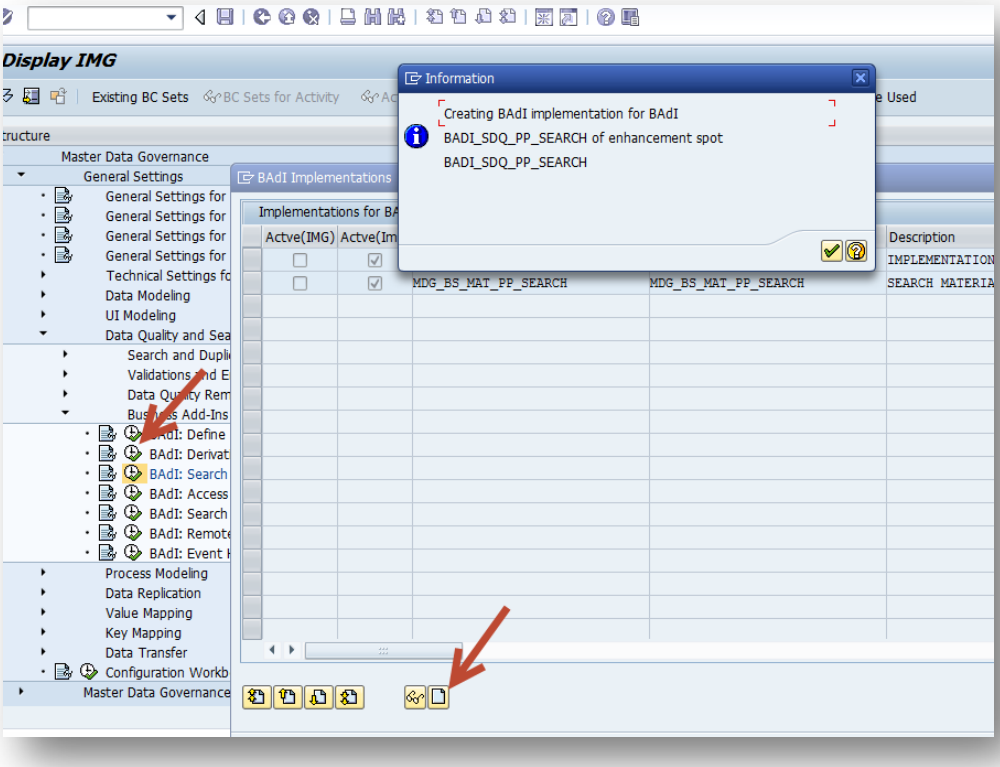
4.1.1 Deactivate existing PP search BAdI implementation

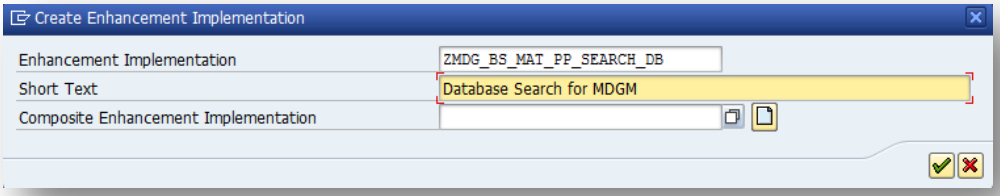
The SAP standard delivery contains an implementation of the BAdI BADI_SDQ_PP_SEARCH: MDG_BS_MAT_PP_SEARCH. This BAdI implementation must be deactivated first.

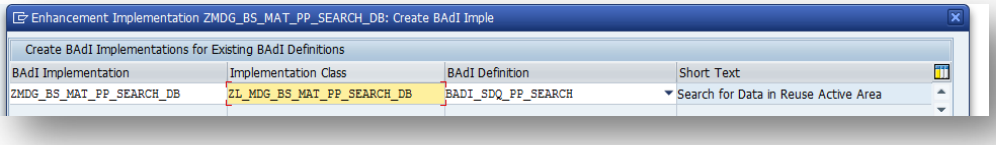


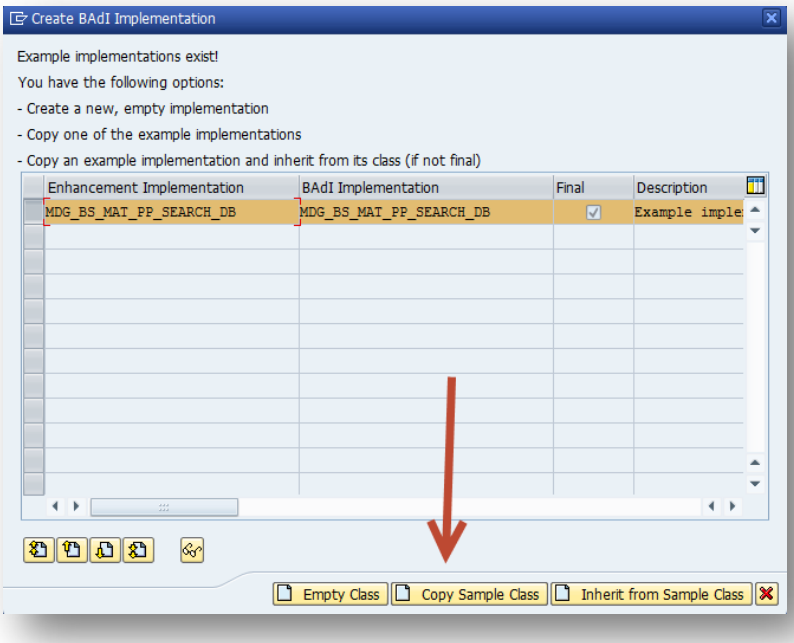
4.1.2 Copy and adapt example implementation

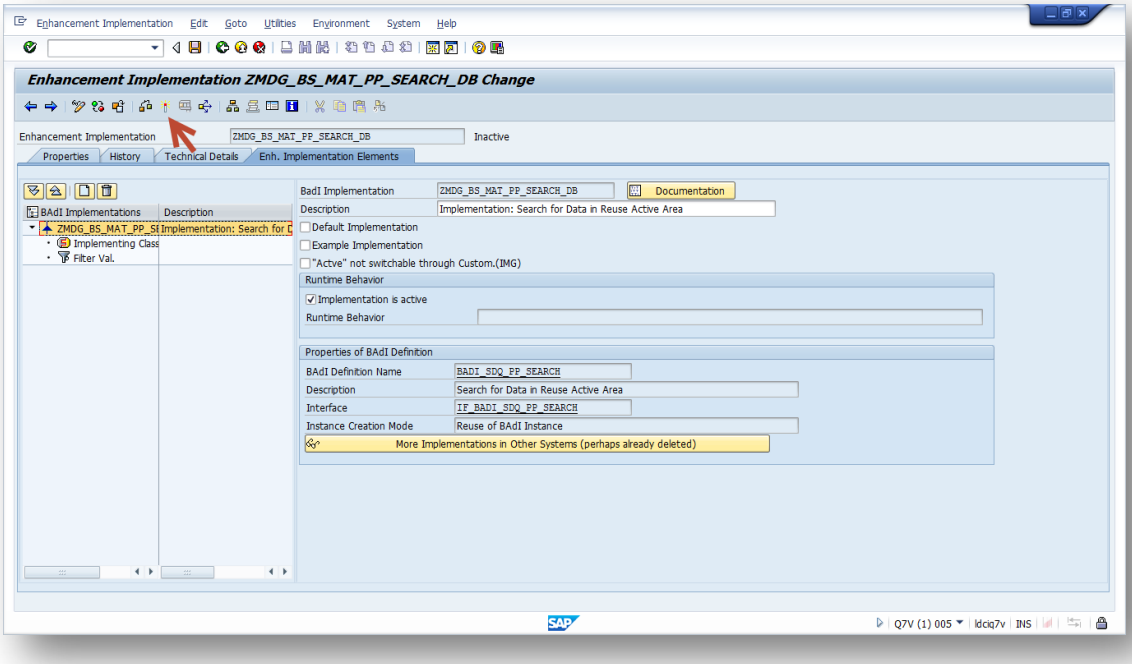
The new search implementation requires a new implementation of BAdI BADI_SDQ_PP_SEARCH. Create this BAdI implementation by copying the example implementation MDG_BS_MAT_PP_SEARCH_DB.









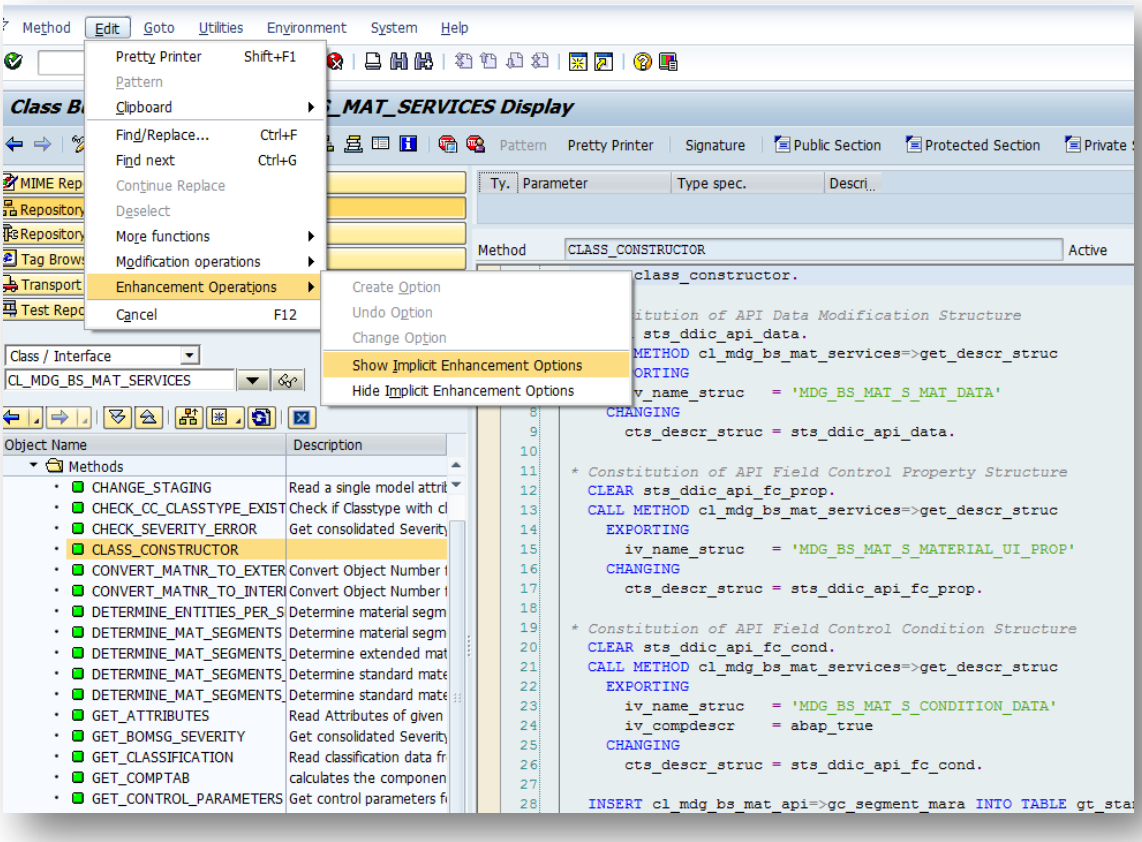


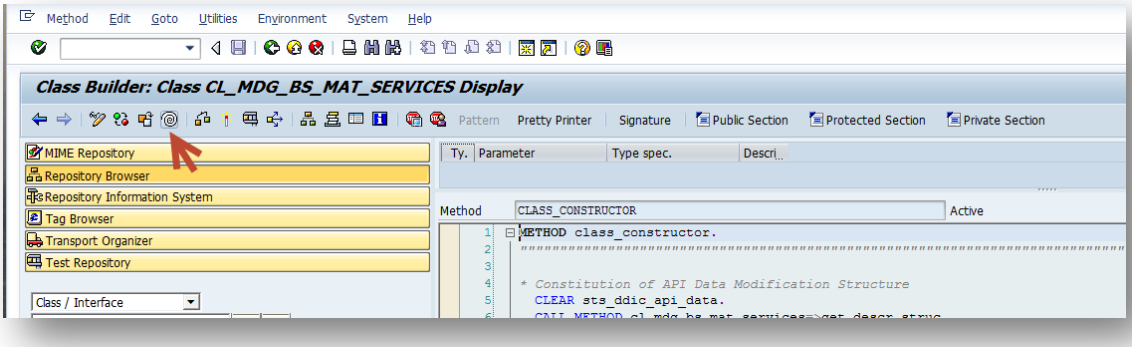
Activate the BAdI Implementation and Class.

4.2 Enable database search in material BO and Access Class

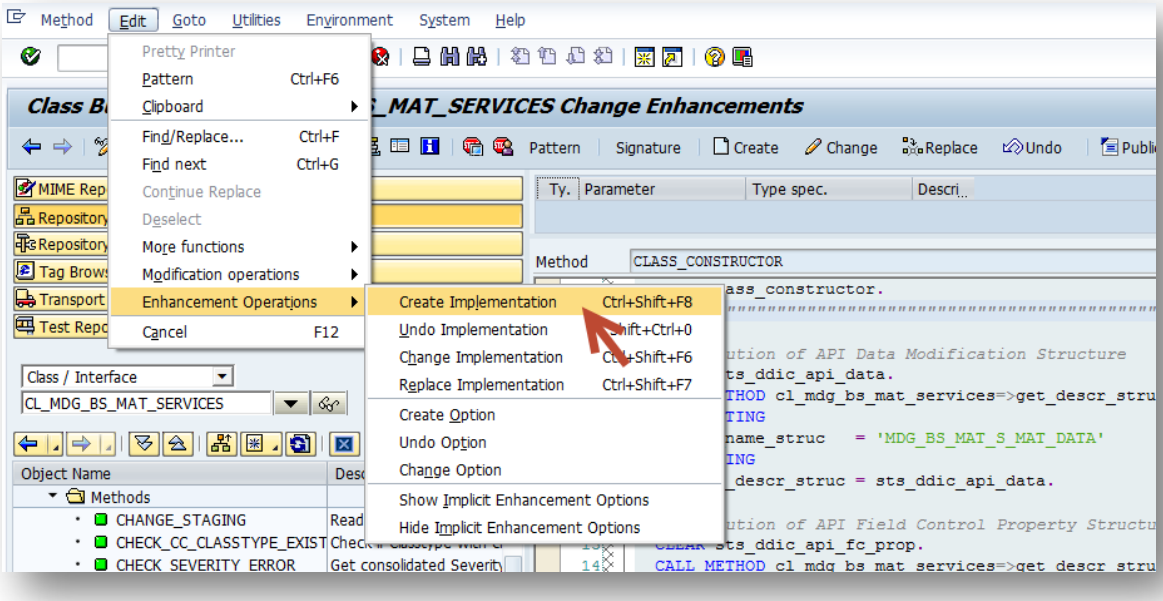
4.2.1 Replace enterprise search as standard search provider

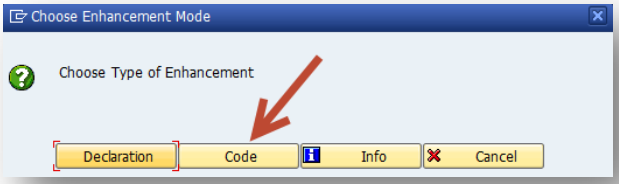
Implement the Implicit Enhancement Option at beginning of the method CLASS_CONSTRUCTOR of class CL_MDG_BS_MAT_SERVICES.

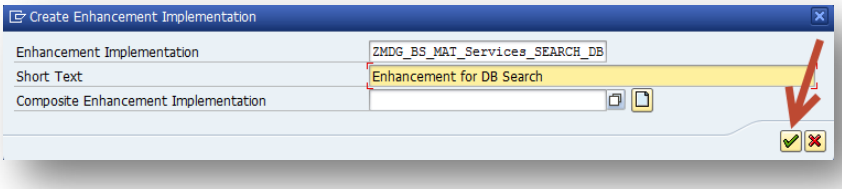


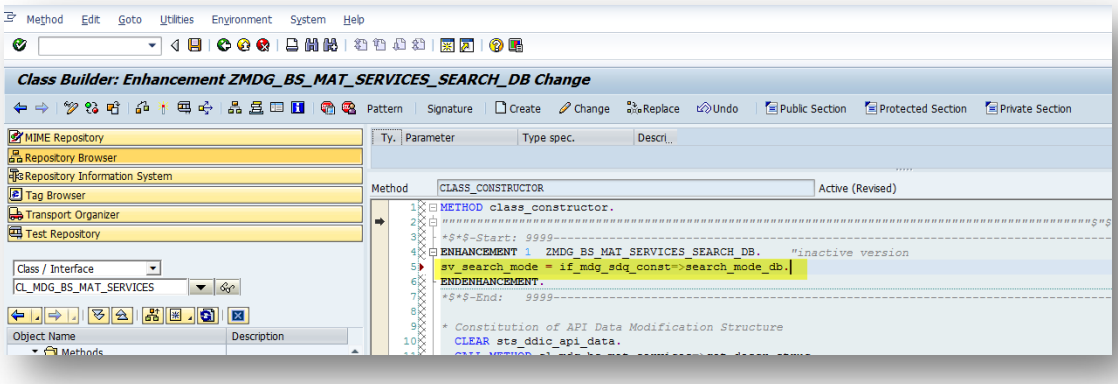


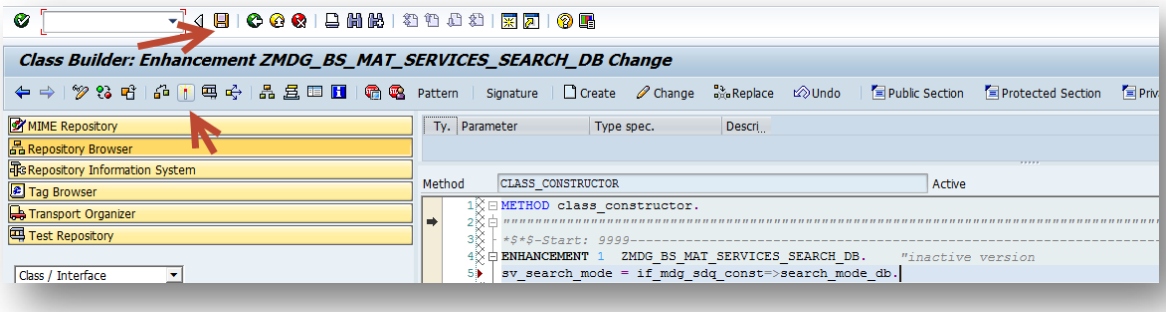
Place curser in line below the METHOD statement.









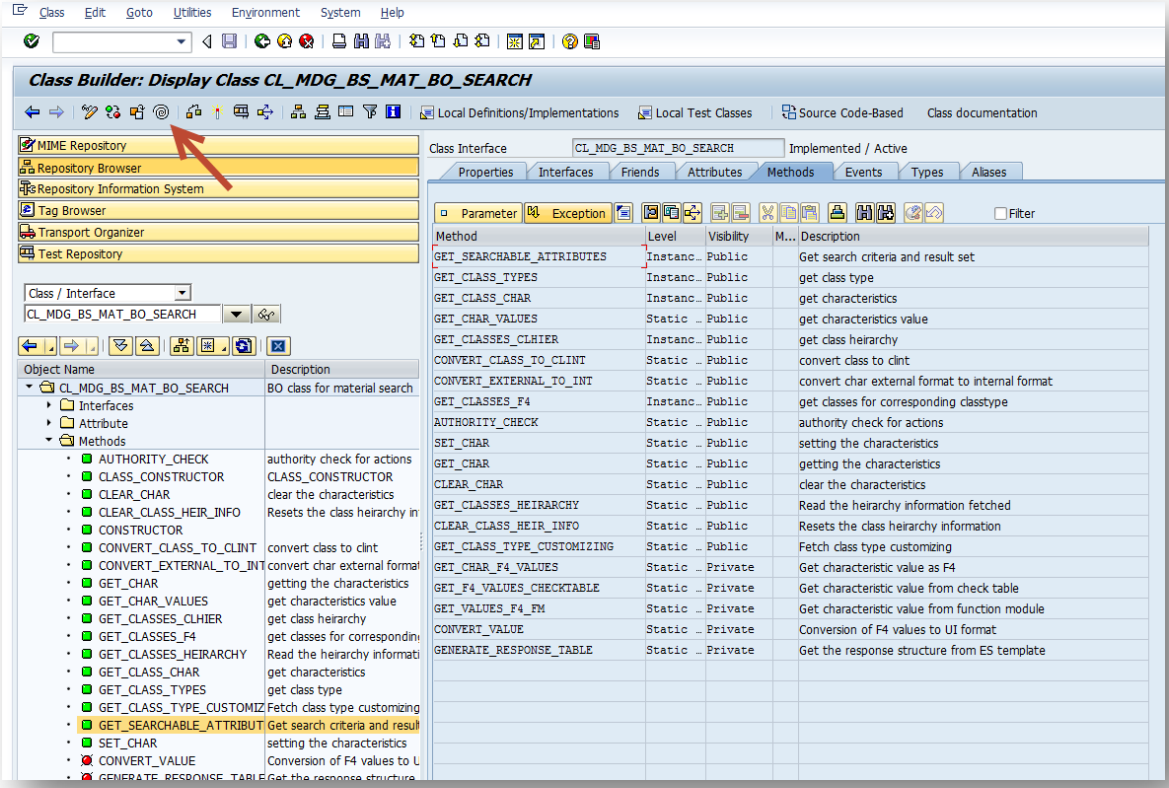


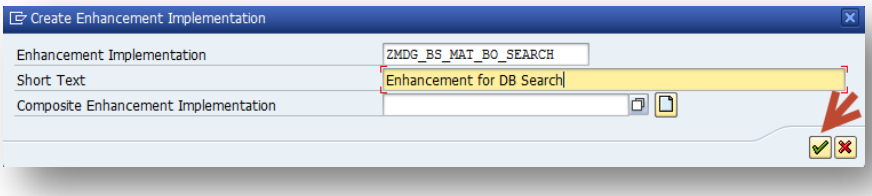
Activate.

4.2.2 Provide search criteria in MDG-M search BO for DB search

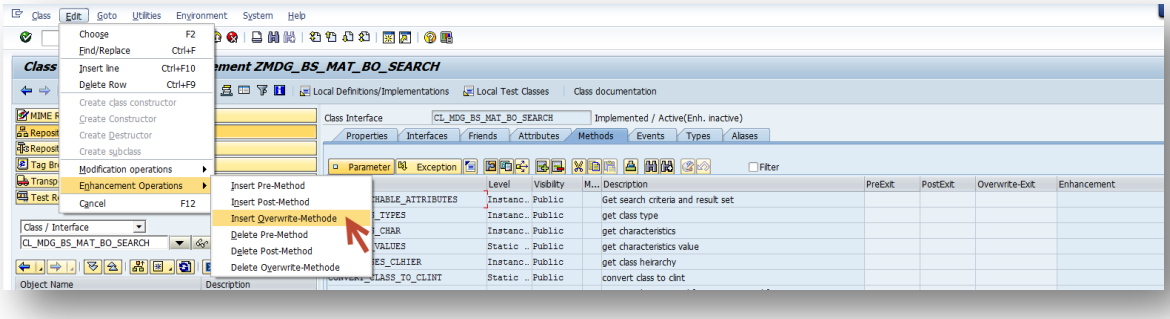
Implement an Overwrite exit for method GET_SEARCHABLE_ATTRIBUTES of class CL_MDG_BS_MAT_BO_SEARCH. This is only necessary for DB search.

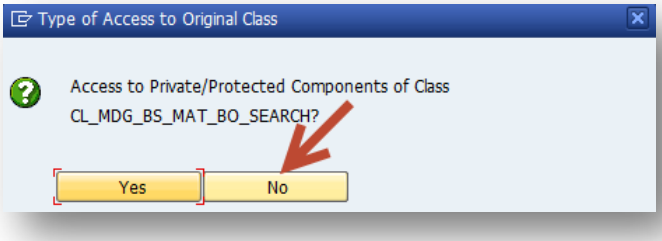
Do not display code of method GET_SEARCHABLE_ATTRIBUTES, but display method list of class CL_MDG_BS_MAT_BO_SEARCH.

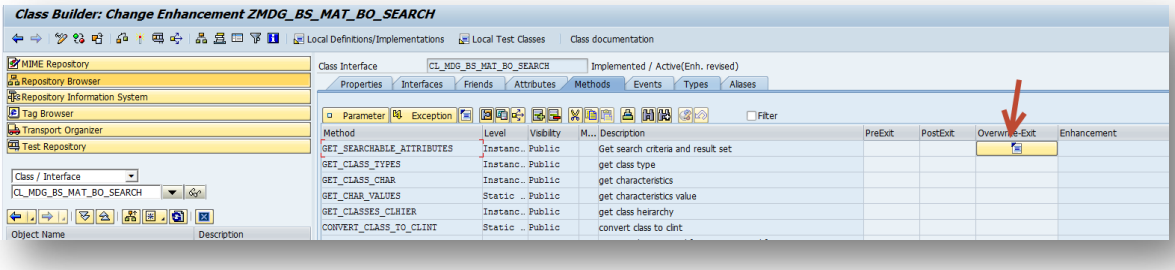


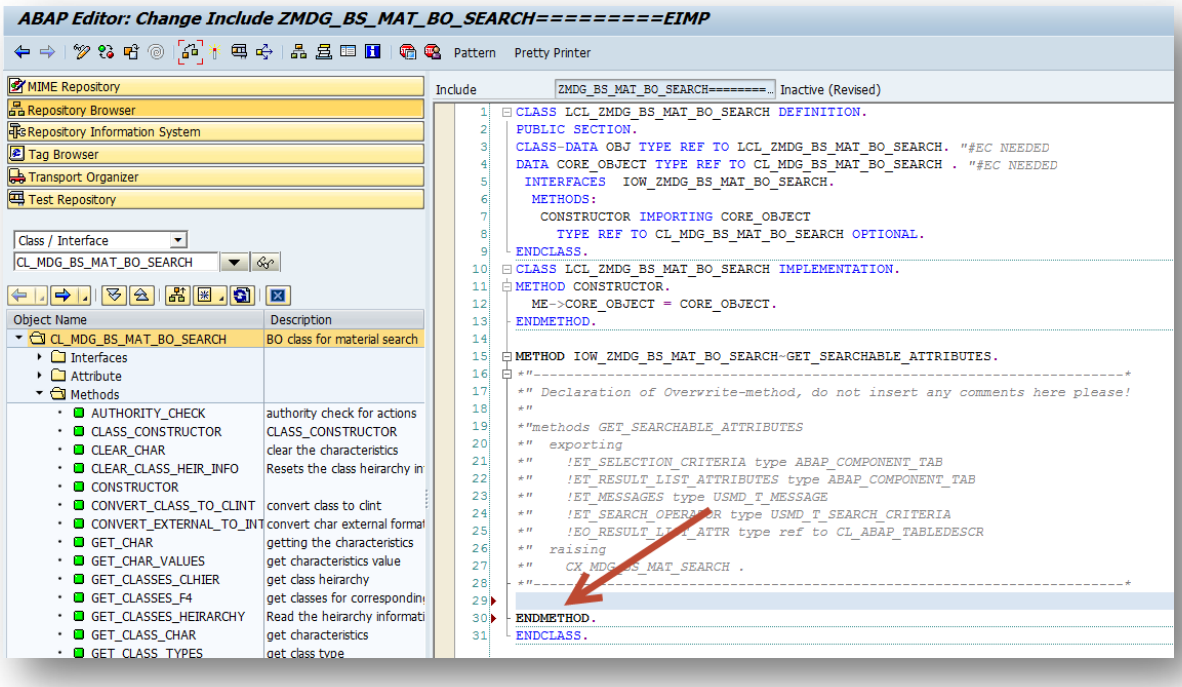


Put the cursor on method GET_SEARCHABLE_ATTRIBUTES in object list.









Example coding:

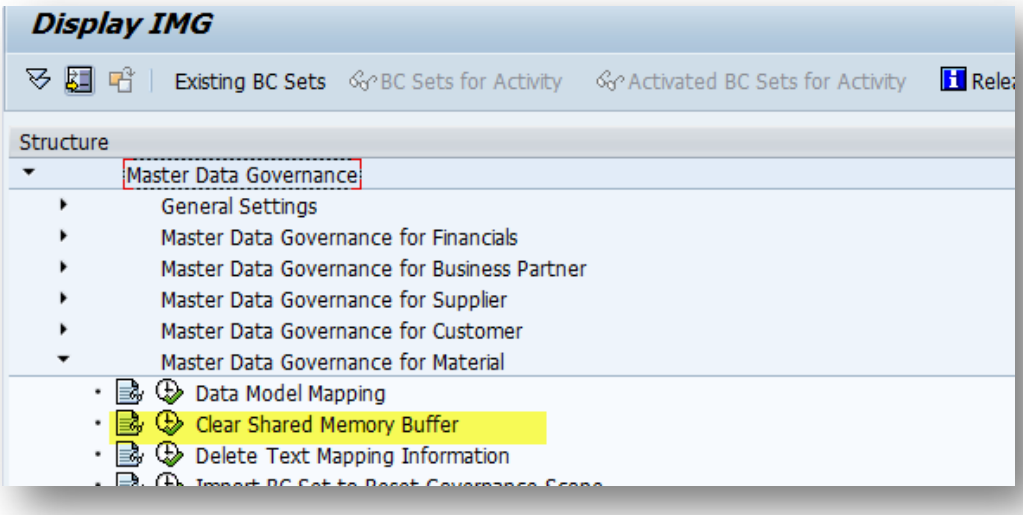
```
* ET_SELECTION_CRITERIA: The request attributes are hard coded
* - MATERIAL, MATKL, TXTMI from entity MATERIAL
* - Standard field USMD_ACTIVE
* ET_RESULT_LIST_ATTRBUTES:
*  The response attributes are derived from customizing
*  (IMG activity "Define Field Properties for UI")
*   Note: Could also be done hard coded
* - ET_SEARCH_OPERATOR: Specify relevant search operators per field
*   For fields without entries (e.g. MATNR, MATKL),
*   the search UI will provide a default set of operator
*   (=, <>, contains, start_with)
* Not considered:
* - ET_MESSAGES (no error handling in this example code)
* - EO_RESULT_LIST_ATTR: Not needed, as we fill ET_RESULT_LIST_ATTRBUTES

    DATA ls_component   TYPE abap_componentdescr.
    DATA ls_entity_attr TYPE usmd_s_entity_attr_prop_ext.
    DATA ls_criterion   TYPE usmd_s_search_criteria.
    DATA: ls_operator   TYPE fpmgb_s_search_operator.

    CLEAR et_result_list_attributes.
    CLEAR et_selection_criteria.
    CLEAR et_messages.
    CLEAR et_search_operator.
    CLEAR eo_result_list_attr.

********** Add (hard coded) search criteria / request attributes **********
    " add search attributes MATERIAL
    ls_component-name  = if_mdg_bs_mat_gen_c=>gc_attr_material.
    ls_component-type ?= cl_abap_typedescr=>describe_by_name( 'MATNR' ).
    INSERT ls_component INTO TABLE et_selection_criteria.
    " add search attributes MATKL
```

```
    ls_component-name  = if_mdg_bs_mat_gen_c=>gc_attr_matkl.
    ls_component-type ?= cl_abap_typedescr=>describe_by_name( 'MATKL' ).
    INSERT ls_component INTO TABLE et_selection_criteria.
    " add search attributes TXTMI
    ls_component-name  = if_mdg_bs_mat_gen_c=>gc_attr_txtmi.
    ls_component-type ?= cl_abap_typedescr=>describe_by_name( 'USMD_TXTMI' ).
    INSERT ls_component INTO TABLE et_selection_criteria.
    ls_component-name  = 'USMD_ACTIVE'. (Can be replaced with
cl_mdg_bs_mat_c=>gc_field_usmd_active in MDG7.0)


    ls_component-type ?= cl_abap_typedescr=>describe_by_name( 'USMD_ACTIVE' ).
    INSERT ls_component INTO TABLE et_selection_criteria.

********** Add response attributes from customizing **********
    " Get all attributes of main entity that are not READ_ONLY
    LOOP AT cl_mdg_bs_mat_bo_search=>go_model- (is renamed to so_model with
MDG7.0)
>dt_entity_attr_prop INTO ls_entity_attr
         WHERE usmd_entity = if_mdg_bs_mat_gen_c=>gc_entity_material AND
               f_read_only IS INITIAL.
      " Get result list attributes ("No Result List" field unchecked)
      READ TABLE cl_mdg_bs_mat_bo_search=>go_model-(is renamed to so_model with
MDG7.0)
>dt_fld_uiprop TRANSPORTING NO FIELDS "VC_USMD006
          WITH KEY usmd_entity    = if_mdg_bs_mat_gen_c=>gc_entity_material "lv
_entity
                   fieldname      = ls_entity_attr-r_fprop->fieldname
                   no_result_list = abap_false.
      IF sy-subrc IS INITIAL.
        CLEAR ls_component.
        ls_component-name = ls_entity_attr-r_fprop->fieldname.
        ls_component-
type ?= cl_abap_typedescr=>describe_by_name( ls_entity_attr-r_fprop->rollname ).
        INSERT ls_component INTO TABLE et_result_list_attributes.
      ENDIF.
    ENDLOOP.
********** Add operators for description (TXTMI): Only allow CONTAINS and STARTS
_WITH, no IS/IS_NOT **********
    ls_operator-operator_id = if_wd_select_options_20=>e_operators-starts_with.
    INSERT ls_operator INTO TABLE ls_criterion-t_operator.
    ls_operator-operator_id = if_wd_select_options_20=>e_operators-contains.
    INSERT ls_operator INTO TABLE ls_criterion-t_operator.
    ls_criterion-fieldname = 'TXTMI'.
    INSERT ls_criterion INTO TABLE et_search_operator.
```

Activate.

4.3 Clear Shared Memory Buffer

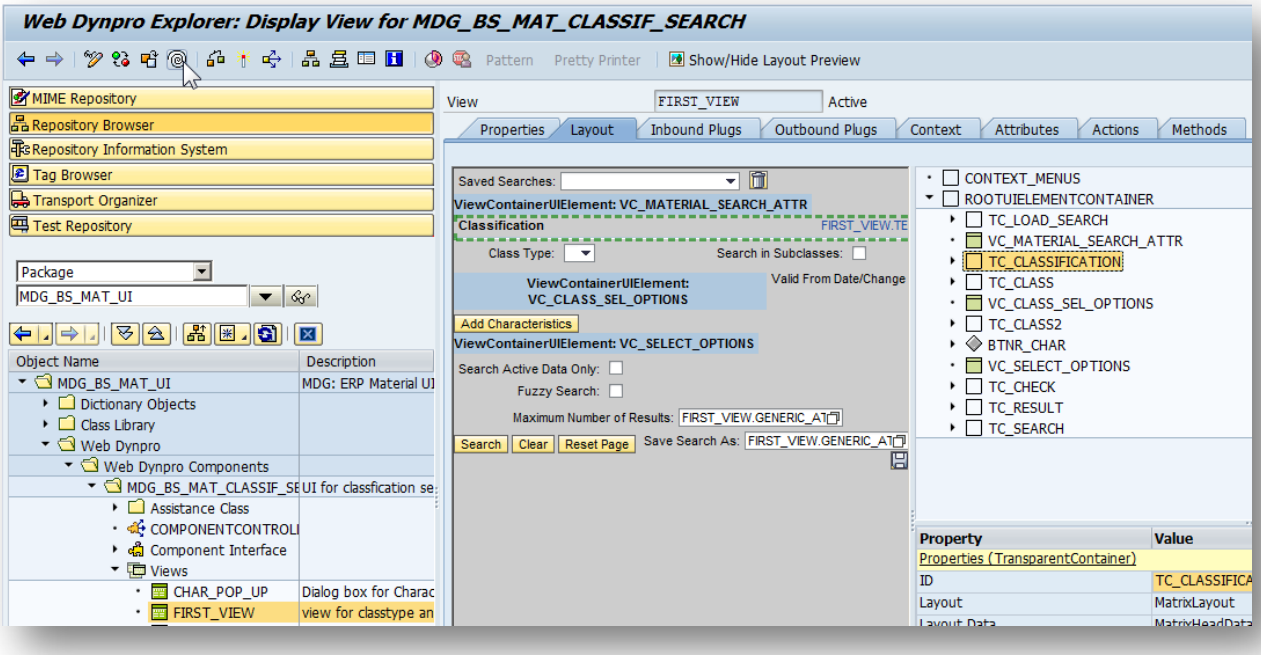
Run the customizing activity Clear Shared Memory Buffer.



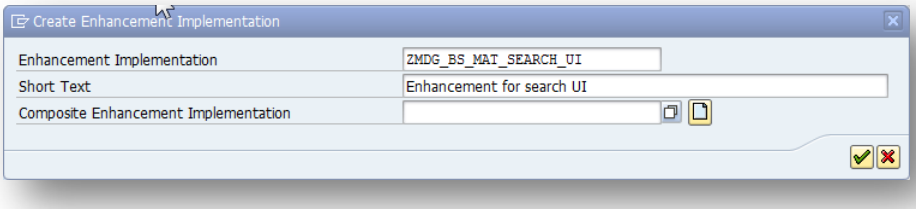
4.4 Adapt UI configuration

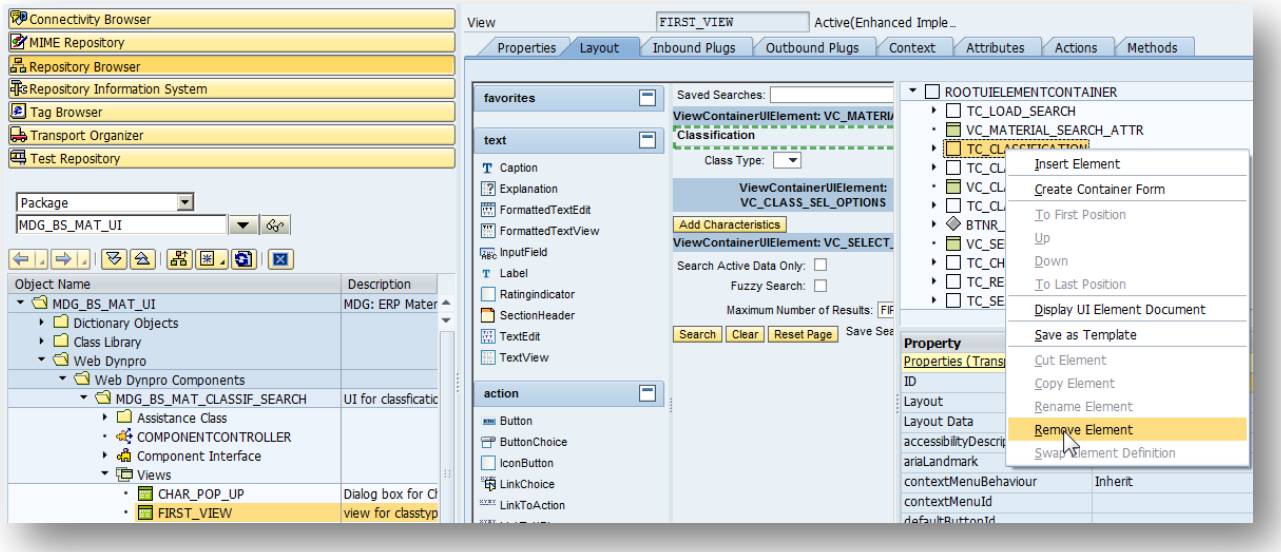
Depending on the scenario, classification search might not be supported. In this case, SAP recommends removing this UI Building Block from the search UI configuration.

Display the view related to your search UI. The view belongs to WD component MDG_BS_CLASSIF_SEARCH.



Create an enhancement implementation.

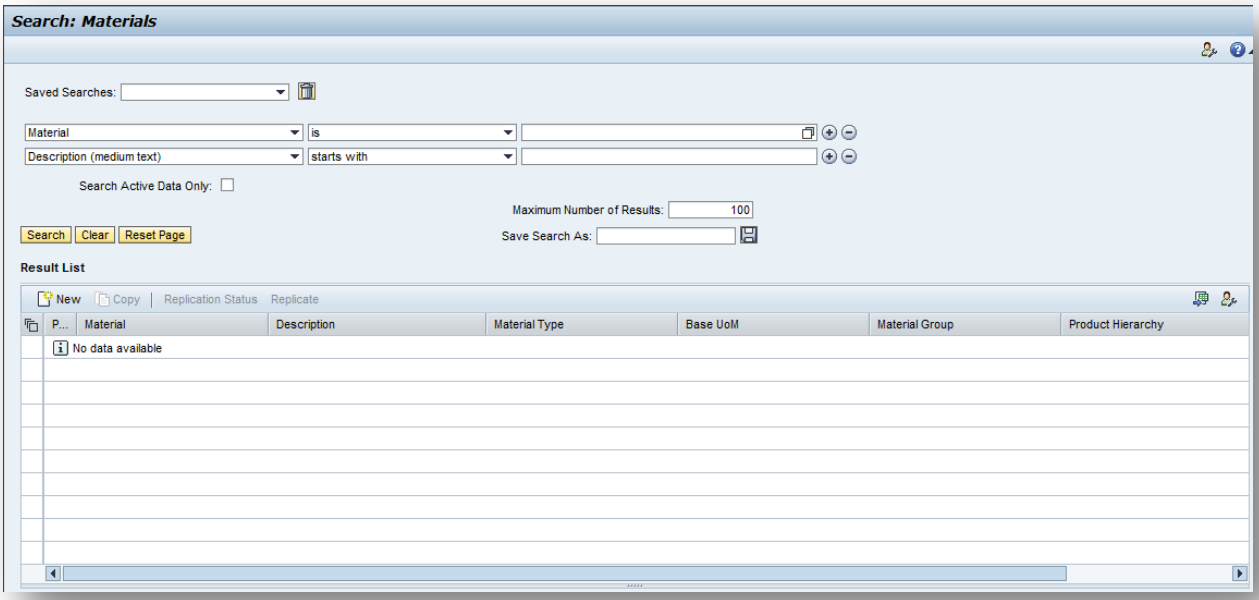




Perform this last step again for the UI elements TC_CLASSIFICATION, TC_CLASS, VC_CLASS_SEL_OPTIONS, TC_CLASS2, BTNR_CHAR, and VC_SELECT_OPTIONS.

Activate.

You should get this results screen:



5 Step by Step Explanation FoR MDG 7.0 and MDG 8.0

There is now a SAP note ‘2281401 - Decoupling MDG Material from Enterprise Search as provider’ available, where you only need to follow these two steps to decouple MDG Material from ES and enable HANA search:

- In the customizing MDGIMG -> Master Data Governance, Central Governance -> Data Quality and Search -> Business Add-Ins -> BAdI: Search for Data in Reuse Active Area deactivate the BAdI Implementation MDG_BS_MAT_PP_SEARCH.
- In the customizing MDGIMG -> Master Data Governance, Central Governance -> Master Data Governance for Material -> Business Add-Ins -> BAdI: Define Alternate DRF Filter Provider deactivate the BAdI Implementation MDG_BS_MAT_DRF_SEARCH.

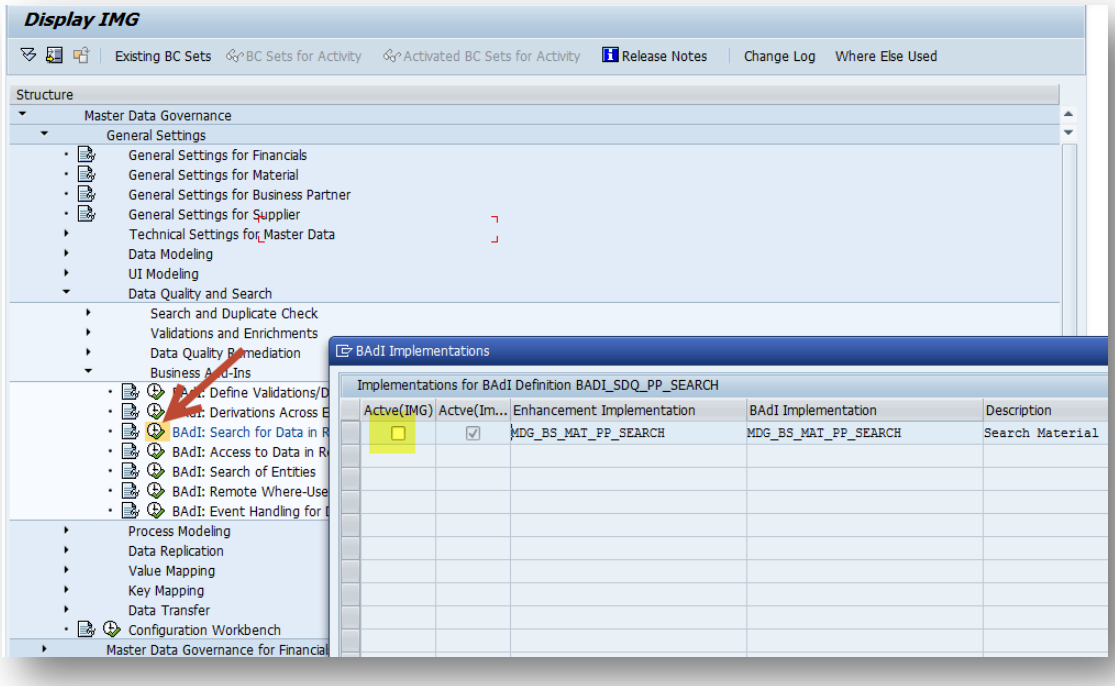
The previous solution is descripted in the following chapters.

5.1 BAdI implementation (DB and HANA)

5.1.1 Deactivate existing search BAdI implementation (valid for DB search and HANA)

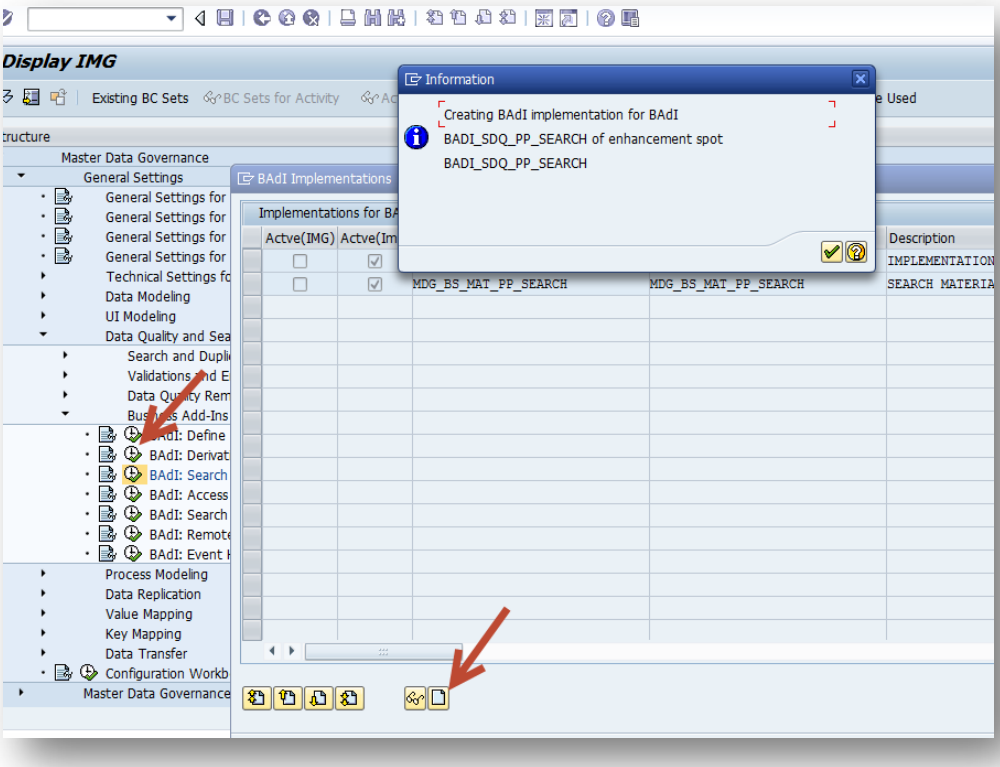
SAP standard delivery contains an implementation of the BAdI BADI_SDQ_PP_SEARCH: MDG_BS_MAT_PP_SEARCH.

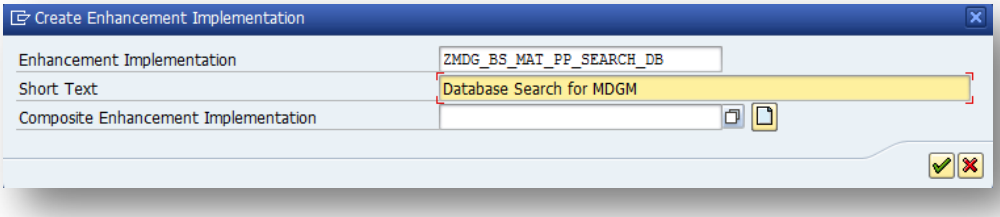
Deactivate this BAdI implementation.

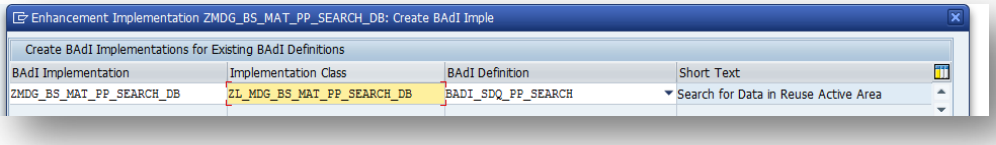


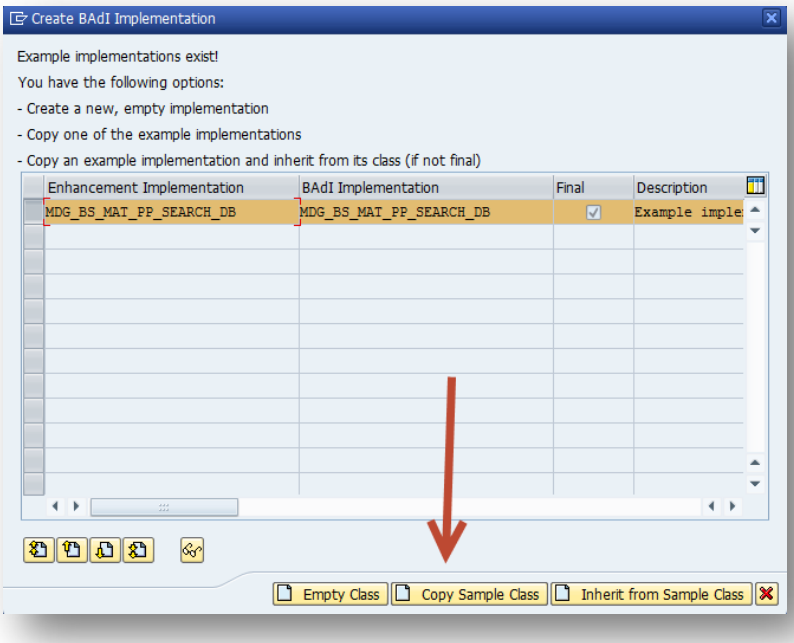
5.1.2 Copy and adapt the example implementation (only for DB Search)

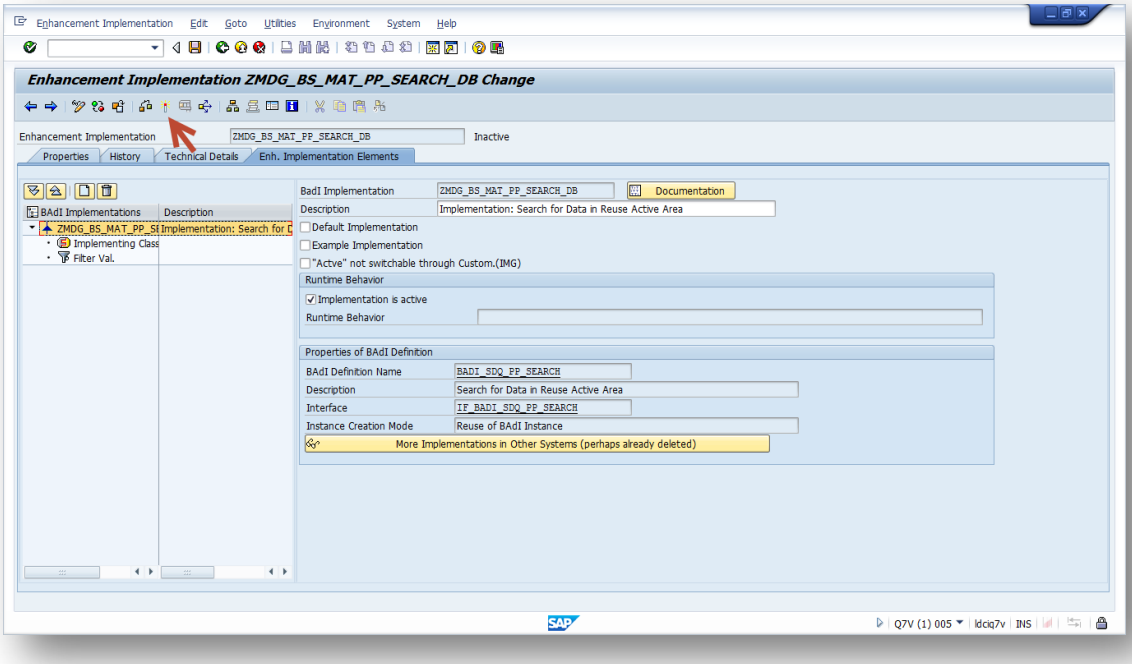
The new search implementation requires a new implementation of BAdI BADI_SDQ_PP_SEARCH. Create this BAdI implementation by copying the example implementation MDG_BS_MAT_PP_SEARCH_DB. This is not necessary for HANA-based search.









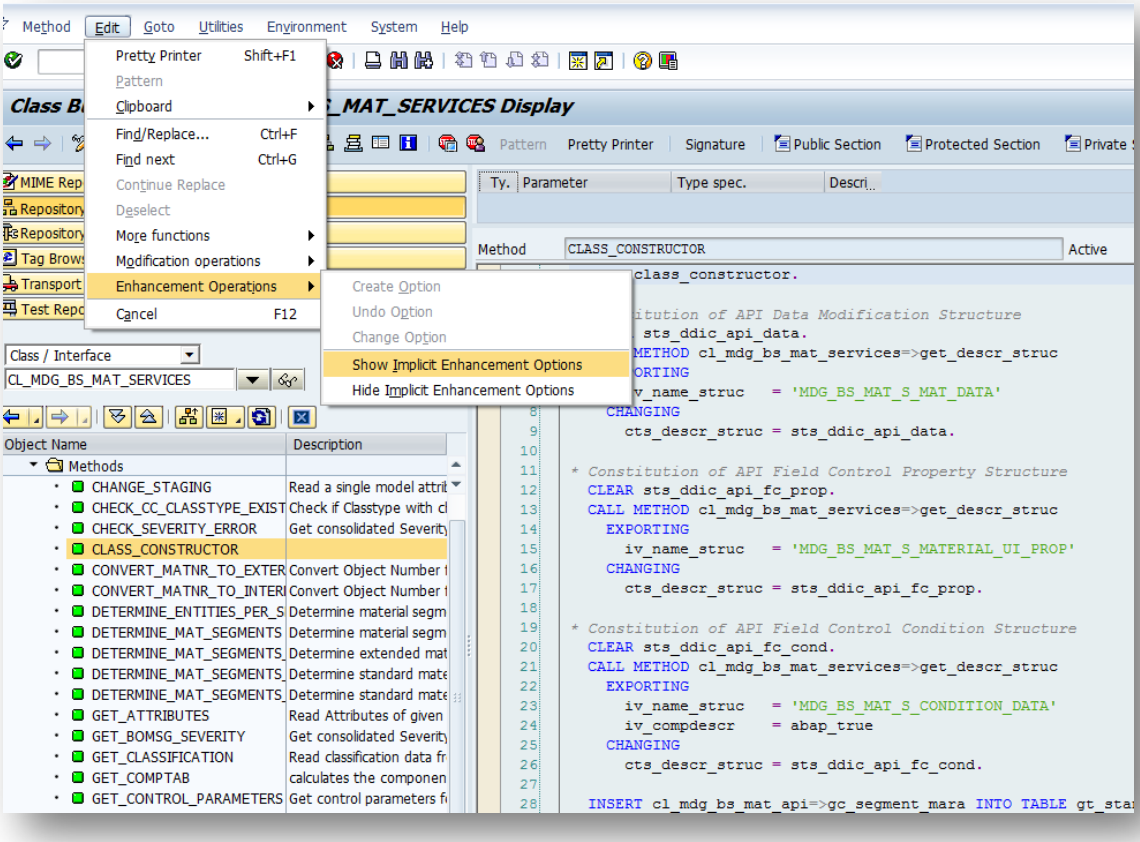


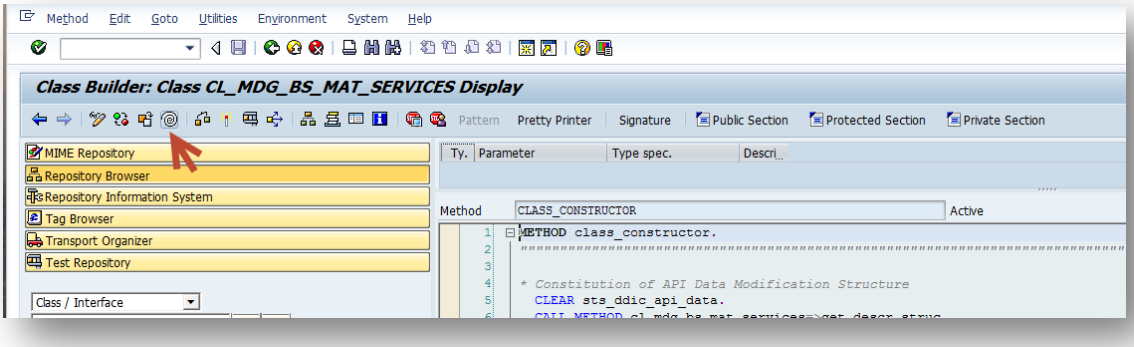
Activate the BAdI Implementation and Class.

5.2 Enable database search in material BO and Access Class (only for DB search)

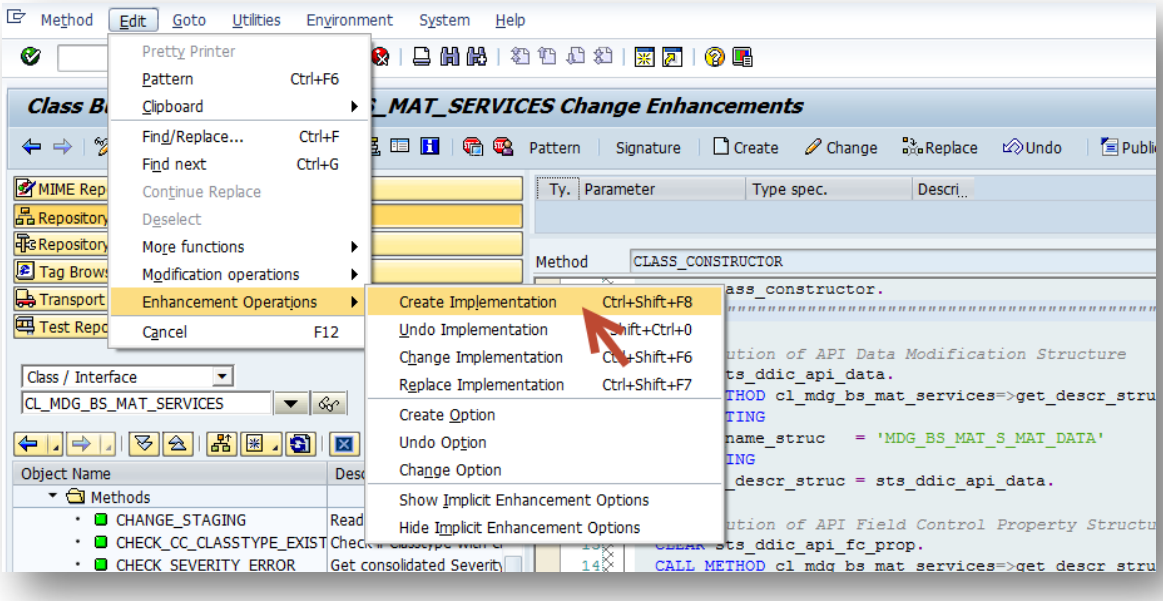
5.2.1 Replace enterprise search as standard search provider (only for DB search)

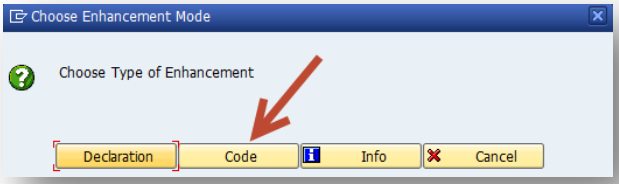
Implement Implicit Enhancement Option at the beginning of the method CLASS_CONSTRUCTOR of class CL_MDG_BS_MAT_SERVICES.

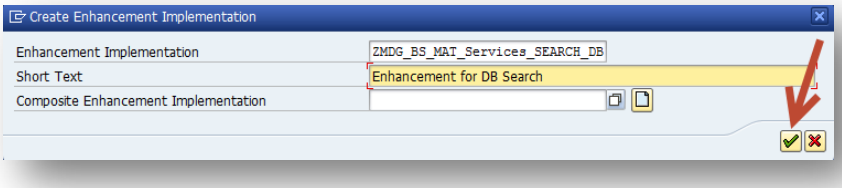


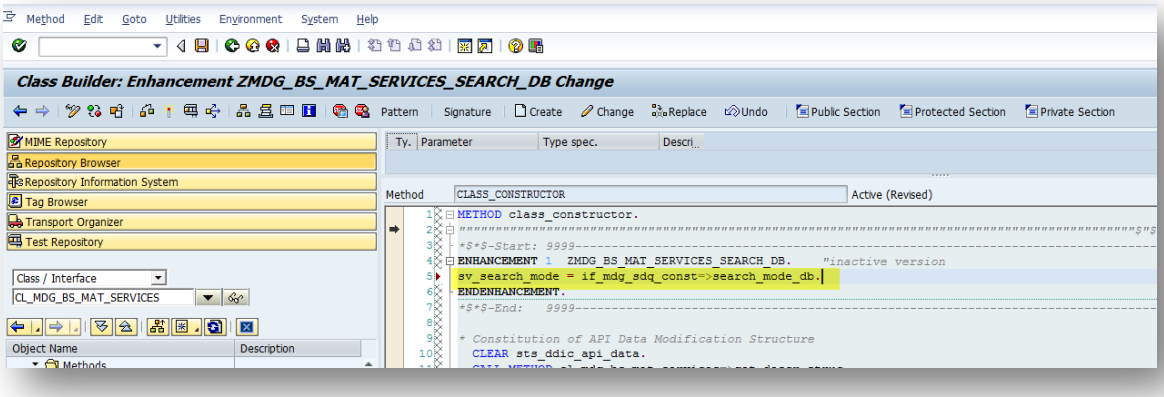


Place curser in line below the METHOD statement.

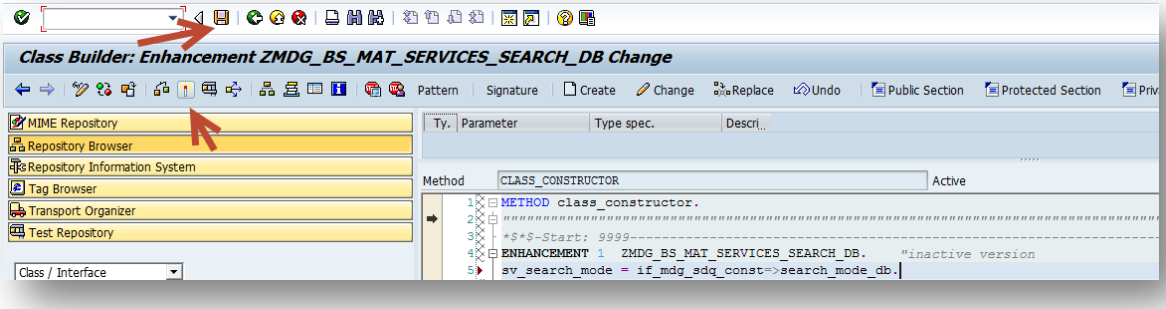








Insert the codeline: *“sv_search_mode = if_mdg_sdq_const=>search_mode_db.”*



Activate.

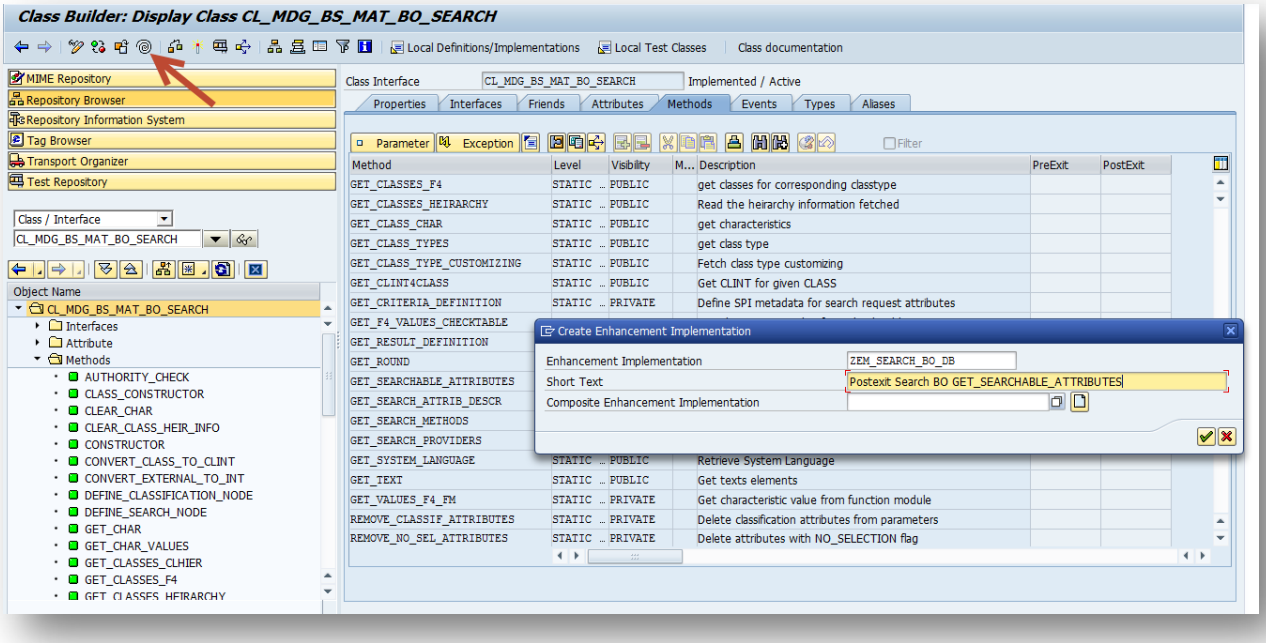
5.2.2 Provide search criteria in MDG-M search BO (only for DB search)

5.2.2.1 Post exit for method GET_SEARCHABLE_ATTRIBUTES (only for DB search)

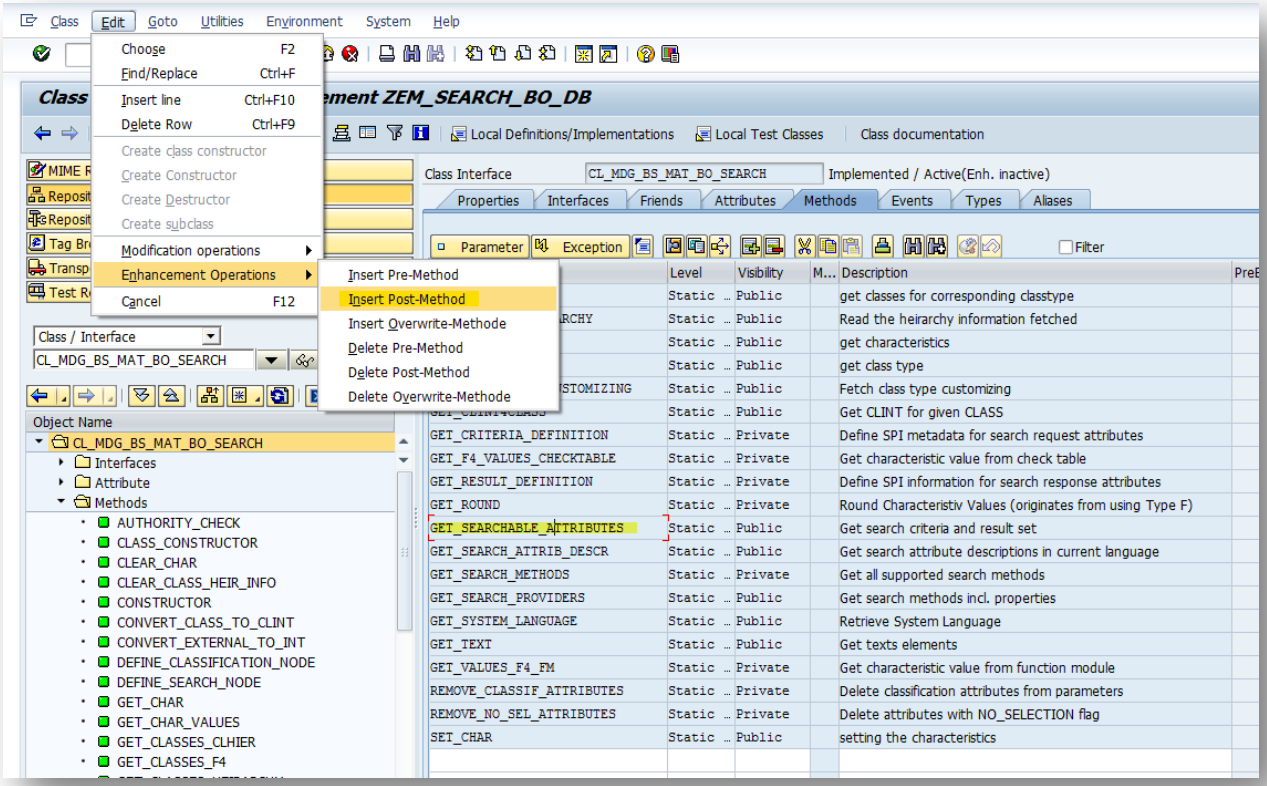
Implement a post exit for the method GET_SEARCHABLE_ATTRIBUTES of class CL_MDG_BS_MAT_BO_SEARCH. This is only necessary for DB search.

Do not display code of method GET_SEARCHABLE_ATTRIBUTES, but display the method list of class CL_MDG_BS_MAT_BO_SEARCH.

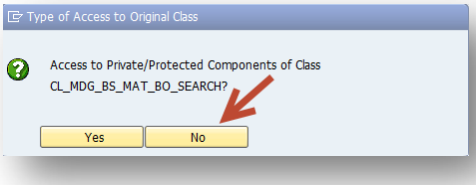
This is not necessary for HANA-based search.



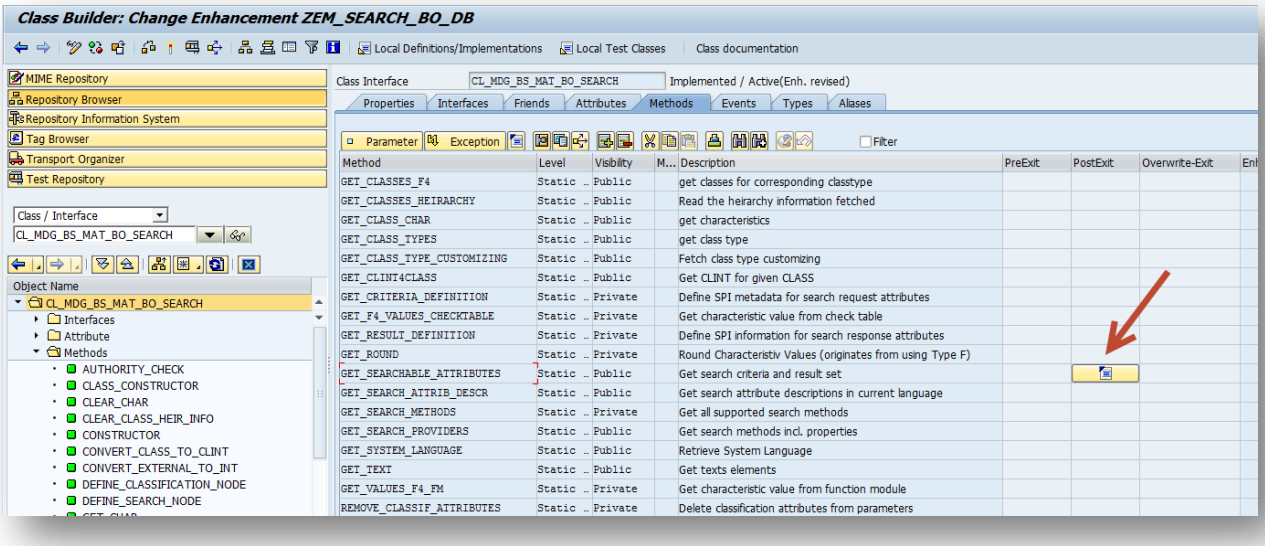
Put cursor on the method GET_SEARCHABLE_ATTRIBUTES in the object list and select Insert Post-Method.



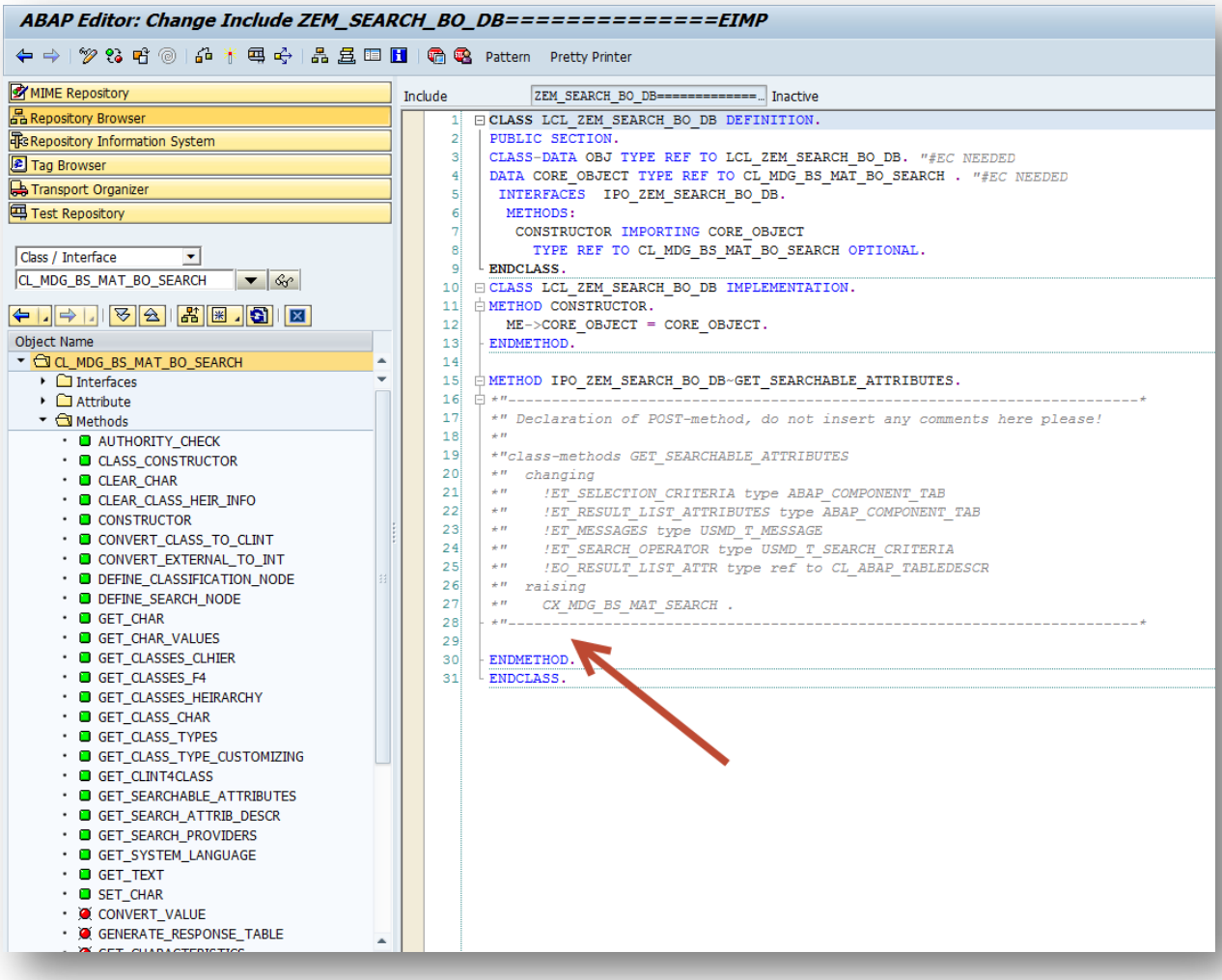
Choose No.



Choose the icon for the post exit.



Insert your coding.



Example Coding:

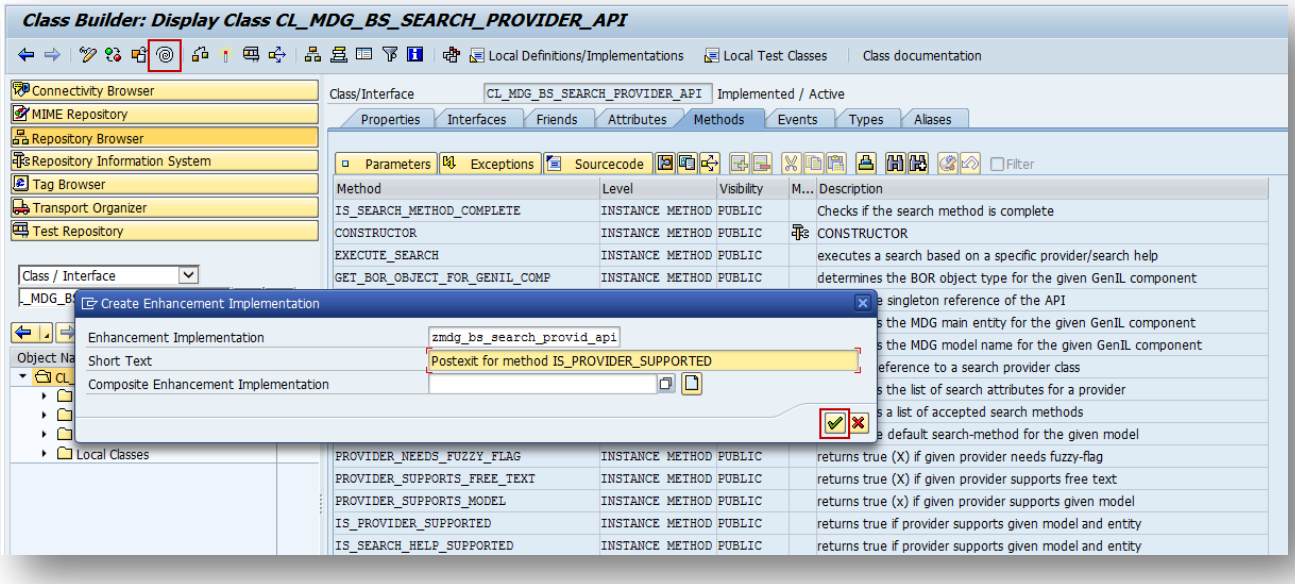
```
*"----------------------------------------------------------------------*
* ET_SELECTION_CRITERIA: The request attributes are hard coded
* - MATERIAL, MATKL, TXTMI from entity MATERIAL
* - Standard field USMD_ACTIVE
* ET_RESULT_LIST_ATTRBUTES:
*  The response attributes are derived from customizing
*  (IMG activity "Define Field Properties for UI")
*   Note: Could also be done hard coded
* - ET_SEARCH_OPERATOR: Specify relevant search operators per field
*   For fields without entries (e.g. MATNR, MATKL),
*   the search UI will provide a default set of operator
*   (=, <>, contains, start_with)
* Not considered:
* - ET_MESSAGES (no error handling in this example code)
* - EO_RESULT_LIST_ATTR: Not needed, as we fill ET_RESULT_LIST_ATTRBUTES

    DATA ls_component   TYPE abap_componentdescr.
    DATA ls_entity_attr TYPE usmd_s_entity_attr_prop_ext.
    DATA ls_criterion   TYPE usmd_s_search_criteria.
    DATA: ls_operator   TYPE fpmgb_s_search_operator.

* Only execute post exit if DB search was selected as search method
* The search method gets defaulted by CL_MDG_BS_MAT_SERVICES=>SV_SEARCH_MODE
* It can be adjusted by dropdown listbox in UI (search method selector)
    CHECK cl_mdg_bs_mat_bo_search=>sv_search_mode = if_mdg_sdq_const=>search_mod
e_db.

    CLEAR et_result_list_attributes.
    CLEAR et_selection_criteria.
    CLEAR et_messages.
    CLEAR et_search_operator.
    CLEAR eo_result_list_attr.

********** Add (hard coded) search criteria / request attributes **********
    " add search attributes MATERIAL
    ls_component-name  = if_mdg_bs_mat_gen_c=>gc_attr_material.
    ls_component-type ?= cl_abap_typedescr=>describe_by_name( 'MATNR' ).
    INSERT ls_component INTO TABLE et_selection_criteria.
    " add search attributes MATKL
    ls_component-name  = if_mdg_bs_mat_gen_c=>gc_attr_matkl.
    ls_component-type ?= cl_abap_typedescr=>describe_by_name( 'MATKL' ).
    INSERT ls_component INTO TABLE et_selection_criteria.
    " add search attributes TXTMI
    ls_component-name  = if_mdg_bs_mat_gen_c=>gc_attr_txtmi.
    ls_component-type ?= cl_abap_typedescr=>describe_by_name( 'USMD_TXTMI' ).
    INSERT ls_component INTO TABLE et_selection_criteria.
    ls_component-name  = cl_mdg_bs_mat_c=>gc_field_usmd_active.
    ls_component-type ?= cl_abap_typedescr=>describe_by_name( 'USMD_ACTIVE' ).
    INSERT ls_component INTO TABLE et_selection_criteria.

********** Add response attributes from customizing **********
    " Get all attributes of main entity that are not READ_ONLY
    LOOP AT cl_mdg_bs_mat_bo_search=>so_model-
>dt_entity_attr_prop INTO ls_entity_attr
         WHERE usmd_entity = if_mdg_bs_mat_gen_c=>gc_entity_material AND
               f_read_only IS INITIAL.
      " Get result list attributes ("No Result List" field unchecked)
```

```
      READ TABLE cl_mdg_bs_mat_bo_search=>so_model-
>dt_fld_uiprop TRANSPORTING NO FIELDS "VC_USMD006
           WITH KEY usmd_entity    = if_mdg_bs_mat_gen_c=>gc_entity_material "lv
_entity
                    fieldname      = ls_entity_attr-r_fprop->fieldname
                    no_result_list = abap_false.
      IF sy-subrc IS INITIAL.
        CLEAR ls_component.
        ls_component-name = ls_entity_attr-r_fprop->fieldname.
        ls_component-
type ?= cl_abap_typedescr=>describe_by_name( ls_entity_attr-r_fprop->rollname ).
        INSERT ls_component INTO TABLE et_result_list_attributes.
      ENDIF.
    ENDLOOP.
********** Add operators for description (TXTMI): Only allow CONTAINS and STARTS
_WITH, no IS/IS_NOT **********
    ls_operator-operator_id = if_wd_select_options_20=>e_operators-starts_with.
    INSERT ls_operator INTO TABLE ls_criterion-t_operator.
    ls_operator-operator_id = if_wd_select_options_20=>e_operators-contains.
    INSERT ls_operator INTO TABLE ls_criterion-t_operator.
    ls_criterion-fieldname = 'TXTMI'.
    INSERT ls_criterion INTO TABLE et_search_operator.
    " This implementation of DB search does not support classification
    cl_mdg_bs_mat_bo_search=>sv_classif_supported = abap_false.
```

5.2.2.2 Post exit for method IS_PROVIDER_SUPPORTED (only for DB search)

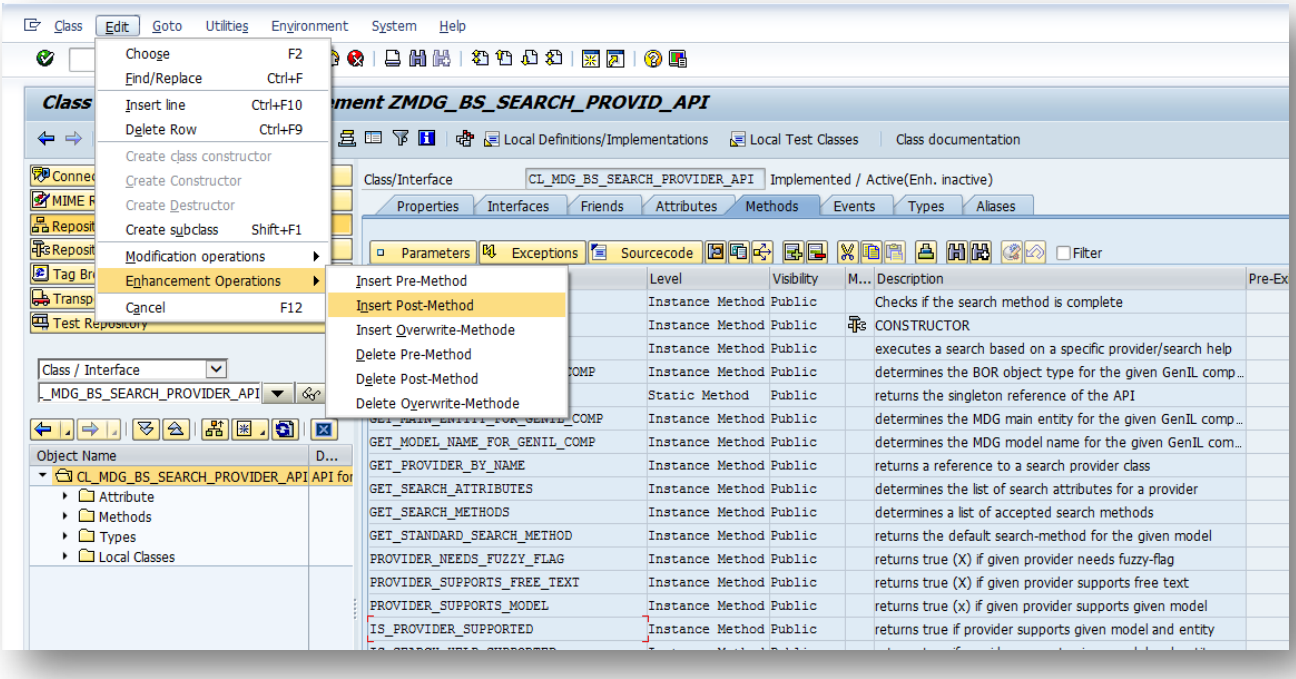
Implement a post exit for the method IS_PROVIDER_SUPPORTED of class CL_MDG_BS_SEARCH_PROVIDER_API.

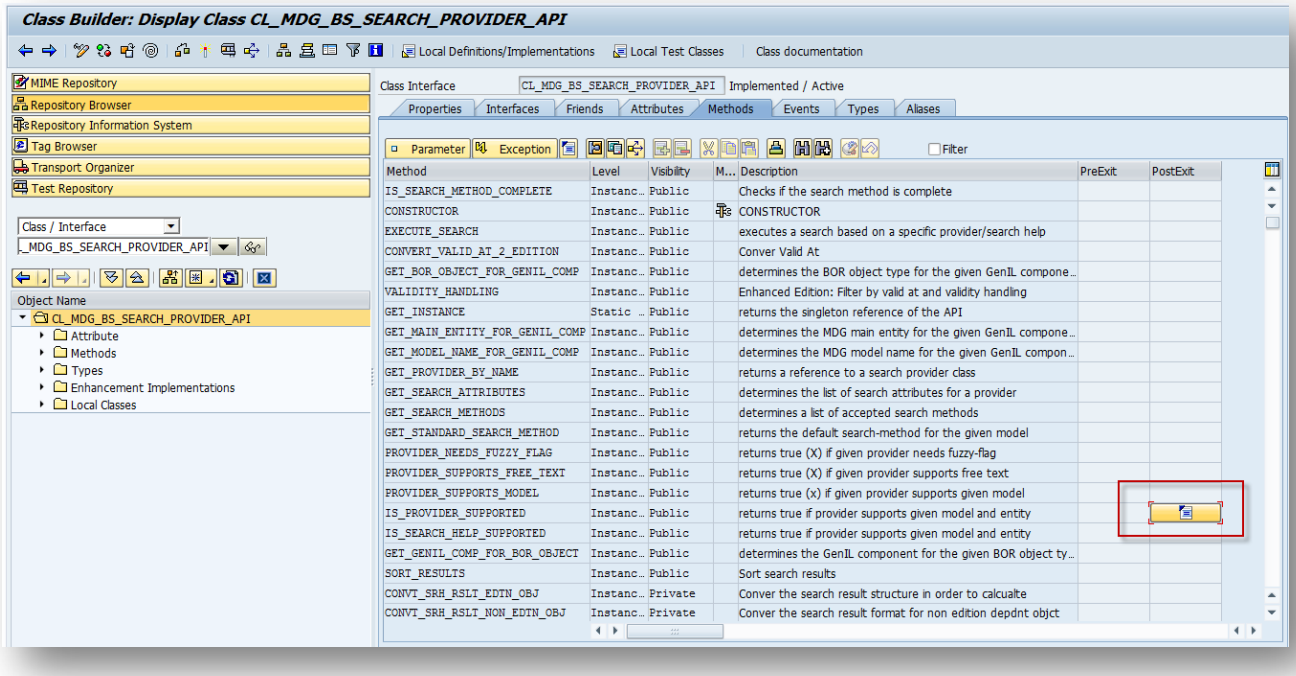
Display the method list of the class and create an enhancement implementation, e.g., ZMDG_BS_SEARCH_PROVID_API:



Place the cursor on the method itself.

Then insert the Post-Method:





Example Coding:

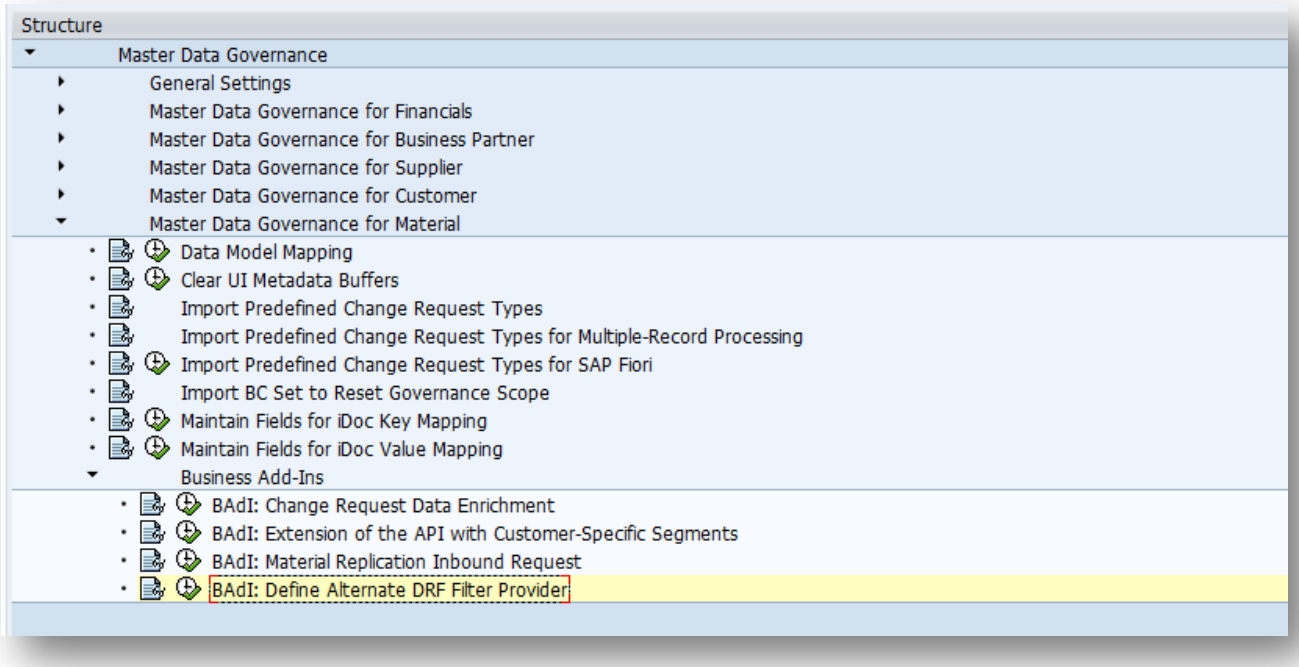
```
  METHOD ipo_zmdg_bs_search_provid_api~is_provider_supported.
*"----------------------------------------------------------------------*
*" Declaration of POST-method, do not insert any comments here please!
*"
*"methods IS_PROVIDER_SUPPORTED
*"  importing
```

```
*"     !IV_SEARCH_PROVIDER type USMD_SEARCH_MODE
*"     !IV_MODEL type USMD_MODEL
*"     !IV_ENTITY type USMD_ENTITY
*"   changing
*"     value(RV_SUPPORTED) type ABAP_BOOL . "#EC CI_VALPAR
*"----------------------------------------------------------------------*
* Support DB search for MM
    IF iv_model = if_mdg_bs_mat_gen_c=>GC_MODEL_MM AND

       iv_search_provider = if_mdg_sdq_const=>search_mode_db .
      rv_supported = abap_true.
    ENDIF.
  ENDMETHOD.                    "IPO_ZMDG_BS_SEARCH_PROVID_API~IS_PROVIDER_SUPPO
RTED
ENDCLASS.
```

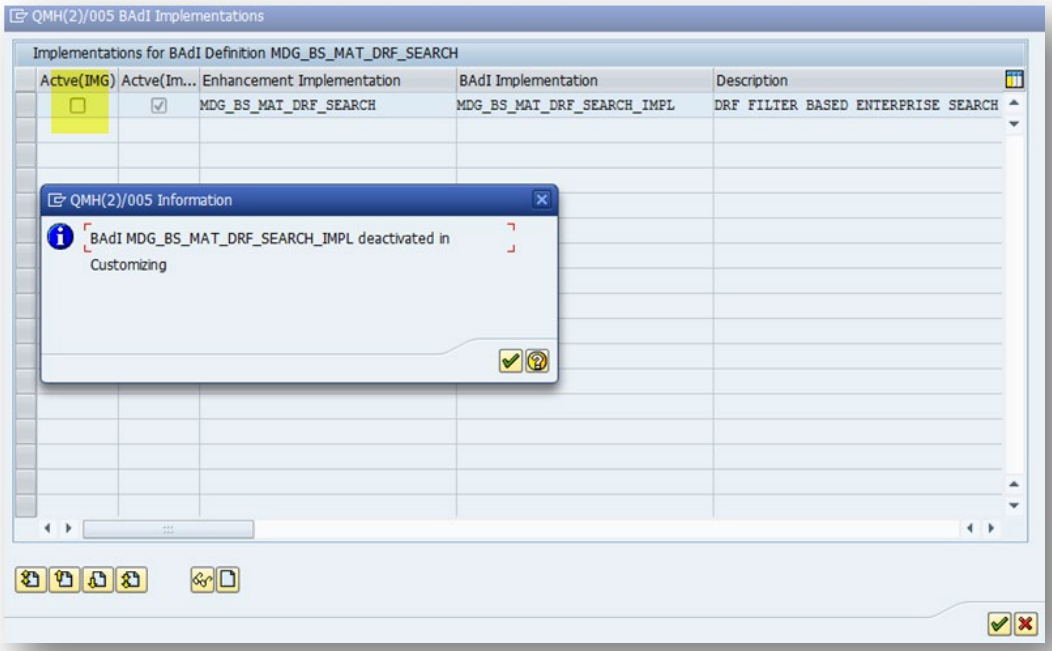
5.3 Enable database search in Material DRF implementation (valid for DB search and HANA)

5.3.1 Copy and adapt example implementation

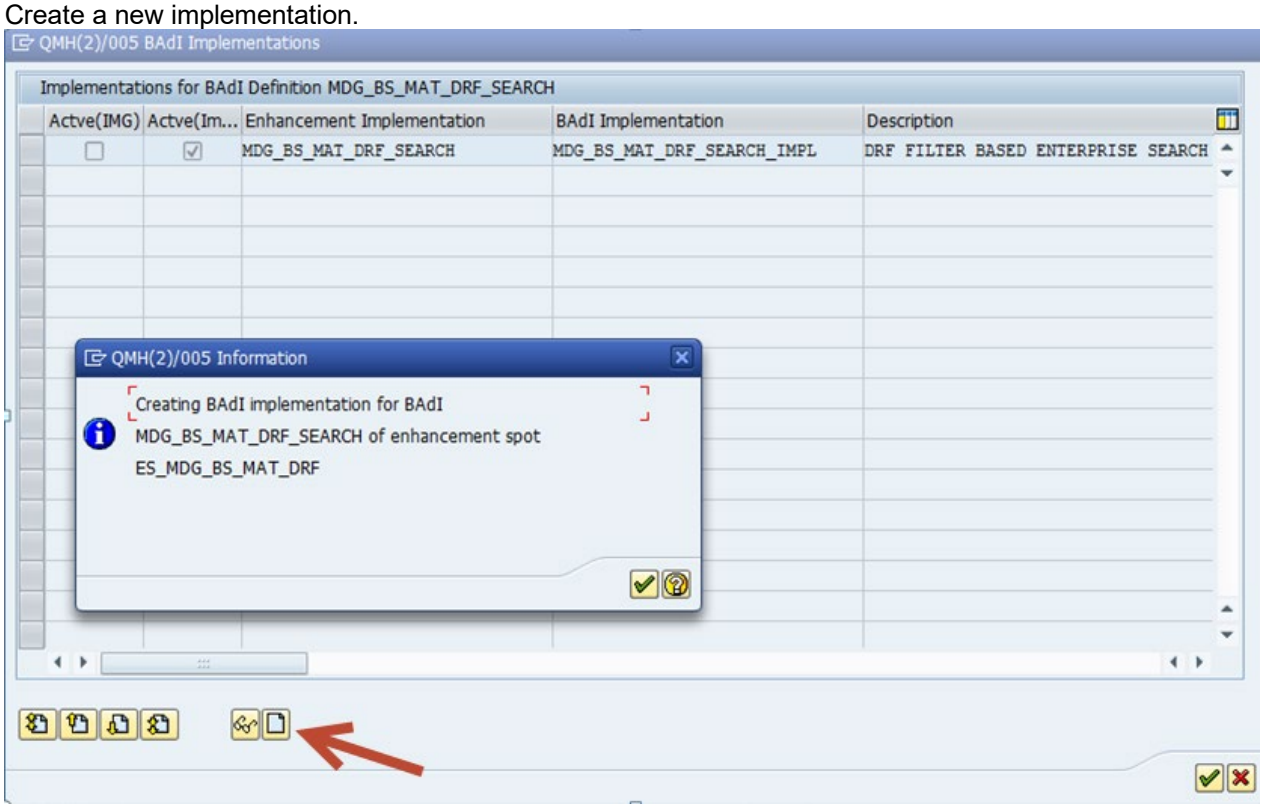
Check if SAP Note 1980991 has been implemented (this note contains the example implementation).

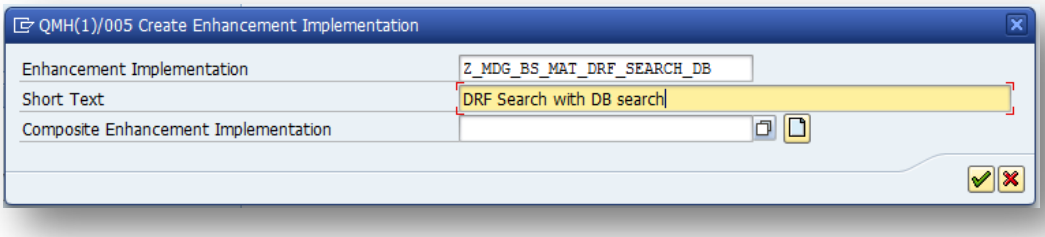


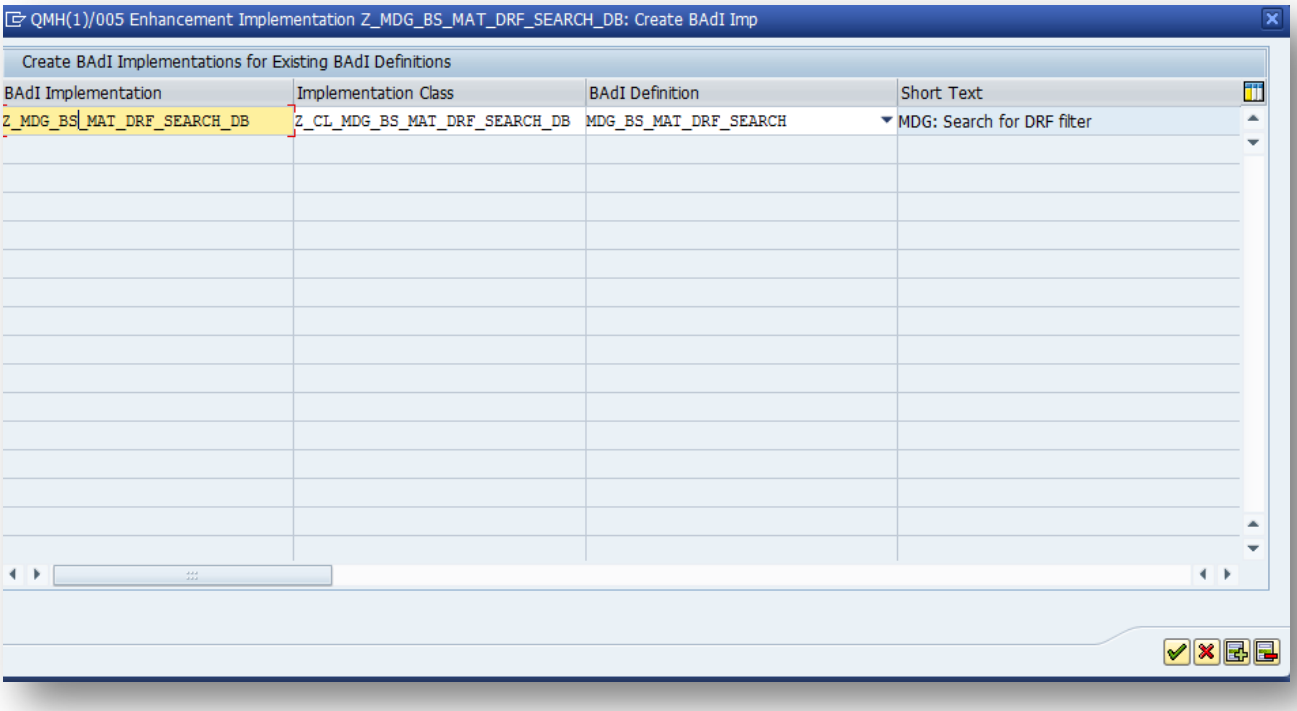
Deactivate current implementation for Enterprise Search.



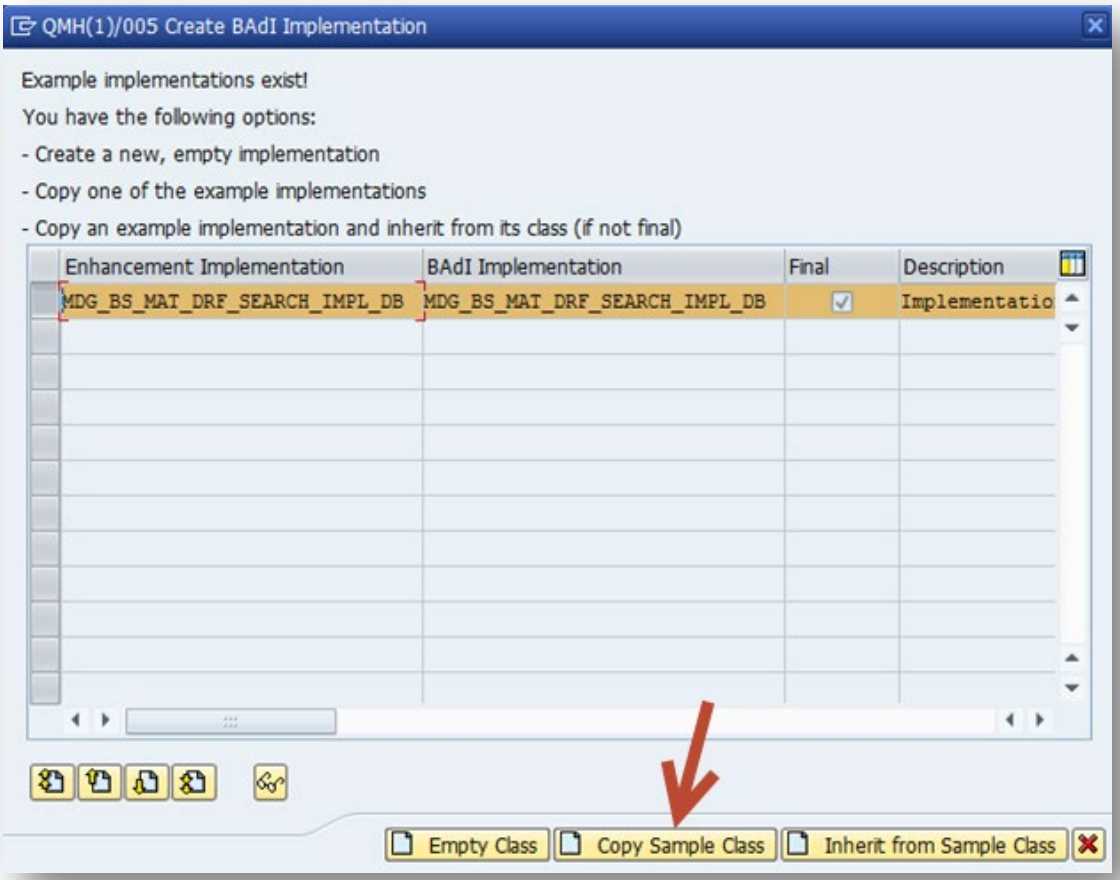
Create a new implementation.



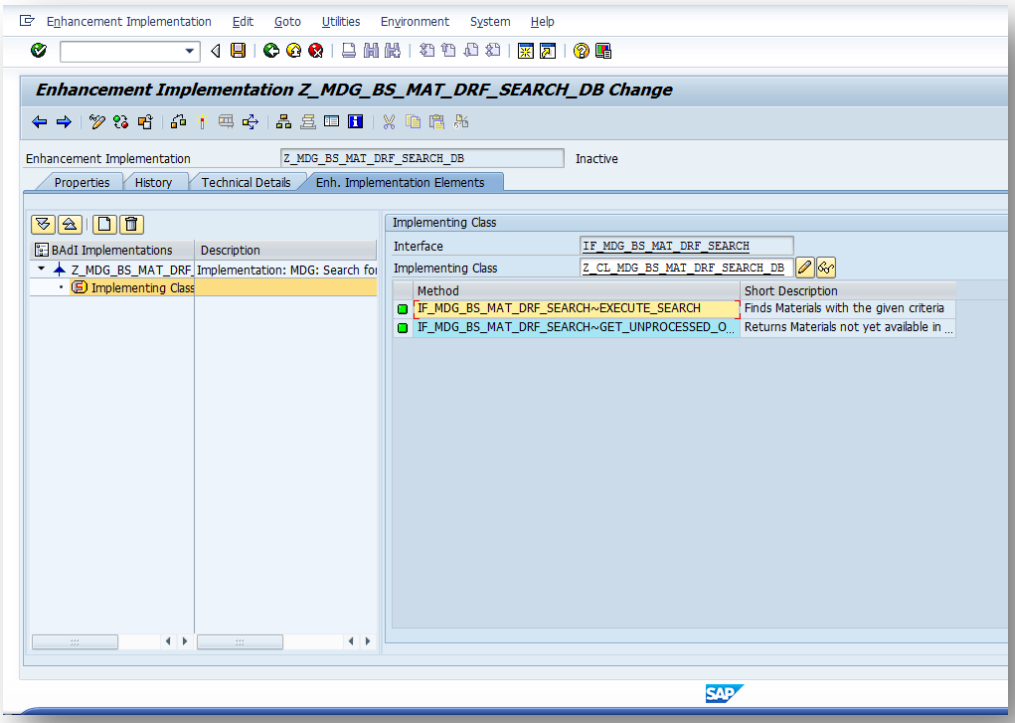


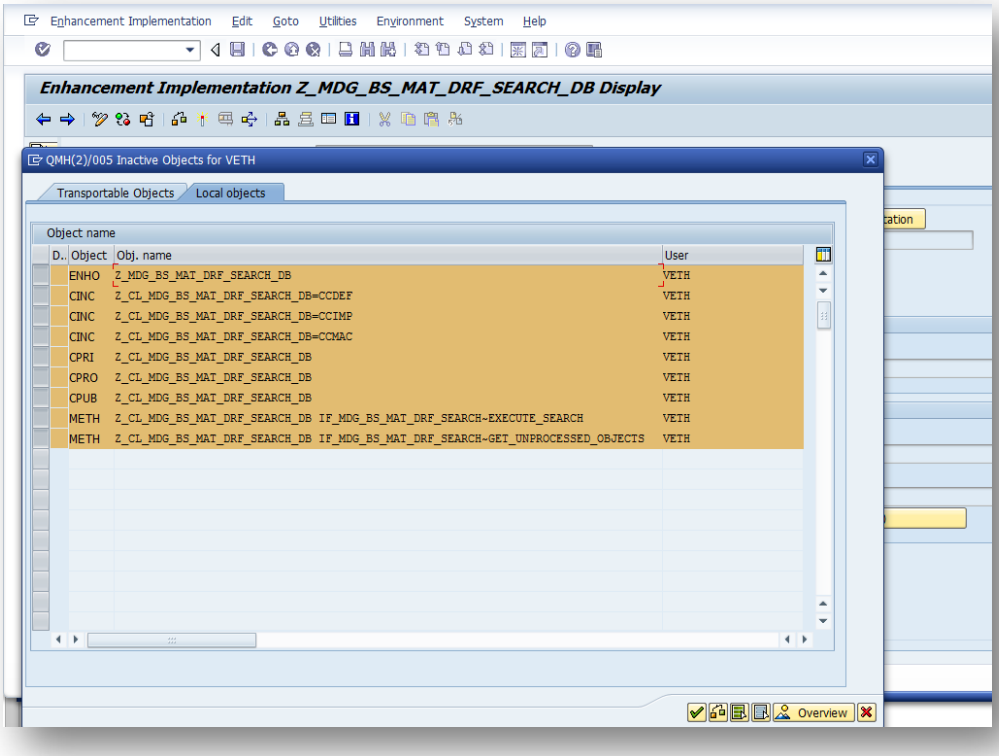


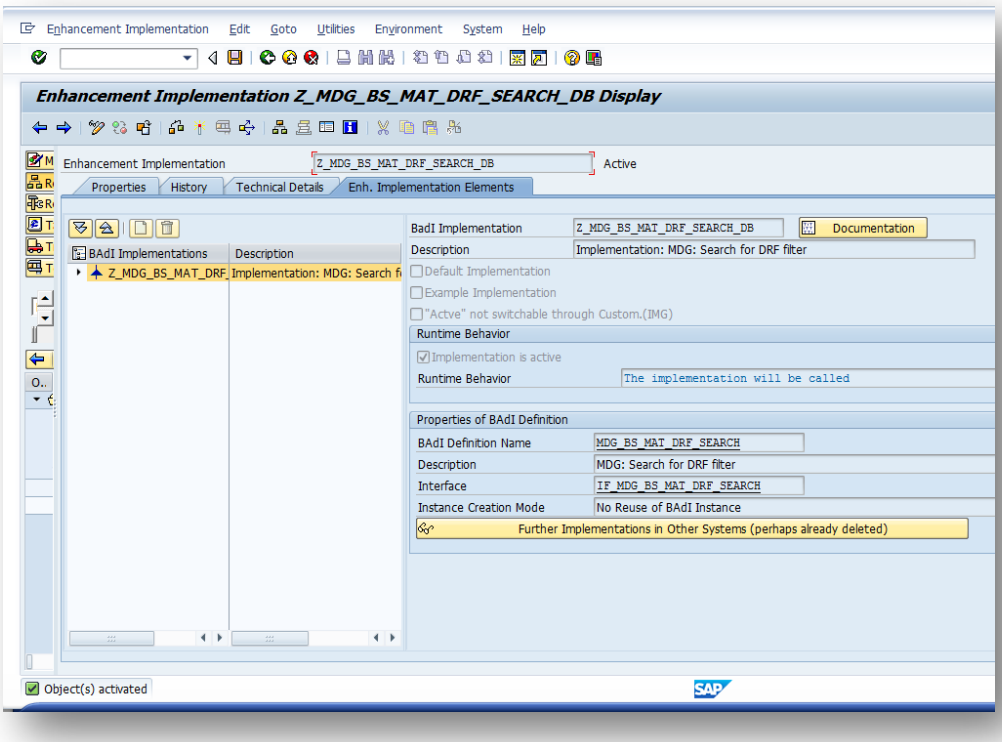
Copy the Sample Class.



Check the coding in the method, extend it for your needs, and activate this enhancement.





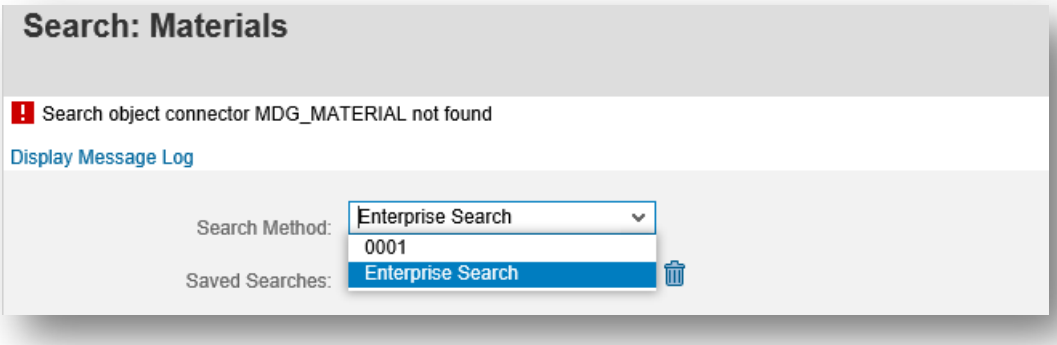


5.4 Search UI (valid for DB search and HANA)

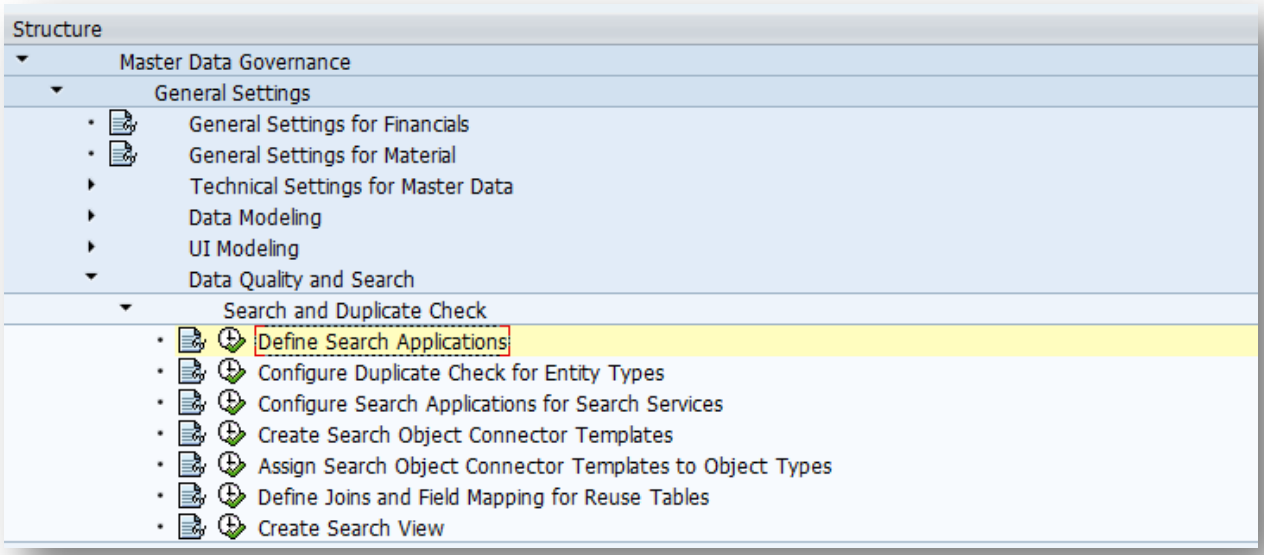
5.4.1 Set description for new Search Method (valid for DB search and HANA)

After you have run all steps above the search UI should look like this and error may occur:

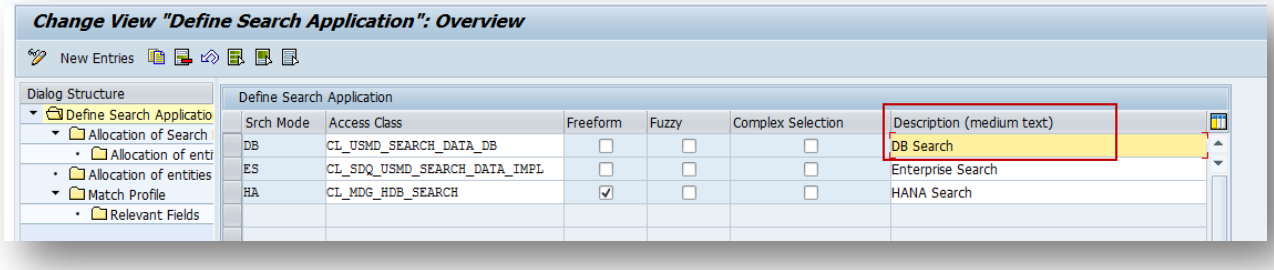
The system provides a drop-down box and the default value is still Enterprise Search (ES).



Check that the search application definition have a description

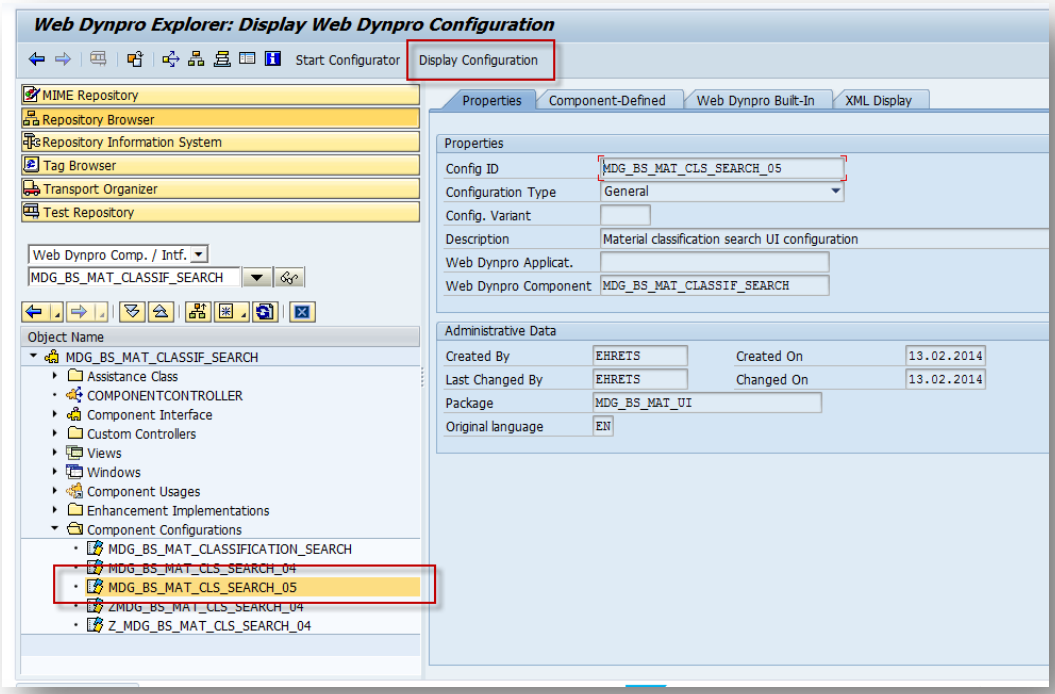


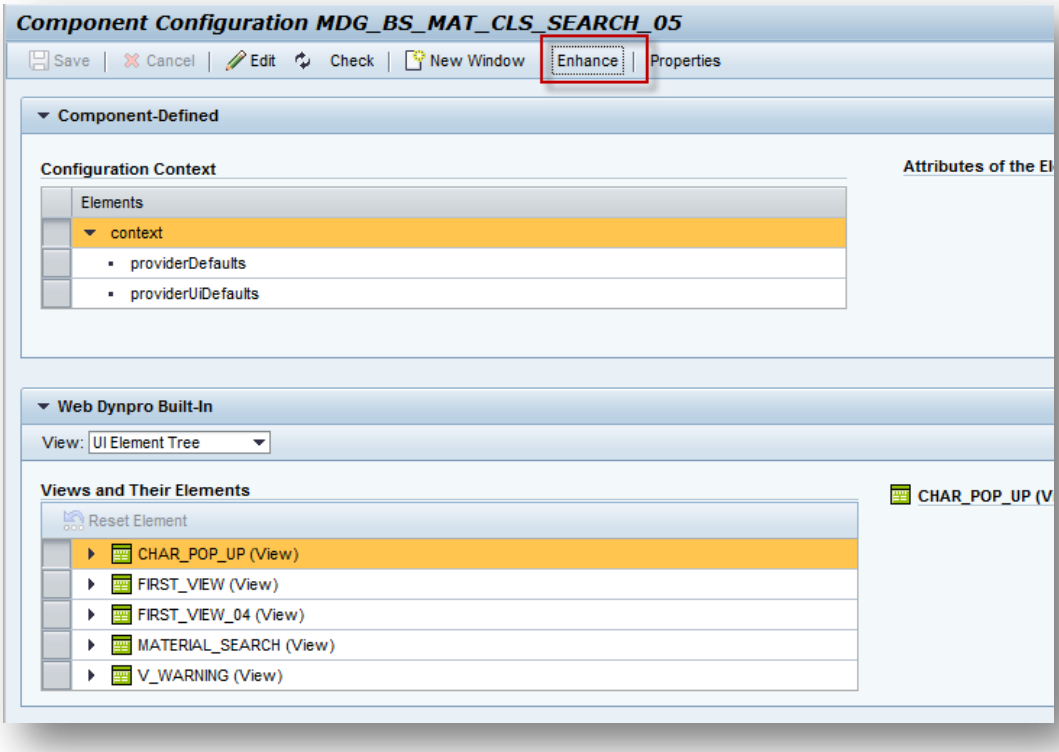
Add a description to the Search Method “DB” which shows up in the method drop-down as ‘0001’:

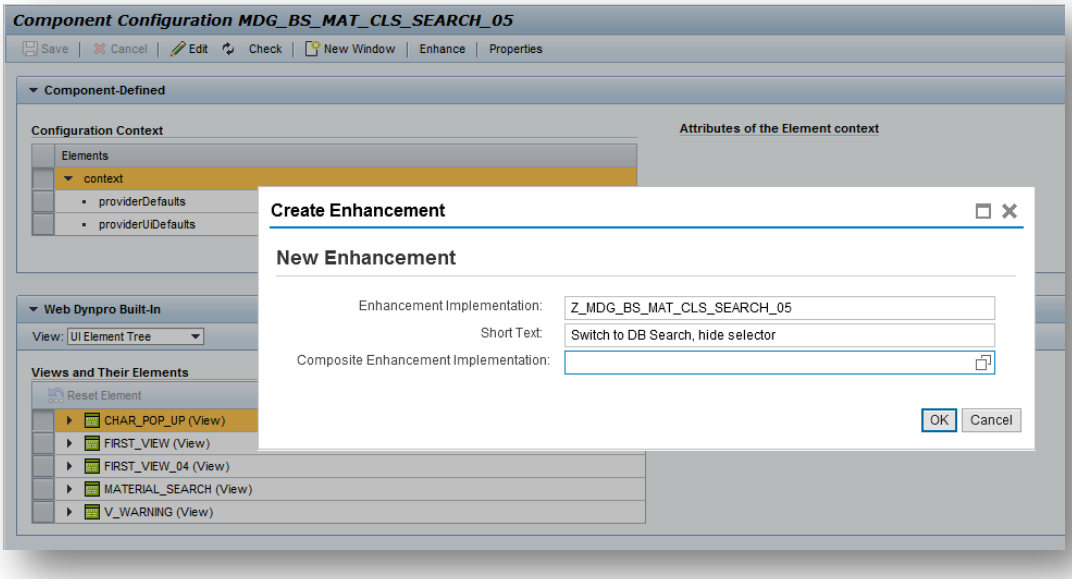


5.4.2 Set new search as default provider and hide selector box (only for HANA)

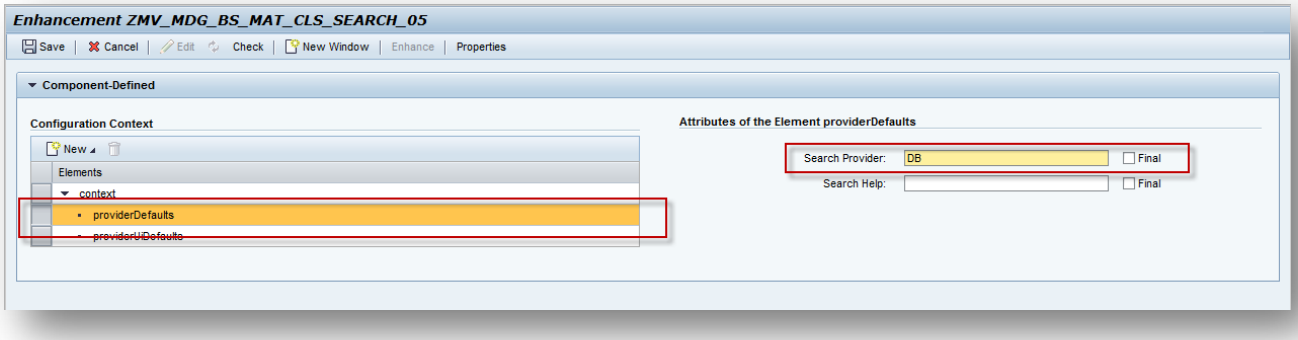
If you want to hide the selector-box, you have to enhance the UI configuration for MDG_BS_MAT_CLS_SEARCH_05:



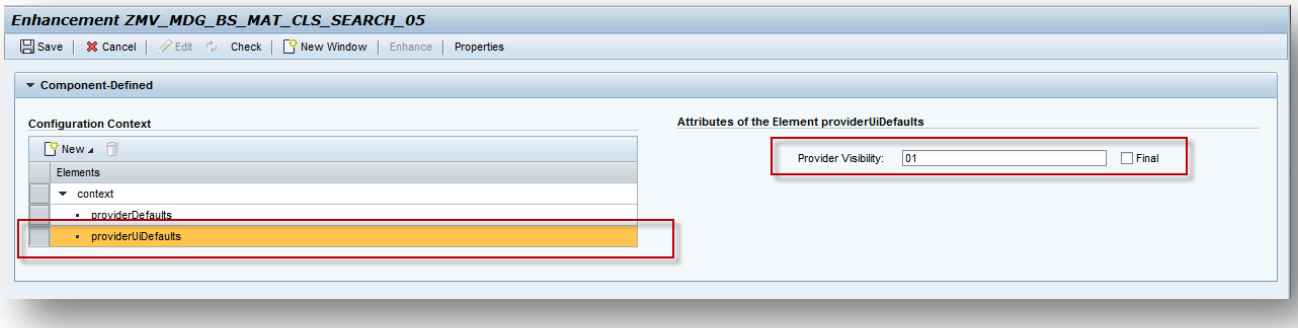




Switch the Search Provider to “DB” or ”HA”. If you use HANA you have also to maintian the Search Help from customizing.



Change the Provider Visibility from “02” (visible) to “01” (invisible). This hides the drop-down box.



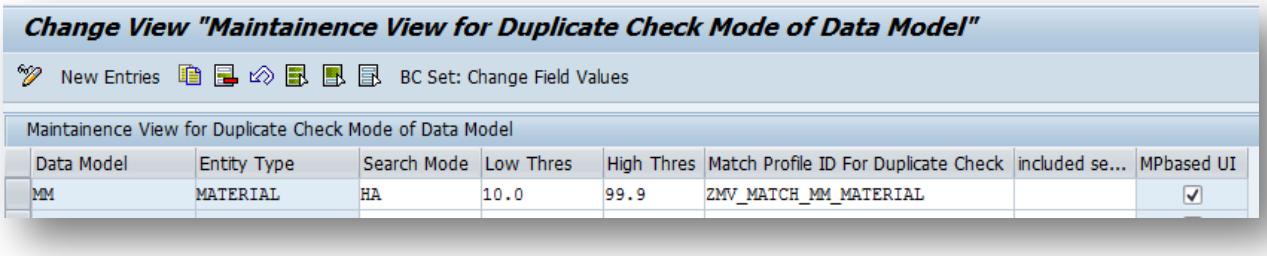
Save the new configuration.

5.5 Customizing Duplicate Check

Enterprise Search or SAP HANA is still required for the MDG-M content in:

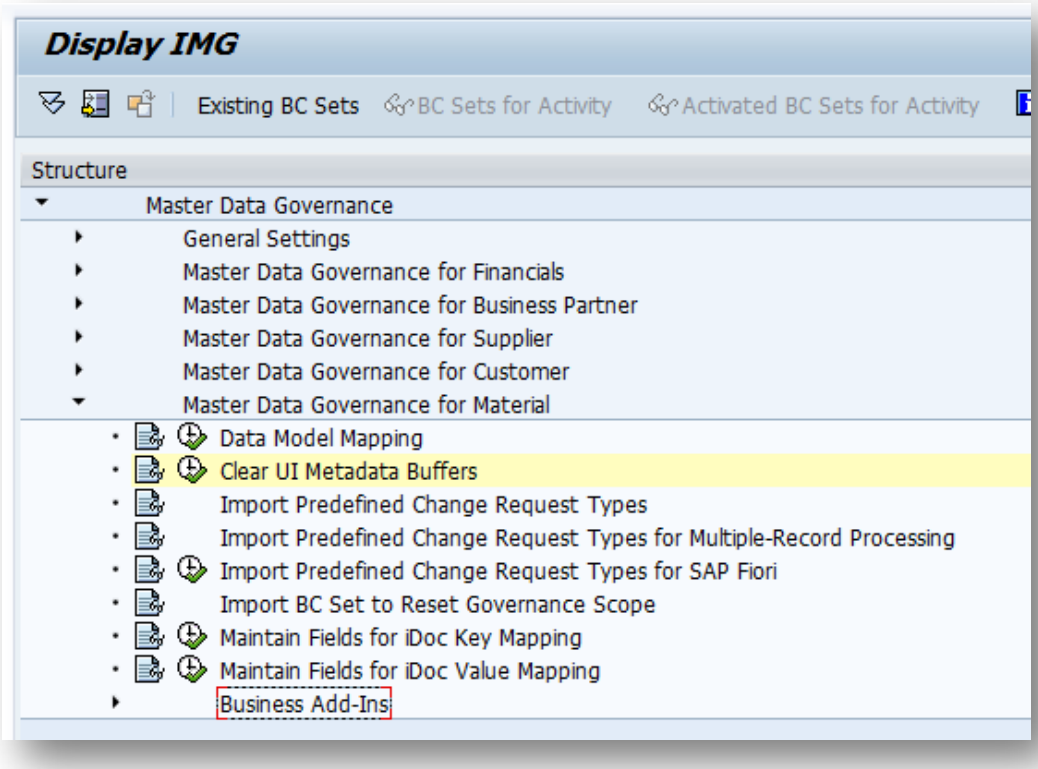
- Duplicate check (does not work with database search)

Customizing -> General Settings-> Data Quality and Search-> Search and Duplicate Check-> Configure Duplicate Check for Entity Types

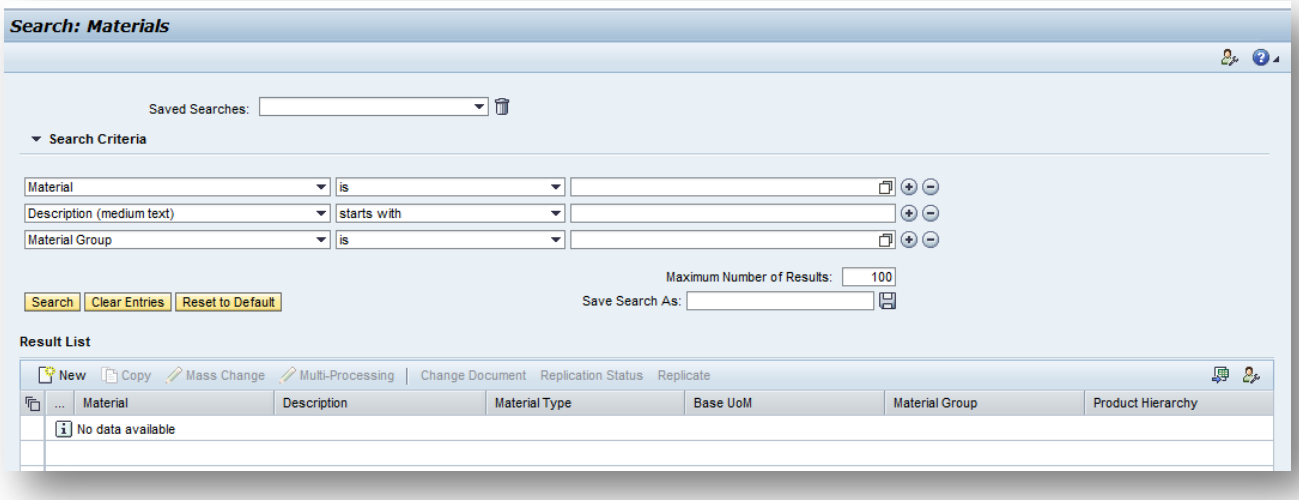


5.6 Clear UI Metadata Buffers

Run the customizing activity Clear UI Metadata Buffer.



After that the search UI should look like this:



6 Additional Information

6.1 Further Reading

6.1.1 Information on SAP MDG on SAP S/4HANA

- Exchange knowledge: SAP Community | Q&A | Blog
- Try SAP Master Data Governance on S/4HANA for free: Trial Version
- Learn more: Latest Release | Webinars | Help Portal | How-to Information | Key Presentations

6.1.2 SAP Roadmap Explorer

- Please see the roadmap for SAP Master Data Governance

6.1.3 Related Information

- Learn more: Floorplan Manager for Web Dynpro ABAP | How to Adapt FPM | FPM Blog | How-to Information | Service Mapping Tool | SAP S/4HANA Cookbook CVI

6.2 SAP Notes

In addition to the detailed explanations written in this document, please see the following SAP Notes for further important information.

Note	Description
3194967	MDG Customer Connection 2021 for S/4HANA 2022
3043582	MDG Customer Connection 2020
3134600	MDG-M: Supported fields in Data Model MM
1806108	Functional restrictions in MDG-M in MDG7 (incl. SP02)
2129261	Functional restrictions in MDG-M in MDG8
2284745	Functional Restrictions in MDG for Material with SAP Master Data Governance 9.0
2461516	Functional Restrictions in MDG for Material with SAP Master Data Governance 9.1
2656693	Functional Restrictions in MDG for Material in SAP Master Data Governance 9.2 and on SAP S/4HANA 1809
2816571	Functional Restrictions in MDG for Material on SAP S/4HANA 1909
2948873	Functional Restrictions in MDG for Material on SAP S/4HANA 2020
3070012	Functional Restrictions in MDG for Material on SAP S/4HANA 2021
3219945	Functional Restrictions in MDG for Material on SAP S/4HANA 2022

2281401	Decoupling MDG Material from Enterprise Search as provider
1980991	Example BAdI impl. for DB-based DRF filters
1883621	Downport search extensibility
1883841	Message "Search connectors missing for MDG material"
1885186	Respect search mode when checking search prerequisites
2105467	MDG Performance
2561461	Scope of support for SAP Master Data Governance (MDG)