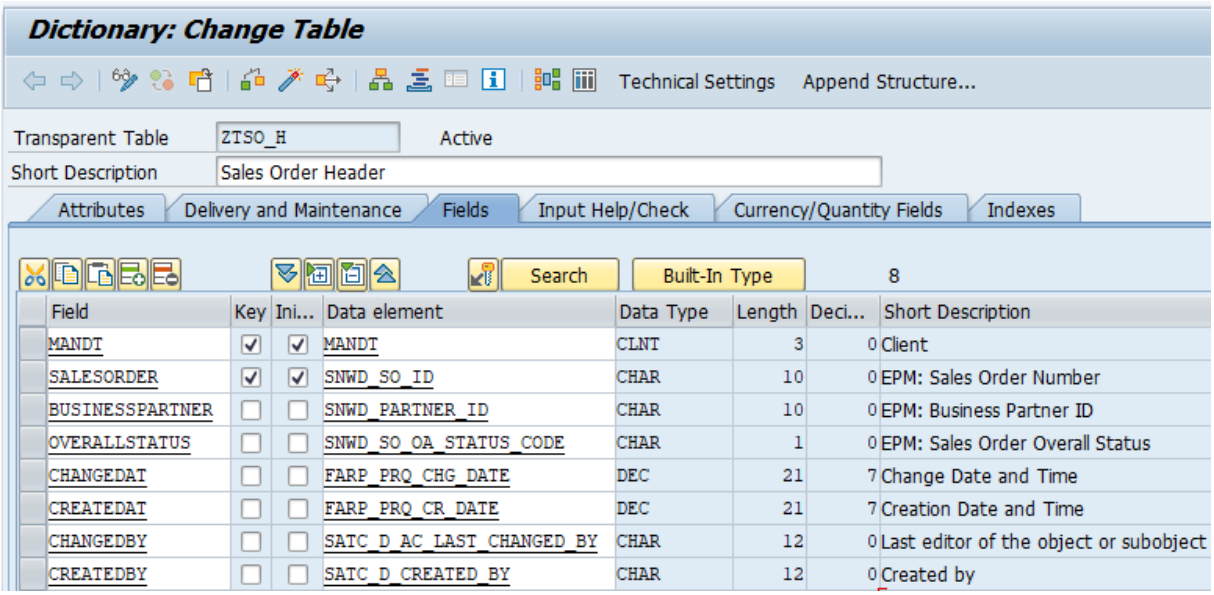
CRUD Application with BOPF and DRAFT functionality

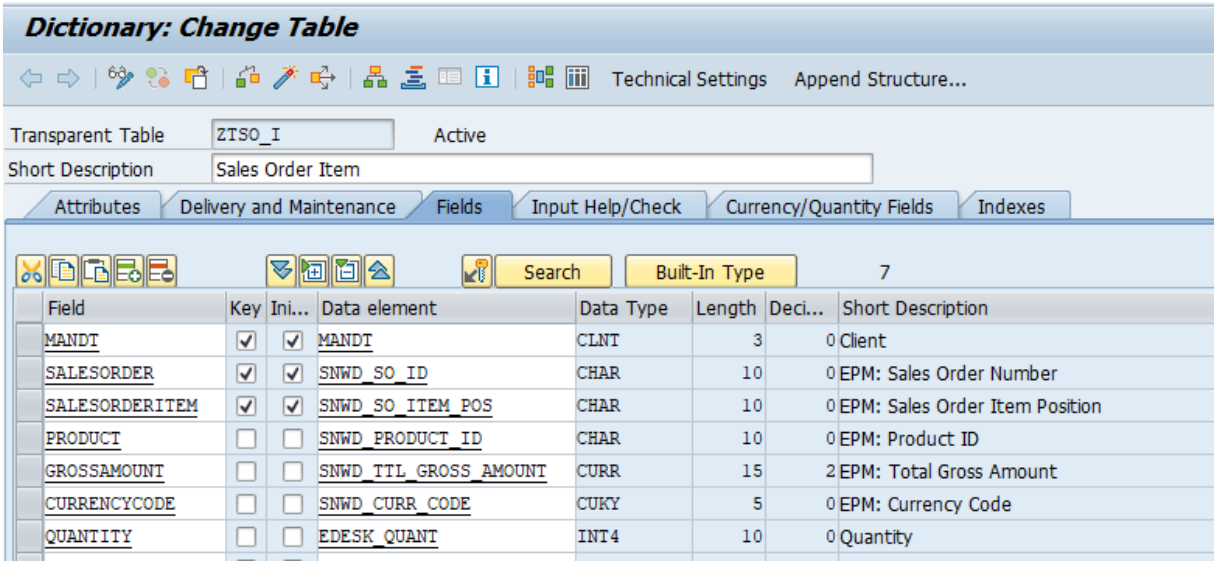
1) Create the tables
   a. Sales Order Header

Field Name	Key	Data Element
MANDT	X	MANDT
SALESORDER	X	SNWD_SO_ID
BUSINESSPARTNER		SNWD_PARTNER_ID
OVERALLSTATUS		SNWD_SO_OA_STATUS_CODE
CHANGEDAT		FARP_PRQ_CHG_DATE
CREATEDAT		FARP_PRQ_CR_DATE
CHANGEDBY		SATC_D_AC_LAST_CHANGED_BY
CREATEDBY		SATC_D_CREATED_BY

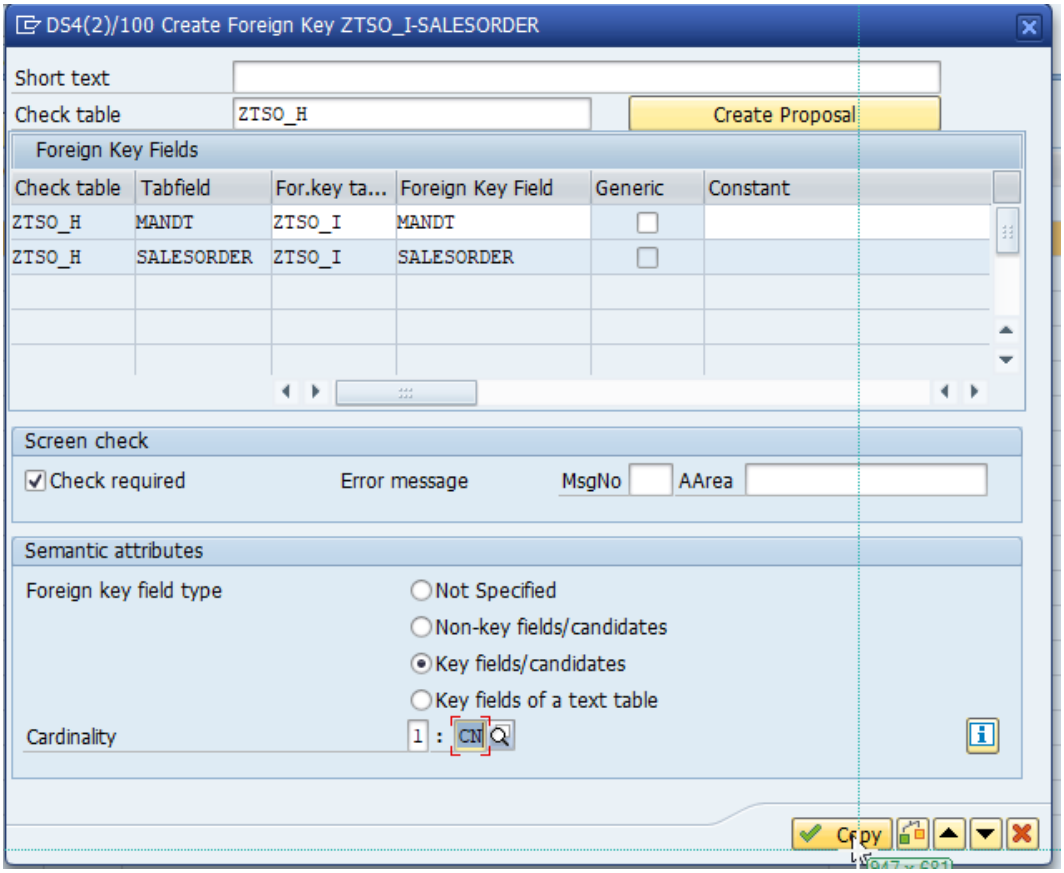


   b. Sales Order Item

Field Name	Key	Data Element
MANDT	X	MANDT
SALESORDER	X	SNWD_SO_ID
SALESORDERITEM	X	SNWD_SO_ITEM_POS
PRODUCT		SNWD_PRODUCT_ID
GROSSAMOUNT		SNWD_TTL_GROSS_AMOUNT
CURRENCYCODE		SNWD_CURR_CODE
QUANTITY		EDESK_QUANT

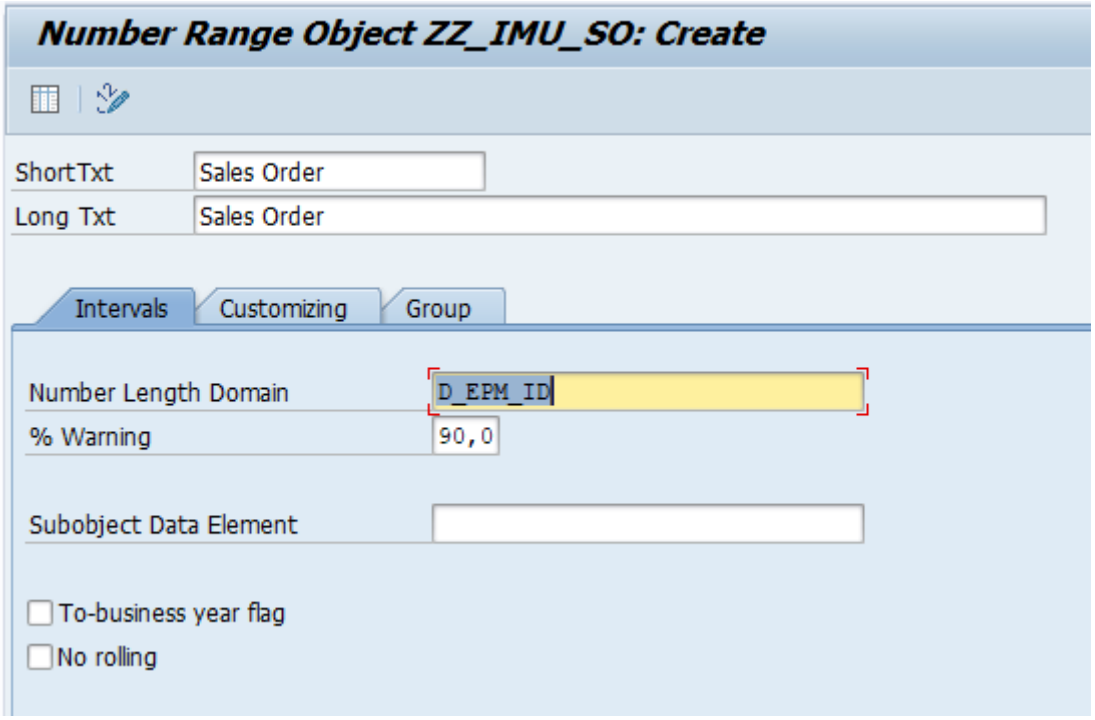


c. Create relationship with foreign key:

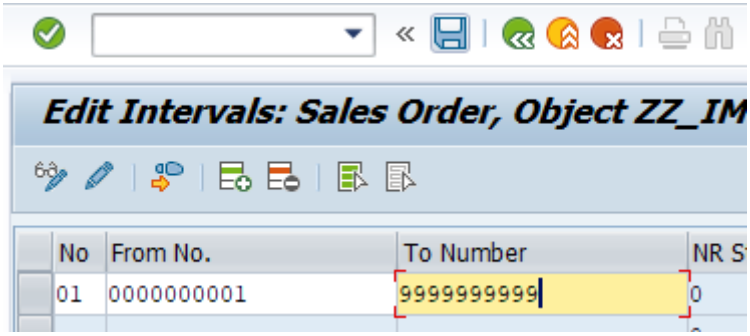


2) Generate Number Object Range

a. Define the domain name and warning, e.g:



b. Define the interval:



3) Create BASIC CDS Views in Eclipse

a. CDS Basic View for Sales Order Header

```
@AbapCatalog.sqlViewName: 'ZBSOH'
@AbapCatalog.compiler.compareFilter: true
@AbapCatalog.preserveKey: true
@AccessControl.authorizationCheck: #CHECK
@EndUserText.label: 'Basic CDS View for ZTSO_H table'

@VDM.viewType: #BASIC
define view ZBSO_H
  as select from ztso_h
{
  key salesorder,
      businesspartner,
      overallstatus,
      changedat,
      createdat,
      changedby,
```

```
      createdby
}
```

b. CDS Basic View for Sales Order Item

```
@AbapCatalog.sqlViewName: 'ZBSOI'
@AbapCatalog.compiler.compareFilter: true
@AbapCatalog.preserveKey: true
@AccessControl.authorizationCheck: #CHECK
@EndUserText.label: 'Basic CDS View for ZTSO_I table'

@VDM.viewType: #BASIC
define view ZBSO_I
  as select from ztso_i
{
  key salesorder,
  key salesorderitem,
      product,
      grossamount,
      currencycode,
      quantity
}
```

4) Create Transactional CDS Views in Eclipse

a. CDS Transactional View for Sales Order Header

```
@AbapCatalog.sqlViewName: 'ZISOHTP'
@AbapCatalog.compiler.compareFilter: true
@AbapCatalog.preserveKey: true
@AccessControl.authorizationCheck: #CHECK
@EndUserText.label: 'Transactional CDS View for ZBSO_H'

@VDM.viewType: #TRANSACTIONAL

//****---->>>> Add the below objectModel code after activation of
both header and items
@ObjectModel: {
    transactionalProcessingEnabled: true,
    compositionRoot: true,
    createEnabled: true,
    updateEnabled: true,
    deleteEnabled: true,
    draftEnabled: true,
    writeDraftPersistence: 'ZTSO_H_DRAFT',
    semanticKey: [ 'salesorder' ]
}
define view ZISO_H_TP
  as select from ZBSO_H as Header
  // Association
  association [0..*] to ZISO_I_TP                    as _Items
    on $projection.salesorder = _Items.salesorder
  // Value Help
```

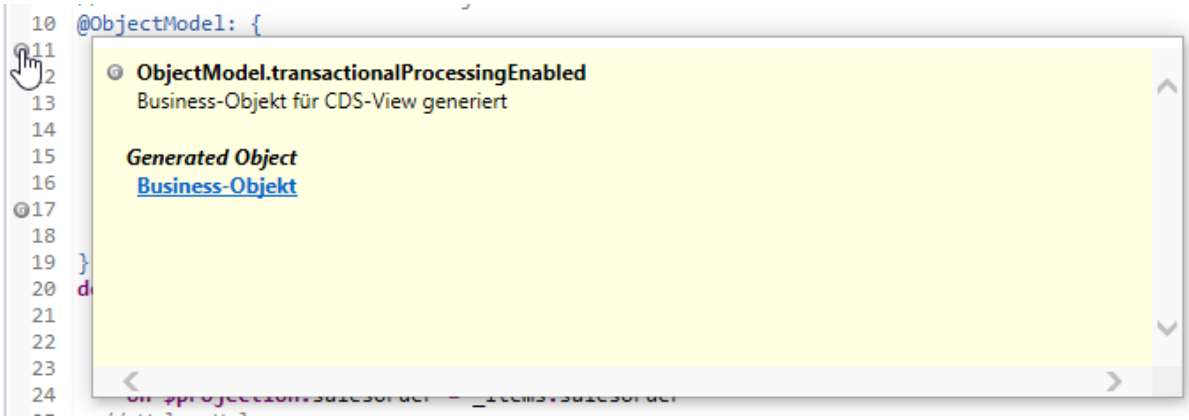
```
  association [0..*] to SEPM_I_BusinessPartner       as _BP
    on $projection.businesspartner = _BP.BusinessPartner
  association [0..1] to Sepm_I_SalesOrdOverallStatus as _Status
    on $projection.overallstatus = _Status.SalesOrderOverallStatus
{
      @ObjectModel.readOnly: true
  key Header.salesorder,
      //      @ObjectModel.foreignKey.association: '_BP'
      Header.businesspartner,
      @ObjectModel.foreignKey.association: '_Status'
      Header.overallstatus,
      @ObjectModel.readOnly: true
      Header.changedat,
      @ObjectModel.readOnly: true
      Header.createdat,
      @ObjectModel.readOnly: true
      Header.changedby,
      @ObjectModel.readOnly: true
      Header.createdby,
      @ObjectModel.association: {
          type: [ #TO_COMPOSITION_CHILD ]
      }
      _Items,
      // Value help assocations
      _Status,
      _BP
}
```

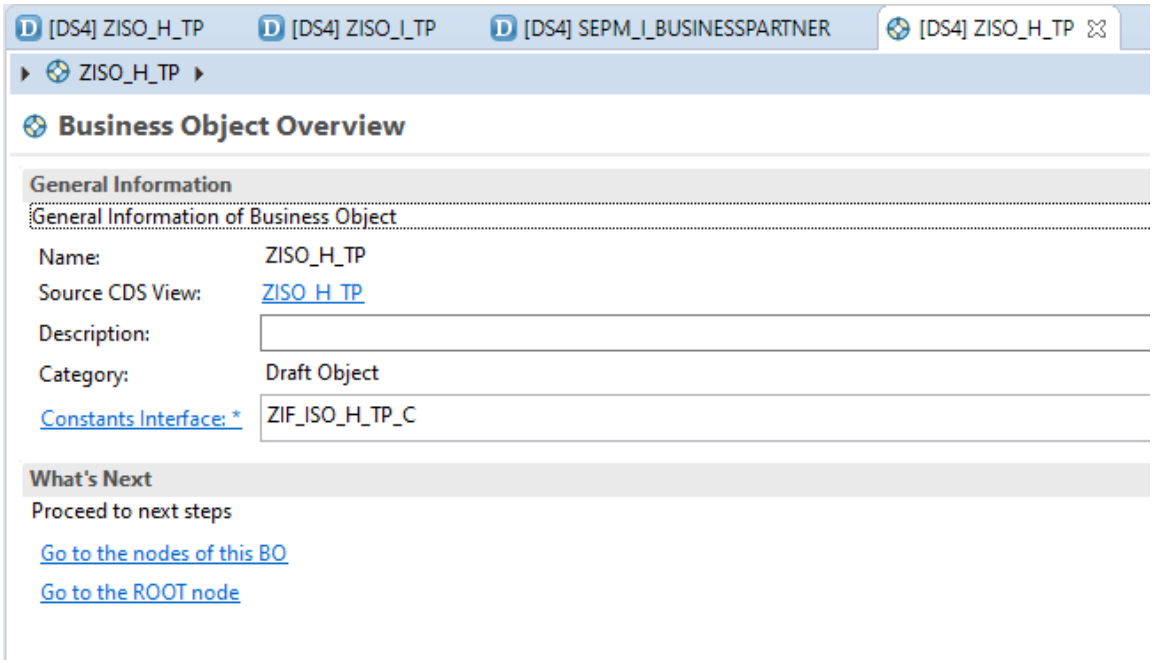
b. CDS Transactional View for Sales Order Item

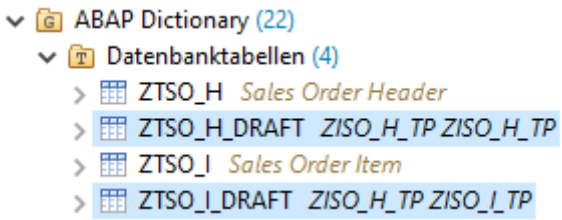
```
@AbapCatalog.sqlViewName: 'ZISOITP'
@AbapCatalog.compiler.compareFilter: true
@AbapCatalog.preserveKey: true
@AccessControl.authorizationCheck: #CHECK
@EndUserText.label: 'Transactional CDS View for ZBSO_I'

@VDM.viewType: #TRANSACTIONAL
@ObjectModel:{
    createEnabled: true,
    updateEnabled: true,
    deleteEnabled: true,
    writeDraftPersistence: 'ZTSO_I_DRAFT',
   semanticKey:['salesorder', 'salesorderitem']
}
define view ZISO_I_TP
  as select from ZBSO_I as Items
  association [1..1] to ZISO_H_TP        as _Header
    on $projection.salesorder = _Header.salesorder
  // Value Help
  association [0..1] to SEPM_I_Product_E as _Product
    on $projection.product = _Product.Product
  association [0..1] to SEPM_I_Currency  as _Currency
    on $projection.currencycode = _Currency.Currency
{
      @ObjectModel.readOnly: true
  key Items.salesorder,
      @ObjectModel.readOnly: true
```

```
  key Items.salesorderitem,
      @ObjectModel.mandatory: true
      @ObjectModel.foreignKey.association: '_Product'
      Items.product,
      @Semantics.amount.currencyCode: 'currencycode'
      Items.grossamount,
      @ObjectModel.foreignKey.association: '_currency'
      @Semantics.currencyCode: true
      Items.currencycode,
      Items.quantity,
      @ObjectModel.association: {
          type: [ #TO_COMPOSITION_PARENT, #TO_COMPOSITION_ROOT ]
      }
      _Header,
      _Product,
      _Currency
}
```

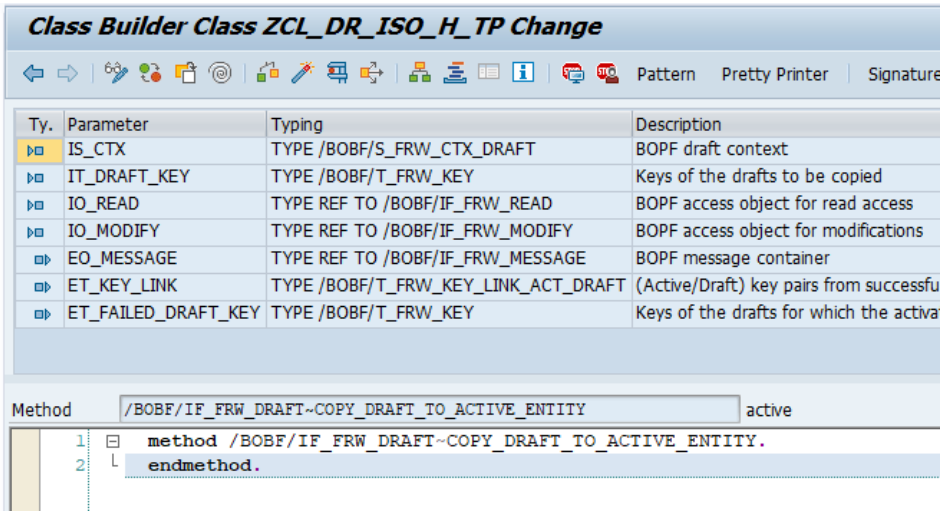
5) Check the generated BOPF objects and draft tables:







a. Go into the DRAFT class and implement the code to save the DRAFT data to the database tables:

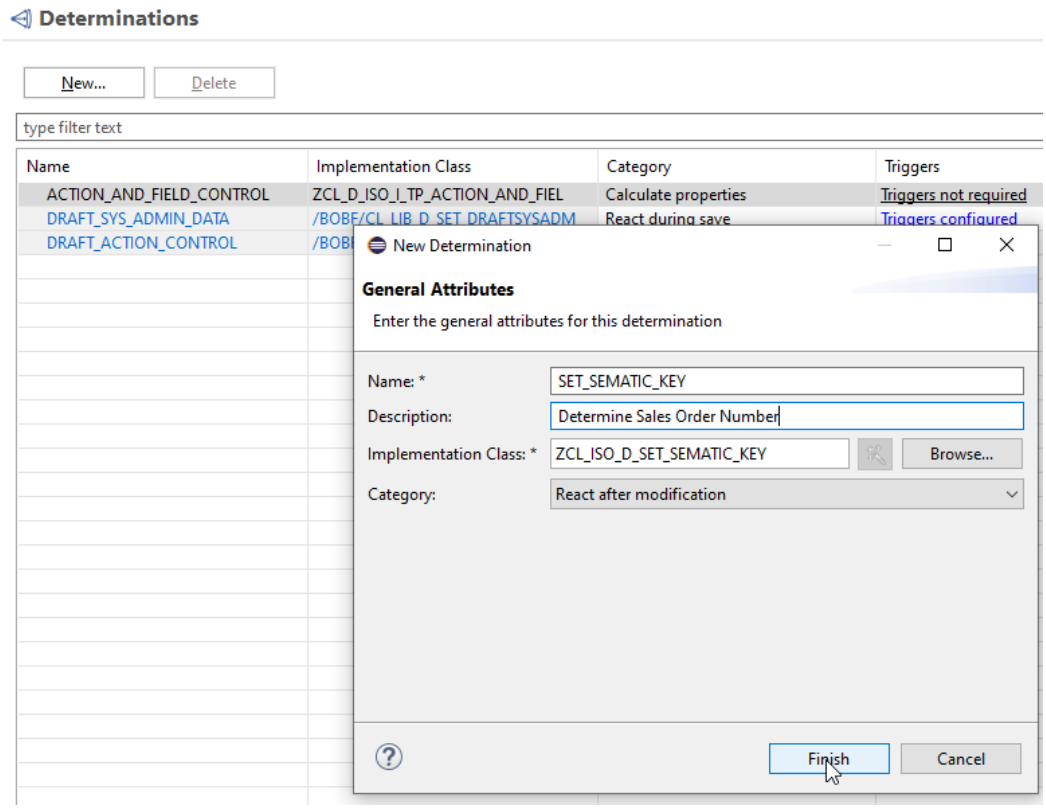


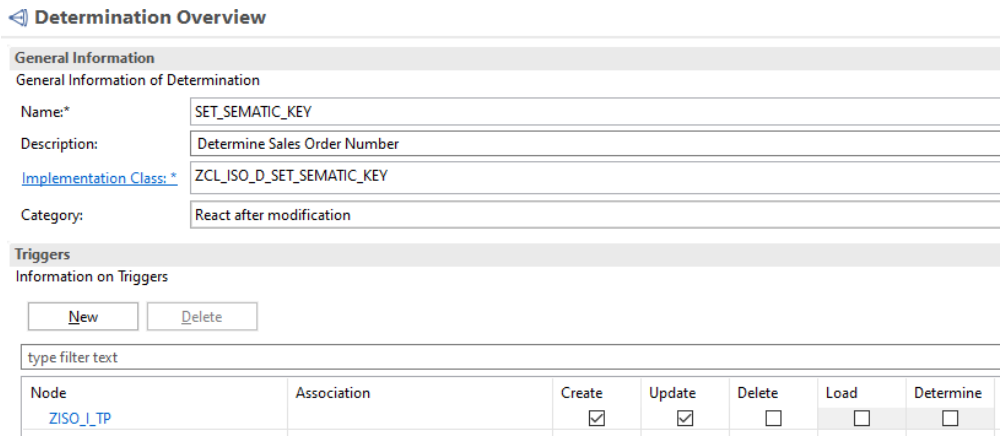

```
METHOD /bobf/if_frw_draft~copy_draft_to_active_entity.

  DATA: ls_msg TYPE symsg.

  "Get the message container, to push any messages to the UI if req
ured
  IF eo_message IS NOT BOUND.
    eo_message = /bobf/cl_frw_message_factory=>create_container( ).
  ENDIF.
  "Header and items data declaration( Generated after activation of
 the Transactional View by the BOPF)
  DATA(lt_header) = VALUE ztiso_h_tp( ).
  DATA(lt_items) = VALUE ztiso_i_tp( ).

  "Read Header Data
  "Pass the node key, which tells if we are trying to read header o
r item, in this case header
  "Pass the draft keys, if we create an entry in the Fiori, they wi
ll be saved as draft initially, those keys we will pass to get the
data
  "Use the Constant Interface generated by your BOPF
  io_read->retrieve(
    EXPORTING
      iv_node        = zif_iso_h_tp_c=>sc_node-ziso_h_tp
      it_key         = it_draft_key
      iv_fill_data = abap_true
    IMPORTING
      et_data        = lt_header ).
  " Read the Items data
  " We need to read via the assocation, so passing the assocation k
ey here
```

```
  io_read->retrieve_by_association(
    EXPORTING
      iv_node                 = zif_iso_h_tp_c=>sc_node-
ziso_h_tp " Node Name
      it_key                  = it_draft_key                      "
 Key Table
      iv_association          = zif_iso_h_tp_c=>sc_association-
ziso_h_tp-_items
      iv_fill_data = abap_true
    IMPORTING
      et_data                 = lt_items ).

  " Always 1 header only expected as we can only create one sales o
rder at a time
  DATA(ls_so_header) = CORRESPONDING ztso_h( lt_header[ 1 ] ). "Use
 the structure created by the generation of the BOPF
  " Updating the header
  GET TIME STAMP FIELD ls_so_header-changedat.
  ls_so_header-changedby = sy-uname.
  " I am checking if the sales order number is initial, it means it
 is the new entry
  " Else it is an existing entry
  " Alternatively we can also use lt_header[ 1 ]-
HASACTIVEENTRY, which will tell if the active entry is available
  " If the active entry is available means it is update sceanrio el
se it is create scenario
  IF ls_so_header-salesorder IS NOT INITIAL.
    MODIFY ztso_h FROM ls_so_header.
  ELSE.
    GET TIME STAMP FIELD ls_so_header-createdat.
    ls_so_header-createdby = sy-uname.

    CALL FUNCTION 'NUMBER_GET_NEXT'
      EXPORTING
        nr_range_nr = '01'
        object      = 'ZZ_IMU_SO'
      IMPORTING
        number      = ls_so_header-salesorder.

    INSERT ztso_h FROM ls_so_header.
  ENDIF.

  " Now update/create/delete the items
  DATA: lt_items_save TYPE TABLE OF ztso_i,
        lt_ztso_i_aux TYPE TABLE OF ztso_i,
        lv_count      TYPE i.

  " Deleting the items
  SELECT *
    FROM ztso_i
    INTO TABLE @DATA(lt_ztso_i)
    WHERE salesorder = @ls_so_header-
salesorder ORDER BY salesorderitem DESCENDING.

  LOOP AT lt_ztso_i ASSIGNING FIELD-SYMBOL(<fs_ztso_i>).
    DATA(lv_tabix) = sy-tabix.
    READ TABLE lt_items WITH KEY salesorder      = <fs_ztso_i>-
salesorder
                                 salesorderitem  = <fs_ztso_i>-
salesorderitem
                                 hasactiveentity = abap_true TRANSP
ORTING NO FIELDS.
```

```
    IF sy-subrc <> 0.
      INSERT <fs_ztso_i> INTO TABLE lt_ztso_i_aux.
      DELETE lt_ztso_i INDEX lv_tabix.
    ENDIF.
  ENDLOOP.

  IF lt_ztso_i_aux IS NOT INITIAL.
    DELETE ztso_i FROM TABLE lt_ztso_i_aux.
  ENDIF.

  " Updating the items
  READ TABLE lt_ztso_i ASSIGNING <fs_ztso_i> INDEX 1. "Get last ite
m
  IF sy-subrc = 0.
    lv_count = <fs_ztso_i>-salesorderitem.
  ENDIF.
  " Setting the item number here.
  LOOP AT lt_items REFERENCE INTO DATA(lo_item) WHERE hasactiveenti
ty EQ abap_false.
    lv_count = lv_count + 1.
    lo_item->salesorder = ls_so_header-salesorder.
    lo_item->salesorderitem = lv_count.
    lo_item->salesorderitem = |{ lo_item-
>salesorderitem ALPHA = IN }|.
  ENDLOOP.

  lt_items_save = CORRESPONDING #( lt_items ).
  IF lt_items_save IS NOT INITIAL.
    MODIFY ztso_i FROM TABLE lt_items_save.
  ENDIF.

  " Now we need to tell the BOPF framework to delete the draft entr
ies as we have successfully created the data in the DB
  " But BOPF only understands the data in GUIDs, so we need to conv
ert the sales order number to BOPF key, we just need to parent key
  DATA(lr_key_util) = /bobf/cl_lib_legacy_key=>get_instance( zif_is
o_h_tp_c=>sc_bo_key ).

  DATA(lv_bobf_key) = lr_key_util-
>convert_legacy_to_bopf_key( iv_node_key   = zif_iso_h_tp_c=>sc_nod
e-ziso_h_tp
                                                                  is_l
egacy_key = ls_so_header-salesorder ).

  APPEND VALUE #( draft = it_draft_key[ 1 ]-
key active = lv_bobf_key ) TO et_key_link.

ENDMETHOD.
```

b. By creating the new item in the UI, we need to link the item with the header, this needs to be done manually through BOPF Determination, so open the Item node and create the Determination:





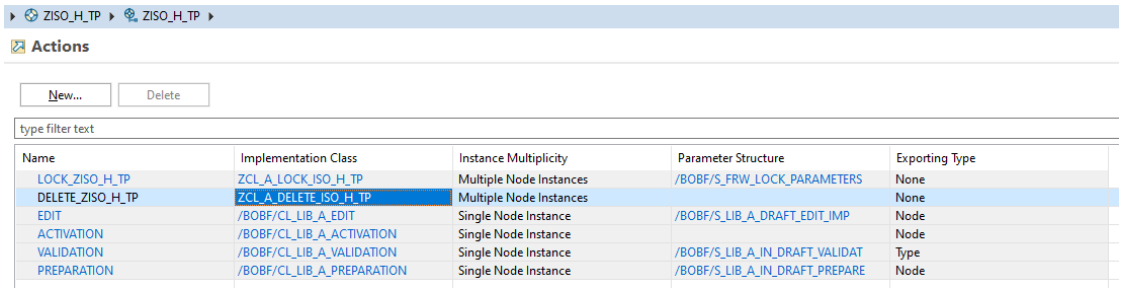
Open the generated implementation class ZCL_ISO_D_SET_SEMATIC_KEY, and do the code:

```
METHOD /bobf/if_frw_determination~execute.

  " This is used in the update scenario of the sales order(wh
ich has already been created) and when we are creating sales
order items
  DATA: lt_header TYPE ztiso_h_tp,
        lt_items  TYPE ztiso_i_tp.
  " read the sales order items
  io_read->retrieve(
    EXPORTING
      iv_node                 = zif_iso_h_tp_c=>sc_node-
ziso_i_tp
      it_key                  = it_key
    IMPORTING
      et_data                 = lt_items ).

  " Obviously one item is only expected, check if the sales o
```

```
rder number is initial for the draft entry
  READ TABLE lt_items REFERENCE INTO DATA(lo_item) INDEX 1.
  IF lo_item->salesorder IS INITIAL.
    " If initial, then get the header draft entry, which will
 have the sales order number via the assocation from child to
 header
    io_read->retrieve_by_association(
      EXPORTING
        iv_node                 = zif_iso_h_tp_c=>sc_node-
ziso_i_tp
        it_key                  = it_key                 " Ke
y Table
        iv_association          = zif_iso_h_tp_c=>sc_associat
ion-ziso_i_tp-to_root
        iv_fill_data            = abap_true
      IMPORTING
        et_data                 = lt_header ).
    " Update the salesorder item with the so number
    lo_item->salesorder = lt_header[ key = lo_item-
>parent_key ]-salesorder.
    io_modify->update(
      EXPORTING
        iv_node           = zif_iso_h_tp_c=>sc_node-ziso_i_tp
        iv_key            = lo_item->key
        iv_root_key       = lo_item->root_key
        is_data           = lo_item ).
  ENDIF.

ENDMETHOD.
```

6) Now lets create the code to do the deletion. We will do it through an BOPF Action:

a. Code the Action in the root node:



Name	Implementation Class	Instance Multiplicity	Parameter Structure	Exporting Type
LOCK_ZISO_H_TP	ZCL_A_LOCK_ISO_H_TP	Multiple Node Instances	/BOBF/S_FRW_LOCK_PARAMETERS	None
DELETE_ZISO_H_TP	ZCL_A_DELETE_ISO_H_TP	Multiple Node Instances		None
EDIT	/BOBF/CL_LIB_A_EDIT	Single Node Instance	/BOBF/S_LIB_A_DRAFT_EDIT_IMP	Node
ACTIVATION	/BOBF/CL_LIB_A_ACTIVATION	Single Node Instance		Node
VALIDATION	/BOBF/CL_LIB_A_VALIDATION	Single Node Instance	/BOBF/S_LIB_A_IN_DRAFT_VALIDAT	Type
PREPARATION	/BOBF/CL_LIB_A_PREPARATION	Single Node Instance	/BOBF/S_LIB_A_IN_DRAFT_PREPARE	Node

b. Code for the method `delete_active_entity`:

```
METHOD /bobf/if_lib_delete_active~delete_active_entity.

  " To get only the active data as this code wil trigger for
draft deletion as well
  " For draft deletion the framework will take care, for acti
ve, we need to code
  /bobf/cl_lib_draft=>/bobf/if_lib_union_utilities~separate_k
eys(
    EXPORTING iv_bo_key   = is_ctx-bo_key
              iv_node_key = is_ctx-node_key
              it_key      = it_key
    IMPORTING
      et_active_key = DATA(lt_active_bopf_keys) ).
  " We will get the data in BOPF keys format, we need to get
the sales order number from that
  CHECK lt_active_bopf_keys IS NOT INITIAL.
```

```
  DATA(ls_header) = VALUE zsk_iso_h_tp_active_entity_key(  ).
  " Convert the bopf key to active document key
  /bobf/cl_lib_draft=>/bobf/if_lib_union_utilities~get_active
_document_key(
    EXPORTING iv_bo_key   = is_ctx-bo_key
              iv_node_key = is_ctx-node_key
              iv_bopf_key = lt_active_bopf_keys[ 1 ]-key
    IMPORTING es_active_document_key = ls_header ).
  " Delete the data
  DELETE FROM ztso_h  WHERE salesorder = ls_header-
salesorder.
  DELETE FROM ztso_i  WHERE salesorder = ls_header-
salesorder.

ENDMETHOD.
```

7) Lets create now the CDS Consumption Views:
   a. Header Consumption View

```
@AbapCatalog.sqlViewName: 'ZCSOH'
@AbapCatalog.compiler.compareFilter: true
@AbapCatalog.preserveKey: true
@AccessControl.authorizationCheck: #CHECK
@EndUserText.label: 'Consumption CDS View for ZISO_H_TP'

@VDM.viewType: #CONSUMPTION

@Metadata.allowExtensions: true

@ObjectModel.transactionalProcessingDelegated: true
@ObjectModel: {
    compositionRoot: true,
    createEnabled: true,
    updateEnabled: true,
    deleteEnabled: true,
    draftEnabled: true
}

@ObjectModel.semanticKey: [ 'salesorder' ]

@OData.publish: true
//@UI.headerInfo: {
//    typeName: 'Sales Order',
//    typeNamePlural: 'Sales Order List'
//}

@UI: {
    headerInfo: {
        typeName: 'Sales Order',
        typeNamePlural: 'Sales Order List'
    }
  }
define view ZCSO_H
  as select from ZISO_H_TP as Header
  association [0..*] to ZCSO_I as _Items
    on $projection.salesorder = _Items.salesorder
{
      //Header
      @UI.selectionField: [{ position: 10 }]
```

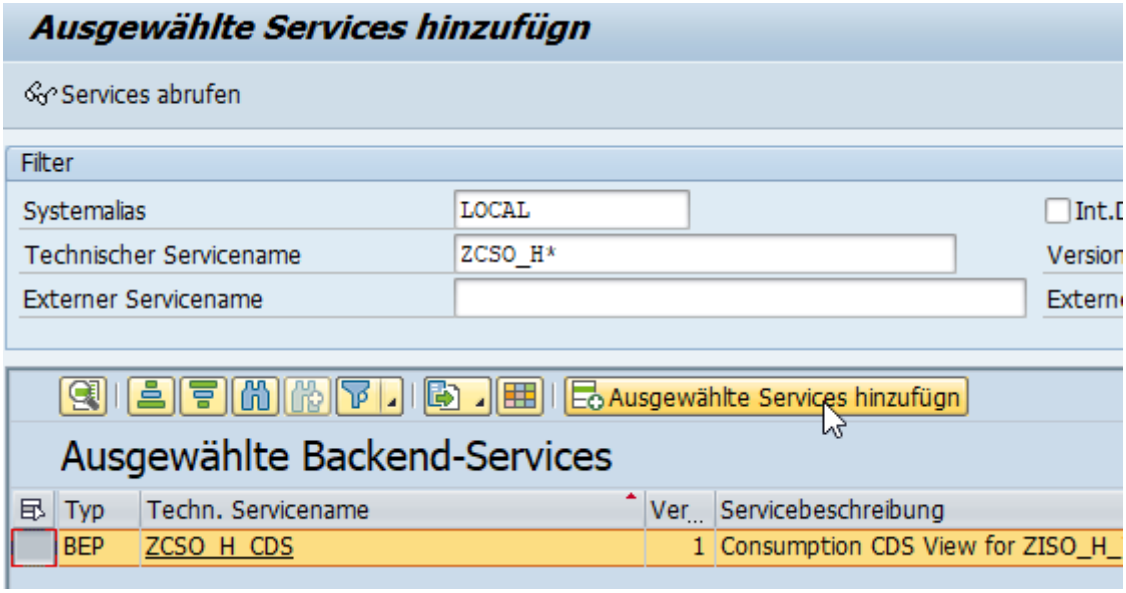
```
      @UI.lineItem.position: 10
      @UI.identification: [{ position: 10 }]
  key Header.salesorder,
      @UI.lineItem.position: 20
      @UI.identification: [{ position: 20 }]
      @Consumption.valueHelp: '_BP'
      Header.businesspartner,
      @UI.lineItem.position: 30
      @UI.identification: [{ position: 30 }]
      Header.overallstatus,
      @UI.lineItem.position: 40
      @UI.identification: [{ position: 40 }]
      Header.changedat,
      @UI.lineItem.position: 50
      @UI.identification: [{ position: 50 }]
      Header.createdat,
      @UI.lineItem.position: 60
      @UI.identification: [{ position: 60 }]
      Header.changedby,
      @UI.lineItem.position: 70
      @UI.identification: [{ position: 70 }]
      Header.createdby,
      /* Associations */
      //Header
      //   _BP,
      @ObjectModel.association.type: [ #TO_COMPOSITION_CHILD ]
      _Items,
      Header._BP,
      Header._Status
      //   _Status
}
```

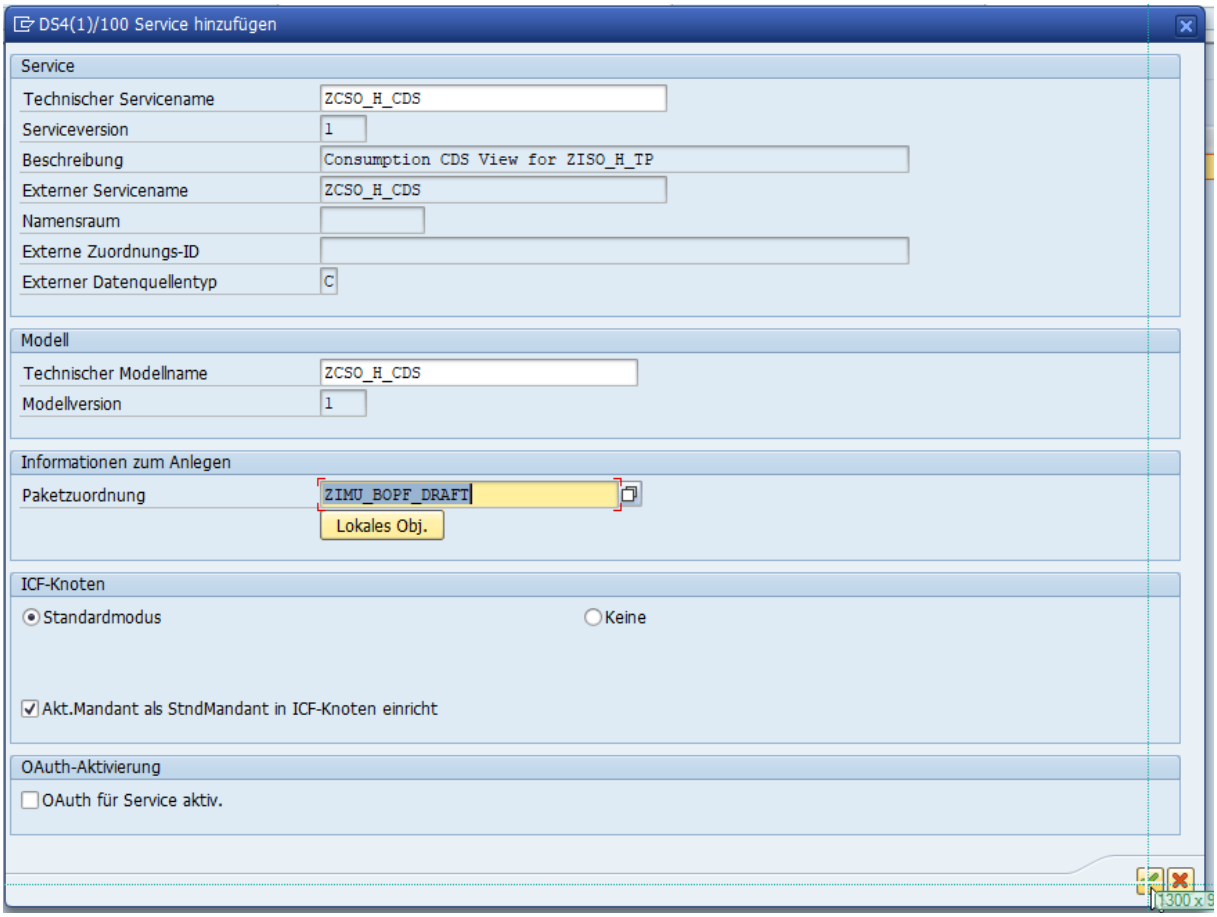
b. Item Consumption View

```
@AbapCatalog.sqlViewName: 'ZCSOI'
@AbapCatalog.compiler.compareFilter: true
@AbapCatalog.preserveKey: true
@AccessControl.authorizationCheck: #CHECK
@EndUserText.label: 'Consumption CDS View for ZISO_I_TP'

@VDM.viewType: #CONSUMPTION
@Metadata.allowExtensions: true

@ObjectModel: {
   semanticKey:['salesorder', 'salesorderitem'],

   createEnabled: true,
   deleteEnabled: true,
   updateEnabled: true
}
define view ZCSO_I
  as select from ZISO_I_TP as Items
  association [1..1] to ZCSO_H as _Header
    on $projection.salesorder = _Header.salesorder
{
      //Items
      @UI.hidden: true
  key Items.salesorder,
```

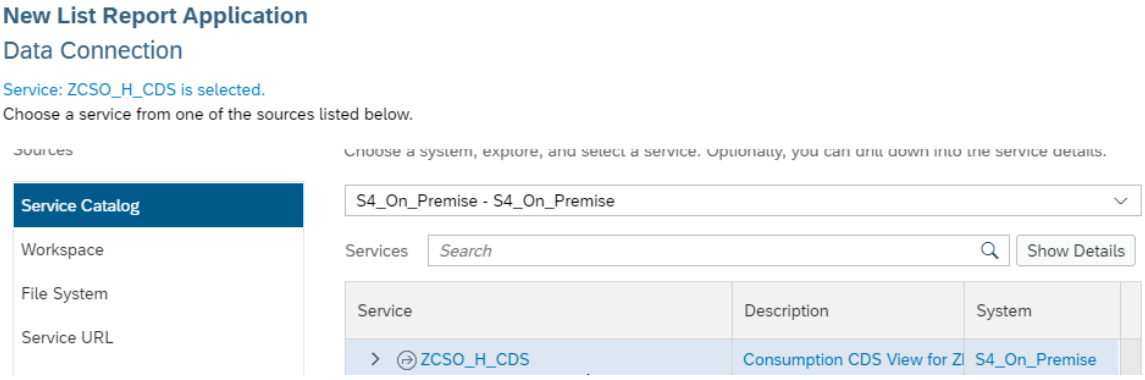
```
      @UI.identification.position: 10
      @UI.lineItem.position: 10
  key Items.salesorderitem,
      @UI.identification.position: 20
      @UI.lineItem.position: 20
      Items.product,
      @UI.identification.position: 30
      @UI.lineItem.position: 30
      Items.grossamount,
      @UI.hidden: true
      Items.currencycode,
      @UI.identification.position: 40
      @UI.lineItem.position: 40
      Items.quantity,
      /* Associations */
      @ObjectModel.association.type: [#TO_COMPOSITION_PARENT,
#TO_COMPOSITION_ROOT]
      _Header,
      Items._Product,
      Items._Currency
}
```

8) Activate the service at transaction /IWFND/MAINT_SERVICE.





9) Create List Report Template through SAP Web IDE.



Template Selection | Basic Information | Data Connection | **Annotation Selection** | Template Customization | Confirmation

New List Report Application

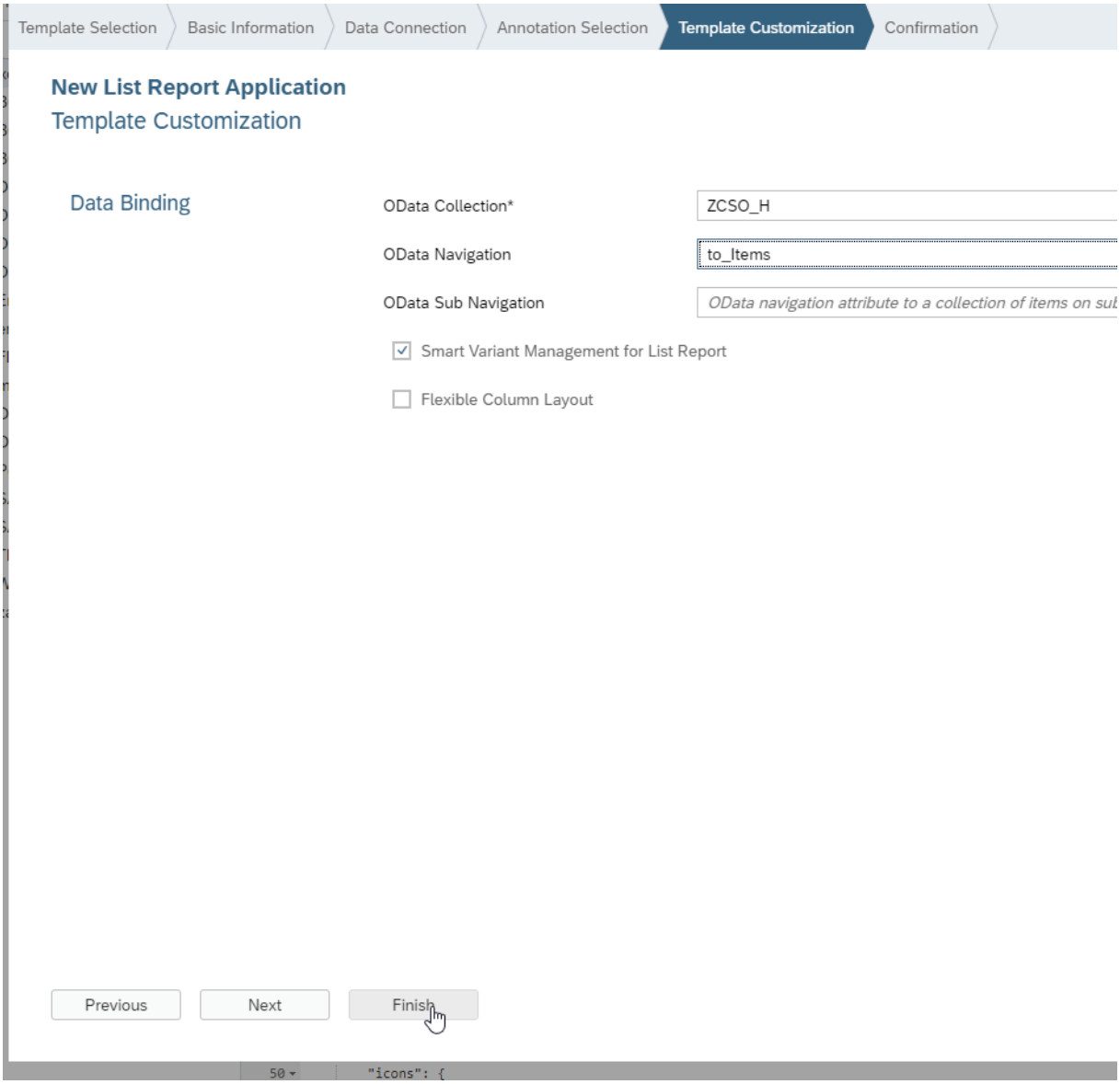
Annotation Selection

Select the desired annotation files and rank them in the order in which they will be loaded.
Note: If the annotation files overlap, the one loaded last will overwrite the previous ones.
The selected service contains annotation data.

+ Add Annotation Files

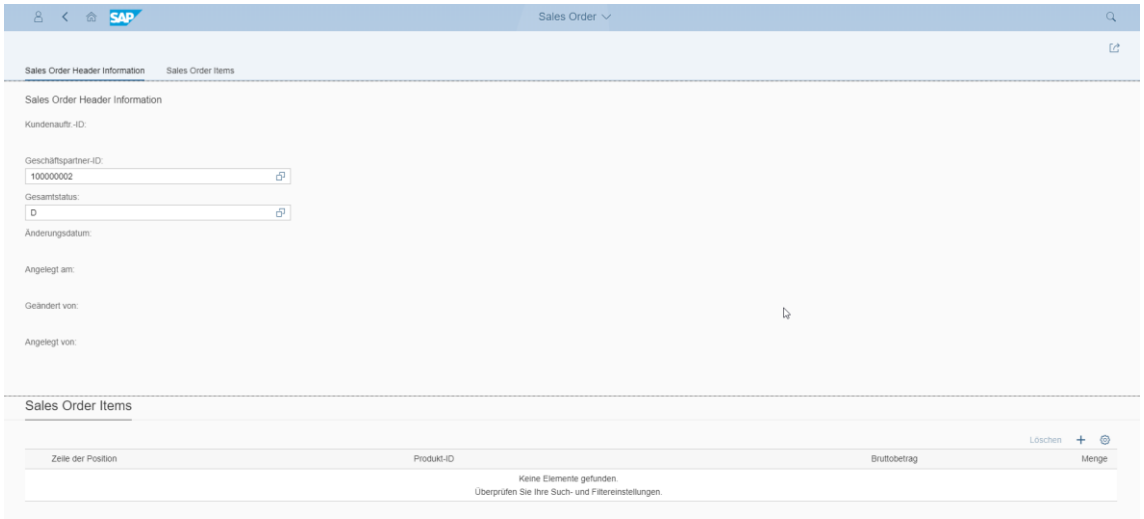
	Rank	Name	Source	
☑	1	Selected Service Metadata	Remote	
☑	2	ZCSO_H_CDS_VAN	Remote	

Previous | Next

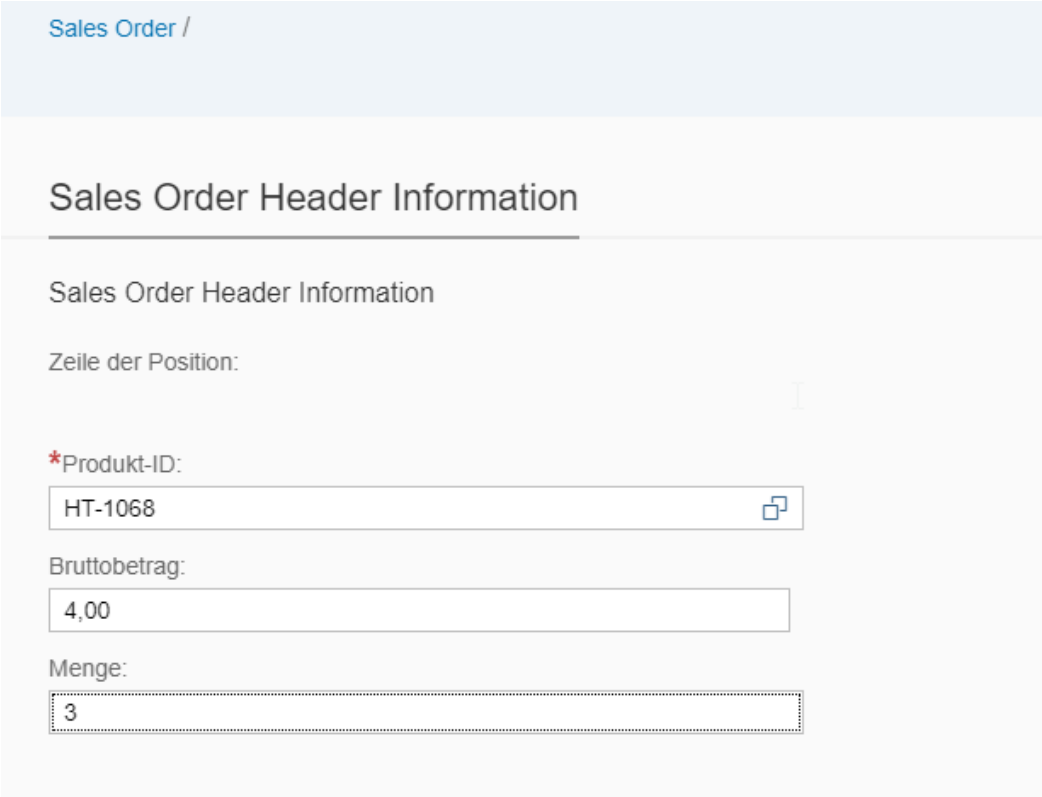


10) Test the application

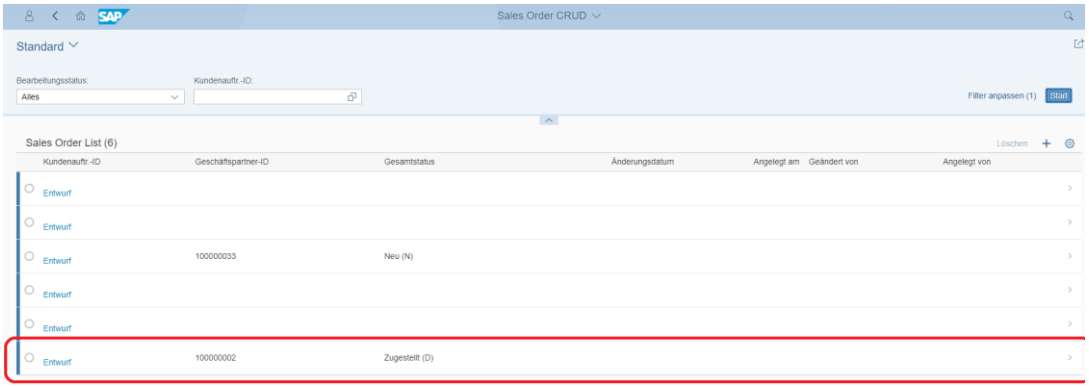
a. Adding data:


Sales Order
Sales Order Header Information
Sales Order Items
Sales Order Header Information
Kundenauftr.-ID:
Geschäftspartner-ID:
100000002
Gesamtstatus:
D
Änderungsdatum:
Angelegt am:
Geändert von:
Angelegt von:
Sales Order Items
Löschen
Zeile der Position
Produkt-ID
Bruttobetrag
Menge
Keine Elemente gefunden.
Überprüfen Sie Ihre Such- und Filtereinstellungen.


Sales Order Items
Löschen
Zeile der Position
Produkt-ID
Bruttobetrag
Menge
Keine Elemente gefunden.
Überprüfen Sie Ihre Such- und Filtereinstellungen.


Sales Order /
Sales Order Header Information
Sales Order Header Information
Zeile der Position:
*Produkt-ID:
HT-1068
Bruttobetrag:
4,00
Menge:
3

b. Close the Browser without saving and open again the app:



c. Open the Draft and then save it:

d. Check the final data generated: