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Change Request Management
SubStatus / Status Reason / Closure Code

How to use SubStatus feature in ChaRM?

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Content

1 Introduction

1.1 Summary

SAP Solution Manager IT Service Management is using Substatus or Status Reason to give end-users the possibility to specify why the current status is choosen. This is a very good feature which can be used for initial status (Why transaction is created?) final status (Why transaction is closed/withdrawn?), approval and confirmation status (Why it is approved/confirmed/rejected?). The status „Sucessfully Tested“ or „Back to Development“ is also a confirmation status in this meaning.

We don’t want to discuss here, why SAP SE introduced a new concept of substatus / status reason which was already existing in SAP CRM long time ago and which is heavily used by leads, opportunities, … This is another topic which is out of scope of this document.

In this document I want to tell you how to enable this feature for Change Request Management, because it is helpful for ChaRM as well.

1.2 Quick Guide

- Configuration of substatus can be done like for ITSM. No additional customizing table is needed.
- Substatus is available as field /AICRM/REASON_ID of table CRMD_SERVICE_H. This is true for ITSM and ChaRM. No field enhancement is needed. If we want to activate processing/change logging for this field we just have to configure it using these technical information.
- Substatus is available as field //BTADMINH/EXT./AICRM/REASON_ID in UI configuration of details form. This is true for ITSM and ChaRM (CR and CD). We just need to make the field visible. However ChaRM is not supporting any value help or input readiness check. This needs to be implemented (see below).
- Substatus is available as Search Criteria and Search Result List Field. This is true for ITSM and ChaRM (CR and CD). We just need to make the field visible. However ITSM and ChaRM are not supporting any value help (search criteria) and key to text conversion (result list field). This needs to be implemented (see below).
- We still have the issue, that the status change is performed by ppf actions in ChaRM. Therefore we have no chance to maintain the substatus / status reason /closure code on change to a final status, because the transaction is final after status change. Only a popup solution can help here which will need a medium-size development (see below).

1.3 Original Requirement of customer

When **withdrawing SolMan test tasks** (for any environment / phase), the possible reason codes should be as follows:

- Created by mistake
- Tested elsewhere
- Effort outweighs Risk
- Function not used

When **closing test tasks as "Failed but ok to go"**, the possible reason codes should be as follows:

- Test result differs from Expectation
- Not tested: lack of resources
- Not tested: environment issue
- Not tested: lack of resources

Reporting:

- Assumption is that reporting against SolMan test task status (Successful, Withdrawn, Failed but ok to go) is already possible. Contradicting the original ALM requirement, no reporting on substatus values are needed yet. Neither Solman Reports nor BW/BO reports.

Withdrawn of **Change Request, Manual Activities and Build CDs:**

- We have a lot of status changes where substatus or multi line texts needs to be maintained.
  This popup solution makes sense here as well to guide the end-users.
- Currently there is no requirement to activate it.
- The technical solution should be flexible to support all these use cases as well (if we will configure it in future).

1.4 Technical Ideas

Technical ideas (field):

- Multi-Level Categorization
- ITSM Status Reason (Substatus)
- SAP CRM Status Reason
- New Field using AET

Solution 1:

- Multi Level: 1 - Close / Withdrawn, 2 - Code (see above)
- Auto trigger of status change (category as start condition)
- --> too dangerous because of unexpected automatism

Solution 2:

- Multi Level: 1 - Close / Withdrawn, 2 - Code (see above)
- Validation on status change (consistency check)
- --> Additional customizing table or mapping to target status based on MLC ID naming
- Pro:
  - Effort is low (3 PD)
  - Use of existing ChaRM framework/features
- Contra:
  - MLC values are not filtered based on status (End-Users gets confused because mismatch of MLC and status change action)

Solution 3:

- Status reason (ITSM or SAP CRM)
- Popup for status reason (before or after action)
- Pro:
  - end-user friendly
- Contra:
  - More complex development logic
  - prototype necessary
  - Effort high (8 PD)

Question ITSM or SAP CRM status reason:

- What is planned in future?
- Reporting possible out of the box?
- --> ITSM Status Reason is easier to implement

1.5 Version History

Version	Author	Date	Comment
1	Peter Weigel	27.10.2016	First "Quick and Dirty" Version (may contain errors in content and layout)
2	Peter Weigel	10.11.2016	Status Change Cancel Feature

1.6 Literature, Disclaimer, Contact and Download

Literature

This document is based on information from SAP Online Library, Implementation Guide of SAP Solution Manager 7.1, several SAP Notes and several SCN articles. These piece of information were enriched by the authors knowledge and experience.

Disclaimer

http://www.hybrid-eichhoernchen.de/rechtliche-hinweise/

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Download

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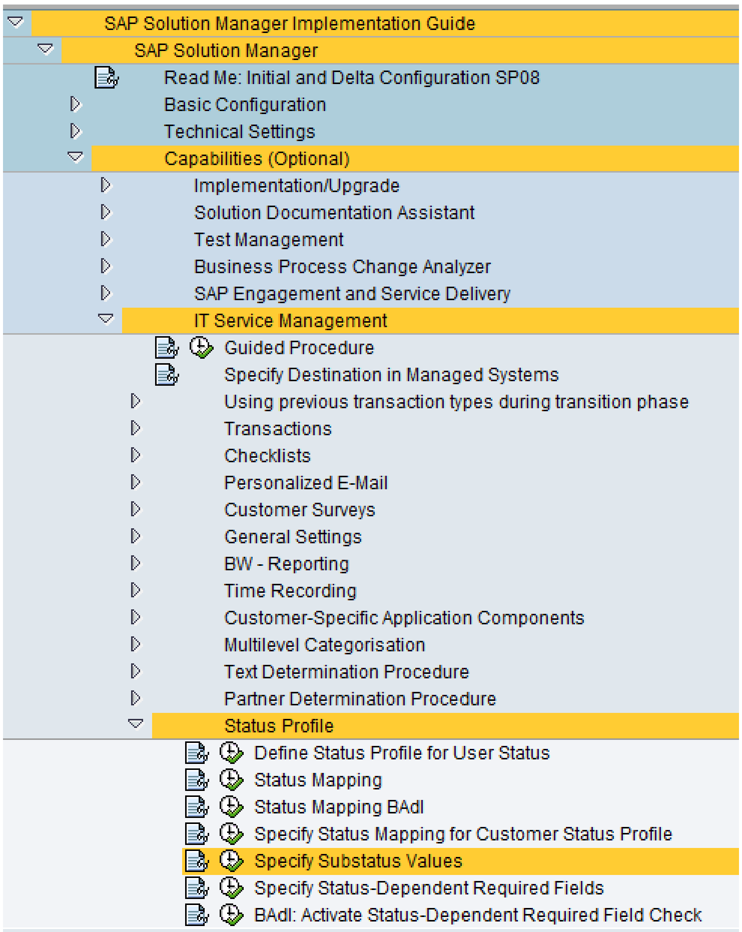
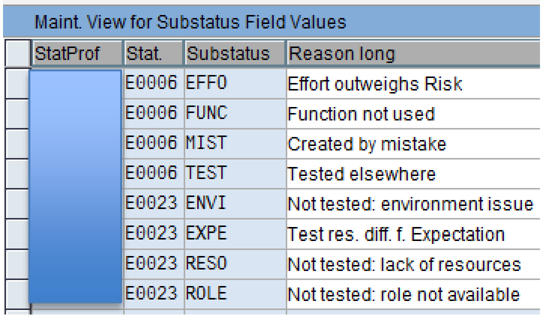
1 ITSM Substatus

1.1 Customizing: Specify Substatus Values

We are using ITSM Substatus. The corresponding configuration can be found in the ITSM section. The requested "closure codes" for test tasks are now maintained there. However the description is technically restricted to 30 characters only. Technically the Substatus keys don't need to be unique. That means the same key can be re-used for different user status resp. process types. However the description can be maintained only once, therefore the technical and functional meaning should be the same.



- SAP Solution Manager Implementation Guide
  - SAP Solution Manager
    - Read Me: Initial and Delta Configuration SP08
    - Basic Configuration
    - Technical Settings
    - Capabilities (Optional)
      - Implementation/Upgrade
      - Solution Documentation Assistant
      - Test Management
      - Business Process Change Analyzer
      - SAP Engagement and Service Delivery
      - IT Service Management
        - Guided Procedure
        - Specify Destination in Managed Systems
        - Using previous transaction types during transition phase
        - Transactions
        - Checklists
        - Personalized E-Mail
        - Customer Surveys
        - General Settings
        - BW - Reporting
        - Time Recording
        - Customer-Specific Application Components
        - Multilevel Categorisation
        - Text Determination Procedure
        - Partner Determination Procedure
        - Status Profile
          - Define Status Profile for User Status
          - Status Mapping
          - Status Mapping BAdI
          - Specify Status Mapping for Customer Status Profile
          - Specify Substatus Values
          - Specify Status-Dependent Required Fields
          - BAdI: Activate Status-Dependent Required Field Check



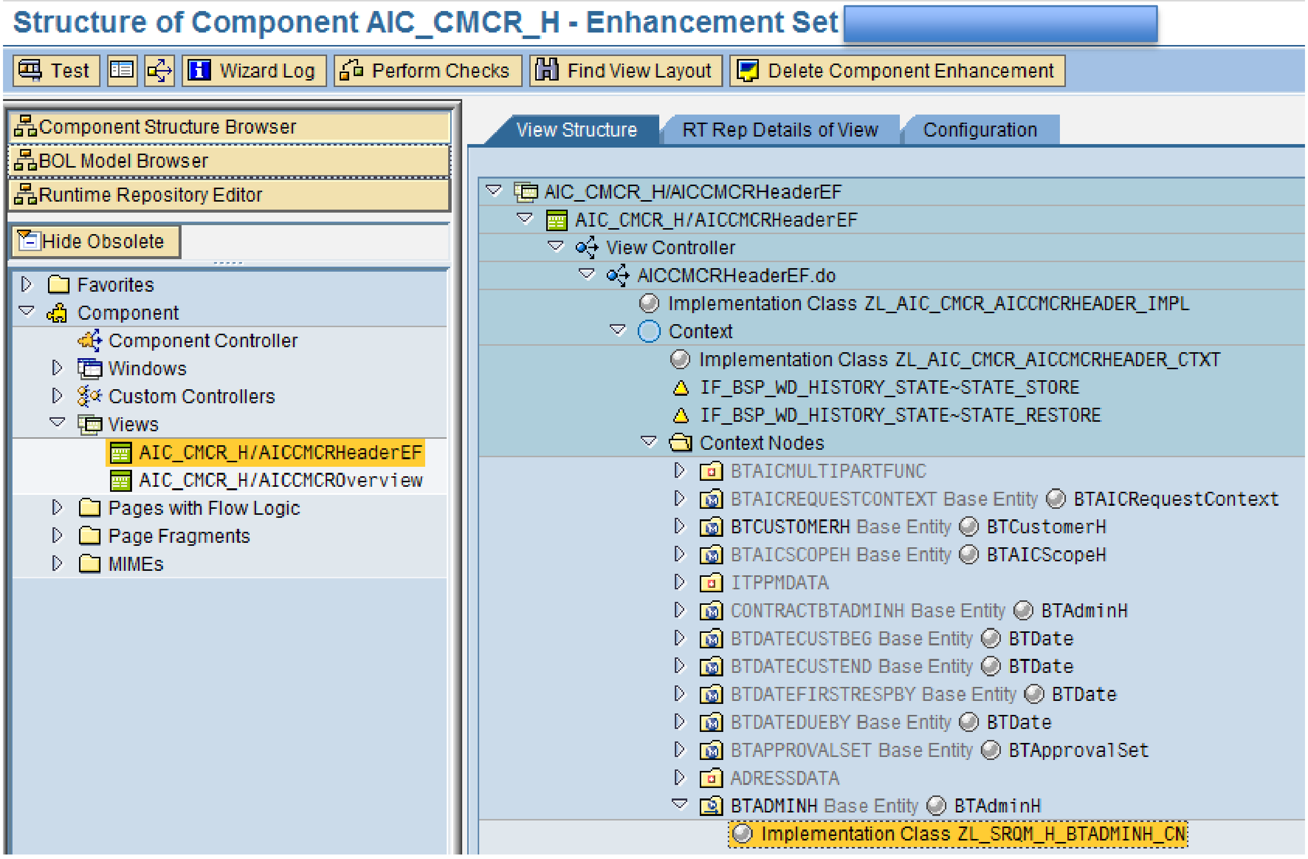
Maint. View for Substatus Field Values

StatProf	Stat.	Substatus	Reason long
	E0006	EFFO	Effort outweighs Risk
	E0006	FUNC	Function not used
	E0006	MIST	Created by mistake
	E0006	TEST	Tested elsewhere
	E0023	ENVI	Not tested: environment issue
	E0023	EXPE	Test res. diff. f. Expectation
	E0023	RESO	Not tested: lack of resources
	E0023	ROLE	Not tested: role not available

1.2 UI Configuration: Display Substatus

The Substatus is stored in field /AICRM/REASON_ID of table CRMD_SERVICE_H. In UI it is available as attribute //BTADMINH/EXT./AICRM/REASON_ID (with the name "Substatus"). It is available for Incident, Change Request and Change Documents (including Test Tasks and Manual Activities). It is now configured for ZTT1 as visible field in details form next to "Status".

The value help and input readiness check is only implemented in Incident solution (AIC_INCIDENT_H). The context node AIC_INCIDENT_H/IncidentHeaderEF->BTADMINH is using controller class CL_AIC_INCI_INCIDENTHEADE_CN03 while AIC_CMCR_H/AICCMCRHeaderEF->BTADMINH is using CL_SRQM_H_BTADMINH_CN. Because CL_AIC_INCI_INCIDENTHEADE_CN03 is inheriting from CL_SRQM_H_BTADMINH_CN we just need to adjust the inheriting hierarchy of the CR context node BTAdminH. There is no need to copy source code. However, this is a SAP bug.

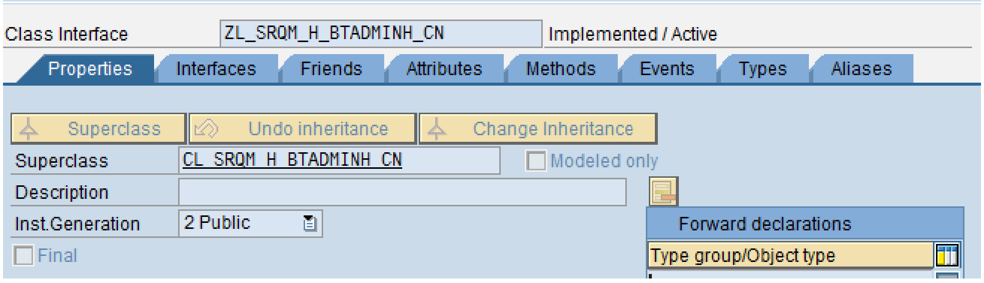


Structure of Component AIC_CMCR_H - Enhancement Set

Favorites
Component
- Component Controller
- Windows
- Custom Controllers
- Views
  - AIC_CMCR_H/AICCMCRHeaderEF
  - AIC_CMCR_H/AICCMCROverview
- Pages with Flow Logic
- Page Fragments
- MIMEs

AIC_CMCR_H/AICCMCRHeaderEF
- AIC_CMCR_H/AICCMCRHeaderEF
  - View Controller
    - AICCMCRHeaderEF.do
      - Implementation Class ZL_AIC_CMCR_AICCMCRHEADER_IMPL
      - Context
        - Implementation Class ZL_AIC_CMCR_AICCMCRHEADER_CTXT
        - IF_BSP_WD_HISTORY_STATE~STATE_STORE
        - IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
        - Context Nodes
          - BTAICMULTIPARTFUNC
          - BTAICREQUESTCONTEXT Base Entity BTAICRequestContext
          - BTCUSTOMERH Base Entity BTCustomerH
          - BTAICSCOPEH Base Entity BTAICScopeH
          - ITPPMDATA
          - CONTRACTBTADMINH Base Entity BTAdminH
          - BTDATECUSTBEG Base Entity BTDate
          - BTDATECUSTEND Base Entity BTDate
          - BTDATEFIRSTRESPBY Base Entity BTDate
          - BTDATEDUEBY Base Entity BTDate
          - BTAPPROVALSET Base Entity BTApprovalSet
          - ADRESSDATA
          - BTADMINH Base Entity BTAdminH
            - Implementation Class ZL_SRQM_H_BTADMINH_CN

Before Adjustment:



Class Interface ZL_SRQM_H_BTADMINH_CN Implemented / Active

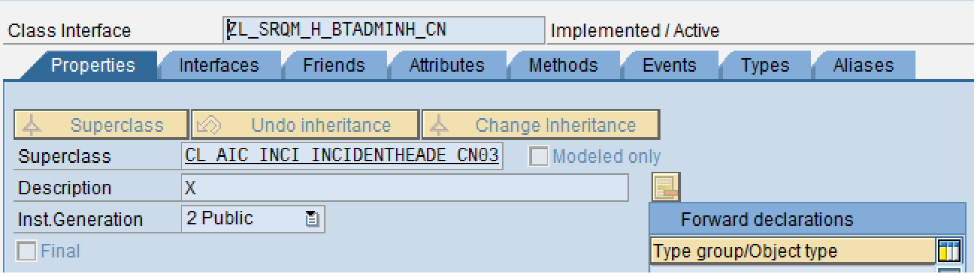
Superclass CL_SRQM_H_BTADMINH_CN □ Modeled only

Description

Inst.Generation 2 Public

□ Final

After Adjustment:



Class Interface ZL_SRQM_H_BTADMINH_CN Implemented / Active

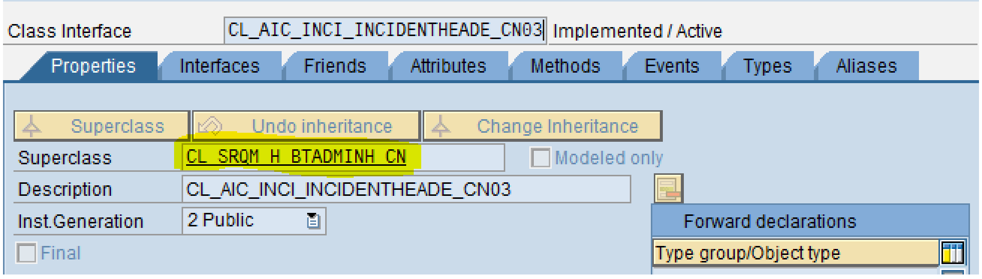
Superclass CL_AIC_INCI_INCIDENTHEADE_CN03 □ Modeled only

Description X

Inst.Generation 2 Public

□ Final

Still valid:



Class Interface CL_AIC_INCI_INCIDENTHEADE_CN03 Implemented / Active

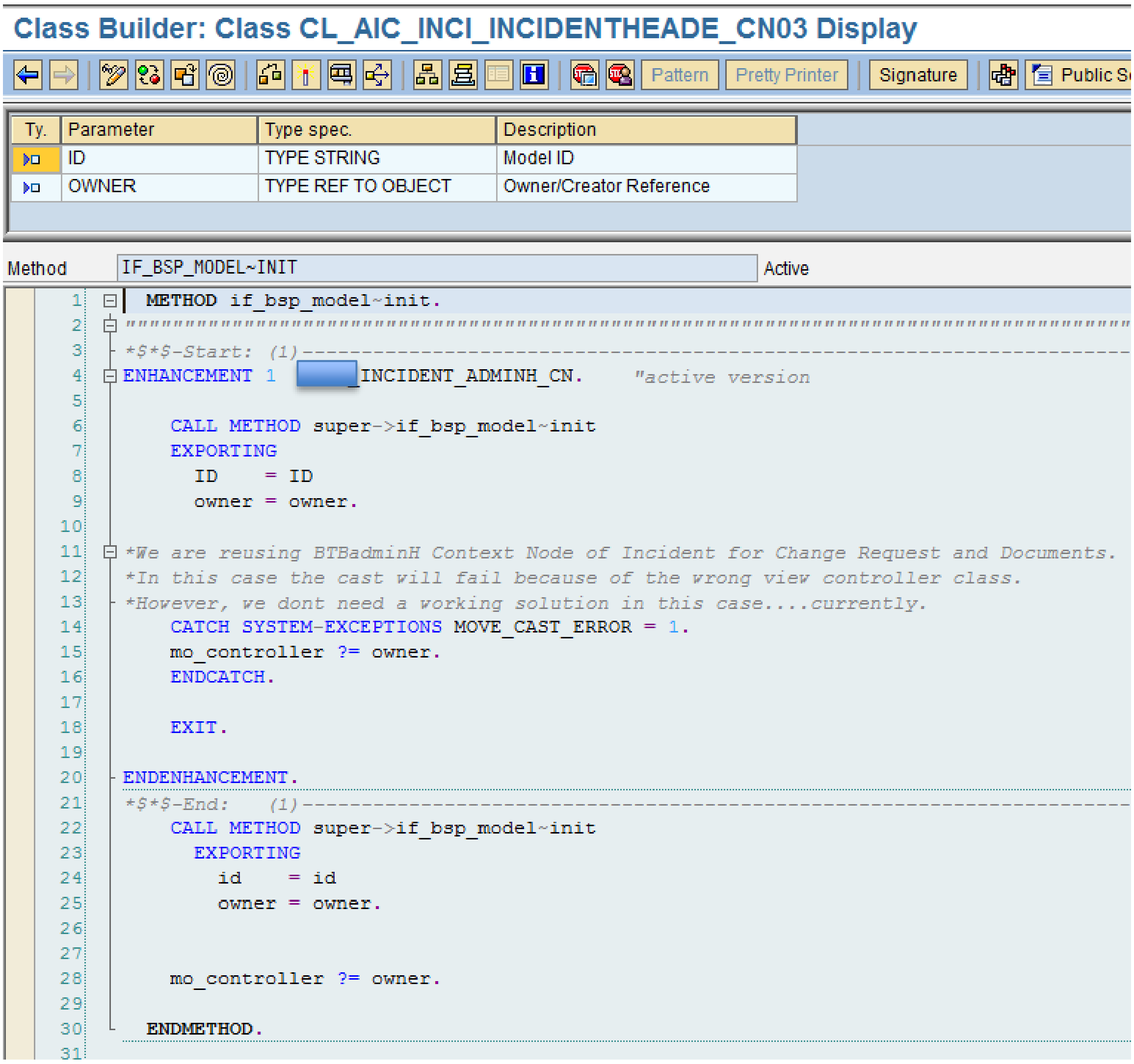
Superclass CL_SRQM_H_BTADMINH_CN □ Modeled only

Description CL_AIC_INCI_INCIDENTHEADE_CN03

Inst.Generation 2 Public

□ Final

Controller class CL_AIC_INCI_INCIDENTHEADE_CN03 has knowledge about the view controller. The corresponding assignment will fail now, because the view controller class of CR is different from INC. However, the assignment is currently not needed for CR. Therefore we just need to ensure that we will get no short dump when trying to take over view controller reference.



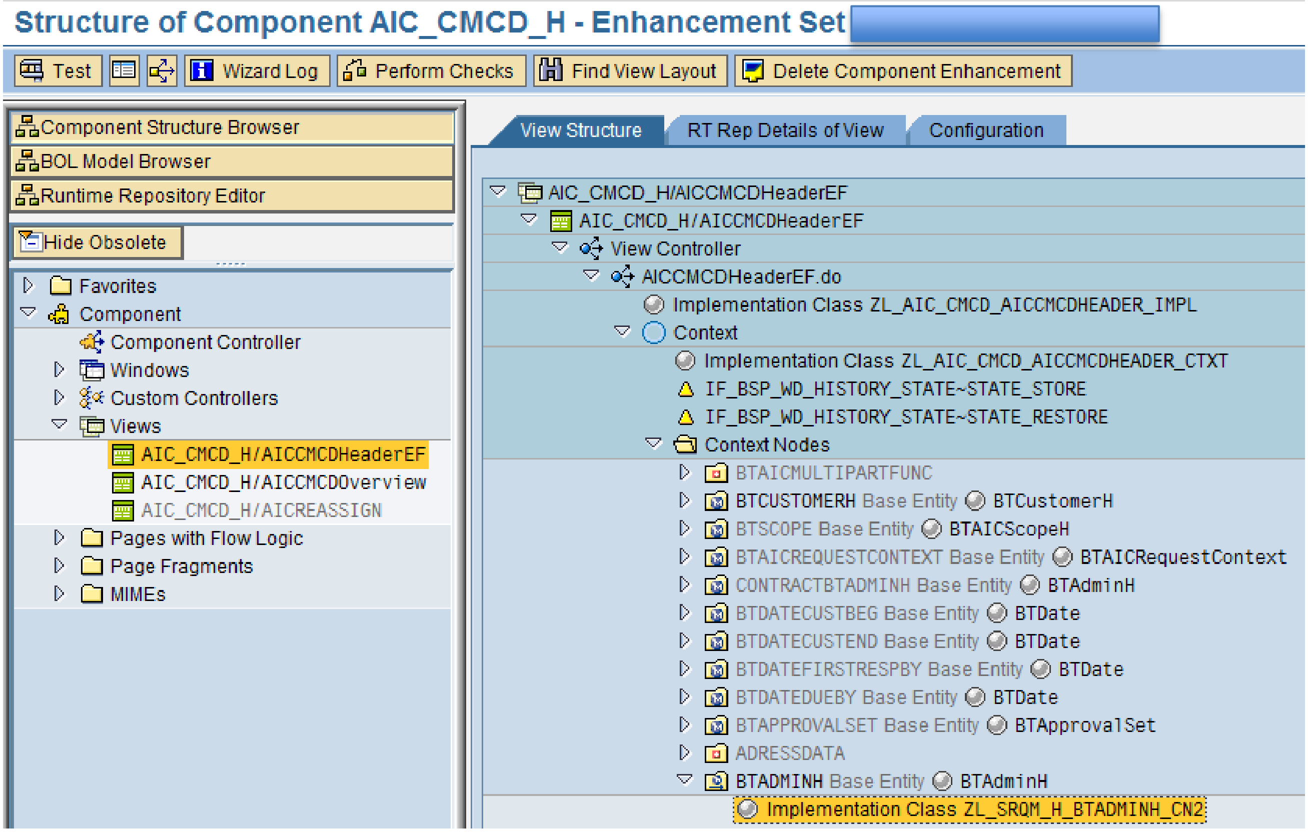
Class Builder: Class CL_AIC_INCI_INCIDENTHEADE_CN03 Display

Ty.	Parameter	Type spec.	Description
▸▫	ID	TYPE STRING	Model ID
▸▫	OWNER	TYPE REF TO OBJECT	Owner/Creator Reference

Method IF_BSP_MODEL~INIT Active

```
  METHOD if_bsp_model~init.
""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""
*$*$-Start: (1)---------------------------------------------------------------------
ENHANCEMENT 1 [redacted]INCIDENT_ADMINH_CN.    "active version

    CALL METHOD super->if_bsp_model~init
    EXPORTING
      ID    = ID
      owner = owner.

*We are reusing BTBadminH Context Node of Incident for Change Request and Documents.
*In this case the cast will fail because of the wrong view controller class.
*However, we dont need a working solution in this case....currently.
    CATCH SYSTEM-EXCEPTIONS MOVE_CAST_ERROR = 1.
    mo_controller ?= owner.
    ENDCATCH.

    EXIT.

ENDENHANCEMENT.
*$*$-End:   (1)---------------------------------------------------------------------
    CALL METHOD super->if_bsp_model~init
      EXPORTING
        id    = id
        owner = owner.


    mo_controller ?= owner.

  ENDMETHOD.
```

Same solution for AIC_CMCD_H:

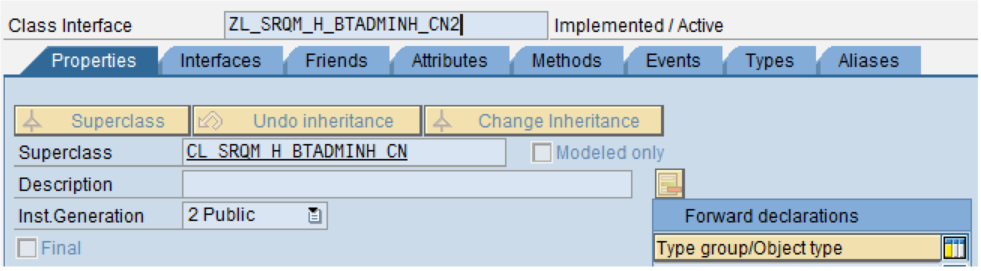


Structure of Component AIC_CMCD_H - Enhancement Set

```
▷ Favorites
▽ Component
    Component Controller
  ▷ Windows
  ▷ Custom Controllers
  ▽ Views
      AIC_CMCD_H/AICCMCDHeaderEF
      AIC_CMCD_H/AICCMCDOverview
      AIC_CMCD_H/AICREASSIGN
  ▷ Pages with Flow Logic
  ▷ Page Fragments
  ▷ MIMEs
```

```
▽ AIC_CMCD_H/AICCMCDHeaderEF
  ▽ AIC_CMCD_H/AICCMCDHeaderEF
    ▽ View Controller
      ▽ AICCMCDHeaderEF.do
          Implementation Class ZL_AIC_CMCD_AICCMCDHEADER_IMPL
        ▽ Context
            Implementation Class ZL_AIC_CMCD_AICCMCDHEADER_CTXT
            IF_BSP_WD_HISTORY_STATE~STATE_STORE
            IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
          ▽ Context Nodes
            ▷ BTAICMULTIPARTFUNC
            ▷ BTCUSTOMERH Base Entity BTCustomerH
            ▷ BTSCOPE Base Entity BTAICScopeH
            ▷ BTAICREQUESTCONTEXT Base Entity BTAICRequestContext
            ▷ CONTRACTBTADMINH Base Entity BTAdminH
            ▷ BTDATECUSTBEG Base Entity BTDate
            ▷ BTDATECUSTEND Base Entity BTDate
            ▷ BTDATEFIRSTRESPBY Base Entity BTDate
            ▷ BTDATEDUEBY Base Entity BTDate
            ▷ BTAPPROVALSET Base Entity BTApprovalSet
            ▷ ADRESSDATA
            ▽ BTADMINH Base Entity BTAdminH
                Implementation Class ZL_SRQM_H_BTADMINH_CN2
```

Before:



Class Interface ZL_SRQM_H_BTADMINH_CN2 Implemented / Active

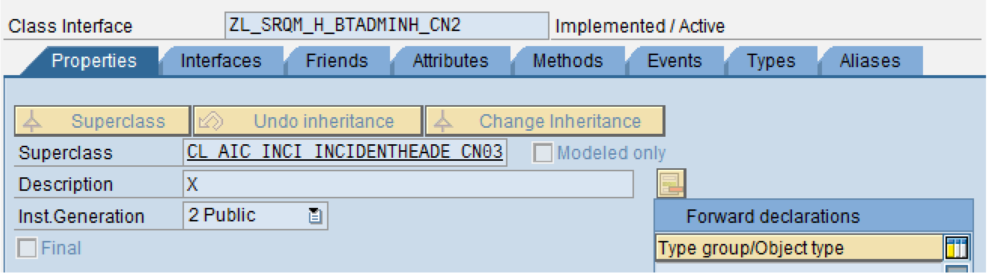
Superclass CL_SRQM_H_BTADMINH_CN ☐ Modeled only

Description

Inst.Generation 2 Public

☐ Final

After:



Class Interface ZL_SRQM_H_BTADMINH_CN2 Implemented / Active

Superclass CL_AIC_INCI_INCIDENTHEADE_CN03 ☐ Modeled only

Description X

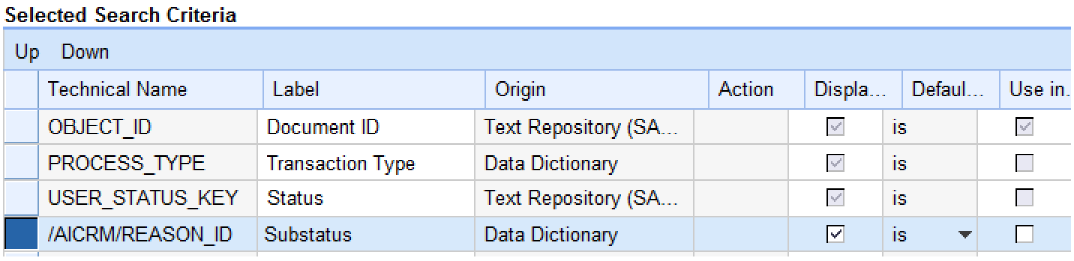
Inst.Generation 2 Public

☐ Final

Caution: I am very sure, that SAP will change the inheritance hierarchy for AIC_CMCR_H and AIC_CMCD_H in future and replace CL_SRQM_H_BTADMIN_H by another class. In this case we have to adjust the inheritance again! However, we have to do it anyway independent from this adjustment. In worst case (if we cannot use inheritance) we have to copy the source code of attribute "Substatus" from AIC_INCIDENT_H after upgrade.

1.3 UI Configuration: Search for Substatus

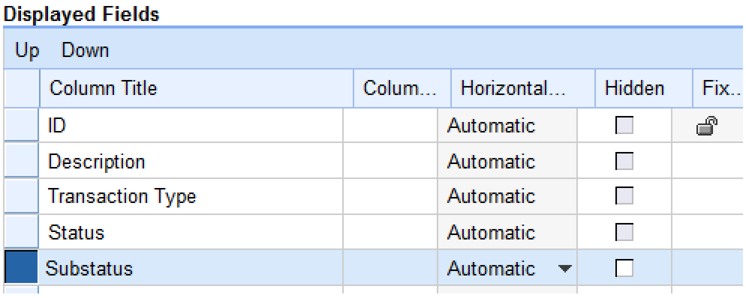
The Substatus is available for Incident, Change Request and Change Documents (including Test Tasks and Manual Activities). It is now configured for Change Documents (incl. Test Tasks) as available and visible search criteria and search result field. In SAP standard only operator "Is" is supported. We improved it to support some more operators (IS and IS NOT).



Selected Search Criteria

Up Down

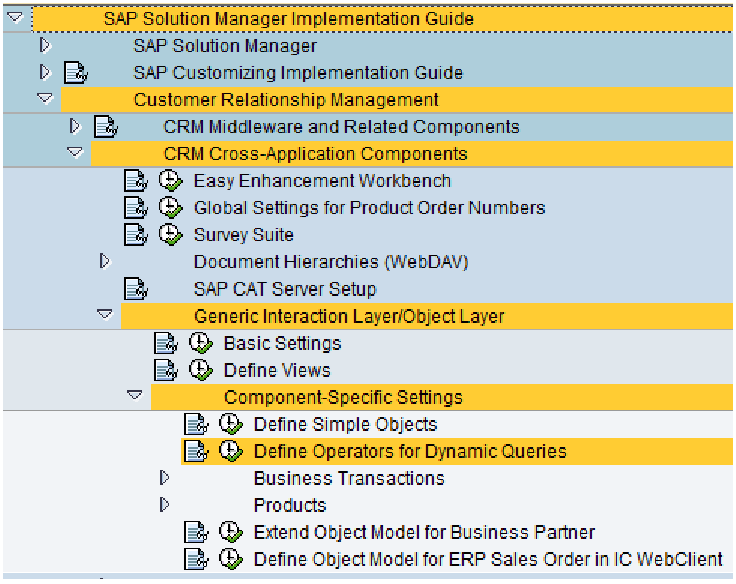
Technical Name	Label	Origin	Action	Displa...	Defaul...	Use in.
OBJECT_ID	Document ID	Text Repository (SA...		☑	is	☑
PROCESS_TYPE	Transaction Type	Data Dictionary		☑	is	☐
USER_STATUS_KEY	Status	Text Repository (SA...		☑	is	☐
/AICRM/REASON_ID	Substatus	Data Dictionary		☑	is	☐



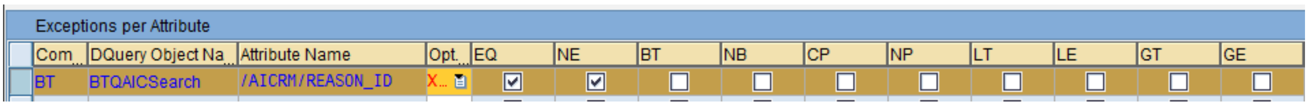
Displayed Fields

Up Down

Column Title	Colum...	Horizontal...	Hidden	Fix..
ID		Automatic	☐	🔓
Description		Automatic	☐	
Transaction Type		Automatic	☐	
Status		Automatic	☐	
Substatus		Automatic	☐	



- SAP Solution Manager Implementation Guide
  - SAP Solution Manager
  - SAP Customizing Implementation Guide
  - Customer Relationship Management
    - CRM Middleware and Related Components
    - CRM Cross-Application Components
      - Easy Enhancement Workbench
      - Global Settings for Product Order Numbers
      - Survey Suite
      - Document Hierarchies (WebDAV)
      - SAP CAT Server Setup
      - Generic Interaction Layer/Object Layer
        - Basic Settings
        - Define Views
        - Component-Specific Settings
          - Define Simple Objects
          - Define Operators for Dynamic Queries
          - Business Transactions
          - Products
          - Extend Object Model for Business Partner
          - Define Object Model for ERP Sales Order in IC WebClient



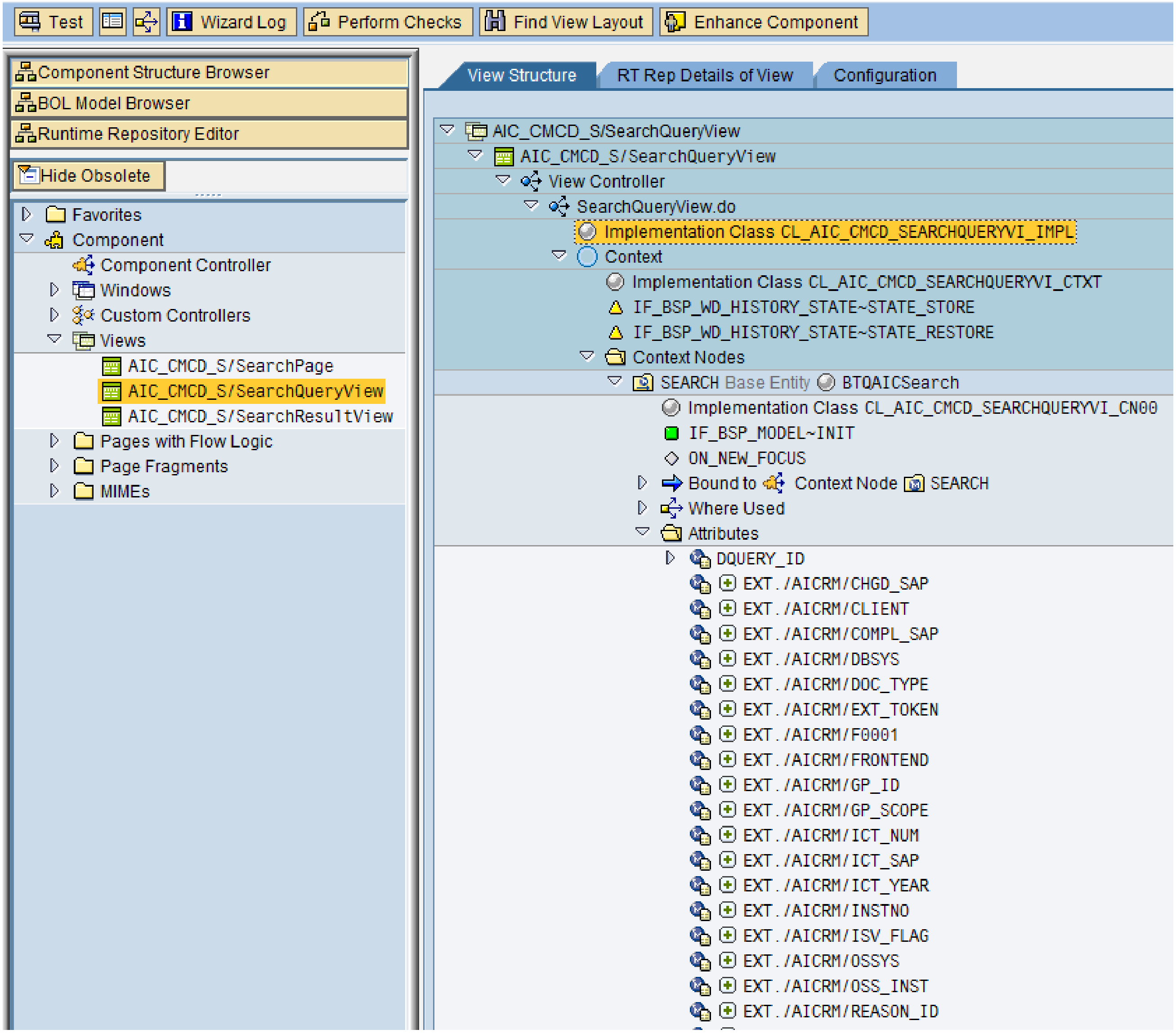
Exceptions per Attribute

Com...	DQuery Object Na...	Attribute Name	Opt...	EQ	NE	BT	NB	CP	NP	LT	LE	GT	GE
BT	BTQAICSearch	/AICRM/REASON_ID	X...	☑	☑	□	□	□	□	□	□	□	□

SAP standard is not providing any value help for the "substatus" search criteria. Because we want to have a value help, we needed to implement it as enhancement.

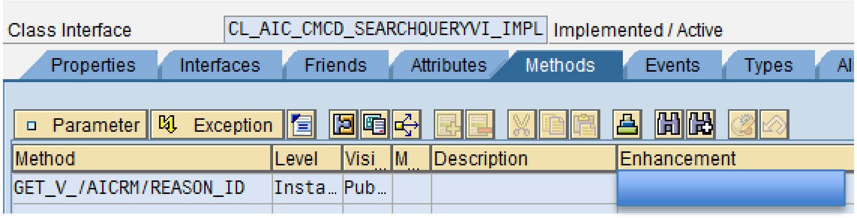
CD Search Criteria:

Structure of Component AIC_CMCD_S - Standard View



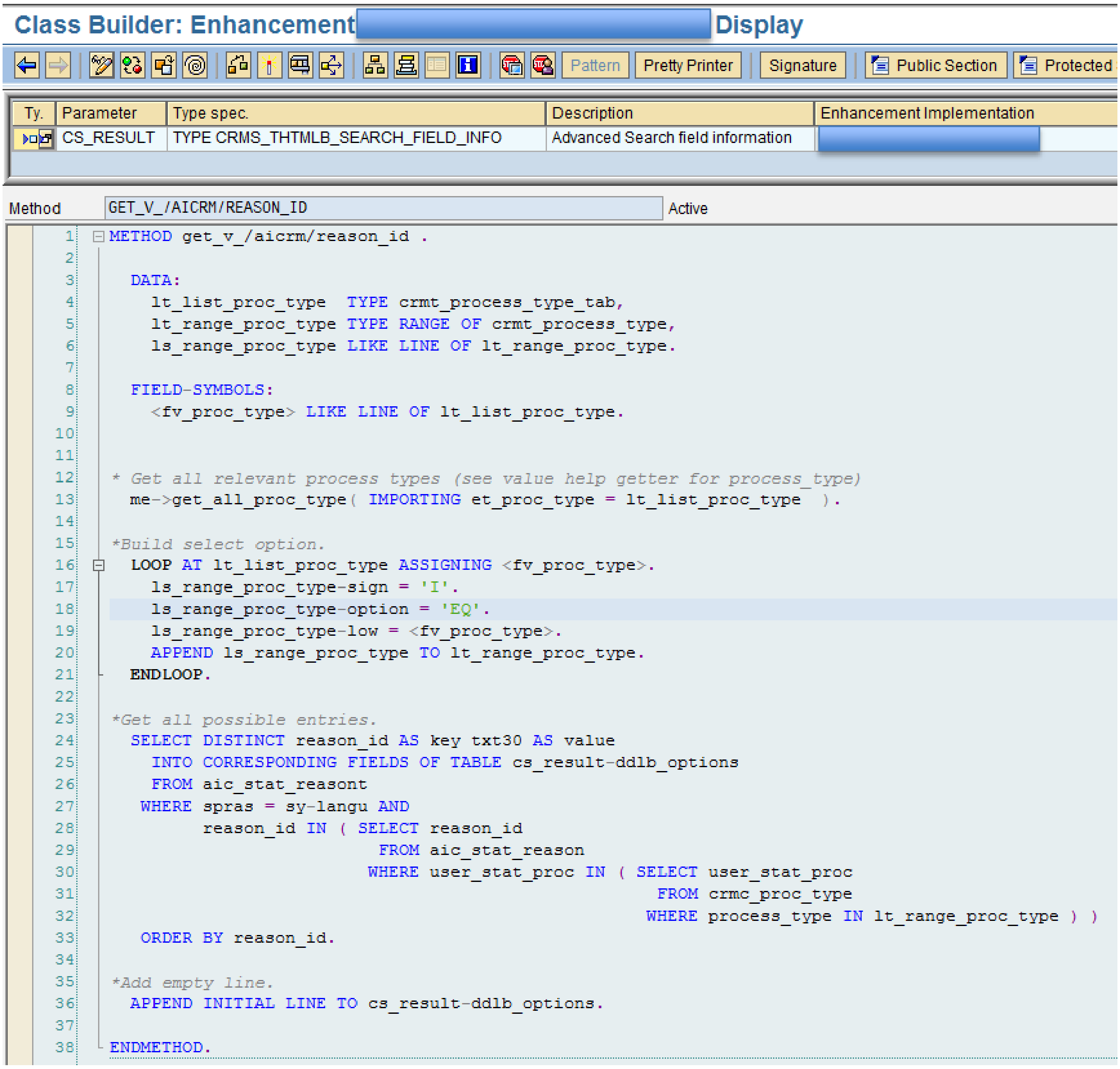
- Favorites
- Component
  - Component Controller
  - Windows
  - Custom Controllers
  - Views
    - AIC_CMCD_S/SearchPage
    - AIC_CMCD_S/SearchQueryView
    - AIC_CMCD_S/SearchResultView
  - Pages with Flow Logic
  - Page Fragments
  - MIMEs

- AIC_CMCD_S/SearchQueryView
  - AIC_CMCD_S/SearchQueryView
    - View Controller
      - SearchQueryView.do
        - Implementation Class CL_AIC_CMCD_SEARCHQUERYVI_IMPL
        - Context
          - Implementation Class CL_AIC_CMCD_SEARCHQUERYVI_CTXT
          - IF_BSP_WD_HISTORY_STATE~STATE_STORE
          - IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
          - Context Nodes
            - SEARCH Base Entity BTQAICSearch
              - Implementation Class CL_AIC_CMCD_SEARCHQUERYVI_CN00
              - IF_BSP_MODEL~INIT
              - ON_NEW_FOCUS
              - Bound to Context Node SEARCH
              - Where Used
              - Attributes
                - DQUERY_ID
                - EXT./AICRM/CHGD_SAP
                - EXT./AICRM/CLIENT
                - EXT./AICRM/COMPL_SAP
                - EXT./AICRM/DBSYS
                - EXT./AICRM/DOC_TYPE
                - EXT./AICRM/EXT_TOKEN
                - EXT./AICRM/F0001
                - EXT./AICRM/FRONTEND
                - EXT./AICRM/GP_ID
                - EXT./AICRM/GP_SCOPE
                - EXT./AICRM/ICT_NUM
                - EXT./AICRM/ICT_SAP
                - EXT./AICRM/ICT_YEAR
                - EXT./AICRM/INSTNO
                - EXT./AICRM/ISV_FLAG
                - EXT./AICRM/OSSYS
                - EXT./AICRM/OSS_INST
                - EXT./AICRM/REASON_ID



Class Interface CL_AIC_CMCD_SEARCHQUERYVI_IMPL Implemented / Active

Method	Level	Visi	M	Description	Enhancement
GET_V_/AICRM/REASON_ID	Insta…	Pub…			



Class Builder: Enhancement [redacted] Display

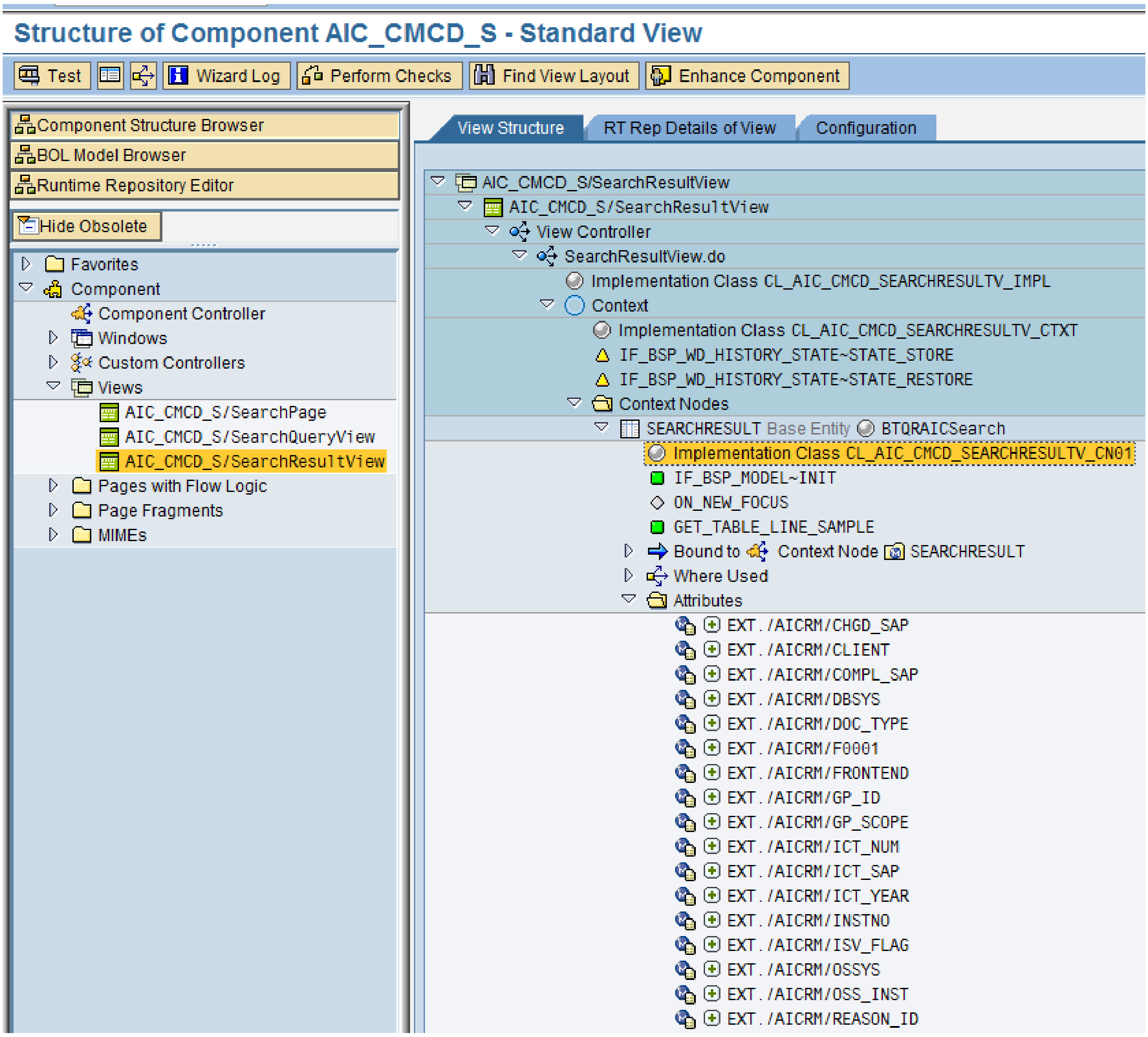
Ty.	Parameter	Type spec.	Description	Enhancement Implementation
	CS_RESULT	TYPE CRMS_THTMLB_SEARCH_FIELD_INFO	Advanced Search field information	[redacted]

Method GET_V_/AICRM/REASON_ID Active

```
METHOD get_v_/aicrm/reason_id .

  DATA:
    lt_list_proc_type  TYPE crmt_process_type_tab,
    lt_range_proc_type TYPE RANGE OF crmt_process_type,
    ls_range_proc_type LIKE LINE OF lt_range_proc_type.

  FIELD-SYMBOLS:
    <fv_proc_type> LIKE LINE OF lt_list_proc_type.


* Get all relevant process types (see value help getter for process_type)
  me->get_all_proc_type( IMPORTING et_proc_type = lt_list_proc_type  ).

*Build select option.
  LOOP AT lt_list_proc_type ASSIGNING <fv_proc_type>.
    ls_range_proc_type-sign = 'I'.
    ls_range_proc_type-option = 'EQ'.
    ls_range_proc_type-low = <fv_proc_type>.
    APPEND ls_range_proc_type TO lt_range_proc_type.
  ENDLOOP.

*Get all possible entries.
  SELECT DISTINCT reason_id AS key txt30 AS value
    INTO CORRESPONDING FIELDS OF TABLE cs_result-ddlb_options
    FROM aic_stat_reasont
   WHERE spras = sy-langu AND
         reason_id IN ( SELECT reason_id
                          FROM aic_stat_reason
                         WHERE user_stat_proc IN ( SELECT user_stat_proc
                                                     FROM crmc_proc_type
                                                    WHERE process_type IN lt_range_proc_type ) )
   ORDER BY reason_id.

*Add empty line.
  APPEND INITIAL LINE TO cs_result-ddlb_options.

ENDMETHOD.
```

```
METHOD get_v_/aicrm/reason_id .

  DATA:
    lt_list_proc_type  TYPE crmt_process_type_tab,
    lt_range_proc_type TYPE RANGE OF crmt_process_type,
    ls_range_proc_type LIKE LINE OF lt_range_proc_type.

  FIELD-SYMBOLS:
    <fv_proc_type> LIKE LINE OF lt_list_proc_type.


* Get all relevant process types (see value help getter for process_type)
  me->get_all_proc_type( IMPORTING et_proc_type = lt_list_proc_type  ).

*Build select option.
  LOOP AT lt_list_proc_type ASSIGNING <fv_proc_type>.
    ls_range_proc_type-sign = 'I'.
    ls_range_proc_type-option = 'EQ'.
    ls_range_proc_type-low = <fv_proc_type>.
    APPEND ls_range_proc_type TO lt_range_proc_type.
  ENDLOOP.

*Get all possible entries.
  SELECT DISTINCT reason_id AS key txt30 AS value
    INTO CORRESPONDING FIELDS OF TABLE cs_result-ddlb_options
    FROM aic_stat_reasont
   WHERE spras = sy-langu AND
         reason_id IN ( SELECT reason_id
                          FROM aic_stat_reason
                         WHERE user_stat_proc IN ( SELECT user_stat_proc
                                                     FROM crmc_proc_type
                                                    WHERE process_type IN lt_range_proc_type ) )
   ORDER BY reason_id.

*Add empty line.
  APPEND INITIAL LINE TO cs_result-ddlb_options.

ENDMETHOD.
```

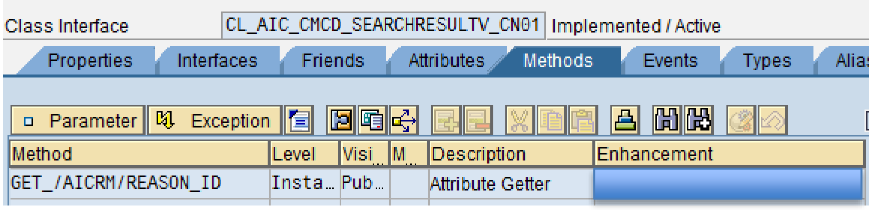
CD Search Result:



Structure of Component AIC_CMCD_S - Standard View

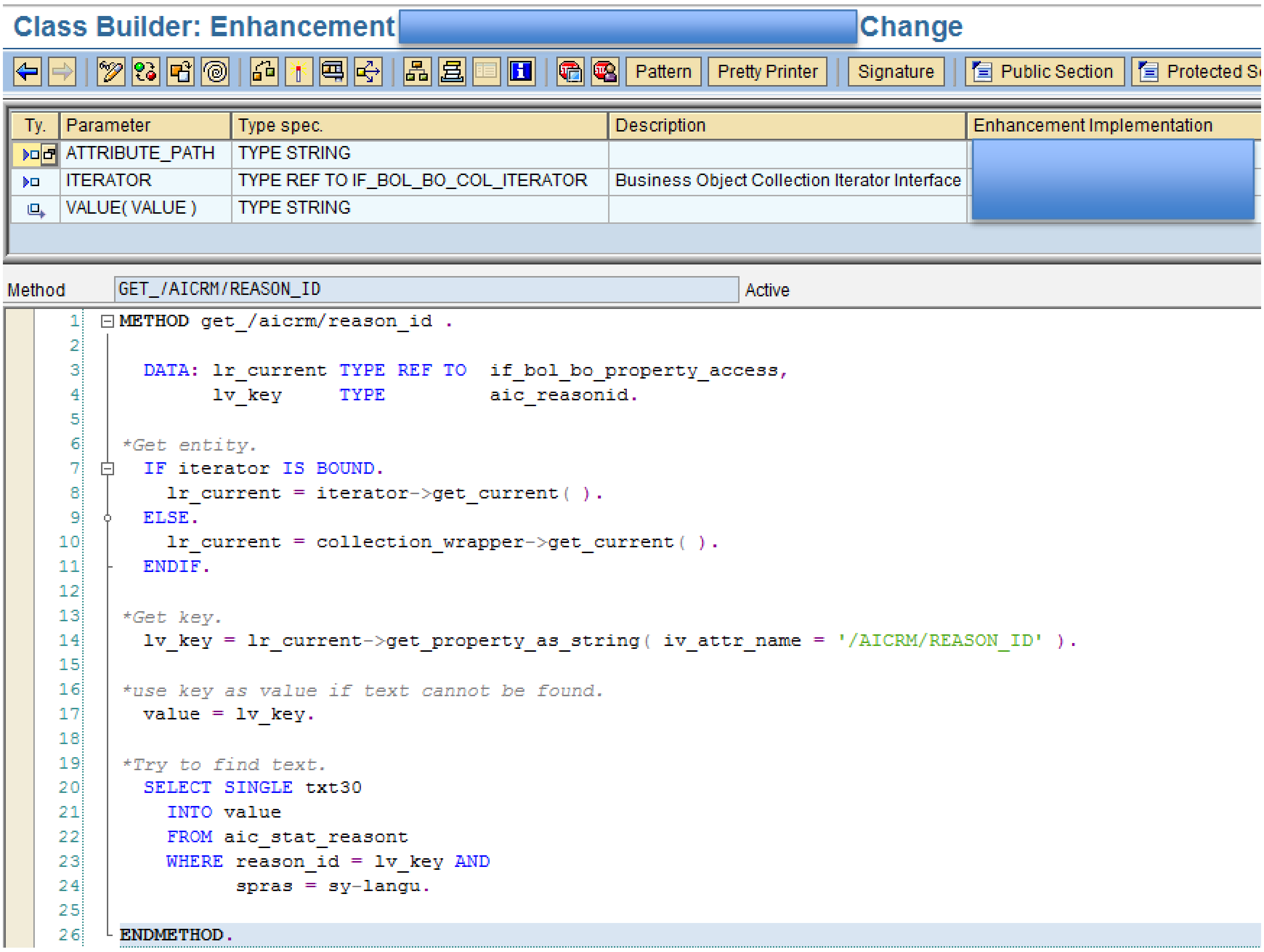
- Favorites
- Component
  - Component Controller
  - Windows
  - Custom Controllers
  - Views
    - AIC_CMCD_S/SearchPage
    - AIC_CMCD_S/SearchQueryView
    - AIC_CMCD_S/SearchResultView
  - Pages with Flow Logic
  - Page Fragments
  - MIMEs

```
AIC_CMCD_S/SearchResultView
  AIC_CMCD_S/SearchResultView
    View Controller
      SearchResultView.do
        Implementation Class CL_AIC_CMCD_SEARCHRESULTV_IMPL
        Context
          Implementation Class CL_AIC_CMCD_SEARCHRESULTV_CTXT
          IF_BSP_WD_HISTORY_STATE~STATE_STORE
          IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
          Context Nodes
            SEARCHRESULT Base Entity BTQRAICSearch
              Implementation Class CL_AIC_CMCD_SEARCHRESULTV_CN01
              IF_BSP_MODEL~INIT
              ON_NEW_FOCUS
              GET_TABLE_LINE_SAMPLE
              Bound to Context Node SEARCHRESULT
              Where Used
              Attributes
                EXT./AICRM/CHGD_SAP
                EXT./AICRM/CLIENT
                EXT./AICRM/COMPL_SAP
                EXT./AICRM/DBSYS
                EXT./AICRM/DOC_TYPE
                EXT./AICRM/F0001
                EXT./AICRM/FRONTEND
                EXT./AICRM/GP_ID
                EXT./AICRM/GP_SCOPE
                EXT./AICRM/ICT_NUM
                EXT./AICRM/ICT_SAP
                EXT./AICRM/ICT_YEAR
                EXT./AICRM/INSTNO
                EXT./AICRM/ISV_FLAG
                EXT./AICRM/OSSYS
                EXT./AICRM/OSS_INST
                EXT./AICRM/REASON_ID
```



Class Interface CL_AIC_CMCD_SEARCHRESULTV_CN01 Implemented / Active

Method	Level	Visi…	M…	Description	Enhancement
GET_/AICRM/REASON_ID	Insta…	Pub…		Attribute Getter	



Class Builder: Enhancement [redacted] Change

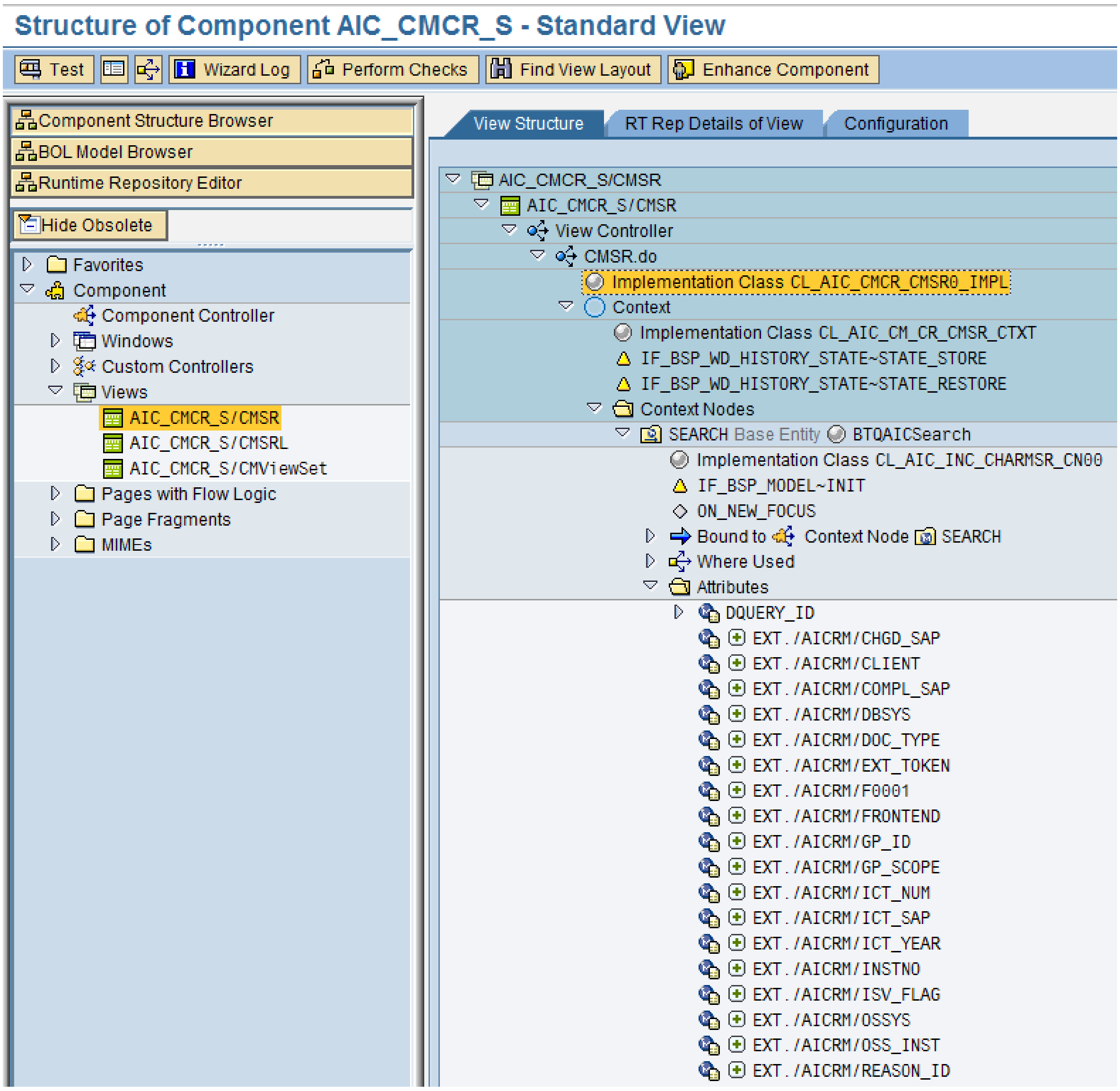
Ty.	Parameter	Type spec.	Description	Enhancement Implementation
	ATTRIBUTE_PATH	TYPE STRING		[redacted]
	ITERATOR	TYPE REF TO IF_BOL_BO_COL_ITERATOR	Business Object Collection Iterator Interface	
	VALUE(VALUE)	TYPE STRING		

Method GET_/AICRM/REASON_ID Active

```
METHOD get_/aicrm/reason_id .

  DATA: lr_current TYPE REF TO  if_bol_bo_property_access,
        lv_key      TYPE         aic_reasonid.

*Get entity.
  IF iterator IS BOUND.
    lr_current = iterator->get_current( ).
  ELSE.
    lr_current = collection_wrapper->get_current( ).
  ENDIF.

*Get key.
  lv_key = lr_current->get_property_as_string( iv_attr_name = '/AICRM/REASON_ID' ).

*use key as value if text cannot be found.
  value = lv_key.

*Try to find text.
  SELECT SINGLE txt30
    INTO value
    FROM aic_stat_reasont
    WHERE reason_id = lv_key AND
          spras = sy-langu.

ENDMETHOD.
```

```
METHOD get_/aicrm/reason_id .

  DATA: lr_current TYPE REF TO  if_bol_bo_property_access,
        lv_key      TYPE         aic_reasonid.

*Get entity.
  IF iterator IS BOUND.
    lr_current = iterator->get_current( ).
  ELSE.
    lr_current = collection_wrapper->get_current( ).
  ENDIF.

*Get key.
  lv_key = lr_current->get_property_as_string( iv_attr_name = '/AICRM/REASON_ID' ).

*use key as value if text cannot be found.
  value = lv_key.

*Try to find text.
  SELECT SINGLE txt30
    INTO value
    FROM aic_stat_reasont
    WHERE reason_id = lv_key AND
          spras = sy-langu.

ENDMETHOD.
```

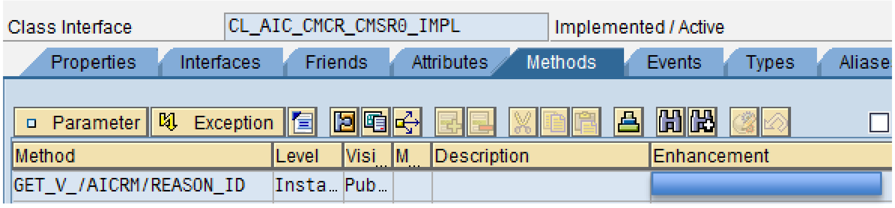
CR Search Criteria.



Structure of Component AIC_CMCR_S - Standard View

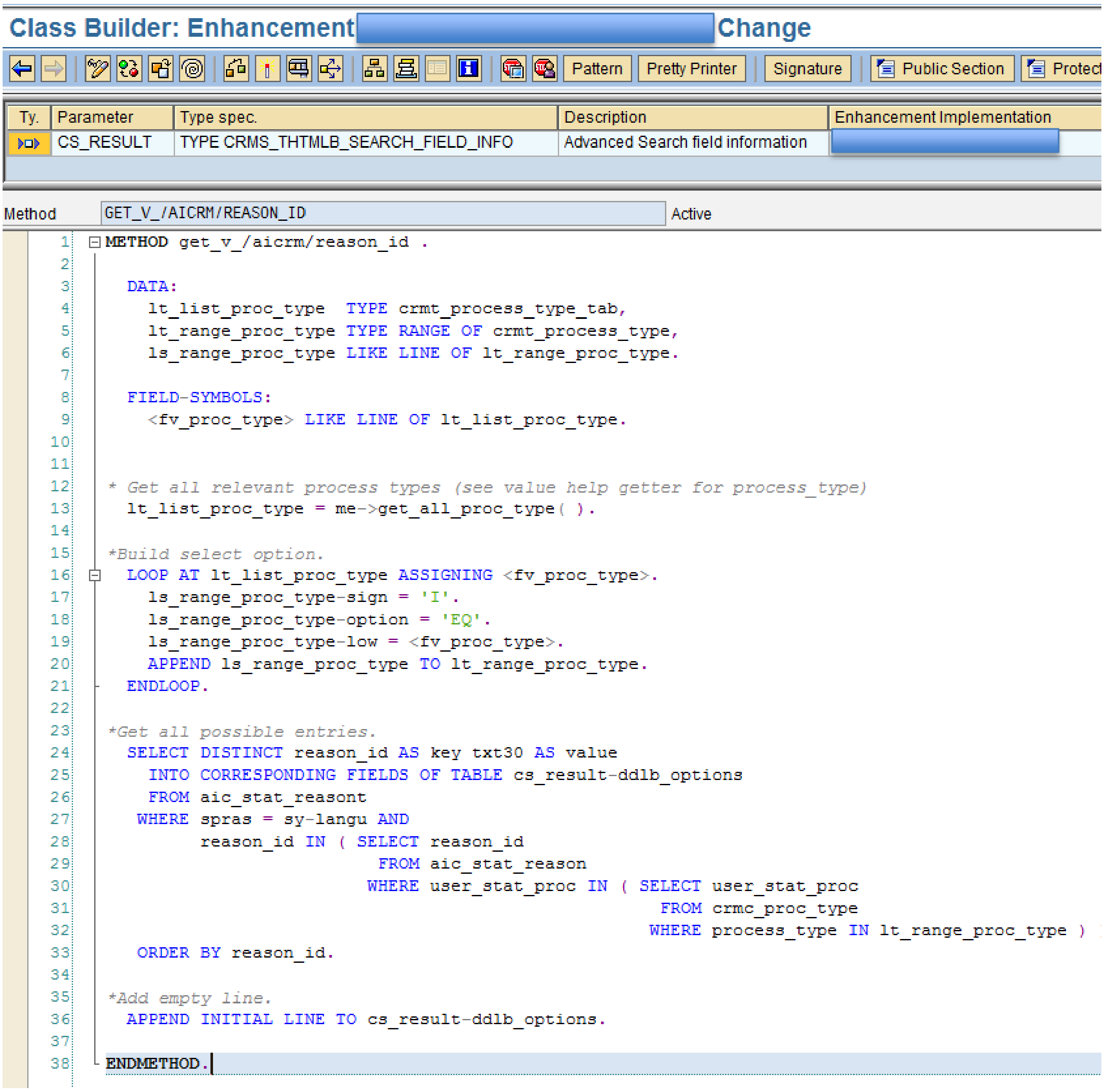
```
Favorites
Component
  Component Controller
  Windows
  Custom Controllers
  Views
    AIC_CMCR_S/CMSR
    AIC_CMCR_S/CMSRL
    AIC_CMCR_S/CMViewSet
  Pages with Flow Logic
  Page Fragments
  MIMEs
```

```
AIC_CMCR_S/CMSR
  AIC_CMCR_S/CMSR
    View Controller
      CMSR.do
        Implementation Class CL_AIC_CMCR_CMSR0_IMPL
        Context
          Implementation Class CL_AIC_CM_CR_CMSR_CTXT
          IF_BSP_WD_HISTORY_STATE~STATE_STORE
          IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
          Context Nodes
            SEARCH Base Entity BTQAICSearch
              Implementation Class CL_AIC_INC_CHARMSR_CN00
              IF_BSP_MODEL~INIT
              ON_NEW_FOCUS
              Bound to Context Node SEARCH
              Where Used
              Attributes
                DQUERY_ID
                EXT./AICRM/CHGD_SAP
                EXT./AICRM/CLIENT
                EXT./AICRM/COMPL_SAP
                EXT./AICRM/DBSYS
                EXT./AICRM/DOC_TYPE
                EXT./AICRM/EXT_TOKEN
                EXT./AICRM/F0001
                EXT./AICRM/FRONTEND
                EXT./AICRM/GP_ID
                EXT./AICRM/GP_SCOPE
                EXT./AICRM/ICT_NUM
                EXT./AICRM/ICT_SAP
                EXT./AICRM/ICT_YEAR
                EXT./AICRM/INSTNO
                EXT./AICRM/ISV_FLAG
                EXT./AICRM/OSSYS
                EXT./AICRM/OSS_INST
                EXT./AICRM/REASON_ID
```



Class Interface CL_AIC_CMCR_CMSR0_IMPL Implemented / Active

Method	Level	Visi	M	Description	Enhancement
GET_V_/AICRM/REASON_ID	Insta…	Pub…			



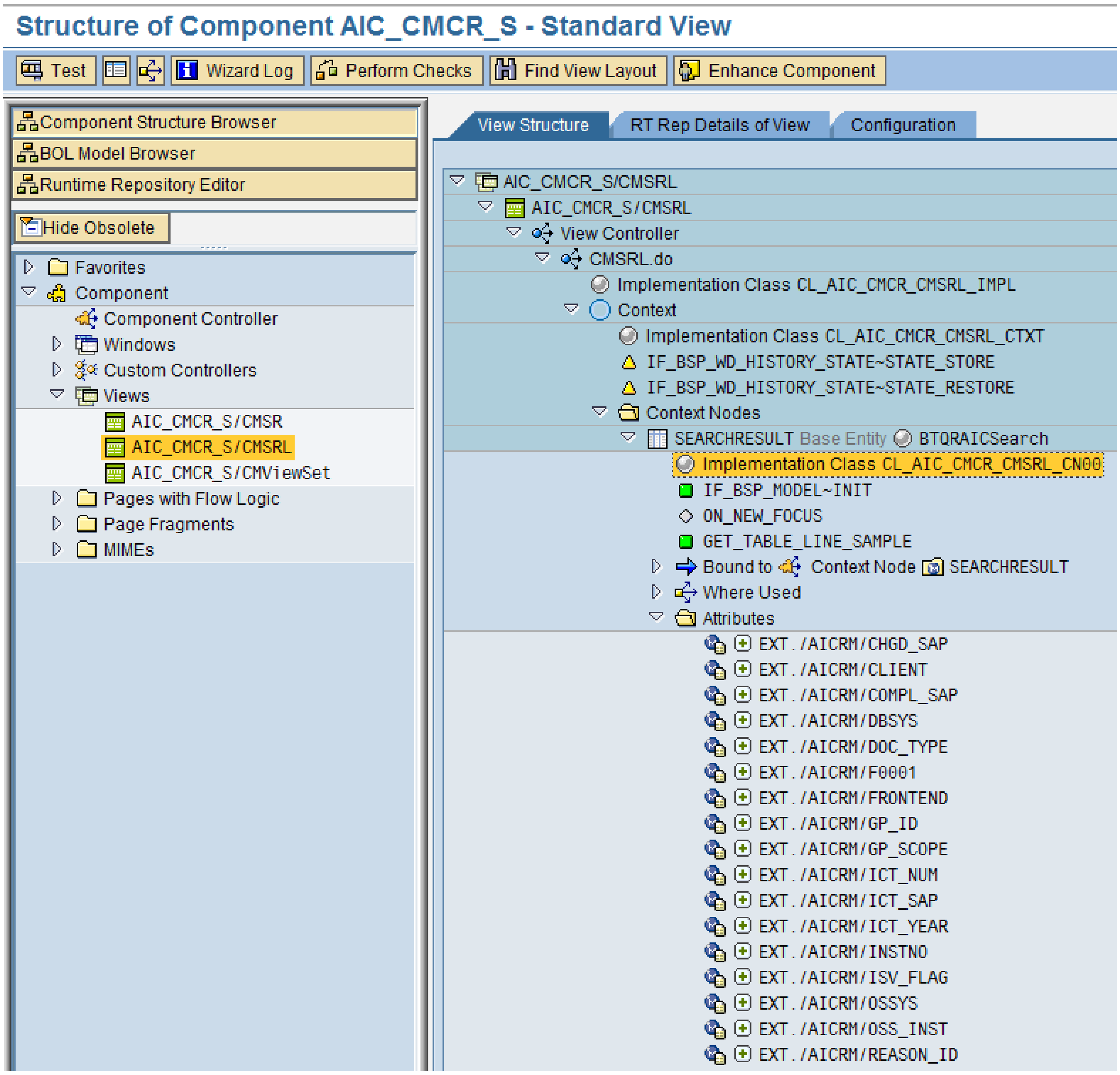
Class Builder: Enhancement [redacted] Change

Ty.	Parameter	Type spec.	Description	Enhancement Implementation
	CS_RESULT	TYPE CRMS_THTMLB_SEARCH_FIELD_INFO	Advanced Search field information	[redacted]

Method GET_V_/AICRM/REASON_ID Active

```
METHOD get_v_/aicrm/reason_id .

  DATA:
    lt_list_proc_type  TYPE crmt_process_type_tab,
    lt_range_proc_type TYPE RANGE OF crmt_process_type,
    ls_range_proc_type LIKE LINE OF lt_range_proc_type.

  FIELD-SYMBOLS:
    <fv_proc_type> LIKE LINE OF lt_list_proc_type.


* Get all relevant process types (see value help getter for process_type)
  lt_list_proc_type = me->get_all_proc_type( ).

*Build select option.
  LOOP AT lt_list_proc_type ASSIGNING <fv_proc_type>.
    ls_range_proc_type-sign = 'I'.
    ls_range_proc_type-option = 'EQ'.
    ls_range_proc_type-low = <fv_proc_type>.
    APPEND ls_range_proc_type TO lt_range_proc_type.
  ENDLOOP.

*Get all possible entries.
  SELECT DISTINCT reason_id AS key txt30 AS value
    INTO CORRESPONDING FIELDS OF TABLE cs_result-ddlb_options
    FROM aic_stat_reasont
   WHERE spras = sy-langu AND
         reason_id IN ( SELECT reason_id
                          FROM aic_stat_reason
                         WHERE user_stat_proc IN ( SELECT user_stat_proc
                                                     FROM crmc_proc_type
                                                    WHERE process_type IN lt_range_proc_type )
   ORDER BY reason_id.

*Add empty line.
  APPEND INITIAL LINE TO cs_result-ddlb_options.

ENDMETHOD.
```

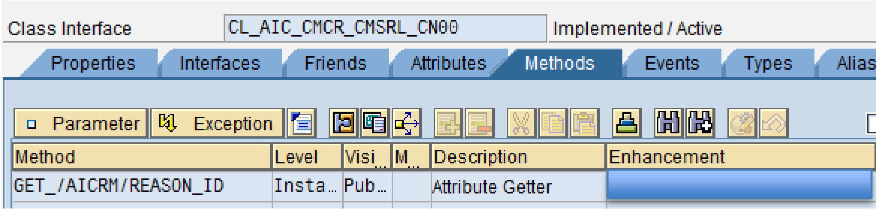
And CR Search Result:



Structure of Component AIC_CMCR_S - Standard View

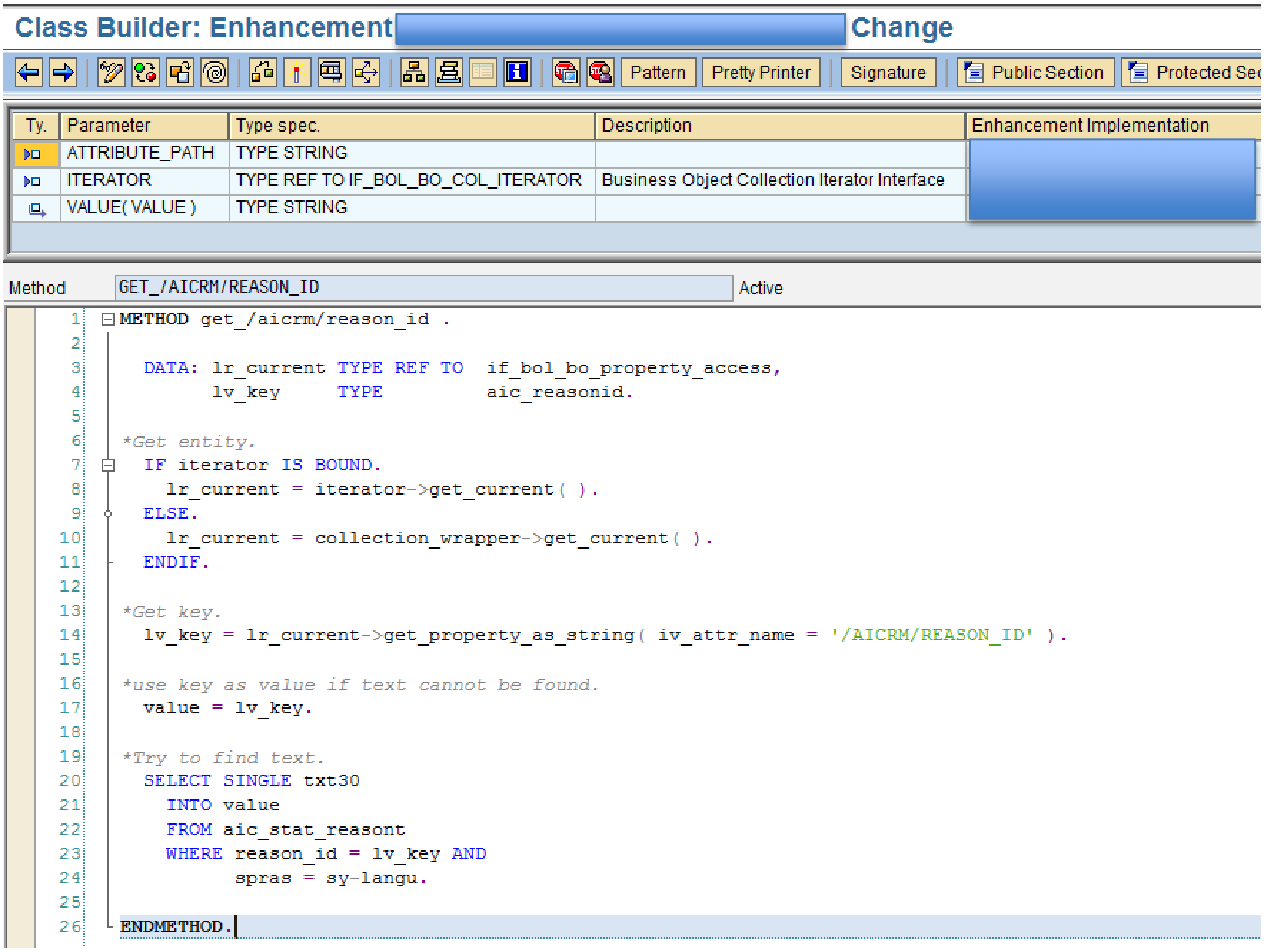
```
Favorites
Component
    Component Controller
    Windows
    Custom Controllers
    Views
        AIC_CMCR_S/CMSR
        AIC_CMCR_S/CMSRL
        AIC_CMCR_S/CMViewSet
    Pages with Flow Logic
    Page Fragments
    MIMEs
```

```
AIC_CMCR_S/CMSRL
  AIC_CMCR_S/CMSRL
    View Controller
      CMSRL.do
        Implementation Class CL_AIC_CMCR_CMSRL_IMPL
        Context
          Implementation Class CL_AIC_CMCR_CMSRL_CTXT
          IF_BSP_WD_HISTORY_STATE~STATE_STORE
          IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
          Context Nodes
            SEARCHRESULT Base Entity BTQRAICSearch
              Implementation Class CL_AIC_CMCR_CMSRL_CN00
              IF_BSP_MODEL~INIT
              ON_NEW_FOCUS
              GET_TABLE_LINE_SAMPLE
              Bound to Context Node SEARCHRESULT
              Where Used
              Attributes
                EXT./AICRM/CHGD_SAP
                EXT./AICRM/CLIENT
                EXT./AICRM/COMPL_SAP
                EXT./AICRM/DBSYS
                EXT./AICRM/DOC_TYPE
                EXT./AICRM/F0001
                EXT./AICRM/FRONTEND
                EXT./AICRM/GP_ID
                EXT./AICRM/GP_SCOPE
                EXT./AICRM/ICT_NUM
                EXT./AICRM/ICT_SAP
                EXT./AICRM/ICT_YEAR
                EXT./AICRM/INSTNO
                EXT./AICRM/ISV_FLAG
                EXT./AICRM/OSSYS
                EXT./AICRM/OSS_INST
                EXT./AICRM/REASON_ID
```



Class Interface CL_AIC_CMCR_CMSRL_CN00 Implemented / Active

Method	Level	Visi	M	Description	Enhancement
GET_/AICRM/REASON_ID	Insta…	Pub…		Attribute Getter	



Class Builder: Enhancement [redacted] Change

Ty.	Parameter	Type spec.	Description	Enhancement Implementation
	ATTRIBUTE_PATH	TYPE STRING		[redacted]
	ITERATOR	TYPE REF TO IF_BOL_BO_COL_ITERATOR	Business Object Collection Iterator Interface	[redacted]
	VALUE(VALUE)	TYPE STRING		[redacted]

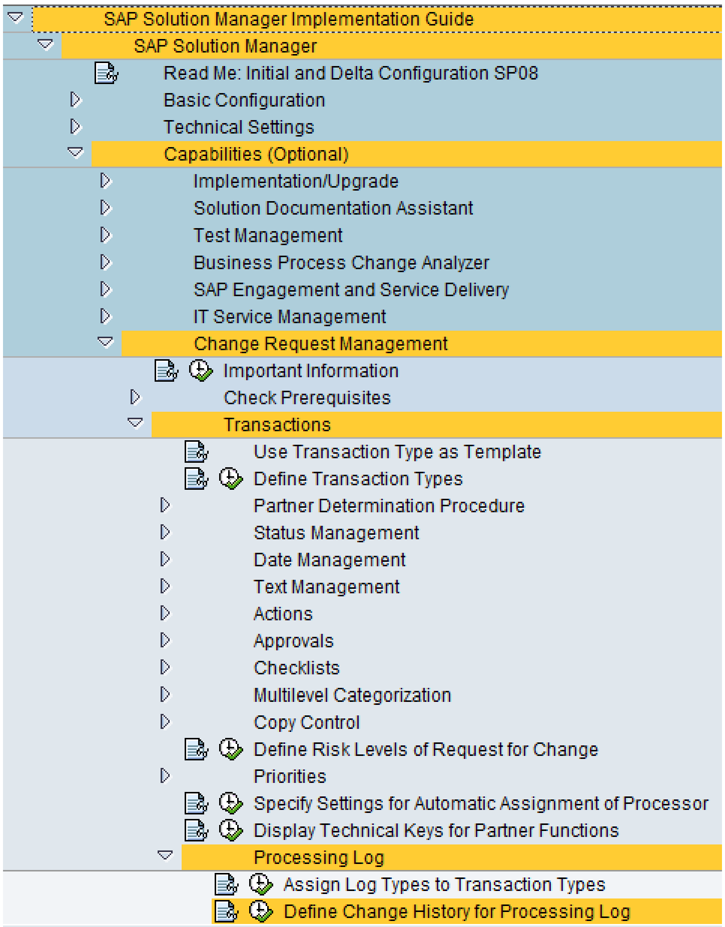
Method GET_/AICRM/REASON_ID Active

```
METHOD get_/aicrm/reason_id .

  DATA: lr_current TYPE REF TO  if_bol_bo_property_access,
        lv_key     TYPE         aic_reasonid.

*Get entity.
  IF iterator IS BOUND.
    lr_current = iterator->get_current( ).
  ELSE.
    lr_current = collection_wrapper->get_current( ).
  ENDIF.

*Get key.
  lv_key = lr_current->get_property_as_string( iv_attr_name = '/AICRM/REASON_ID' ).

*use key as value if text cannot be found.
  value = lv_key.

*Try to find text.
  SELECT SINGLE txt30
    INTO value
    FROM aic_stat_reasont
    WHERE reason_id = lv_key AND
          spras = sy-langu.

ENDMETHOD.
```

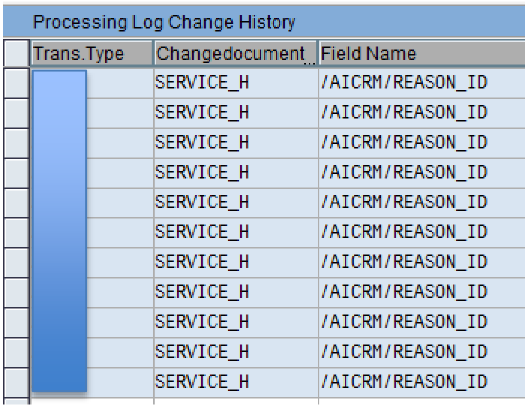
Please note: Method cl_ai_crm_im_utility=>get_reason_ids cannot be used because this is only working for a specific transaction guid.

1.4 Change Logs

We want to log all changes to the Sub Status as Change Log. This feature is now activated for all existing transaction types.



- SAP Solution Manager Implementation Guide
  - SAP Solution Manager
    - Read Me: Initial and Delta Configuration SP08
    - Basic Configuration
    - Technical Settings
    - Capabilities (Optional)
      - Implementation/Upgrade
      - Solution Documentation Assistant
      - Test Management
      - Business Process Change Analyzer
      - SAP Engagement and Service Delivery
      - IT Service Management
      - Change Request Management
        - Important Information
        - Check Prerequisites
        - Transactions
          - Use Transaction Type as Template
          - Define Transaction Types
          - Partner Determination Procedure
          - Status Management
          - Date Management
          - Text Management
          - Actions
          - Approvals
          - Checklists
          - Multilevel Categorization
          - Copy Control
          - Define Risk Levels of Request for Change
          - Priorities
          - Specify Settings for Automatic Assignment of Processor
          - Display Technical Keys for Partner Functions
          - Processing Log
            - Assign Log Types to Transaction Types
            - Define Change History for Processing Log

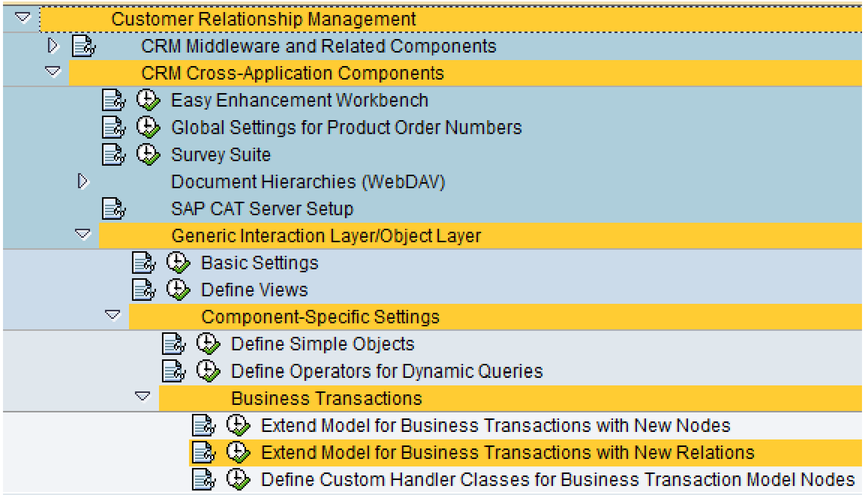


Processing Log Change History

Trans.Type	Changedocument	Field Name
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID
	SERVICE_H	/AICRM/REASON_ID

2 Multi Line Texts

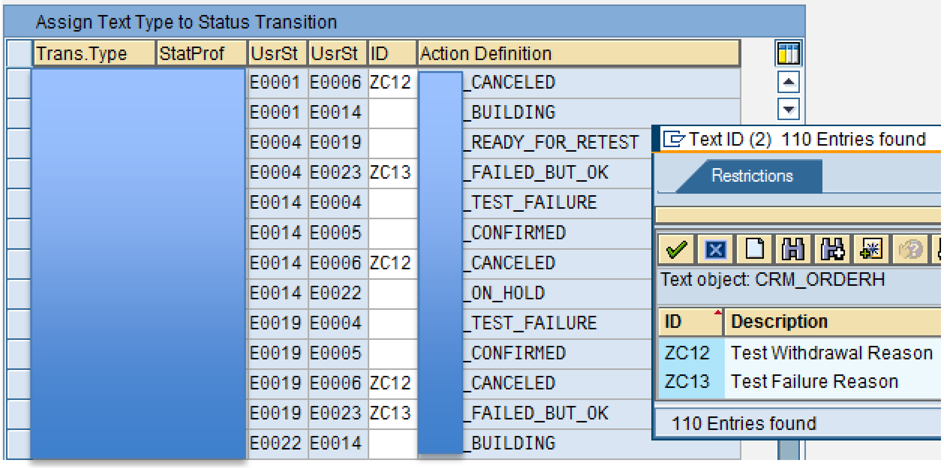
Together with substatus we want to maintain a multi-line text (i.e. Withdrawal Reason or Test Failure Reason) on status change. Because text type can be different, this text type needs to be assigned to a specific status transition. Additionally this text type needs to be accessible via BOL/GenIL.



- Customer Relationship Management
  - CRM Middleware and Related Components
  - CRM Cross-Application Components
    - Easy Enhancement Workbench
    - Global Settings for Product Order Numbers
    - Survey Suite
    - Document Hierarchies (WebDAV)
    - SAP CAT Server Setup
    - Generic Interaction Layer/Object Layer
      - Basic Settings
      - Define Views
      - Component-Specific Settings
        - Define Simple Objects
        - Define Operators for Dynamic Queries
        - Business Transactions
          - Extend Model for Business Transactions with New Nodes
          - Extend Model for Business Transactions with New Relations
          - Define Custom Handler Classes for Business Transaction Model Nodes

2.1 Customizing: Assign Text Type to Status Transition

This maintenance is customer specific.



Assign Text Type to Status Transition

Trans.Type	StatProf	UsrSt	UsrSt	ID	Action Definition
[redacted]	[redacted]	E0001	E0006	ZC12	[redacted]_CANCELED
[redacted]	[redacted]	E0001	E0014		[redacted]_BUILDING
[redacted]	[redacted]	E0004	E0019		[redacted]_READY_FOR_RETEST
[redacted]	[redacted]	E0004	E0023	ZC13	[redacted]_FAILED_BUT_OK
[redacted]	[redacted]	E0014	E0004		[redacted]_TEST_FAILURE
[redacted]	[redacted]	E0014	E0005		[redacted]_CONFIRMED
[redacted]	[redacted]	E0014	E0006	ZC12	[redacted]_CANCELED
[redacted]	[redacted]	E0014	E0022		[redacted]_ON_HOLD
[redacted]	[redacted]	E0019	E0004		[redacted]_TEST_FAILURE
[redacted]	[redacted]	E0019	E0005		[redacted]_CONFIRMED
[redacted]	[redacted]	E0019	E0006	ZC12	[redacted]_CANCELED
[redacted]	[redacted]	E0019	E0023	ZC13	[redacted]_FAILED_BUT_OK
[redacted]	[redacted]	E0022	E0014		[redacted]_BUILDING

Text ID (2) 110 Entries found

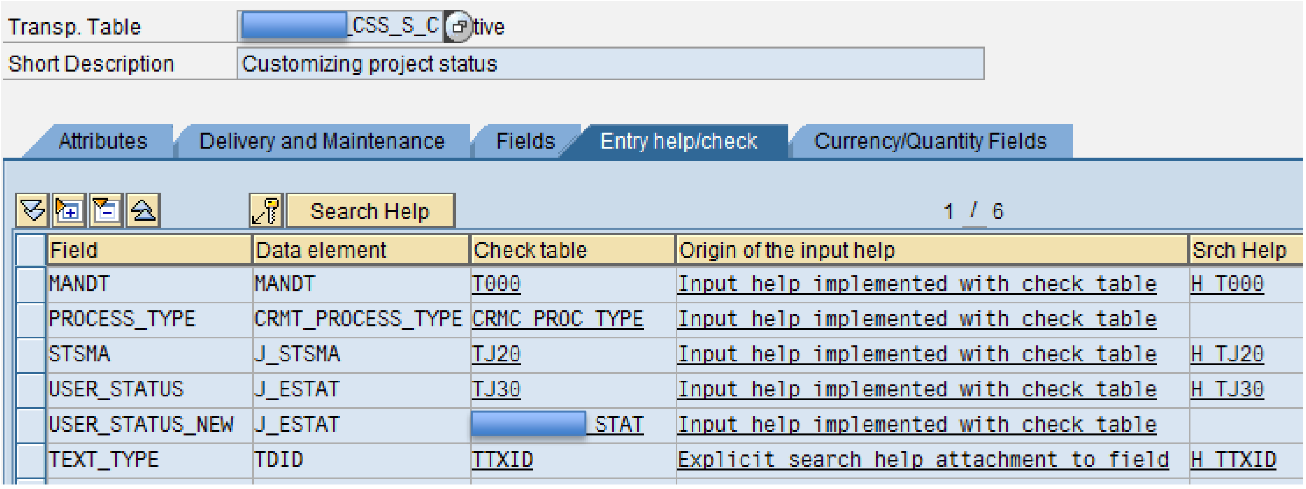
Restrictions

Text object: CRM_ORDERH

ID	Description
ZC12	Test Withdrawal Reason
ZC13	Test Failure Reason

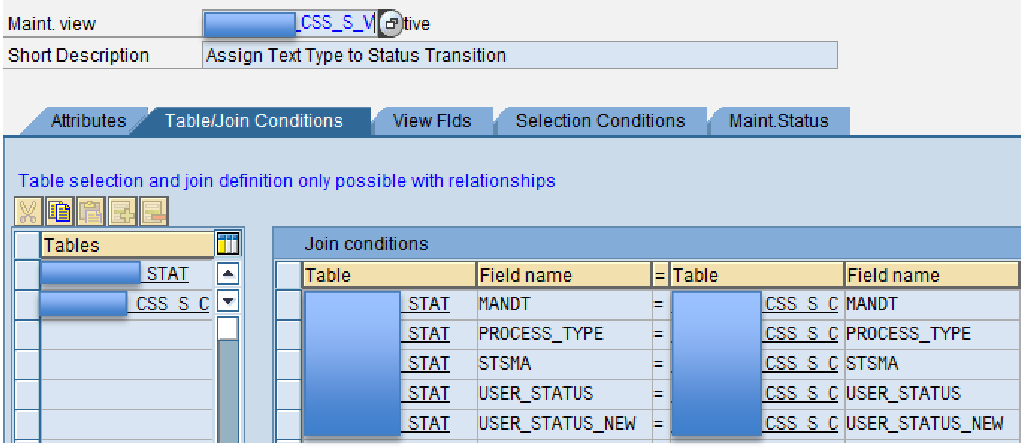
110 Entries found

Maintenance View ???_CSS_S_V and customizing table ???_CSS_S_C are extending the already existing table ???_STAT by the text type field.



Transp. Table	[redacted]CSS_S_C tive
Short Description	Customizing project status

Field	Data element	Check table	Origin of the input help	Srch Help
MANDT	MANDT	T000	Input help implemented with check table	H_T000
PROCESS_TYPE	CRMT_PROCESS_TYPE	CRMC_PROC_TYPE	Input help implemented with check table	
STSMA	J_STSMA	TJ20	Input help implemented with check table	H_TJ20
USER_STATUS	J_ESTAT	TJ30	Input help implemented with check table	H_TJ30
USER_STATUS_NEW	J_ESTAT	[redacted] STAT	Input help implemented with check table	
TEXT_TYPE	TDID	TTXID	Explicit search help attachment to field	H_TTXID



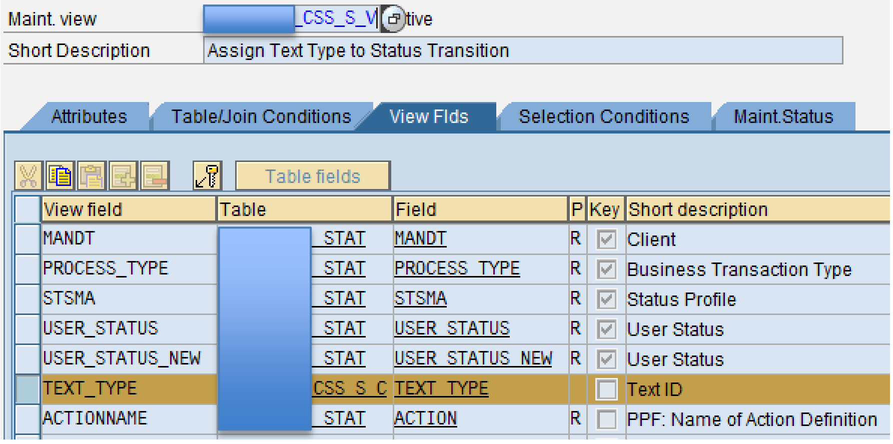
Maint. view	[redacted]CSS_S_V tive
Short Description	Assign Text Type to Status Transition

Table selection and join definition only possible with relationships

Tables
[redacted] STAT
[redacted] CSS_S_C

Join conditions

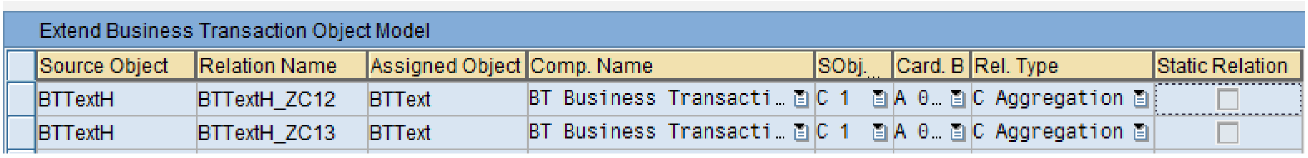
Table	Field name	=	Table	Field name
[redacted] STAT	MANDT	=	[redacted] CSS_S_C	MANDT
[redacted] STAT	PROCESS_TYPE	=	[redacted] CSS_S_C	PROCESS_TYPE
[redacted] STAT	STSMA	=	[redacted] CSS_S_C	STSMA
[redacted] STAT	USER_STATUS	=	[redacted] CSS_S_C	USER_STATUS
[redacted] STAT	USER_STATUS_NEW	=	[redacted] CSS_S_C	USER_STATUS_NEW



Maint. view	[redacted]CSS_S_V tive
Short Description	Assign Text Type to Status Transition

View field	Table	Field	P	Key	Short description
MANDT	[redacted] STAT	MANDT	R	☑	Client
PROCESS_TYPE	[redacted] STAT	PROCESS_TYPE	R	☑	Business Transaction Type
STSMA	[redacted] STAT	STSMA	R	☑	Status Profile
USER_STATUS	[redacted] STAT	USER_STATUS	R	☑	User Status
USER_STATUS_NEW	[redacted] STAT	USER_STATUS_NEW	R	☑	User Status
TEXT_TYPE	[redacted] CSS_S_C	TEXT_TYPE		☐	Text ID
ACTIONNAME	[redacted] STAT	ACTION	R	☐	PPF: Name of Action Definition

2.2 Enable BOL/GenIL access for Text Type



Extend Business Transaction Object Model

Source Object	Relation Name	Assigned Object	Comp. Name	SObj…	Card. B	Rel. Type	Static Relation
BTTextH	BTTextH_ZC12	BTText	BT Business Transacti…	C 1	A 0…	C Aggregation	☐
BTTextH	BTTextH_ZC13	BTText	BT Business Transacti…	C 1	A 0…	C Aggregation	☐

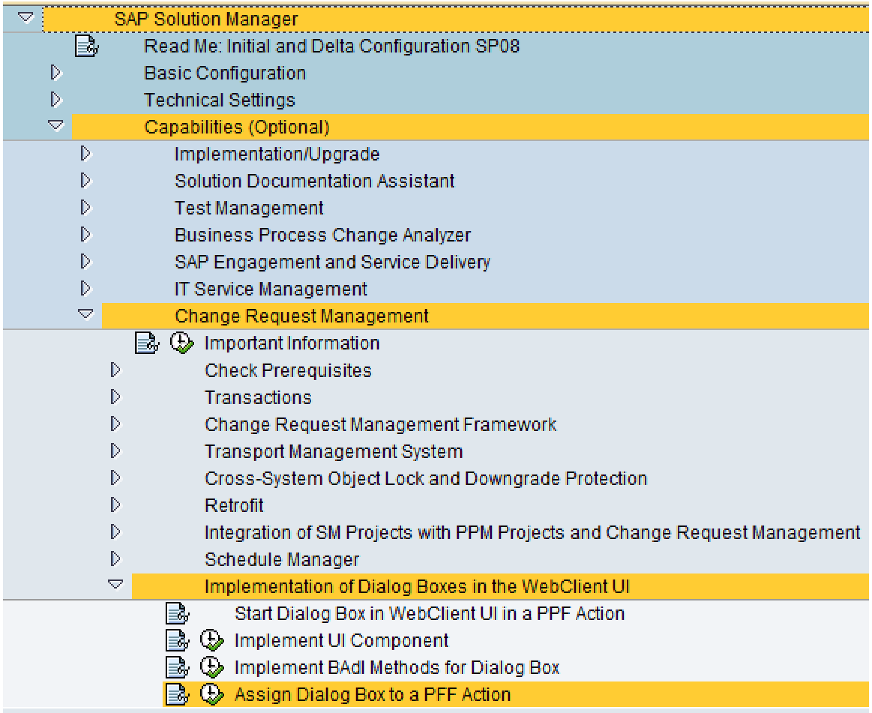
3 Sub Status Popup

3.1 Customizing: Assign Dialog Box to a PPF Action

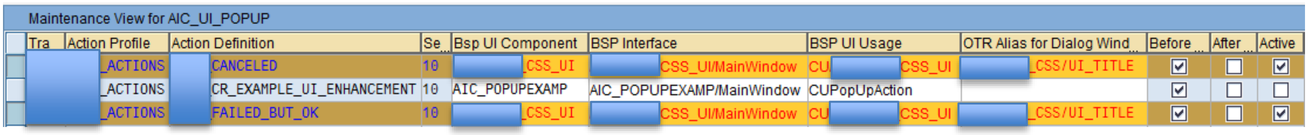
We want to show a popup before executing a status change action. The popup is used to select a sub status and to maintain a multi-line text.

The popup cannot be show after status change because the selection/maintenance done in the popup might be needed for some consistency checks. The popup cannot be shown after status change because the transaction is not changeable anymore after change to a final status.

On status change some consistency checks will be executed which might cancel the status change. One of these consistency check is a check for a valid sub status. In case of status change cancel, the already selected sub status will be removed. These both features (consistency check and sub status clean-up) are not part of this section. However we might need to keep it in mind to understand the whole solution.



- SAP Solution Manager
  - Read Me: Initial and Delta Configuration SP08
  - Basic Configuration
  - Technical Settings
  - Capabilities (Optional)
    - Implementation/Upgrade
    - Solution Documentation Assistant
    - Test Management
    - Business Process Change Analyzer
    - SAP Engagement and Service Delivery
    - IT Service Management
    - Change Request Management
      - Important Information
      - Check Prerequisites
      - Transactions
      - Change Request Management Framework
      - Transport Management System
      - Cross-System Object Lock and Downgrade Protection
      - Retrofit
      - Integration of SM Projects with PPM Projects and Change Request Management
      - Schedule Manager
      - Implementation of Dialog Boxes in the WebClient UI
        - Start Dialog Box in WebClient UI in a PPF Action
        - Implement UI Component
        - Implement BAdI Methods for Dialog Box
        - Assign Dialog Box to a PFF Action



Maintenance View for AIC_UI_POPUP

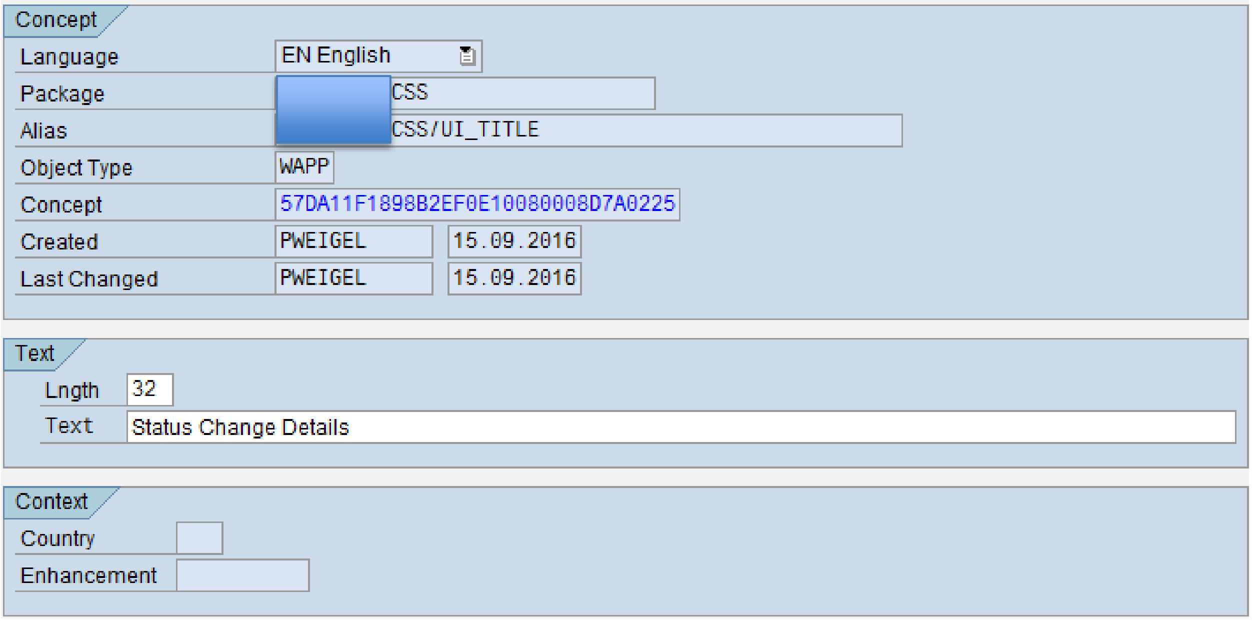
Tra	Action Profile	Action Definition	Se...	Bsp UI Component	BSP Interface	BSP UI Usage	OTR Alias for Dialog Wind...	Before ...	After ...	Active
[redacted]	[redacted]_ACTIONS	[redacted]_CANCELED	10	[redacted]_CSS_UI	[redacted]CSS_UI/MainWindow	CU[redacted]CSS_UI	[redacted]_CSS/UI_TITLE	☑	☐	☑
[redacted]	[redacted]_ACTIONS	[redacted]CR_EXAMPLE_UI_ENHANCEMENT	10	AIC_POPUPEXAMP	AIC_POPUPEXAMP/MainWindow	CUPopUpAction		☑	☐	☐
[redacted]	[redacted]_ACTIONS	[redacted]_FAILED_BUT_OK	10	[redacted]_CSS_UI	[redacted]CSS_UI/MainWindow	CU[redacted]CSS_UI	[redacted]_CSS/UI_TITLE	☑	☐	☑

To activate the popup we need to configure it including ui component, BSP interface, BSP UI usage, OTR Alias. We also need to set the flag "Before PPF Action" and

"Active". Actually the popup solution can be configured for all Change Requests and Change Documents. It cannot be configured for Incidents, problems, Service Requests, because the Popup framework is not supported here.

3.2 Text: Popup Title

The OTR Alias for the popup title is defined it transaction SOTR_EDIT:



Concept

Language	EN English	
Package	[redacted]CSS	
Alias	[redacted]CSS/UI_TITLE	
Object Type	WAPP	
Concept	57DA11F1898B2EF0E10080008D7A0225	
Created	PWEIGEL	15.09.2016
Last Changed	PWEIGEL	15.09.2016

Text

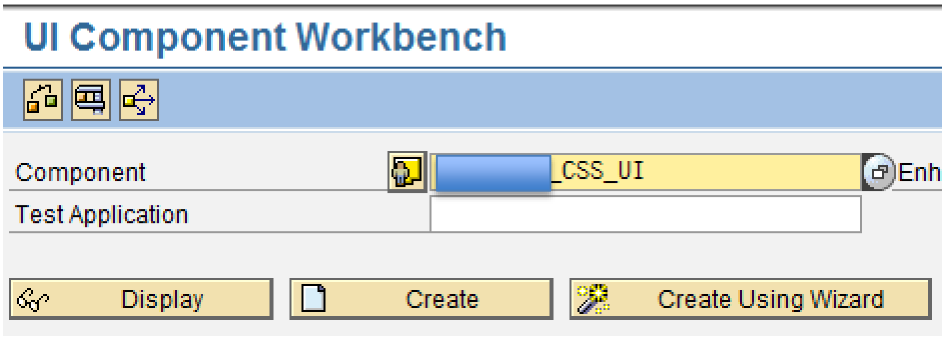
Lngth	32
Text	Status Change Details

Context

Country	
Enhancement	

3.3 UI Component CSS_UI

The popup is implemented as own UI component CSS_UI.

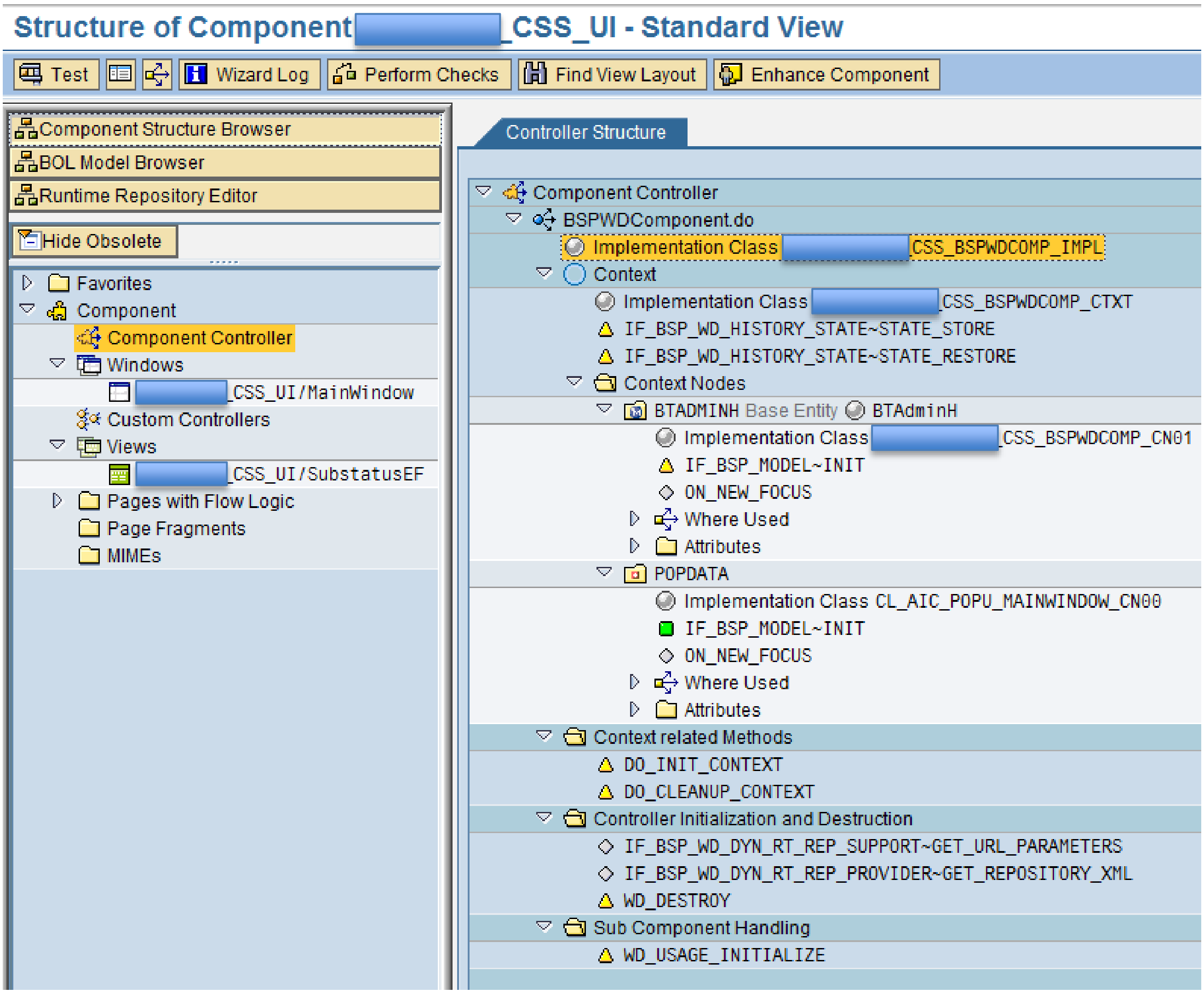


UI Component Workbench

Component	[redacted]CSS_UI
Test Application	

3.4 Component Controller

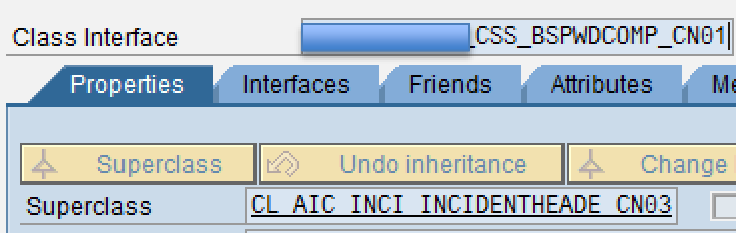
The ui component has a component controller with context node to hold popup data (POPDATA) like action name and transaction root (BTAdminH). Context node of BTAdminH is inheriting from AIC_INCIDENT_H. It is using all implementations already done for Incident but it can be enhanced. Context Node POPDATA is re-using implementation of Popup Example (AIC_POPUPEXAMP) - it cannot be enhanced actually.



Structure of Component [redacted]_CSS_UI - Standard View

- Favorites
- Component
  - Component Controller
  - Windows
    - [redacted]_CSS_UI/MainWindow
  - Custom Controllers
  - Views
    - [redacted]_CSS_UI/SubstatusEF
  - Pages with Flow Logic
  - Page Fragments
  - MIMEs

- Component Controller
  - BSPWDComponent.do
    - Implementation Class [redacted]_CSS_BSPWDCOMP_IMPL
    - Context
      - Implementation Class [redacted]_CSS_BSPWDCOMP_CTXT
      - IF_BSP_WD_HISTORY_STATE~STATE_STORE
      - IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
      - Context Nodes
        - BTADMINH Base Entity BTAdminH
          - Implementation Class [redacted]_CSS_BSPWDCOMP_CN01
          - IF_BSP_MODEL~INIT
          - ON_NEW_FOCUS
          - Where Used
          - Attributes
        - POPDATA
          - Implementation Class CL_AIC_POPU_MAINWINDOW_CN00
          - IF_BSP_MODEL~INIT
          - ON_NEW_FOCUS
          - Where Used
          - Attributes
    - Context related Methods
      - DO_INIT_CONTEXT
      - DO_CLEANUP_CONTEXT
    - Controller Initialization and Destruction
      - IF_BSP_WD_DYN_RT_REP_SUPPORT~GET_URL_PARAMETERS
      - IF_BSP_WD_DYN_RT_REP_PROVIDER~GET_REPOSITORY_XML
      - WD_DESTROY
    - Sub Component Handling
      - WD_USAGE_INITIALIZE



Class Interface [redacted]_CSS_BSPWDCOMP_CN01

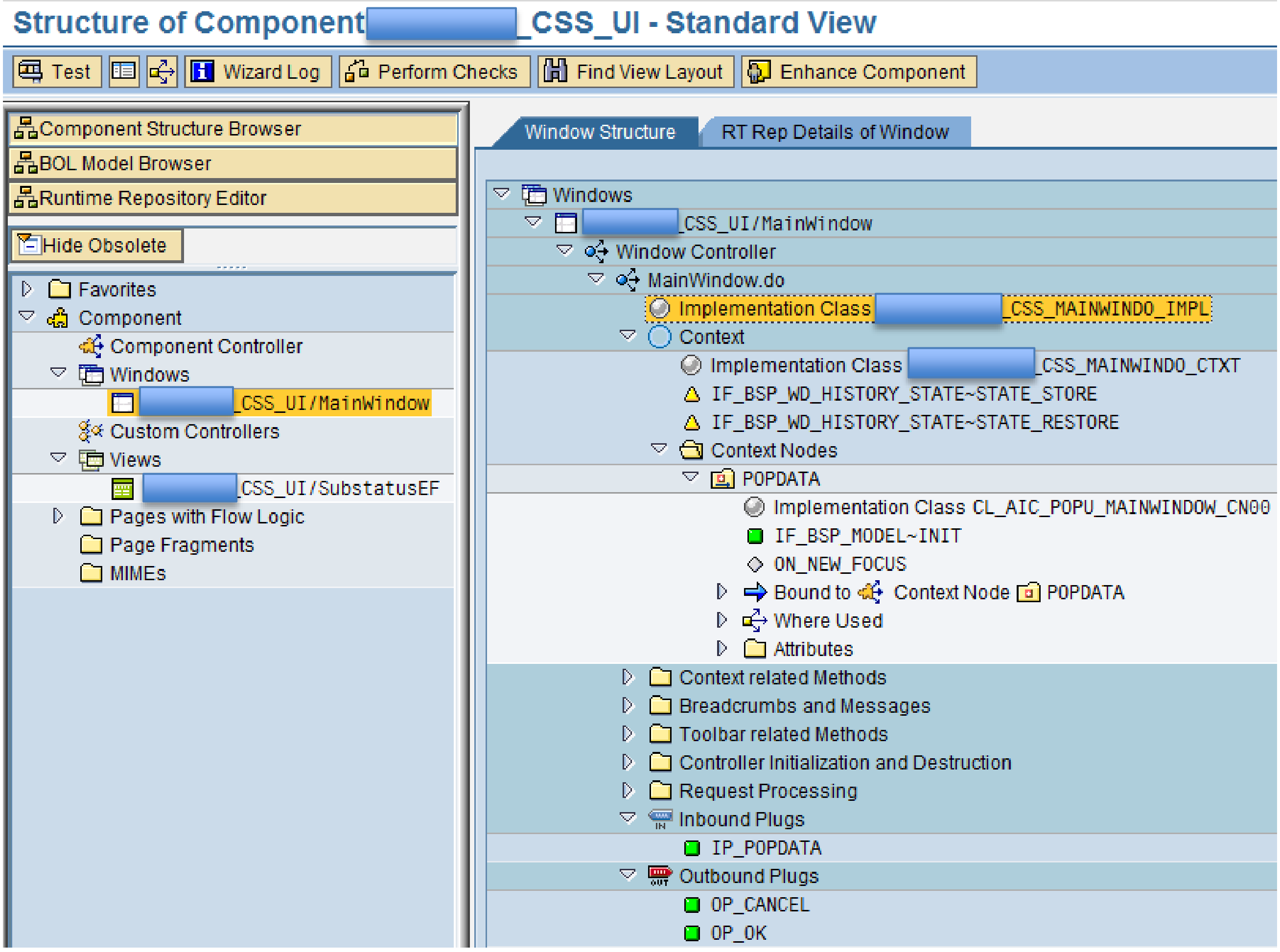
Superclass CL_AIC_INCI_INCIDENTHEADE_CN03

3.5 Window CSS_UI/MainWindow

The root and entry point of the popup is the window which is showing the popup view.

Context node POPDATA is connected with the corresponding context nodes of the component controller. POPDATA is the standard implementation of AIC_POPUPEXAMP (like component controller).

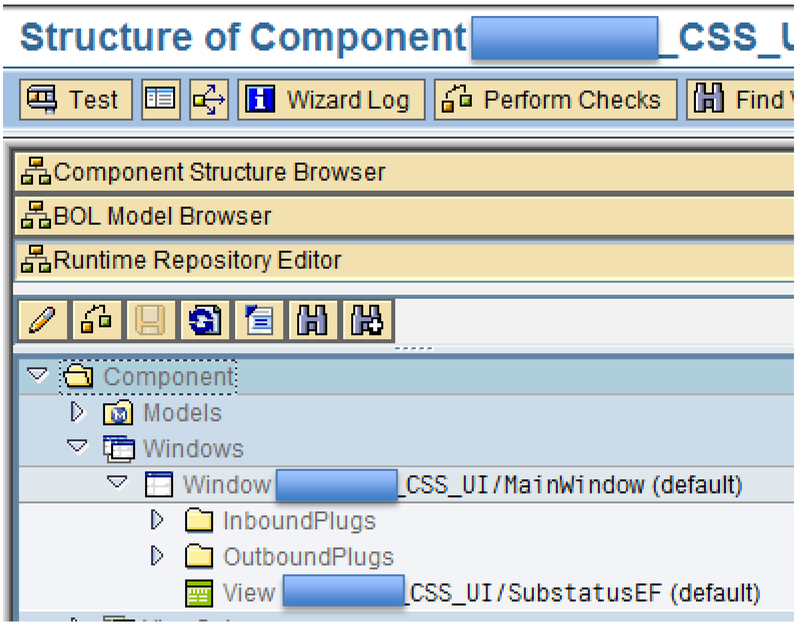
The plugs are described in section 3.9 and 3.10.



Structure of Component [redacted]_CSS_UI - Standard View

- Favorites
- Component
  - Component Controller
  - Windows
    - [redacted]_CSS_UI/MainWindow
  - Custom Controllers
  - Views
    - [redacted]_CSS_UI/SubstatusEF
  - Pages with Flow Logic
  - Page Fragments
  - MIMEs

- Windows
  - [redacted]_CSS_UI/MainWindow
    - Window Controller
      - MainWindow.do
        - Implementation Class [redacted]_CSS_MAINWINDO_IMPL
        - Context
          - Implementation Class [redacted]_CSS_MAINWINDO_CTXT
          - IF_BSP_WD_HISTORY_STATE~STATE_STORE
          - IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
          - Context Nodes
            - POPDATA
              - Implementation Class CL_AIC_POPU_MAINWINDOW_CN00
              - IF_BSP_MODEL~INIT
              - ON_NEW_FOCUS
              - Bound to Context Node POPDATA
              - Where Used
              - Attributes
        - Context related Methods
        - Breadcrumbs and Messages
        - Toolbar related Methods
        - Controller Initialization and Destruction
        - Request Processing
        - Inbound Plugs
          - IP_POPDATA
        - Outbound Plugs
          - OP_CANCEL
          - OP_OK



Structure of Component [redacted]_CSS_U

Component Structure Browser
BOL Model Browser
Runtime Repository Editor

Component
Models
Windows
Window [redacted]_CSS_UI/MainWindow (default)
InboundPlugs
OutboundPlugs
View [redacted]_CSS_UI/SubstatusEF (default)

3.6 View CSS_UI/SubstatusEF

View CSS_UI/SubstatusEF is embedded in Window CSS_UI/MainWindow. It will be shown as soon as the Window will be shown.

Context Nodes POPDATA and BTADMINH are connected with the corresponding context nodes of the component controller (not visible in screenshot). Context nodes BTTEXTSETH and BTTEXT are dependent on context nodes BTAdminH. Note: All changes done in BTADMINH, BTTEXTSETH and BTTEXT are real changes and will be send to BOL/GenIL and API automatically.

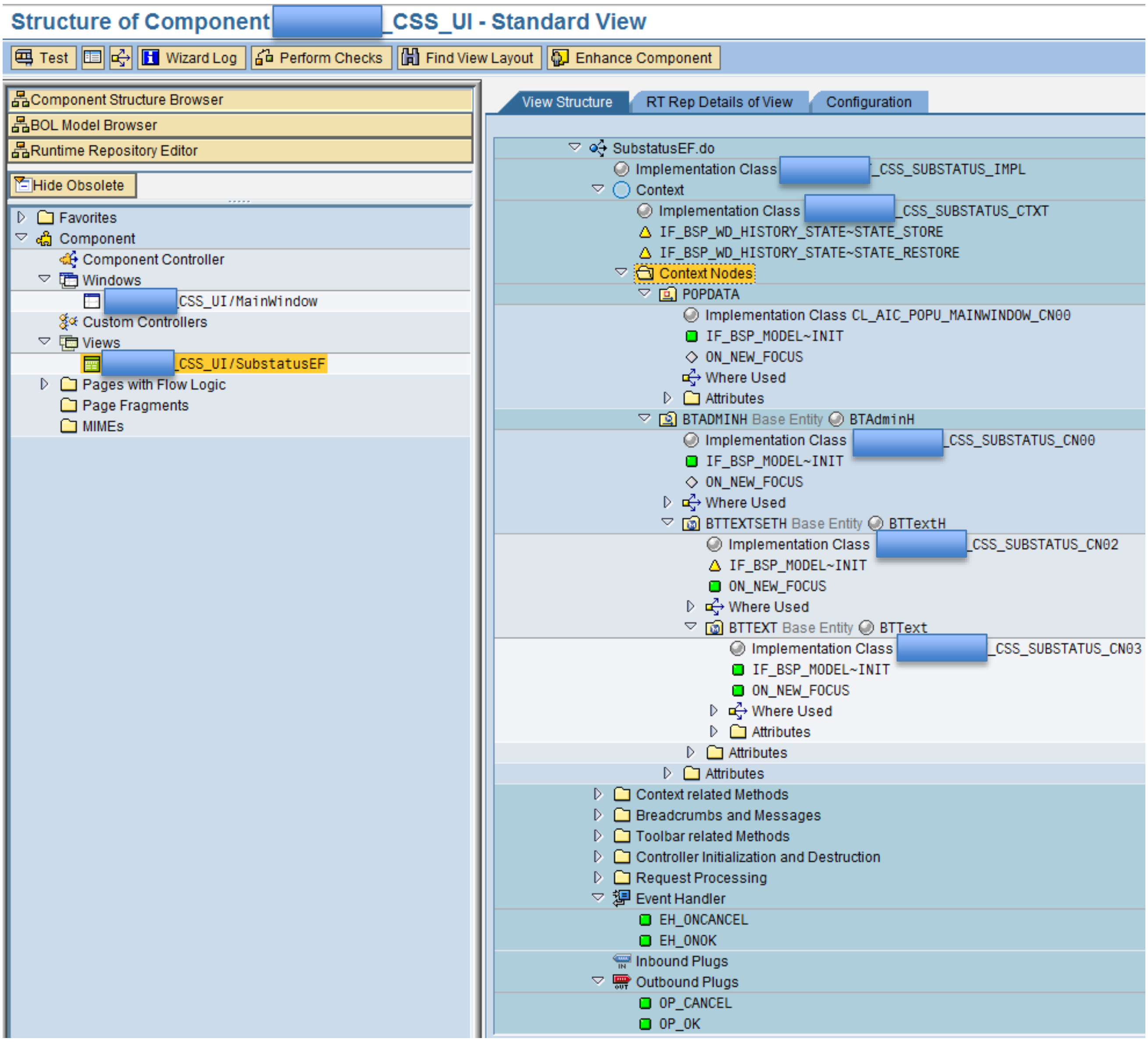
POPDATA is the standard implementation of AIC_POPUPEXAMP (like component controller and window).

BTADMINH is again inheriting the standard implementation from AIC_INCIDENT_H (which is supporting Sub Status, like component controller). However some adjustements wetre needed to show the target user status and to allow selection of substatus of the target user status. More details concerning this topic can be found in section 3.7.

BTTEXTSETH is generated by wizard based on relation BTAdminH->BTHeaderTextSet. BTTEXT is generated by wizard based on relation BTTEXTSETH->BTTextH_<TDID>. However after generation the implementation was adjusted to be more dynamically. More details concerning this topic can be found in section 3.8.

Actually there is only one UI configuration where user status is read-only and substatus and text type are mandatory. It can happen that we need to change this in future in case sub status or text type are not mandatory in some cases.

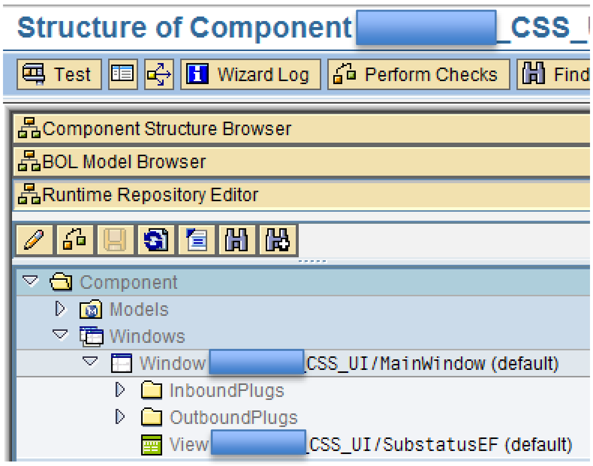
This view is not using view group contexts because it is always in edit mode.



Structure of Component [redacted]_CSS_UI - Standard View

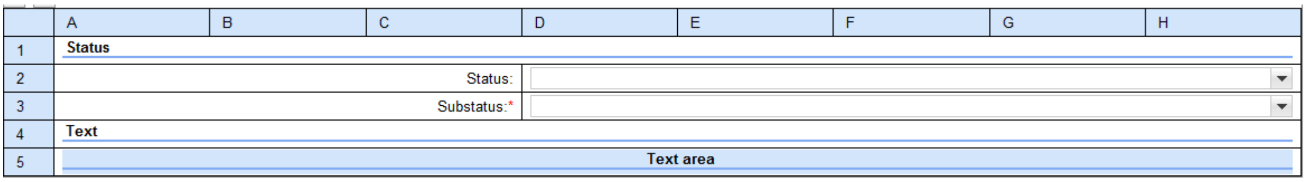
- Favorites
- Component
  - Component Controller
  - Windows
    - [redacted]CSS_UI/MainWindow
  - Custom Controllers
  - Views
    - [redacted]CSS_UI/SubstatusEF
  - Pages with Flow Logic
  - Page Fragments
  - MIMEs

- SubstatusEF.do
  - Implementation Class [redacted]_CSS_SUBSTATUS_IMPL
  - Context
    - Implementation Class [redacted]_CSS_SUBSTATUS_CTXT
    - IF_BSP_WD_HISTORY_STATE~STATE_STORE
    - IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
    - Context Nodes
      - POPDATA
        - Implementation Class CL_AIC_POPU_MAINWINDOW_CN00
        - IF_BSP_MODEL~INIT
        - ON_NEW_FOCUS
        - Where Used
        - Attributes
      - BTADMINH Base Entity BTAdminH
        - Implementation Class [redacted]_CSS_SUBSTATUS_CN00
        - IF_BSP_MODEL~INIT
        - ON_NEW_FOCUS
        - Where Used
        - BTTEXTSETH Base Entity BTTextH
          - Implementation Class [redacted]_CSS_SUBSTATUS_CN02
          - IF_BSP_MODEL~INIT
          - ON_NEW_FOCUS
          - Where Used
          - BTTEXT Base Entity BTText
            - Implementation Class [redacted]_CSS_SUBSTATUS_CN03
            - IF_BSP_MODEL~INIT
            - ON_NEW_FOCUS
            - Where Used
            - Attributes
          - Attributes
        - Attributes
  - Context related Methods
  - Breadcrumbs and Messages
  - Toolbar related Methods
  - Controller Initialization and Destruction
  - Request Processing
  - Event Handler
    - EH_ONCANCEL
    - EH_ONOK
  - Inbound Plugs
  - Outbound Plugs
    - OP_CANCEL
    - OP_OK

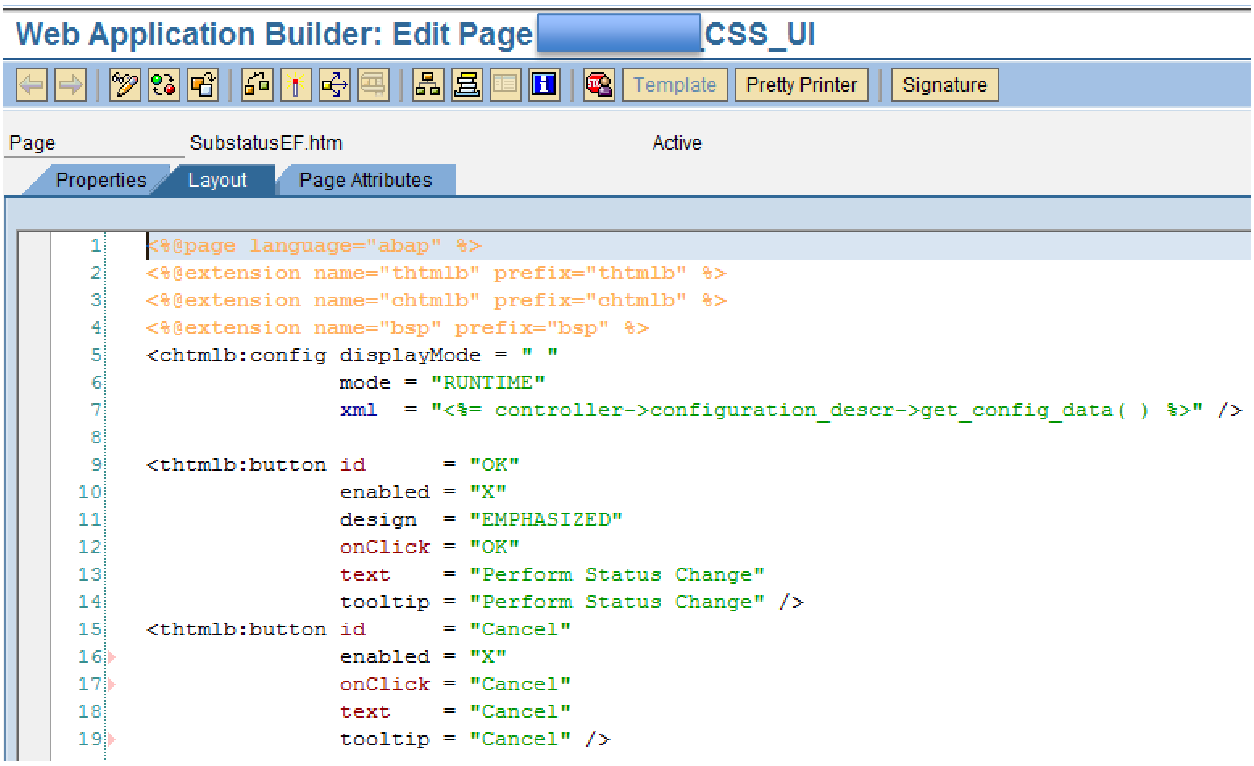


Structure of Component [redacted] CSS_

Test
Wizard Log
Perform Checks
Find
Component Structure Browser
BOL Model Browser
Runtime Repository Editor
Component
Models
Windows
Window [redacted] CSS_UI/MainWindow (default)
InboundPlugs
OutboundPlugs
View [redacted] CSS_UI/SubstatusEF (default)



	A	B	C	D	E	F	G	H
1	Status							
2			Status:					
3			Substatus:*					
4	Text							
5					Text area			



Web Application Builder: Edit Page [redacted] CSS_UI

Page SubstatusEF.htm Active

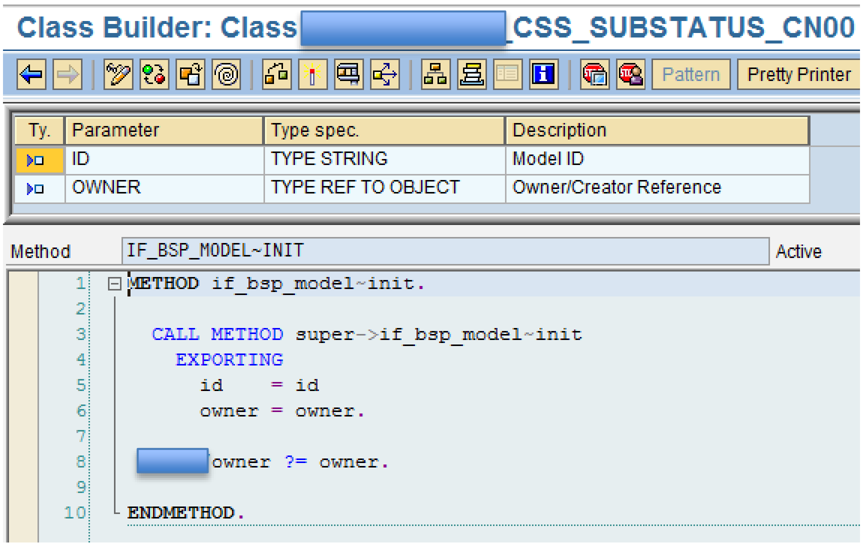
```
<%@page language="abap" %>
<%@extension name="thtmlb" prefix="thtmlb" %>
<%@extension name="chtmlb" prefix="chtmlb" %>
<%@extension name="bsp" prefix="bsp" %>
<chtmlb:config displayMode = " "
               mode = "RUNTIME"
               xml  = "<%= controller->configuration_descr->get_config_data( ) %>" />

<thtmlb:button id      = "OK"
               enabled = "X"
               design  = "EMPHASIZED"
               onClick = "OK"
               text    = "Perform Status Change"
               tooltip = "Perform Status Change" />
<thtmlb:button id      = "Cancel"
               enabled = "X"
               onClick = "Cancel"
               text    = "Cancel"
               tooltip = "Cancel" />
```

Note: Actually the button texts "Perform Status Change" and "Cancel" are hard coded. If we will need a multi-lingual solution in future, we have to adjust this. Please have a look at the Transport creation popup to see how to do this.

3.7 Context Node BTAdminH

As mentioned context node BTAdminH is inheriting all logic from AIC_INCIDENT_H. This means user status and substatus are already supported for the current user status. But we want to show the target user status. We want to select a substatus for the target user status.

Context Node BTAdminH needs to remember his owner to have access to other context nodes of the same context node controller. That is why we need to save the reference on init.



Class Builder: Class [redacted]CSS_SUBSTATUS_CN00

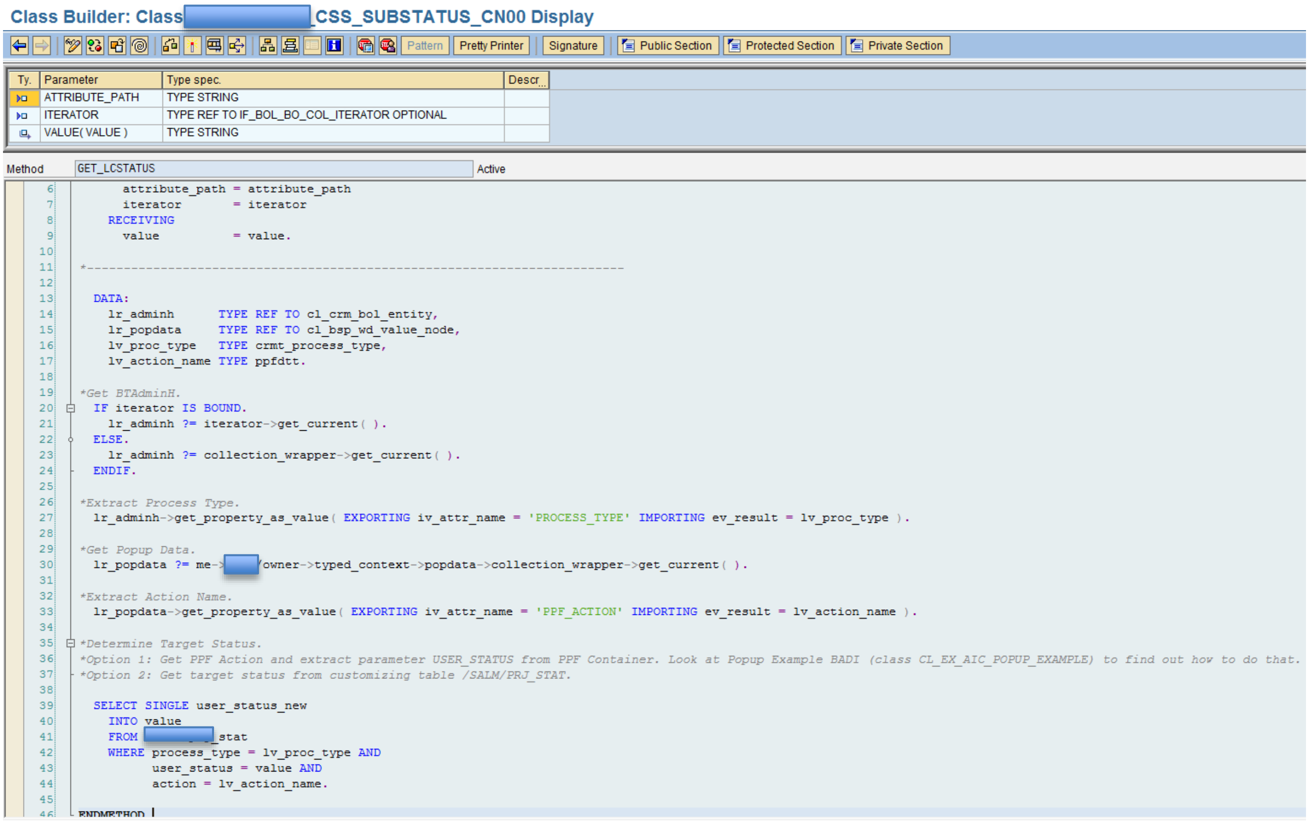
Ty.	Parameter	Type spec.	Description
▸□	ID	TYPE STRING	Model ID
▸□	OWNER	TYPE REF TO OBJECT	Owner/Creator Reference

Method IF_BSP_MODEL~INIT Active

```
METHOD if_bsp_model~init.

  CALL METHOD super->if_bsp_model~init
    EXPORTING
      id    = id
      owner = owner.

 [redacted]owner ?= owner.

ENDMETHOD.
```

Get Target User Status (GET_LCSTATUS):

- Call super method to get current user status.
- Get AdminH and extract process type.
- Get POPDATA and extract action name.
- Determine target user status from table ???_STAT.



Class Builder: Class [redacted] CSS_SUBSTATUS_CN00 Display

Ty.	Parameter	Type spec.	Descr.
▸□	ATTRIBUTE_PATH	TYPE STRING	
▸□	ITERATOR	TYPE REF TO IF_BOL_BO_COL_ITERATOR OPTIONAL	
□	VALUE(VALUE)	TYPE STRING	

Method GET_LCSTATUS Active

```
        attribute_path = attribute_path
        iterator       = iterator
      RECEIVING
        value          = value.

*----------------------------------------------------------------------

  DATA:
    lr_adminh      TYPE REF TO cl_crm_bol_entity,
    lr_popdata     TYPE REF TO cl_bsp_wd_value_node,
    lv_proc_type   TYPE crmt_process_type,
    lv_action_name TYPE ppfdtt.

*Get BTAdminH.
  IF iterator IS BOUND.
    lr_adminh ?= iterator->get_current( ).
  ELSE.
    lr_adminh ?= collection_wrapper->get_current( ).
  ENDIF.

*Extract Process Type.
  lr_adminh->get_property_as_value( EXPORTING iv_attr_name = 'PROCESS_TYPE' IMPORTING ev_result = lv_proc_type ).

*Get Popup Data.
  lr_popdata ?= me->[redacted]owner->typed_context->popdata->collection_wrapper->get_current( ).

*Extract Action Name.
  lr_popdata->get_property_as_value( EXPORTING iv_attr_name = 'PPF_ACTION' IMPORTING ev_result = lv_action_name ).

*Determine Target Status.
*Option 1: Get PPF Action and extract parameter USER_STATUS from PPF Container. Look at Popup Example BADI (class CL_EX_AIC_POPUP_EXAMPLE) to find out how to do that.
*Option 2: Get target status from customizing table /SALM/PRJ_STAT.

  SELECT SINGLE user_status_new
    INTO value
    FROM [redacted]stat
    WHERE process_type = lv_proc_type AND
          user_status = value AND
          action = lv_action_name.

ENDMETHOD.
```

```
METHOD get_lcstatus.

*Get Current User Status.
  CALL METHOD super->get_lcstatus
    EXPORTING
      attribute_path = attribute_path
      iterator       = iterator
    RECEIVING
      value          = value.

*----------------------------------------------------------------------

  DATA:
    lr_adminh      TYPE REF TO cl_crm_bol_entity,
    lr_popdata     TYPE REF TO cl_bsp_wd_value_node,
    lv_proc_type   TYPE crmt_process_type,
    lv_action_name TYPE ppfdtt.

*Get BTAdminH.
  IF iterator IS BOUND.
    lr_adminh ?= iterator->get_current( ).
  ELSE.
    lr_adminh ?= collection_wrapper->get_current( ).
  ENDIF.

*Extract Process Type.
  lr_adminh-
>get_property_as_value( EXPORTING iv_attr_name = 'PROCESS_TYPE' IMPORTING ev_result = lv_proc_typ
e ).

*Get Popup Data.
  lr_popdata ?= me->???_owner->typed_context->popdata->collection_wrapper->get_current( ).

*Extract Action Name.
  lr_popdata-
>get_property_as_value( EXPORTING iv_attr_name = 'PPF_ACTION' IMPORTING ev_result = lv_action_nam
e ).

*Determine Target Status.
*Option 1: Get PPF Action and extract parameter USER_STATUS from PPF Container. Look at Popup Exa
mple BADI (class CL_EX_AIC_POPUP_EXAMPLE) to find out how to do that.
*Option 2: Get target status from customizing table /SALM/PRJ_STAT.

  SELECT SINGLE user_status_new
    INTO value
    FROM ???_stat
    WHERE process_type = lv_proc_type AND
          user_status = value AND
          action = lv_action_name.

ENDMETHOD.
```

Get Substatus value help for target user status (GET_V_/AICRM/REASON_ID):

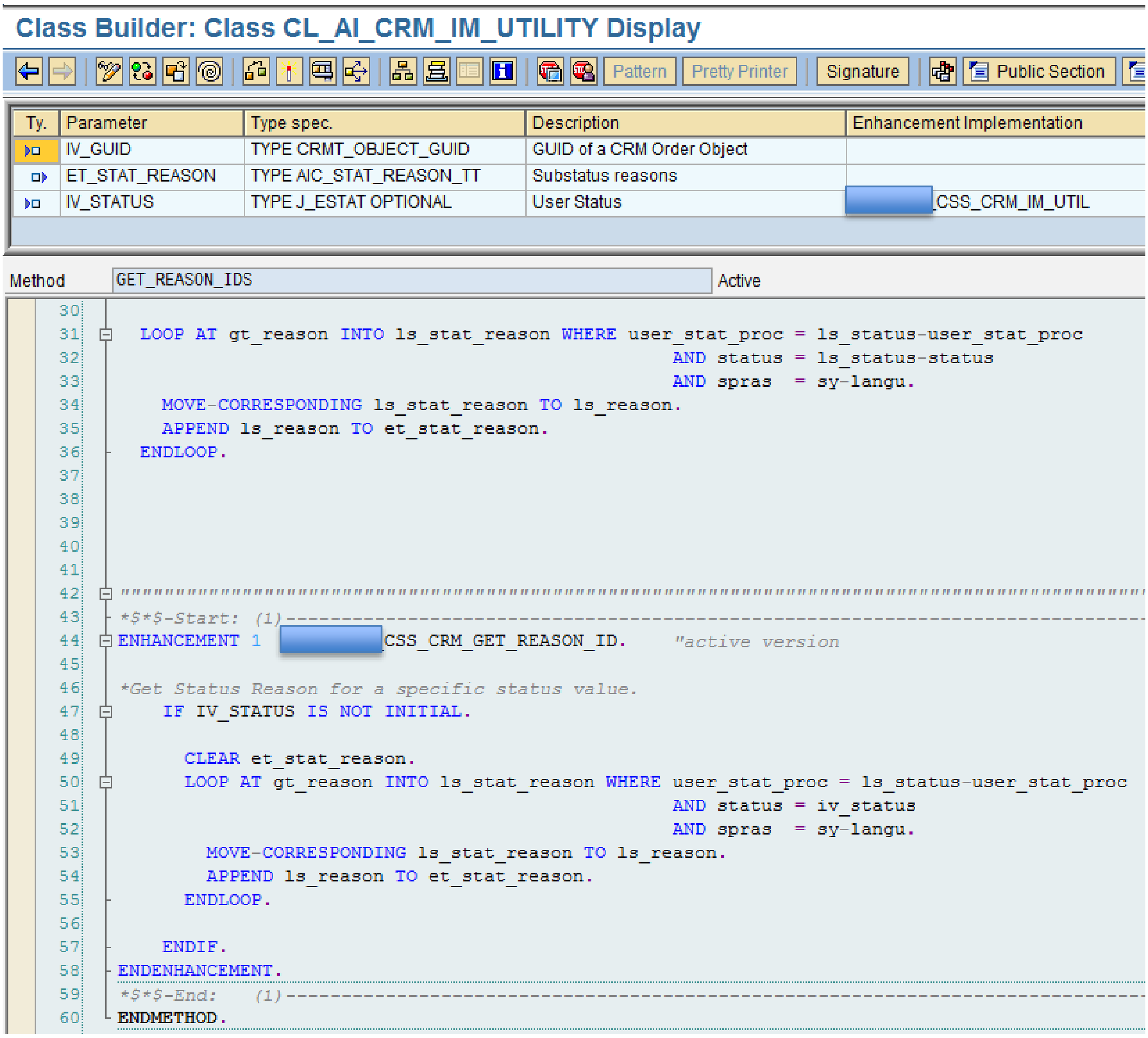
- Check whether substatus values are already determined. if not:
  - Get BTAdminH
  - Extract transaction guid
  - Get target user status using method GET_LCSTATUS
  - Get Substatus values using method cl_ai_crm_im_utility=>get_reason_ids
- Build value help descriptor.

```
METHOD get_v_/aicrm/reason_id.
*CALL METHOD SUPER->GET_V_/AICRM/REASON_ID
**  EXPORTING
**    iv_mode                 = IF_BSP_WD_MODEL_SETTER_GETTER=>RUNTIME_MODE
**    iv_index                =
*  RECEIVING
*    RV_VALUEHELP_DESCRIPTOR =
*    .

  DATA: lt_ddlb            TYPE         bsp_wd_dropdown_table,
        ls_ddlb            TYPE         bsp_wd_dropdown_line,
        cr_ddlb            TYPE REF TO  cl_crm_uiu_ddlb,
        lr_btadminh        TYPE REF TO  cl_crm_bol_entity,
        lr_current         TYPE REF TO  if_bol_bo_property_access.

  DATA:  lv_reason_id      TYPE aic_reasonid,
         lv_guid           TYPE crmt_object_guid,
         lt_stat_reason    TYPE aic_stat_reason_tt,
         ls_stat_reason    TYPE aic_s_stat_reason,
         lv_dummy_key      TYPE char40.

  IF me->mt_stat_reason IS INITIAL.
    lr_current = collection_wrapper->get_current( ).
    CHECK lr_current IS BOUND.
    lr_btadminh ?= lr_current.
* GET PARENT ENTITY
    TRY.
        WHILE lr_btadminh->get_name( ) NE 'BTAdminH'.

          lr_btadminh = lr_btadminh->get_parent( ).

        ENDWHILE.
      CATCH cx_sy_ref_is_initial.
    ENDTRY.
* GET PROCESSISNG ORDER GUID
```

```
    IF lr_btadminh IS BOUND.

      lr_btadminh->get_property_as_value( EXPORTING iv_attr_name = 'GUID'
                                          IMPORTING ev_result    = lv_guid ).

*--------------------------------------------------------------------------
*Get Target User Status and Reason ID for it.

      DATA:
        lv_status TYPE j_estat.

      lv_status = me->get_lcstatus( attribute_path = '' ).

      cl_ai_crm_im_utility=>get_reason_ids( EXPORTING iv_guid = lv_guid iv_status = lv_status
                                            IMPORTING et_stat_reason = mt_stat_reason ).

*--------------------------------------------------------------------------

*      cl_ai_crm_im_utility=>get_reason_ids( EXPORTING iv_guid = lv_guid
*                                            IMPORTING et_stat_reason = mt_stat_reason ).

    ENDIF.
  ENDIF.

  lv_dummy_key = lv_reason_id.

  IF gr_ddlb_reason IS NOT BOUND.
    CREATE OBJECT gr_ddlb_reason
      EXPORTING
        iv_source_type = 'T'.
  ENDIF.
*   add initial line
  ls_ddlb-key = lv_dummy_key.
  APPEND ls_ddlb TO lt_ddlb.


  LOOP AT mt_stat_reason INTO ls_stat_reason.


    ls_ddlb-key    =   ls_stat_reason-reason_id.
    ls_ddlb-value  =   ls_stat_reason-txt30.

    APPEND ls_ddlb TO lt_ddlb.

  ENDLOOP.

  gr_ddlb_reason->set_selection_table( lt_ddlb ).

  rv_valuehelp_descriptor = gr_ddlb_reason.


ENDMETHOD.
```

Get Substatus values (cl_ai_crm_im_utility=>get_reason_ids):

In SAP standard, method cl_ai_crm_im_utility=>get_reason_ids is not able to determine substatus values for a given user status. Therefore this method needed an enhancement.



Ty.	Parameter	Type spec.	Description	Enhancement Implementation
▸□	IV_GUID	TYPE CRMT_OBJECT_GUID	GUID of a CRM Order Object	
□▸	ET_STAT_REASON	TYPE AIC_STAT_REASON_TT	Substatus reasons	
▸□	IV_STATUS	TYPE J_ESTAT OPTIONAL	User Status	[redacted]CSS_CRM_IM_UTIL

Method GET_REASON_IDS Active

```
  LOOP AT gt_reason INTO ls_stat_reason WHERE user_stat_proc = ls_status-user_stat_proc
                                              AND status = ls_status-status
                                              AND spras  = sy-langu.
    MOVE-CORRESPONDING ls_stat_reason TO ls_reason.
    APPEND ls_reason TO et_stat_reason.
  ENDLOOP.





""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""
*$*$-Start: (1)----------------------------------------------------------------------------------
ENHANCEMENT 1 [redacted]CSS_CRM_GET_REASON_ID.    "active version

*Get Status Reason for a specific status value.
    IF IV_STATUS IS NOT INITIAL.

      CLEAR et_stat_reason.
      LOOP AT gt_reason INTO ls_stat_reason WHERE user_stat_proc = ls_status-user_stat_proc
                                              AND status = iv_status
                                              AND spras  = sy-langu.
        MOVE-CORRESPONDING ls_stat_reason TO ls_reason.
        APPEND ls_reason TO et_stat_reason.
      ENDLOOP.

    ENDIF.
ENDENHANCEMENT.
*$*$-End:   (1)----------------------------------------------------------------------------------
ENDMETHOD.
```

```
METHOD get_reason_ids.

  DATA: ls_status        TYPE crmt_status_wrk,
        ls_stat_reason   like line of gt_reason,
        ls_reason        TYPE aic_s_stat_reason.

clear: et_stat_reason.

  CALL FUNCTION 'CRM_STATUS_READ_OW'
    EXPORTING
      iv_guid                 = iv_guid
    IMPORTING
      es_current_user_status = ls_status
    EXCEPTIONS
      not_found               = 1
      OTHERS                  = 2.

IF gt_reason IS INITIAL.

    SELECT * FROM aic_stat_reason INTO CORRESPONDING FIELDS OF ls_stat_reason.   "#EC CI_NOWHERE
```

```
      IF sy-subrc NE 0.
        EXIT.
      ENDIF.
      SELECT spras txt30 FROM aic_stat_reasont INTO CORRESPONDING FIELDS OF ls_stat_reason
       WHERE reason_id EQ ls_stat_reason-reason_id.
        APPEND ls_stat_reason TO gt_reason.
      ENDSELECT.
    ENDSELECT.
  ENDIF.

  LOOP AT gt_reason INTO ls_stat_reason WHERE user_stat_proc = ls_status-user_stat_proc
                                                  AND status = ls_status-status
                                                  AND spras  = sy-langu.
    MOVE-CORRESPONDING ls_stat_reason TO ls_reason.
    APPEND ls_reason TO et_stat_reason.
  ENDLOOP.




""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""$"$\
SE:(1) Class CL_AI_CRM_IM_UTILITY, Method GET_REASON_IDS, End
                                                         A
*$*$-Start: (1)----------------------------------------------------------------------------------
$*$*
ENHANCEMENT 1  ???_CSS_CRM_GET_REASON_ID.    "active version

*Get Status Reason for a specific status value.
    IF IV_STATUS IS NOT INITIAL.

      CLEAR et_stat_reason.
      LOOP AT gt_reason INTO ls_stat_reason WHERE user_stat_proc = ls_status-user_stat_proc
                                                  AND status = iv_status
                                                  AND spras  = sy-langu.
        MOVE-CORRESPONDING ls_stat_reason TO ls_reason.
        APPEND ls_reason TO et_stat_reason.
      ENDLOOP.

    ENDIF.
ENDENHANCEMENT.
*$*$-End:   (1)----------------------------------------------------------------------------------
$*$*
ENDMETHOD.
```

Check Input Readiness (GET_I_/AICRM/REASON_ID)

Analogous to GET_V_/AICRM/REASON_ID we copied the sap standard source code and replaced the current user status by the target user status.

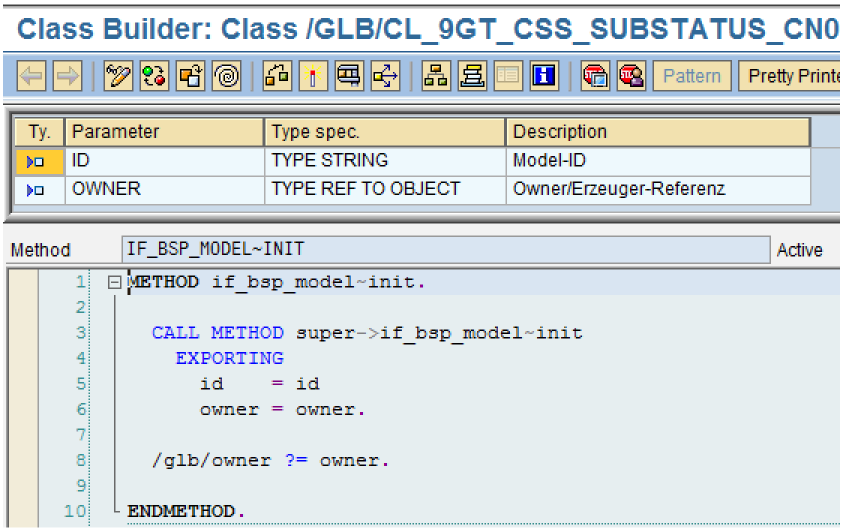
The sap standard solution contains a very dirty code to clear the substatus in case no valid values are available. This solution is dirty because the input readiness check is not designed to do such things. That is why we deactivated this solution. However it is still active and working in details form of the change transaction.

```
METHOD get_i_/aicrm/reason_id.
*CALL METHOD SUPER->GET_I_/AICRM/REASON_ID
**  EXPORTING
**    iterator    =
*  RECEIVING
*    RV_DISABLED =
*    .

  DATA: lr_current        TYPE REF TO if_bol_bo_property_access,
        lr_btadminh       TYPE REF TO cl_crm_bol_entity,
        lr_entity        TYPE REF TO cl_crm_bol_entity,
        lr_coll          TYPE REF TO if_bol_entity_col,
        lt_stat_reason   TYPE aic_stat_reason_tt,
        lv_guid          TYPE crmt_object_guid.

  rv_disabled = 'TRUE'.
  IF iterator IS BOUND.
    lr_current = iterator->get_current( ).
  ELSE.
    lr_current = collection_wrapper->get_current( ).
  ENDIF.

  CHECK lr_current IS BOUND.
  lr_btadminh ?= lr_current.
* GET PARENT ENTITY
  TRY.
      WHILE lr_btadminh->get_name( ) NE 'BTAdminH'.

        lr_btadminh = lr_btadminh->get_parent( ).

      ENDWHILE.
    CATCH cx_sy_ref_is_initial.
  ENDTRY.
* GET PROCESSISNG ORDER GUID

  IF lr_btadminh IS BOUND.

    lr_btadminh->get_property_as_value( EXPORTING iv_attr_name = 'GUID'
                                        IMPORTING ev_result    = lv_guid ).

*-------------------------------------------------------------------------
*Get Target User Status and Reason ID for it.

    DATA:
      lv_status TYPE j_estat.

    lv_status = me->get_lcstatus( attribute_path = '' ).

    cl_ai_crm_im_utility=>get_reason_ids( EXPORTING iv_guid = lv_guid iv_status = lv_status
                                          IMPORTING et_stat_reason = mt_stat_reason ).

*-------------------------------------------------------------------------

*    cl_ai_crm_im_utility=>get_reason_ids( EXPORTING iv_guid = lv_guid
*                                          IMPORTING et_stat_reason = mt_stat_reason ).

  ENDIF.

  IF mt_stat_reason IS NOT INITIAL.

    rv_disabled = 'FALSE'.
  ELSE.

*    TRY.
*
*        lr_entity ?= lr_current.
*        lr_coll = lr_entity-
>get_related_entities( iv_relation_name = 'BTHeaderServiceExt' ). "#EC NOTEXT
*
*        lr_current = lr_coll->get_current( ).
*        IF lr_current IS NOT BOUND.
*          RETURN.
*        ENDIF.
*
*        TRY.
*            lr_current->set_property_as_string( iv_attr_name = '/AICRM/REASON_ID'
*                                                iv_value     = space ).
*          CATCH cx_crm_cic_parameter_error.
*        ENDTRY.
*
*      CATCH cx_sy_ref_is_initial cx_sy_move_cast_error
*            cx_crm_genil_model_error.
*        RETURN.
*    ENDTRY.


  ENDIF.




*    rv_disabled = 'TRUE'.
*    if iterator is bound.
*      current = iterator->get_current( ).
*    else.
*      current = collection_wrapper->get_current( ).
*    endif.
*
*  TRY.
*
*        IF current->is_property_readonly(
*                      '/AICRM/REASON_ID' ) = abap_false. "#EC NOTEXT
*          rv_disabled = 'FALSE'.
*        ENDIF.
*
*    CATCH cx_sy_ref_is_initial cx_sy_move_cast_error
*          cx_crm_genil_model_error.
*      RETURN.
*  ENDTRY.

ENDMETHOD.
```

3.8 Context Node BTText

As mentioned before BTText is a dynamic context node. Only at run time we know which text type is assigned and should be used.

On context node initialization we store reference to context controller because in a later step we need access to another context node of this context controller.



Class Builder: Class /GLB/CL_9GT_CSS_SUBSTATUS_CN0

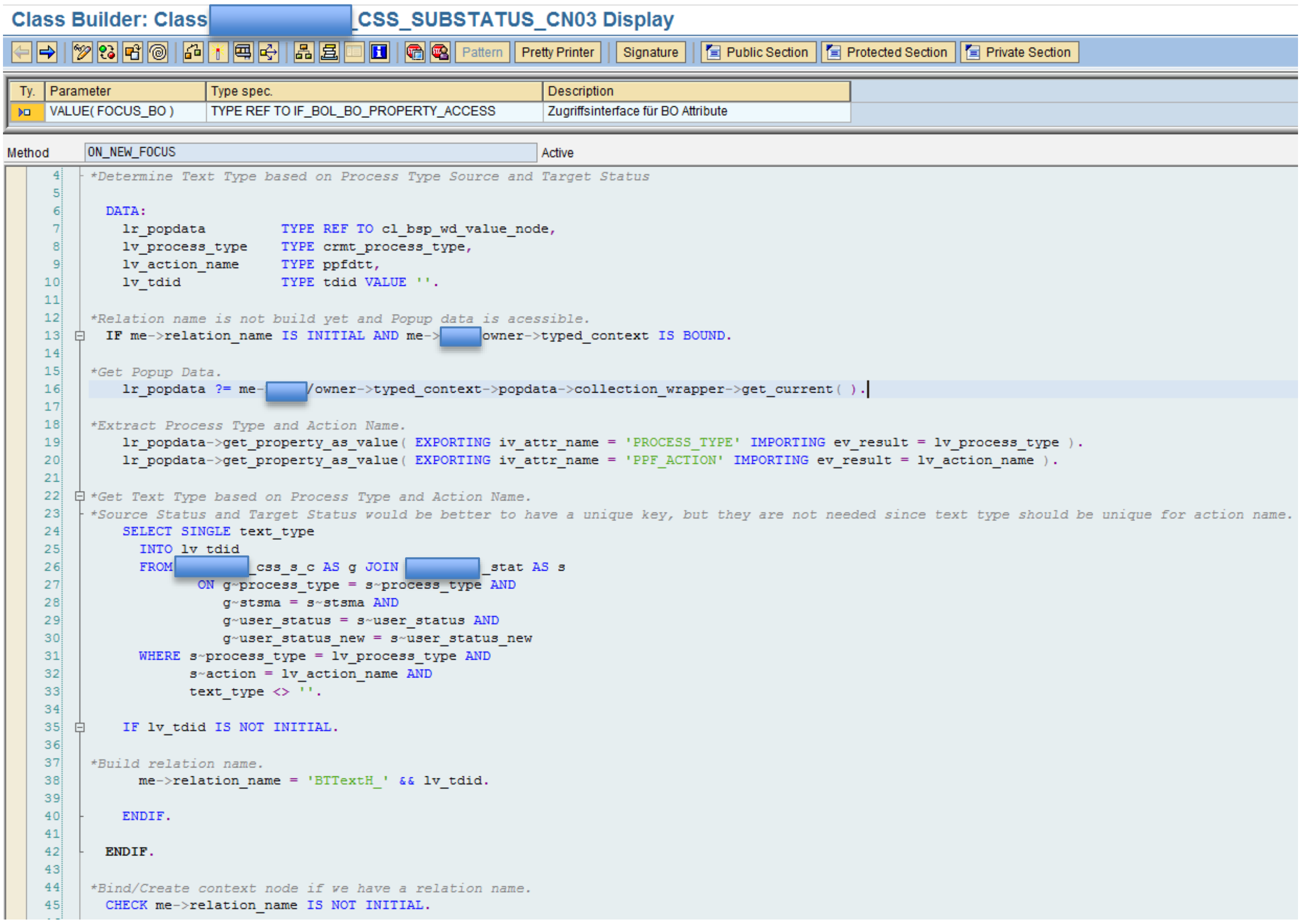
Ty.	Parameter	Type spec.	Description
▶□	ID	TYPE STRING	Model-ID
▶□	OWNER	TYPE REF TO OBJECT	Owner/Erzeuger-Referenz

Method IF_BSP_MODEL~INIT Active

```
METHOD if_bsp_model~init.

  CALL METHOD super->if_bsp_model~init
    EXPORTING
      id    = id
      owner = owner.

  /glb/owner ?= owner.

ENDMETHOD.
```

At event ON_NEW_FOCUS (will be called after initialization or after change of BTADMINH) we need to determine the relevant text type and read/get the corresponding BOL/GenIL entity.

- Check whether relation_name is not build yet and whether context is available.
  - Get popup data from context node POPDATA of context controller
  - Extract process type and action name
  - Determine text type from customizing table ???_CSS_S_C and ???_STAT
  - Build relation name "BTTextH_<TDID>".
- Get or create entity for relation name (code generated by wizard).



Class Builder: Class [redacted]CSS_SUBSTATUS_CN03 Display

Ty.	Parameter	Type spec.	Description
▸□	VALUE(FOCUS_BO)	TYPE REF TO IF_BOL_BO_PROPERTY_ACCESS	Zugriffsinterface für BO Attribute

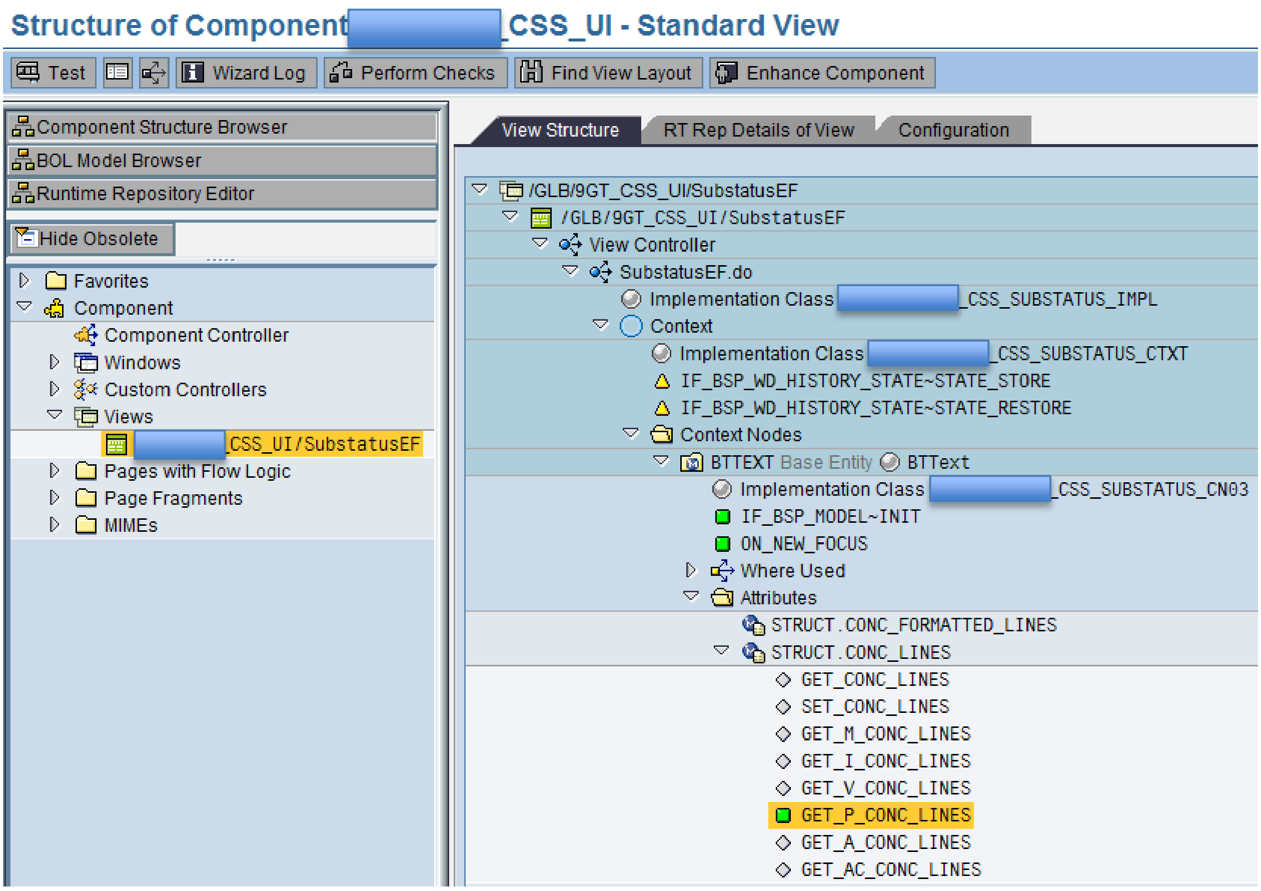
Method ON_NEW_FOCUS Active

```
*Determine Text Type based on Process Type Source and Target Status

  DATA:
    lr_popdata          TYPE REF TO cl_bsp_wd_value_node,
    lv_process_type     TYPE crmt_process_type,
    lv_action_name      TYPE ppfdtt,
    lv_tdid             TYPE tdid VALUE ''.

*Relation name is not build yet and Popup data is acessible.
  IF me->relation_name IS INITIAL AND me->[redacted]owner->typed_context IS BOUND.

*Get Popup Data.
    lr_popdata ?= me-[redacted]/owner->typed_context->popdata->collection_wrapper->get_current( ).

*Extract Process Type and Action Name.
    lr_popdata->get_property_as_value( EXPORTING iv_attr_name = 'PROCESS_TYPE' IMPORTING ev_result = lv_process_type ).
    lr_popdata->get_property_as_value( EXPORTING iv_attr_name = 'PPF_ACTION' IMPORTING ev_result = lv_action_name ).

*Get Text Type based on Process Type and Action Name.
*Source Status and Target Status would be better to have a unique key, but they are not needed since text type should be unique for action name.
    SELECT SINGLE text_type
      INTO lv_tdid
      FROM[redacted]_css_s_c AS g JOIN [redacted]_stat AS s
             ON g~process_type = s~process_type AND
                g~stsma = s~stsma AND
                g~user_status = s~user_status AND
                g~user_status_new = s~user_status_new
      WHERE s~process_type = lv_process_type AND
            s~action = lv_action_name AND
            text_type <> ''.

    IF lv_tdid IS NOT INITIAL.

*Build relation name.
      me->relation_name = 'BTTextH_' && lv_tdid.

    ENDIF.

  ENDIF.

*Bind/Create context node if we have a relation name.
  CHECK me->relation_name IS NOT INITIAL.
```

```
METHOD on_new_focus.

*---------------------------------------------------------------------------
*Determine Text Type based on Process Type Source and Target Status

  DATA:
    lr_popdata          TYPE REF TO cl_bsp_wd_value_node,
    lv_process_type     TYPE crmt_process_type,
    lv_action_name      TYPE ppfdtt,
    lv_tdid             TYPE tdid VALUE ''.

*Relation name is not build yet and Popup data is acessible.
  IF me->relation_name IS INITIAL AND me->???_owner->typed_context IS BOUND.

*Get Popup Data.
    lr_popdata ?= me->???_owner->typed_context->popdata->collection_wrapper->get_current( ).
```

```
*Extract Process Type and Action Name.
    lr_popdata-
>get_property_as_value( EXPORTING iv_attr_name = 'PROCESS_TYPE' IMPORTING ev_result = lv_process_
type ).
    lr_popdata-
>get_property_as_value( EXPORTING iv_attr_name = 'PPF_ACTION' IMPORTING ev_result = lv_action_nam
e ).

*Get Text Type based on Process Type and Action Name.
*Source Status and Target Status would be better to have a unique key, but they are not needed si
nce text type should be unique for action name.
    SELECT SINGLE text_type
      INTO lv_tdid
      FROM ???_css_s_c AS g JOIN ???_stat AS s
             ON g~process_type = s~process_type AND
                g~stsma = s~stsma AND
                g~user_status = s~user_status AND
                g~user_status_new = s~user_status_new
      WHERE s~process_type = lv_process_type AND
            s~action = lv_action_name AND
            text_type <> ''.

    IF lv_tdid IS NOT INITIAL.

*Build relation name.
      me->relation_name = 'BTTextH_' && lv_tdid.

    ENDIF.

  ENDIF.

*Bind/Create context node if we have a relation name.
  CHECK me->relation_name IS NOT INITIAL.

*-------------------------------------------------------------------------

  DATA: lv_collection TYPE REF TO if_bol_bo_col,
        entity        TYPE REF TO cl_crm_bol_entity.

*   get collection of dependent nodes
  entity ?= focus_bo.
  TRY.
      lv_collection = entity->get_related_entities(
             iv_relation_name = me->relation_name ).

      IF lv_collection IS NOT BOUND OR lv_collection->size( ) = 0.
        IF entity->is_changeable( ) = abap_true.
          TRY.
              entity = entity->create_related_entity(
               iv_relation_name = me->relation_name ).
            CATCH cx_crm_genil_model_error cx_crm_genil_duplicate_rel.
*               should never happen
          ENDTRY.
          IF entity IS BOUND.
            CREATE OBJECT lv_collection TYPE cl_crm_bol_bo_col.
            lv_collection->add( entity ).
          ENDIF.
        ENDIF.
      ENDIF.

    CATCH cx_crm_genil_model_error.
*       should never happen
      EXIT.
    CATCH cx_sy_ref_is_initial.
  ENDTRY.
  me->set_collection( lv_collection ).


ENDMETHOD.
```

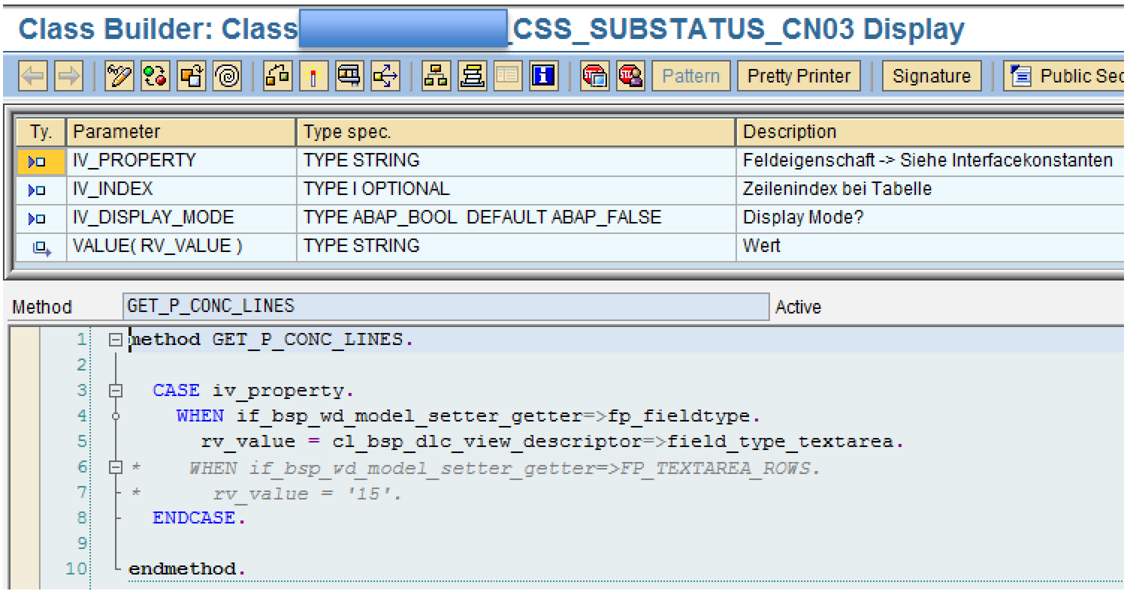
BTTextH is a multi-line textarea. We need to help the Web UI framework to identify it as text area.



Structure of Component [redacted]CSS_UI - Standard View

[redacted]CSS_UI/SubstatusEF

```
/GLB/9GT_CSS_UI/SubstatusEF
  /GLB/9GT_CSS_UI/SubstatusEF
    View Controller
      SubstatusEF.do
        Implementation Class [redacted]CSS_SUBSTATUS_IMPL
        Context
          Implementation Class [redacted]CSS_SUBSTATUS_CTXT
          IF_BSP_WD_HISTORY_STATE~STATE_STORE
          IF_BSP_WD_HISTORY_STATE~STATE_RESTORE
          Context Nodes
            BTTEXT Base Entity BTText
              Implementation Class [redacted]CSS_SUBSTATUS_CN03
              IF_BSP_MODEL~INIT
              ON_NEW_FOCUS
              Where Used
              Attributes
                STRUCT.CONC_FORMATTED_LINES
                STRUCT.CONC_LINES
                  GET_CONC_LINES
                  SET_CONC_LINES
                  GET_M_CONC_LINES
                  GET_I_CONC_LINES
                  GET_V_CONC_LINES
                  GET_P_CONC_LINES
                  GET_A_CONC_LINES
                  GET_AC_CONC_LINES
```



Class Builder: Class [redacted]CSS_SUBSTATUS_CN03 Display

Ty.	Parameter	Type spec.	Description
	IV_PROPERTY	TYPE STRING	Feldeigenschaft -> Siehe Interfacekonstanten
	IV_INDEX	TYPE I OPTIONAL	Zeilenindex bei Tabelle
	IV_DISPLAY_MODE	TYPE ABAP_BOOL DEFAULT ABAP_FALSE	Display Mode?
	VALUE(RV_VALUE)	TYPE STRING	Wert

Method GET_P_CONC_LINES Active

```
method GET_P_CONC_LINES.

  CASE iv_property.
    WHEN if_bsp_wd_model_setter_getter=>fp_fieldtype.
      rv_value = cl_bsp_dlc_view_descriptor=>field_type_textarea.
*   WHEN if_bsp_wd_model_setter_getter=>FP_TEXTAREA_ROWS.
*     rv_value = '15'.
  ENDCASE.

endmethod.
```

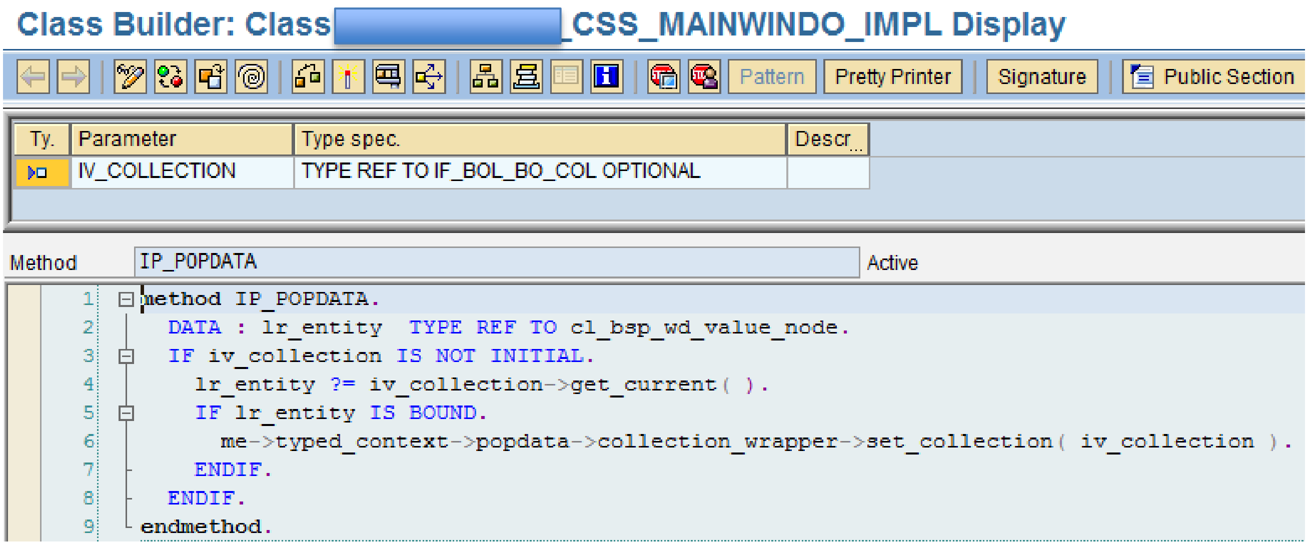
```
method GET_P_CONC_LINES.

  CASE iv_property.
    WHEN if_bsp_wd_model_setter_getter=>fp_fieldtype.
      rv_value = cl_bsp_dlc_view_descriptor=>field_type_textarea.
*     WHEN if_bsp_wd_model_setter_getter=>FP_TEXTAREA_ROWS.
*       rv_value = '15'.
  ENDCASE.

endmethod.
```

3.9 Inbound Plug IP_POPDATA

When opening the popup the inbound plug IP_POPDATA of the window will be called. The popup data will be provided by the caller. We store these data in context node POPDATA of the window. The context node POPDATA is connected with POPDATA of the component controller, therefore the data will be synchronized. The implementation of both context nodes are equal (same controller class).

View CSS_UI/SubstatusEF is embedded in the window. Therefore it will be shown automatically. The view also have a context node POPDATA which is conntected to the component controller, therefore the data will be synchronized as well.

The context node BTAdminH will be synchronized between component controller and view using the same technique. Because of technical reasons the initial synchronization will not be done by the inbound plug. It will be done by context node binding described in section 3.11.



Class Builder: Class [redacted] CSS_MAINWINDO_IMPL Display

Ty.	Parameter	Type spec.	Descr...
▶□	IV_COLLECTION	TYPE REF TO IF_BOL_BO_COL OPTIONAL	

Method IP_POPDATA Active

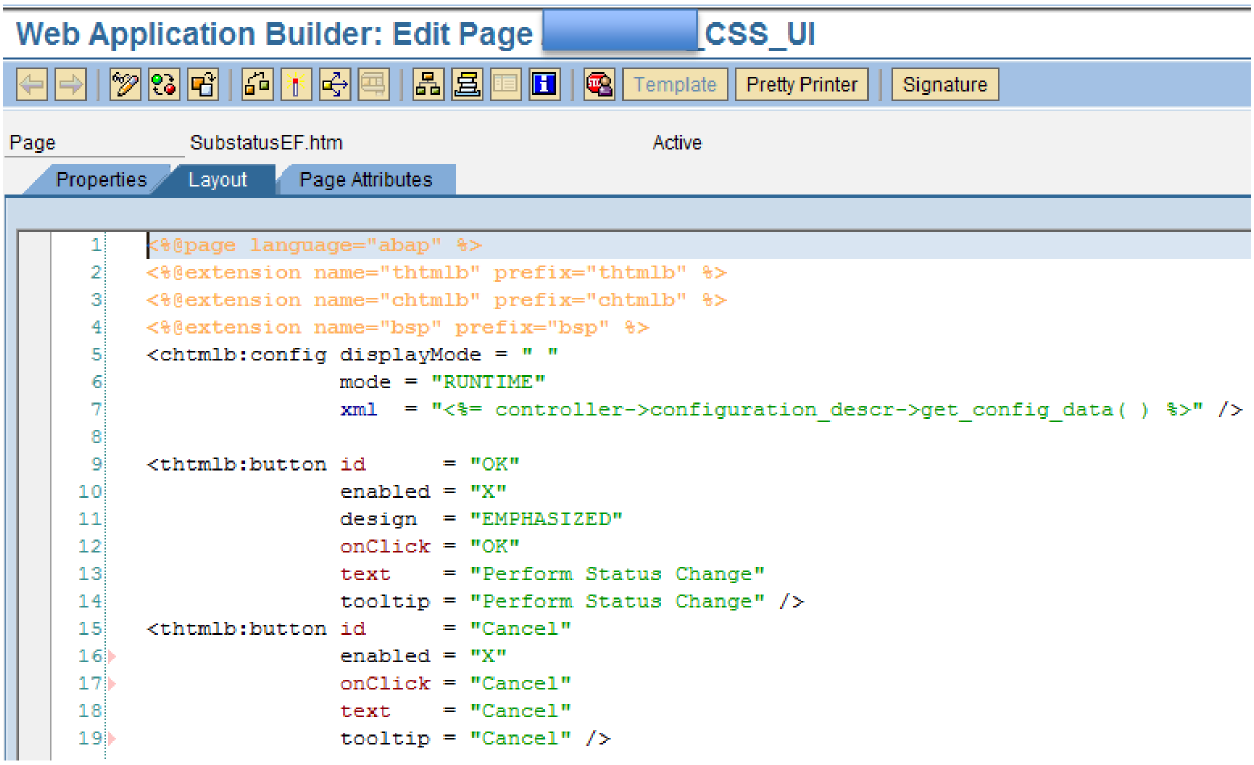
```
method IP_POPDATA.
  DATA : lr_entity  TYPE REF TO cl_bsp_wd_value_node.
  IF iv_collection IS NOT INITIAL.
    lr_entity ?= iv_collection->get_current( ).
    IF lr_entity IS BOUND.
      me->typed_context->popdata->collection_wrapper->set_collection( iv_collection ).
    ENDIF.
  ENDIF.
endmethod.
```

3.10 Outbound Plug OP_CANCEL / OP_OK

End-users have the capability to perform the status change or to cancel the status change. Actually we have a "Perform Status Change" and a "Cancel" button available. Additionally the popup can be closed by clicking the X at the right upper corner of the popup window.

When pressing the button "Perform Status Change", the event EH_OK will be raised. This event will check all mandatory fields and raise the outbound plug in case all mandatory fields are maintained. The outbound plug will raise the corresponding outbound plug of the window. The outbound plug of the window will publish the outbound plug and close the popup. The Cancel button will behave similar but without mandatory field check.

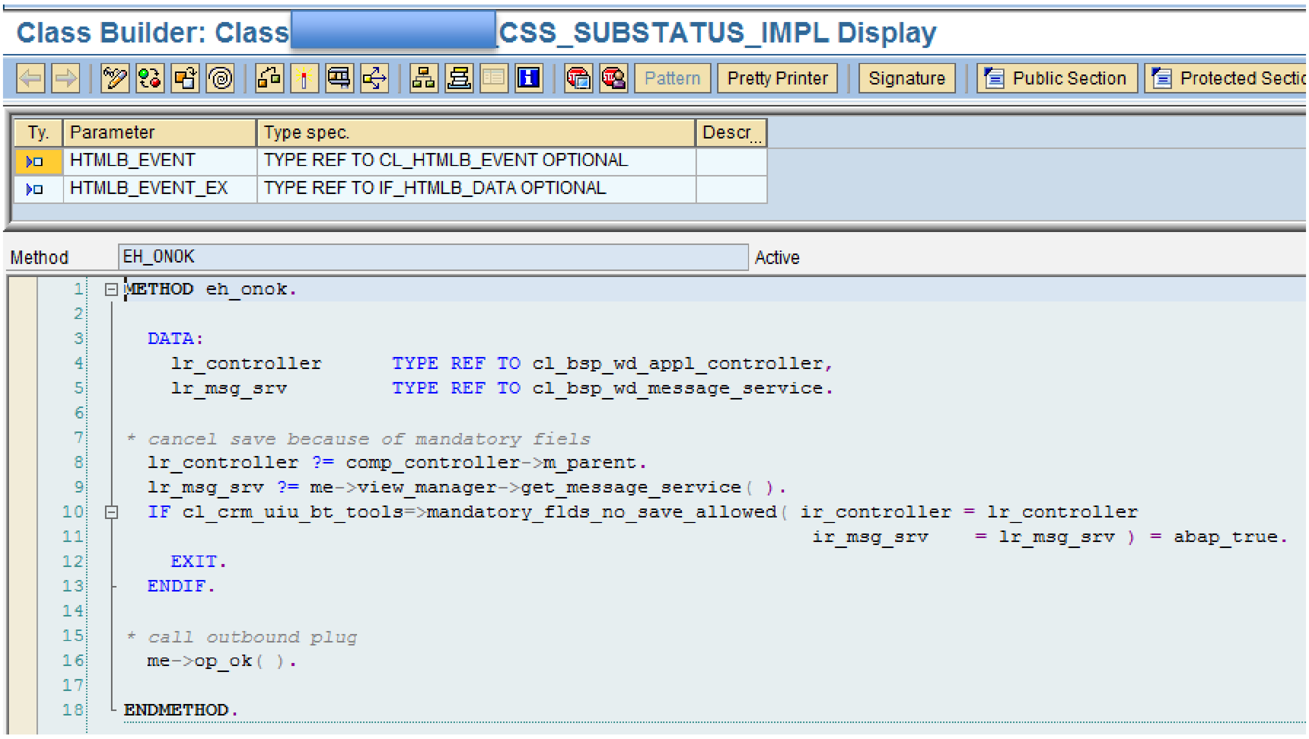
Please note that end-users can click the X which will bypass the events and plugs and therefore the mandatory field check. We cannot avoid this, but we can check for substatus and text type using a consistency check. (You remember this features? :-)



Web Application Builder: Edit Page [redacted]CSS_UI

Page SubstatusEF.htm Active

```
<%@page language="abap" %>
<%@extension name="thtmlb" prefix="thtmlb" %>
<%@extension name="chtmlb" prefix="chtmlb" %>
<%@extension name="bsp" prefix="bsp" %>
<chtmlb:config displayMode = " "
               mode = "RUNTIME"
               xml  = "<%= controller->configuration_descr->get_config_data( ) %>" />

<thtmlb:button id      = "OK"
               enabled = "X"
               design  = "EMPHASIZED"
               onClick = "OK"
               text    = "Perform Status Change"
               tooltip = "Perform Status Change" />
<thtmlb:button id      = "Cancel"
               enabled = "X"
               onClick = "Cancel"
               text    = "Cancel"
               tooltip = "Cancel" />
```



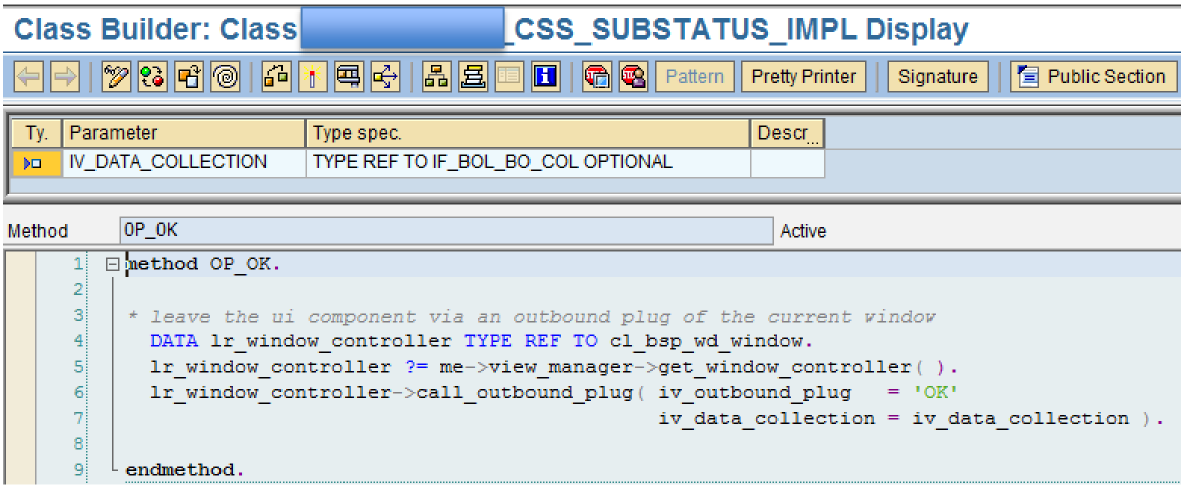
Class Builder: Class [redacted] CSS_SUBSTATUS_IMPL Display

Ty.	Parameter	Type spec.	Descr...
	HTMLB_EVENT	TYPE REF TO CL_HTMLB_EVENT OPTIONAL	
	HTMLB_EVENT_EX	TYPE REF TO IF_HTMLB_DATA OPTIONAL	

Method EH_ONOK Active

```
METHOD eh_onok.

  DATA:
    lr_controller       TYPE REF TO cl_bsp_wd_appl_controller,
    lr_msg_srv          TYPE REF TO cl_bsp_wd_message_service.

* cancel save because of mandatory fiels
  lr_controller ?= comp_controller->m_parent.
  lr_msg_srv ?= me->view_manager->get_message_service( ).
  IF cl_crm_uiu_bt_tools=>mandatory_flds_no_save_allowed( ir_controller = lr_controller
                                                           ir_msg_srv    = lr_msg_srv ) = abap_true.
    EXIT.
  ENDIF.

* call outbound plug
  me->op_ok( ).

ENDMETHOD.
```

```
METHOD eh_onok.

  DATA:
    lr_controller       TYPE REF TO cl_bsp_wd_appl_controller,
    lr_msg_srv          TYPE REF TO cl_bsp_wd_message_service.

* cancel save because of mandatory fiels
  lr_controller ?= comp_controller->m_parent.
  lr_msg_srv ?= me->view_manager->get_message_service( ).
  IF cl_crm_uiu_bt_tools=>mandatory_flds_no_save_allowed( ir_controller = lr_controller
                                                           ir_msg_srv    = lr_msg_srv ) = abap_tr
ue.
    EXIT.
  ENDIF.

* call outbound plug
  me->op_ok( ).

ENDMETHOD.
```



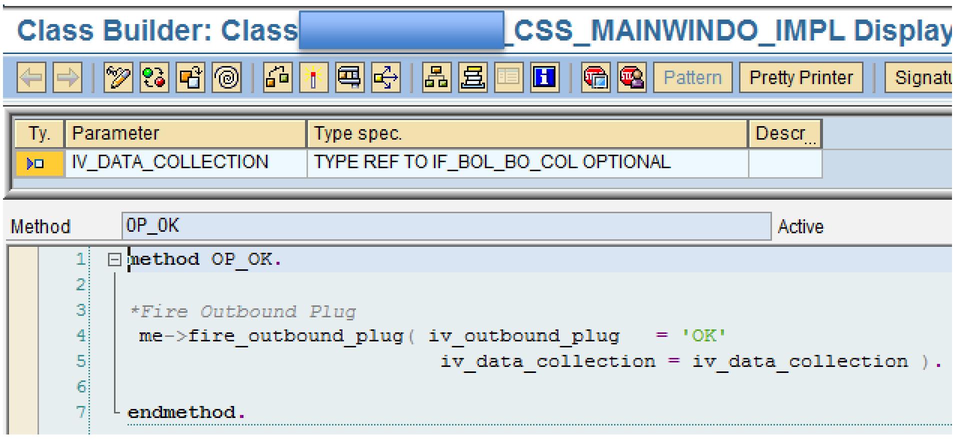
Class Builder: Class [redacted] CSS_SUBSTATUS_IMPL Display

Ty.	Parameter	Type spec.	Descr...
▸□	IV_DATA_COLLECTION	TYPE REF TO IF_BOL_BO_COL OPTIONAL	

Method OP_OK Active

```
method OP_OK.

* leave the ui component via an outbound plug of the current window
  DATA lr_window_controller TYPE REF TO cl_bsp_wd_window.
  lr_window_controller ?= me->view_manager->get_window_controller( ).
  lr_window_controller->call_outbound_plug( iv_outbound_plug   = 'OK'
                                            iv_data_collection = iv_data_collection ).

endmethod.
```

```
method OP_OK.

* leave the ui component via an outbound plug of the current window
  DATA lr_window_controller TYPE REF TO cl_bsp_wd_window.
  lr_window_controller ?= me->view_manager->get_window_controller( ).
  lr_window_controller->call_outbound_plug( iv_outbound_plug   = 'OK'
                                            iv_data_collection = iv_data_collection ).

endmethod.
```



Class Builder: Class [redacted] CSS_MAINWINDO_IMPL Display

Ty.	Parameter	Type spec.	Descr...
▸□	IV_DATA_COLLECTION	TYPE REF TO IF_BOL_BO_COL OPTIONAL	

Method OP_OK Active

```
method OP_OK.

*Fire Outbound Plug
 me->fire_outbound_plug( iv_outbound_plug   = 'OK'
                         iv_data_collection = iv_data_collection ).

endmethod.
```

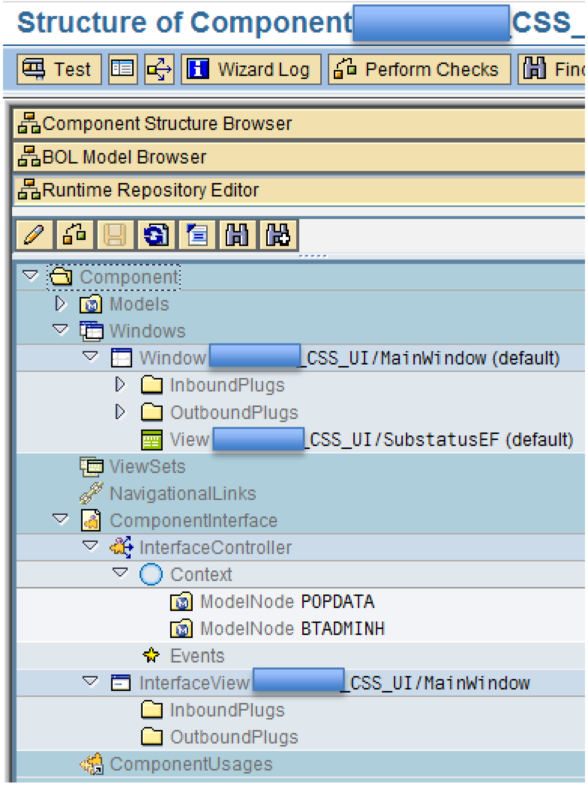
```
method OP_OK.

*Fire Outbound Plug
 me->fire_outbound_plug( iv_outbound_plug   = 'OK'
                         iv_data_collection = iv_data_collection ).

endmethod.
```

3.11 Interface, Component Usage and Context Node Binding

UI component CSS_UI is providing one interface to call the popup. To call the popup the InterfaceView CSS_UI/MainWindow needs to be called. Additionally context node BTADMINH needs to be bound.

Note: There is no need to bind POPDATA because it will be done by the inbound plug described in section 3.9. In case the caller is not able to bind BTADMINH we could do it inside inbound plug of the UI component, because POPDATA also contains the transaction guid (this solution is not implemented yet!). However, it is easier and more transparent if the caller will do the binding.

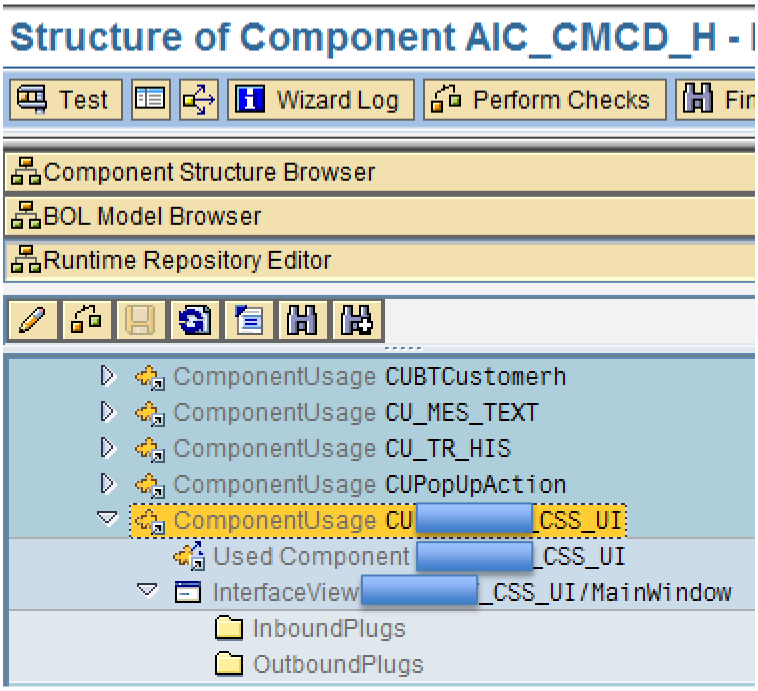
The calling UI component (AIC_CMCR_H and AIC_CMCD_H) needs to define a component usage and needs to do the context node binding for BTAdminH. All the rest will be done by the ChaRM popup framework.


Structure of Component [redacted] CSS_
Test
Wizard Log
Perform Checks
Find
Component Structure Browser
BOL Model Browser
Runtime Repository Editor

Component
- Models
- Windows
  - Window [redacted] CSS_UI/MainWindow (default)
    - InboundPlugs
    - OutboundPlugs
    - View [redacted] CSS_UI/SubstatusEF (default)
- ViewSets
- NavigationalLinks
- ComponentInterface
  - InterfaceController
    - Context
      - ModelNode POPDATA
      - ModelNode BTADMINH
    - Events
  - InterfaceView [redacted] CSS_UI/MainWindow
    - InboundPlugs
    - OutboundPlugs
- ComponentUsages

AIC_CMCD_H / AIC_CMCR_H:

Component Usage CU_CSS_UI:



Structure of Component AIC_CMCD_H - I

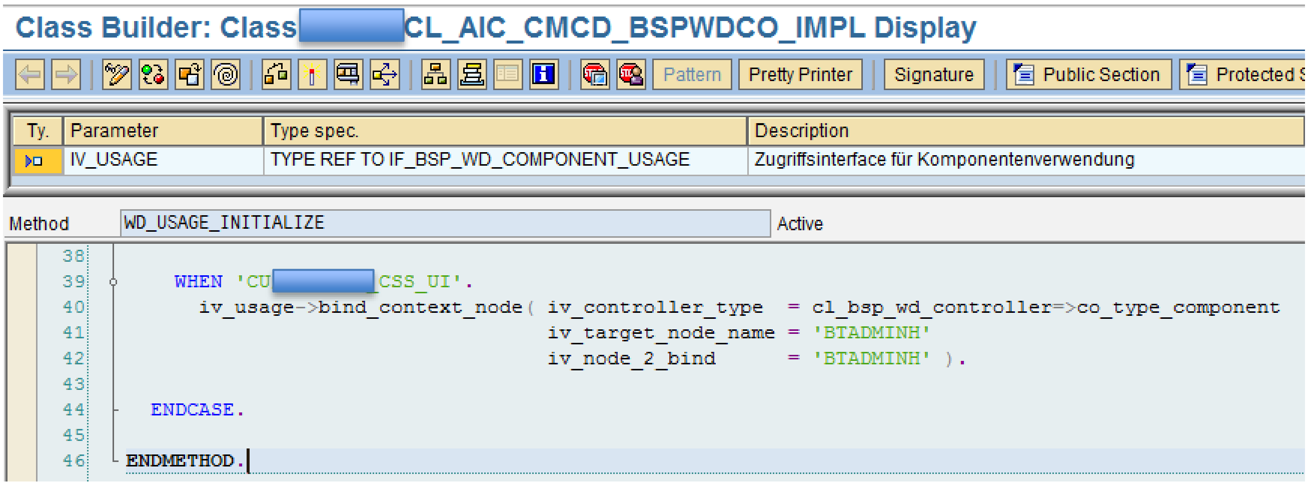
Component Structure Browser

BOL Model Browser

Runtime Repository Editor

```
ComponentUsage CUBTCustomerh
ComponentUsage CU_MES_TEXT
ComponentUsage CU_TR_HIS
ComponentUsage CUPopUpAction
ComponentUsage CU[redacted]CSS_UI
  Used Component [redacted]CSS_UI
  InterfaceView[redacted]_CSS_UI/MainWindow
    InboundPlugs
    OutboundPlugs
```

Component Controller Method WD_USAGE_INITIALIZE:



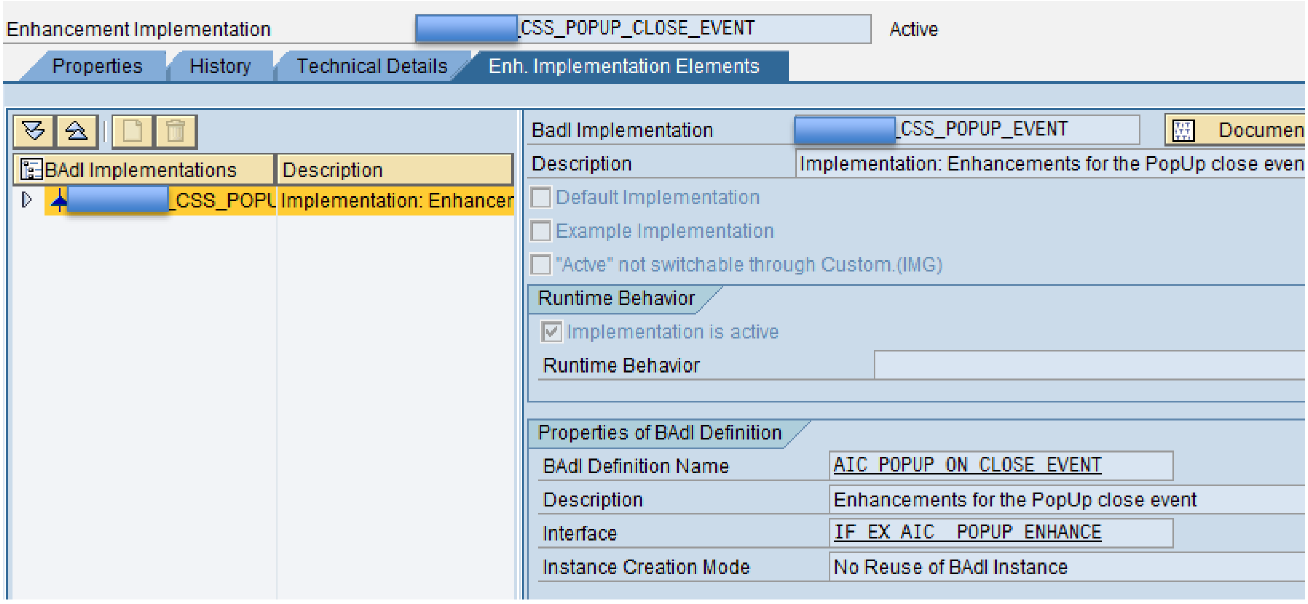
Class Builder: Class[redacted]CL_AIC_CMCD_BSPWDCO_IMPL Display

Ty.	Parameter	Type spec.	Description
▶□	IV_USAGE	TYPE REF TO IF_BSP_WD_COMPONENT_USAGE	Zugriffsinterface für Komponentenverwendung

Method WD_USAGE_INITIALIZE Active

```

    WHEN 'CU[redacted]CSS_UI'.
      iv_usage->bind_context_node( iv_controller_type  = cl_bsp_wd_controller=>co_type_component
                                   iv_target_node_name = 'BTADMINH'
                                   iv_node_2_bind      = 'BTADMINH' ).

  ENDCASE.

ENDMETHOD.
```

3.12 BADI: Check Pop-up Start & On Close Event



Enhancement Implementation [redacted]CSS_POPUP_CLOSE_EVENT Active

BAdI Implementations	Description
[redacted]_CSS_POPU	Implementation: Enhancer

BadI Implementation [redacted]_CSS_POPUP_EVENT

Description: Implementation: Enhancements for the PopUp close even

□ Default Implementation

□ Example Implementation

□ "Actve" not switchable through Custom.(IMG)

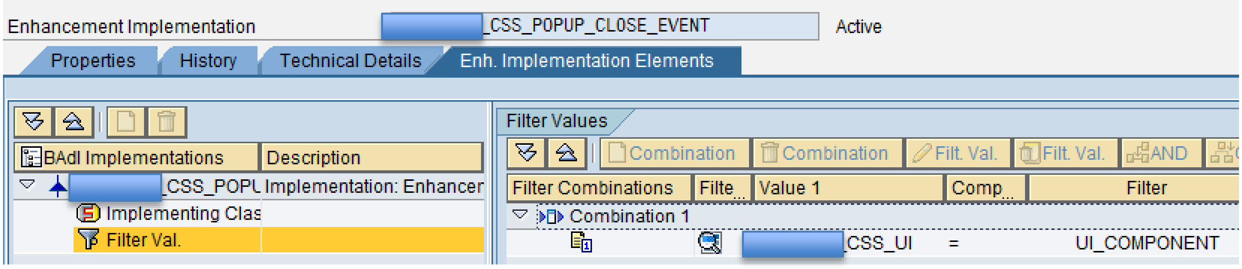
Runtime Behavior

☑ Implementation is active

Runtime Behavior

Properties of BAdI Definition

BAdI Definition Name	AIC_POPUP_ON_CLOSE_EVENT
Description	Enhancements for the PopUp close event
Interface	IF_EX_AIC__POPUP_ENHANCE
Instance Creation Mode	No Reuse of BAdI Instance



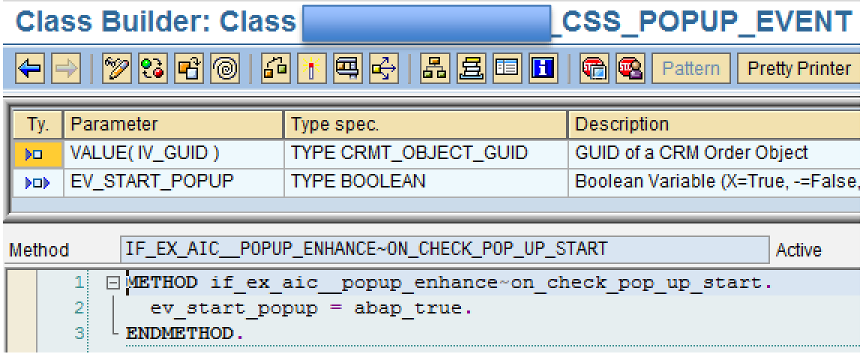
Enhancement Implementation [redacted]CSS_POPUP_CLOSE_EVENT Active

BAdI Implementations	Description
[redacted]CSS_POPU	Implementation: Enhancer
Implementing Clas	
Filter Val.	

Filter Values

Filter Combinations	Filte...	Value 1	Comp...	Filter
Combination 1				
		[redacted]CSS_UI	=	UI_COMPONENT

Actually the popup should always be shown if configured. That is why the method call IF_EX_AIC__POPUP_ENHANCE~ON_CHECK_POP_UP_START always returns true.



Class Builder: Class [redacted]_CSS_POPUP_EVENT

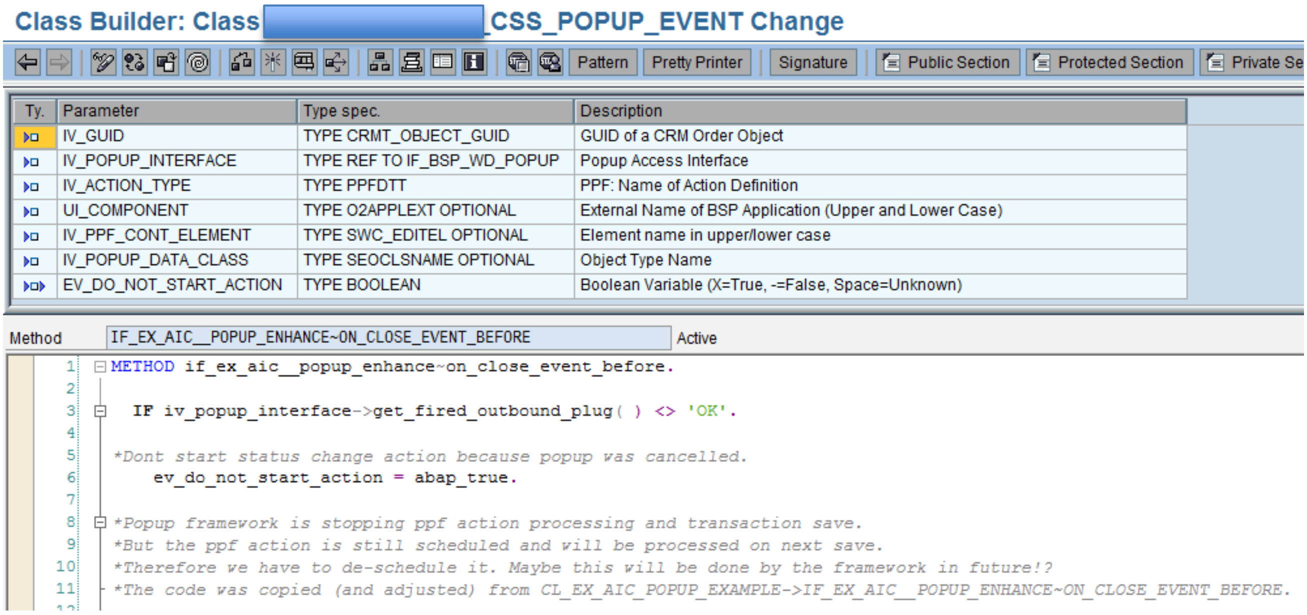
Ty.	Parameter	Type spec.	Description
▶□	VALUE(IV_GUID)	TYPE CRMT_OBJECT_GUID	GUID of a CRM Order Object
▶□▶	EV_START_POPUP	TYPE BOOLEAN	Boolean Variable (X=True, -=False,

Method IF_EX_AIC__POPUP_ENHANCE~ON_CHECK_POP_UP_START Active

```
METHOD if_ex_aic__popup_enhance~on_check_pop_up_start.
  ev_start_popup = abap_true.
ENDMETHOD.
```

In case of OK: Nothing to do.

In case of CANCEL: The popup gets closed with outbound plug "CANCEL" (Cancel button) or "" (X on right-upper corner). The action execution will be cancelled by setting the returning parameter in method IF_EX_AIC__POPUP_ENHANCE~ON_CLOSE_EVENT_BEFORE accordingly. But the action is still scheduled and will be executed on next transaction save (without popup). To fix this issue we need to de-schedule the action. This is what the method is doing.



Class Builder: Class [redacted] CSS_POPUP_EVENT Change

Ty.	Parameter	Type spec.	Description
▶□	IV_GUID	TYPE CRMT_OBJECT_GUID	GUID of a CRM Order Object
▶□	IV_POPUP_INTERFACE	TYPE REF TO IF_BSP_WD_POPUP	Popup Access Interface
▶□	IV_ACTION_TYPE	TYPE PPFDTT	PPF: Name of Action Definition
▶□	UI_COMPONENT	TYPE O2APPLEXT OPTIONAL	External Name of BSP Application (Upper and Lower Case)
▶□	IV_PPF_CONT_ELEMENT	TYPE SWC_EDITEL OPTIONAL	Element name in upper/lower case
▶□	IV_POPUP_DATA_CLASS	TYPE SEOCLSNAME OPTIONAL	Object Type Name
▶□▶	EV_DO_NOT_START_ACTION	TYPE BOOLEAN	Boolean Variable (X=True, -=False, Space=Unknown)

Method IF_EX_AIC__POPUP_ENHANCE~ON_CLOSE_EVENT_BEFORE Active

```
METHOD if_ex_aic__popup_enhance~on_close_event_before.

  IF iv_popup_interface->get_fired_outbound_plug( ) <> 'OK'.

*Dont start status change action because popup was cancelled.
    ev_do_not_start_action = abap_true.

*Popup framework is stopping ppf action processing and transaction save.
*But the ppf action is still scheduled and will be processed on next save.
*Therefore we have to de-schedule it. Maybe this will be done by the framework in future!?
*The code was copied (and adjusted) from CL_EX_AIC_POPUP_EXAMPLE->IF_EX_AIC__POPUP_ENHANCE~ON_CLOSE_EVENT_BEFORE.
```

```
METHOD if_ex_aic__popup_enhance~on_close_event_before.

  IF iv_popup_interface->get_fired_outbound_plug( ) <> 'OK'.

*Dont start status change action because popup was cancelled.
    ev_do_not_start_action = abap_true.

*Popup framework is stopping ppf action processing and transaction save.
*But the ppf action is still scheduled and will be processed on next save.
*Therefore we have to de-schedule it. Maybe this will be done by the framework in future!?
*The code was copied (and adjusted) from CL_EX_AIC_POPUP_EXAMPLE-
>IF_EX_AIC__POPUP_ENHANCE~ON_CLOSE_EVENT_BEFORE.

    DATA:
      lo_context                TYPE REF TO cl_doc_context_crm_order,
      lo_manager                TYPE REF TO cl_manager_ppf,
      lo_context_ppf            TYPE REF TO cl_context_ppf,
      lo_context_manager        TYPE REF TO cl_context_manager_ppf,
      lo_current_trigger_list   TYPE REF TO cl_trigger_coll_ppf,
      lo_trigger_cr             TYPE REF TO cl_trigger_ppf.

*Get context
    CALL FUNCTION 'CRM_ACTION_CONTEXT_CREATE'
      EXPORTING
        iv_header_guid                 = iv_guid
        iv_object_guid                 = iv_guid
      IMPORTING
        ev_context                     = lo_context
      EXCEPTIONS
        no_actionprofile_for_proc_type = 1
        no_actionprofile_for_item_type = 2
        order_read_failed              = 3
        OTHERS                         = 4.

* get PPF Manager
    lo_manager = cl_manager_ppf=>get_instance( ).

    lo_context_ppf ?= lo_context.

* get context manager
    CALL METHOD lo_manager->get_context_manager
```

```
      EXPORTING
        io_context         = lo_context_ppf
      RECEIVING
        ro_context_manager = lo_context_manager.

* get trigger list
    lo_current_trigger_list = lo_context_manager->get_triggers( iv_action_type ).

*process every action.
    IF lo_current_trigger_list->get_number_of_elements( ) > 0.
      DO.
        CALL METHOD lo_current_trigger_list->get_next_element
          RECEIVING
            ro_element        = lo_trigger_cr
          EXCEPTIONS
            element_not_found = 1
            OTHERS            = 2.
        IF sy-subrc <> 0.
          EXIT. " if list has no next element
        ENDIF.

*Check whether action is unprocessed.
        IF lo_trigger_cr->get_is_inactiv( ) = space AND lo_trigger_cr-
>get_status( ) = sppf_status_unprocessed.

*Deactivate/Delete it.
          lo_trigger_cr->if_action_ppf~deactivate( ).

        ENDIF.

      ENDDO.
    ENDIF.
  ENDIF.

ENDMETHOD.
```

4 Consistency Checks and Clean-Up Actions

SAP Standard is initializing substatus by Input Readiness Check in UI Component. This is a very bad solution. That is why we check and correct substatus after every status change. However, there is no easy solution, because...

BADI ORDER_SAVE cannot be used because method CHECK_BEFORE_SAVE or PREPARE are called before status change and CHANGE_BEFORE_UPDATE is called after changes are sent to database.

BADI CRM_ORDER_STATUS cannot be used, because AFTER_CHANGE is not called for status reset. (SAP Bug!)

BADI SOCM_CHECK_CONDITION cannot be used, because consistency checks are not executed on reset to previous status. On status change the status change will be done. After that all consistency checks will be executed in the defined sequence. If one consistency check is triggering a status reset, all following checks will be skipped. After reset to the source status, no consistency check will be executed for the source status. Therefore it can happen, that the validation check will not be executed.

Solution 1: Use ChaRM Consistency Check (SOCM_CHECK_CONDITION) for maintenance check.

Solution 2: Use CRM_ORDER_STATUS for validation & correction, but react on all status changes (user and system). In case of status cancel an error message should be (deleted) and added which causes a system status change (I1030).

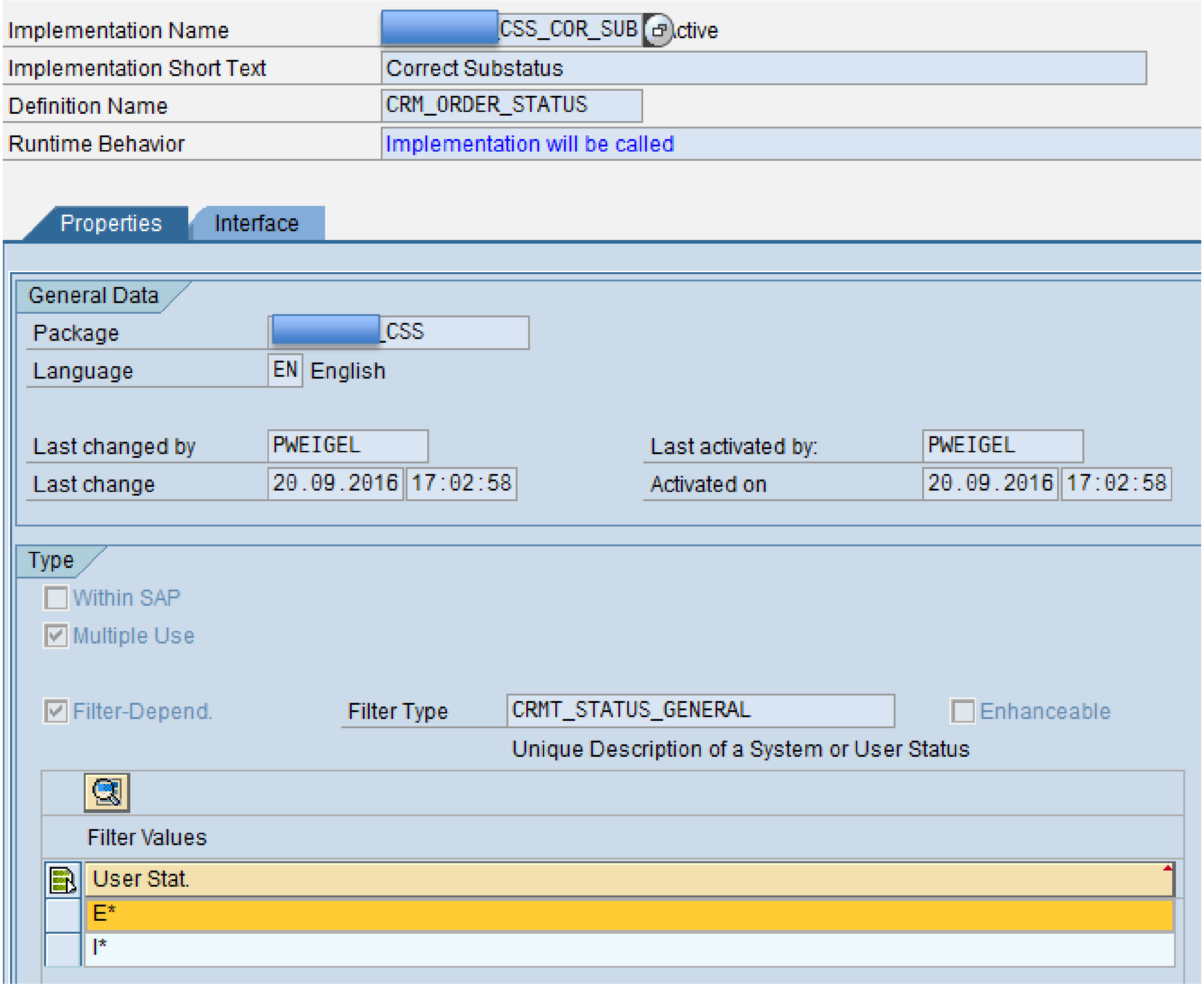
4.1 BADI: Clean-up substatus value

Substatus can be selected in Details form of Change Request or Change Document.

Substatus can be selected in Substatus popup if activated.

However on status change the substatus needs to be removed if invalid.

- Use case 1: We do a status reset but the substatus was already selected for target status. -> Clear.
- Use case 2: We do a status change and substatus was only valid for source status. -> Clear
- Use case 3: We do a status change and substatus was selected before status change by substatus popup. -> Keep
- Use case 4: We do a status change and substatus is valid for source and target status. -> Keep
- Use case 5: We cancel status change by pressing cancel button or closing popup. Before cancellation we maintained a substatus. -> Clear [supported by dirty sap standard input readiness check solution]



Implementation Name	[redacted]CSS_COR_SUB Active
Implementation Short Text	Correct Substatus
Definition Name	CRM_ORDER_STATUS
Runtime Behavior	Implementation will be called

General Data

Package	[redacted]CSS		
Language	EN English		
Last changed by	PWEIGEL	Last activated by:	PWEIGEL
Last change	20.09.2016 17:02:58	Activated on	20.09.2016 17:02:58

Type

□ Within SAP

☑ Multiple Use

☑ Filter-Depend. Filter Type CRMT_STATUS_GENERAL □ Enhanceable

Unique Description of a System or User Status

Filter Values

User Stat.
E*
I*

After Change:

- Get SERVICE_H using function module CRM_SERVICE_H_READ_OW.
- Exit if substatus is empty (it is valid in this case).
- Get possible substatus values using method cl_ai_crm_im_utility=>get_reason_ids.
- Check whether current value is mentioned in the list. Exit if yes.
- If not: Clear current substatus using function module CRM_SERVICE_H_MAINTAIN_OW.

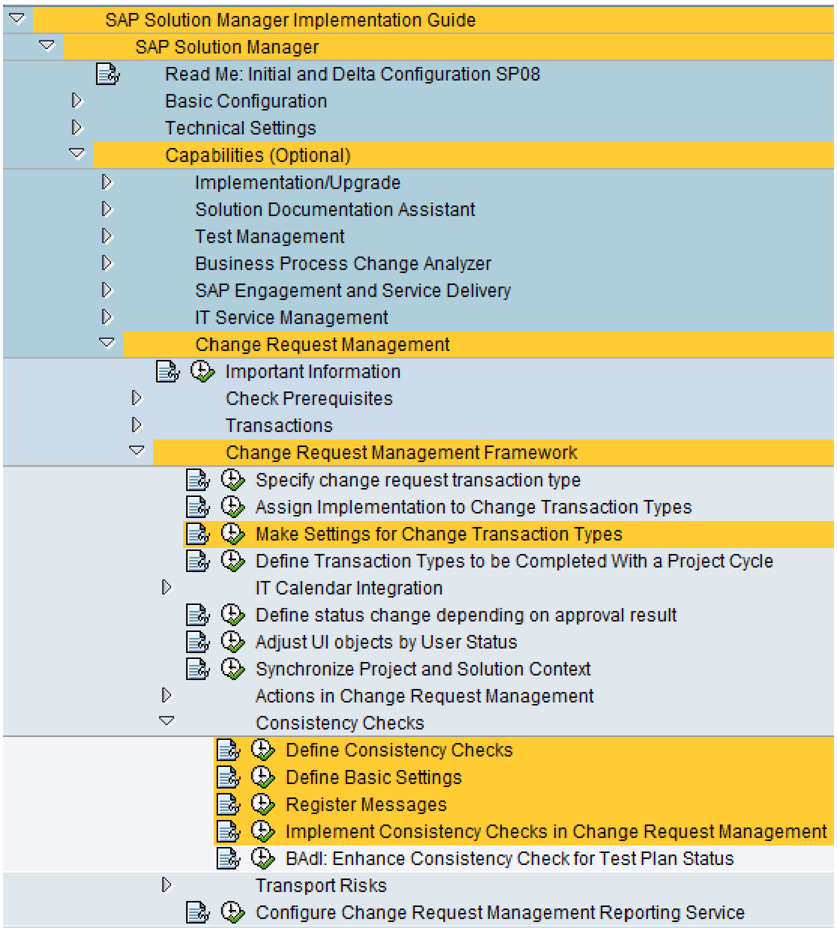
```
method IF_EX_CRM_ORDER_STATUS~AFTER_CHANGE.

  DATA:
    ls_service_h_wrk      TYPE crmt_service_h_wrk,
    ls_service_h_com     TYPE crmt_service_h_com,
    lt_input_field_names TYPE crmt_input_field_names_tab,
    ls_input_field_name  LIKE LINE OF lt_input_field_names,
    lt_status_reason     TYPE aic_stat_reason_tt.

**We are optimistic.
*  conditions_ok = abap_true.

*Get current value.
  CALL FUNCTION 'CRM_SERVICE_H_READ_OW'
    EXPORTING
      iv_guid                    = is_status_wrk-guid
    IMPORTING
      es_service_h_wrk           = ls_service_h_wrk
    EXCEPTIONS
      service_header_not_found = 1
      OTHERS                     = 2.

*SERVICE_H found.
  CHECK sy-subrc = 0.

**Maintenance check only. That is easy to do.
*  IF flt_val = '???_CSS_MAINT'.
*
*    IF ls_service_h_wrk-/aicrm/reason_id IS INITIAL.
*
**Check failed.
*      conditions_ok = abap_false.
*
*    ENDIF.
*
*    EXIT.
*
*  ENDIF.

*Reason ID found.
  CHECK ls_service_h_wrk-/aicrm/reason_id IS NOT INITIAL.

*Get valid status reason.
  CALL METHOD cl_ai_crm_im_utility=>get_reason_ids
    EXPORTING
      iv_guid        = is_status_wrk-guid
*     iv_status      =
    IMPORTING
      et_stat_reason = lt_status_reason.

*Check validity.
  READ TABLE lt_status_reason
    TRANSPORTING NO FIELDS
    WITH KEY reason_id = ls_service_h_wrk-/aicrm/reason_id.

*Current reason is not valid and needs to be deleted.
  CHECK sy-subrc <> 0.

**Check failed.
*  conditions_ok = abap_false.

  CLEAR ls_service_h_com.
  ls_service_h_com-ref_guid = is_status_wrk-guid.
  ls_service_h_com-ref_kind = 'A'.
  ls_service_h_com-mode     = ' '.
  CLEAR ls_service_h_com-/aicrm/reason_id.

  ls_input_field_name-fieldname = '/AICRM/REASON_ID'.
  APPEND ls_input_field_name TO lt_input_field_names.

*Delete invalid reason.
  CALL FUNCTION 'CRM_SERVICE_H_MAINTAIN_OW'
    EXPORTING
      is_service_h_com     = ls_service_h_com
    CHANGING
      ct_input_field_names = lt_input_field_names
    EXCEPTIONS
      header_change_error  = 1
      header_create_error  = 2
      error_occurred       = 3
      OTHERS               = 4.

  CHECK sy-subrc <> 0.

endmethod.
```

4.2 ChaRM Consistency Check: Substatus Maintained

As mentioned before, we need a consistency check to ensure that a substatus is maintained on status change. Of course the substatus popup is ensuring that a substatus is selected. But we are able to bypass this mandatory field check by closing the popup. It is also possible to do indirect status changes (i.e. by status reset) where the popup is not occuring. To ensure consistency we therefore need to check whether substatus is maintained.

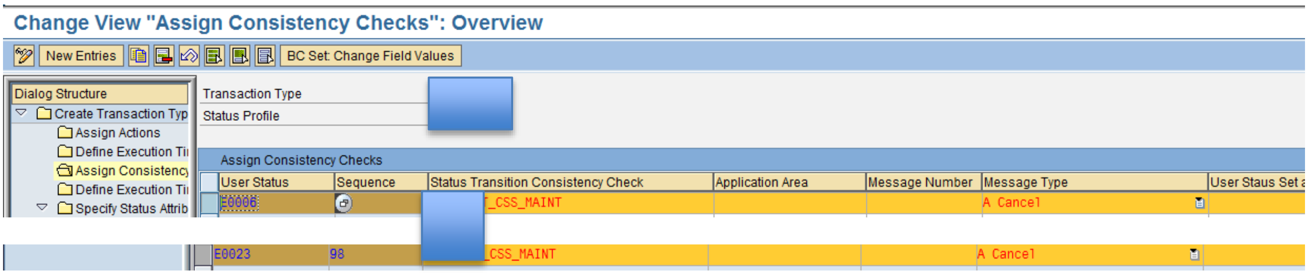
The maintenance check for text type is done by another solution and therefore out of scope here.

Note: Validation check is also implemented as consistency check but not used yet because of mentioned restrictions and implemented solution described in section 4.1.



- SAP Solution Manager Implementation Guide
  - SAP Solution Manager
    - Read Me: Initial and Delta Configuration SP08
    - Basic Configuration
    - Technical Settings
    - Capabilities (Optional)
      - Implementation/Upgrade
      - Solution Documentation Assistant
      - Test Management
      - Business Process Change Analyzer
      - SAP Engagement and Service Delivery
      - IT Service Management
      - Change Request Management
        - Important Information
        - Check Prerequisites
        - Transactions
        - Change Request Management Framework
          - Specify change request transaction type
          - Assign Implementation to Change Transaction Types
          - Make Settings for Change Transaction Types
          - Define Transaction Types to be Completed With a Project Cycle
          - IT Calendar Integration
          - Define status change depending on approval result
          - Adjust UI objects by User Status
          - Synchronize Project and Solution Context
          - Actions in Change Request Management
          - Consistency Checks
            - Define Consistency Checks
            - Define Basic Settings
            - Register Messages
            - Implement Consistency Checks in Change Request Management
            - BAdI: Enhance Consistency Check for Test Plan Status
          - Transport Risks
          - Configure Change Request Management Reporting Service

Assign consistency check "Is substatus maintained" to user status "Withdrawn" and "Test Failed but OK to go" of Test Task.



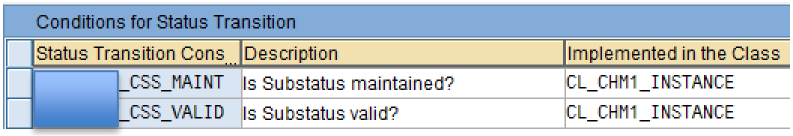
Change View "Assign Consistency Checks": Overview

Transaction Type [redacted]
Status Profile

Assign Consistency Checks

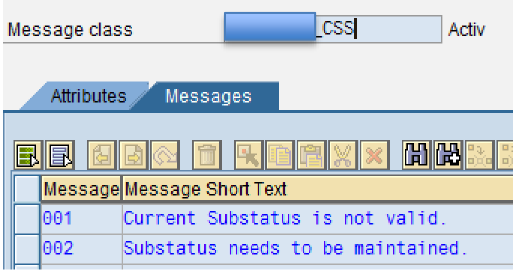
User Status	Sequence	Status Transition Consistency Check	Application Area	Message Number	Message Type	User Staus Set a
E0006		[redacted]_CSS_MAINT			A Cancel	
E0023	98	[redacted]_CSS_MAINT			A Cancel	

Define Consistency Check "Is Substatus maintained?". Note: check "Is substatus valid?" is implemented but not used yet.



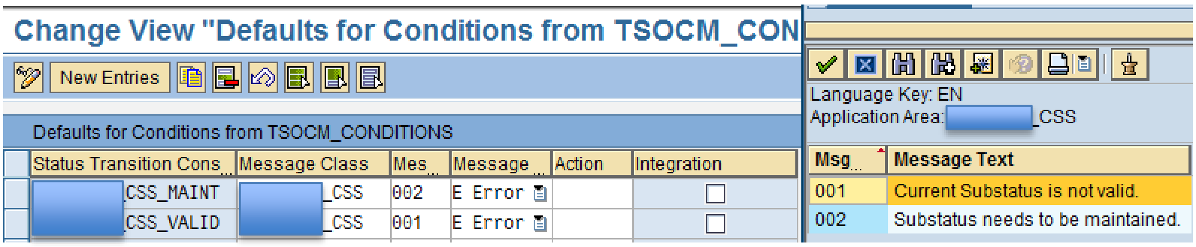
Conditions for Status Transition

Status Transition Cons	Description	Implemented in the Class
[redacted]_CSS_MAINT	Is Substatus maintained?	CL_CHM1_INSTANCE
[redacted]_CSS_VALID	Is Substatus valid?	CL_CHM1_INSTANCE



Message class [redacted]_CSS Activ

Message	Message Short Text
001	Current Substatus is not valid.
002	Substatus needs to be maintained.



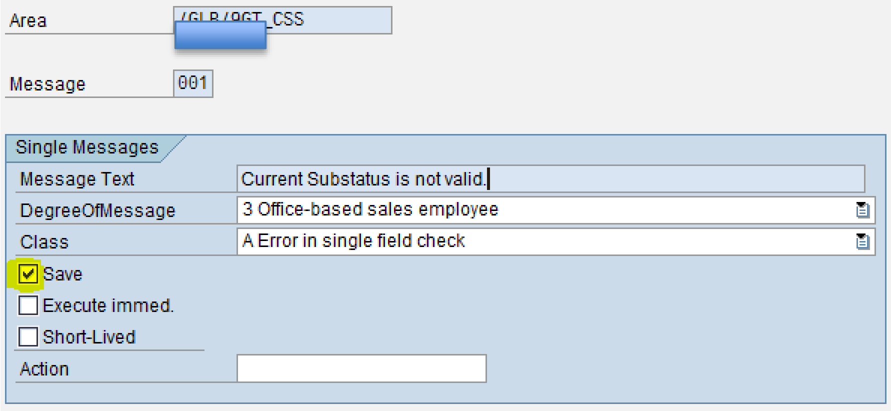
Change View "Defaults for Conditions from TSOCM_CON

Defaults for Conditions from TSOCM_CONDITIONS

Status Transition Cons	Message Class	Mes	Message	Action	Integration
[redacted]_CSS_MAINT	[redacted]_CSS	002	E Error		□
[redacted]_CSS_VALID	[redacted]_CSS	001	E Error		□

Language Key: EN
Application Area: [redacted]_CSS

Msg	Message Text
001	Current Substatus is not valid.
002	Substatus needs to be maintained.



Area	[redacted]_CSS
Message	001

Single Messages

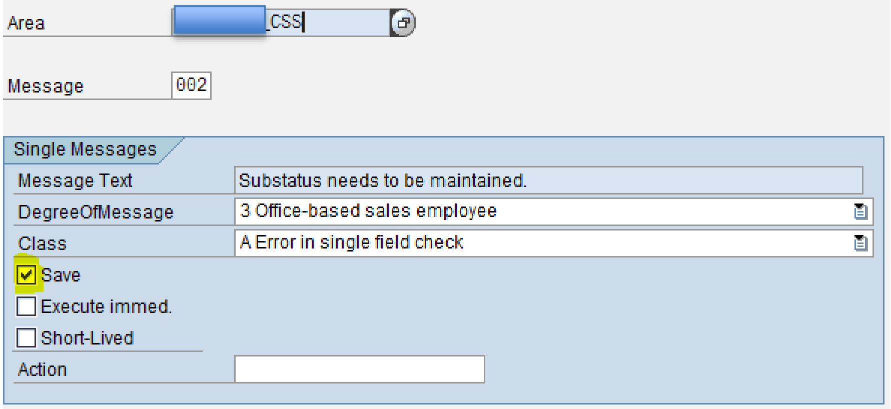
Message Text	Current Substatus is not valid.
DegreeOfMessage	3 Office-based sales employee
Class	A Error in single field check

☑ Save

□ Execute immed.

□ Short-Lived

Action



Area	[redacted]CSS
Message	002

Single Messages

Message Text	Substatus needs to be maintained.
DegreeOfMessage	3 Office-based sales employee
Class	A Error in single field check

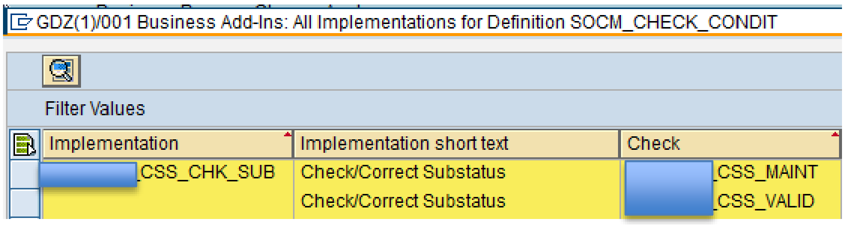
☑ Save

□ Execute immed.

□ Short-Lived

Action

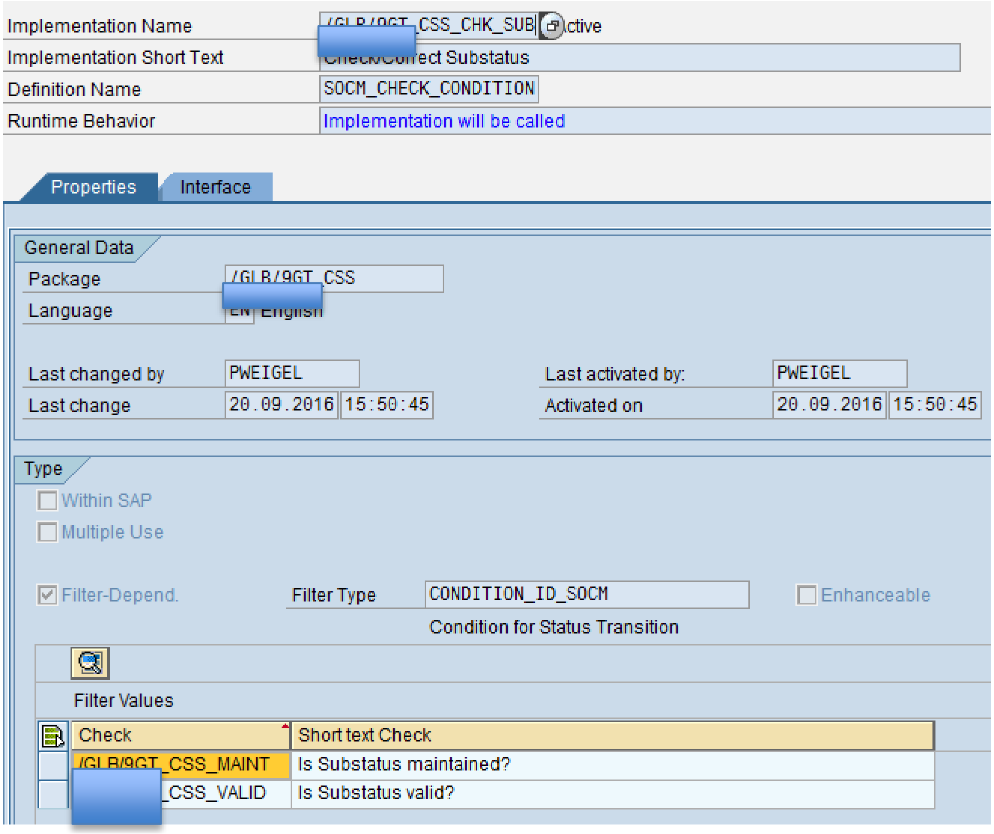
BADI implementation for both consistency checks:



GDZ(1)/001 Business Add-Ins: All Implementations for Definition SOCM_CHECK_CONDIT

Filter Values

Implementation	Implementation short text	Check
[redacted]CSS_CHK_SUB	Check/Correct Substatus	[redacted]CSS_MAINT
	Check/Correct Substatus	[redacted]CSS_VALID



Implementation Name	[redacted]CSS_CHK_SUB Active
Implementation Short Text	[redacted]ect Substatus
Definition Name	SOCM_CHECK_CONDITION
Runtime Behavior	Implementation will be called

General Data

Package	[redacted]CSS		
Language	[redacted]		
Last changed by	PWEIGEL	Last activated by:	PWEIGEL
Last change	20.09.2016 15:50:45	Activated on	20.09.2016 15:50:45

Type

☐ Within SAP
☐ Multiple Use

☑ Filter-Depend.   Filter Type CONDITION_ID_SOCM   ☐ Enhanceable
Condition for Status Transition

Filter Values

Check	Short text Check
[redacted]CSS_MAINT	Is Substatus maintained?
[redacted]CSS_VALID	Is Substatus valid?

Is substatus maintained?

- Get SERVICE_H using function module CRM_SERVICE_H_READ_OW.
- Return false if substatus is emtpy. otherwise return true.

Is substatus valid?

- Get SERVICE_H using function module CRM_SERVICE_H_READ_OW.
- Return true if substatus is empty (it is valid in this case).
- Get possible substatus values using method cl_ai_crm_im_utility=>get_reason_ids.
- Check whether current value is mentioned in the list. Return true if yes.
- if not: Clear current substatus using function module CRM_SERVICE_H_MAINTAIN_OW and return false.

```
METHOD if_ex_socm_check_condition~check_condition.

  DATA:
    ls_service_h_wrk      TYPE crmt_service_h_wrk,
    ls_service_h_com      TYPE crmt_service_h_com,
    lt_input_field_names TYPE crmt_input_field_names_tab,
    ls_input_field_name  LIKE LINE OF lt_input_field_names,
    lt_status_reason      TYPE aic_stat_reason_tt.

*We are optimistic.
```

```
  conditions_ok = abap_true.

*Get current value.
  CALL FUNCTION 'CRM_SERVICE_H_READ_OW'
    EXPORTING
      iv_guid                  = hf_instance->change_document_id
    IMPORTING
      es_service_h_wrk         = ls_service_h_wrk
    EXCEPTIONS
      service_header_not_found = 1
      OTHERS                   = 2.

*SERVICE_H found.
  CHECK sy-subrc = 0.

*Maintenance check only. That is easy to do.
  IF flt_val = '???_CSS_MAINT'.

    IF ls_service_h_wrk-/aicrm/reason_id IS INITIAL.

*Check failed.
      conditions_ok = abap_false.

    ENDIF.

    EXIT.

  ENDIF.

*Reason ID found.
  CHECK ls_service_h_wrk-/aicrm/reason_id IS NOT INITIAL.

*Get valid status reason.
  CALL METHOD cl_ai_crm_im_utility=>get_reason_ids
    EXPORTING
      iv_guid        = hf_instance->change_document_id
*     iv_status      =
    IMPORTING
      et_stat_reason = lt_status_reason.

*Check validity.
  READ TABLE lt_status_reason
    TRANSPORTING NO FIELDS
    WITH KEY reason_id = ls_service_h_wrk-/aicrm/reason_id.

*Current reason is not valid and needs to be deleted.
  CHECK sy-subrc <> 0.

*Check failed.
  conditions_ok = abap_false.

  CLEAR ls_service_h_com.
  ls_service_h_com-ref_guid = hf_instance->change_document_id.
  ls_service_h_com-ref_kind = 'A'.
  ls_service_h_com-mode     = ' '.
  CLEAR ls_service_h_com-/aicrm/reason_id.

  ls_input_field_name-fieldname = '/AICRM/REASON_ID'.
  APPEND ls_input_field_name TO lt_input_field_names.

*Delete invalid reason.
  CALL FUNCTION 'CRM_SERVICE_H_MAINTAIN_OW'
    EXPORTING
      is_service_h_com     = ls_service_h_com
    CHANGING
      ct_input_field_names = lt_input_field_names
    EXCEPTIONS
      header_change_error  = 1
      header_create_error  = 2
      error_occurred       = 3
      OTHERS               = 4.
  CHECK sy-subrc <> 0.

ENDMETHOD.
```

5 Reporting

There exist no reporting requirements yet. If such a requirement will be raised in future, we can read the substatus from field /AICRM/REASON_ID of table CRMD_SERVICE_H. The list of possible substatus (incl. text) can be read from table aic_stat_reason and aic_stat_reasont.