

References

Literature

Dickersbach, J. Th.:
Supply Chain Management with APO.
Springer-Verlag, Berlin Heidelberg 2004

Eversheim, W.:
Organisation in der Produktionstechnik Band 1.
VDI-Verlag, Düsseldorf 1996

Knolmayer, G., Mertens, P., Zeier, A.:
Supply Chain Management Based on SAP Systems.
Springer-Verlag, Berlin Heidelberg 2002

OSS Notes

- 33396 Batch determination.: Selection with remaining life LOBM_RLZ
- 78235 Revaluating reference characteristics in batch classification
- 391018 Shelf life R/3 → APO, settings in R/3
- 426563 CTP: Settings, system behaviour and performance
- 453921 X: char. value, batch no., copy acc. assignment to RBATP item
- 483576 Required shelf life per customer/material without configuration

- 484144 Information on characteristics-based forecasting
- 495825 CDP definitions for block planning via user exit
- 526883 CDP: Unspecified characteristics in planning and pegging
- 528189 Additional information on block planning
- 551124 APO: Finite scheduling with MRP heuristic
- 601255 Variant functions cannot be created
- 602174 Standard LOBM_APO_SL* characteristics do not exist in client
- 604757 Incorrect variant functions and object dependencies
- 614280 Variant tables cannot be created
- 714929 Changing characteristic and class master data for CDP
- 751392 Shelf life R/3 → APO, settings in R/3 system
- 815018 Change of component using dependency

Abbreviations

APO	Advanced Planner and Optimiser
ATP	Available-to-Promise
BAdI	Business Add-In
BOM	Bill of Material
CBF	Characteristic Based Forecasting
CBP	Characteristic Based Planning
CDP	Characteristic Dependent Planning
CIF	Core Interface
CTM	Capable-to-Match
CTP	Capable-to-Promise
CVC	Characteristic Value Combination
DP	Demand Planning
GR	Goods Receipt
IS	Industry Solution
MLATP	Multi-Level ATP
MTO	Make-to-Order
MTS	Make-to-Stock
PDS	Production Data Structure
PIR	Planned Independent Requirement
PP/DS	Production Planning and Detailed Scheduling
PPM	Production Process Model
RBATP	Rules-Based ATP
RTO	Run-Time Object
SCM	Supply Chain Management
SNP	Supply Network Planning
TP/VS	Transportation Planning and Vehicle Scheduling
VC	Variant Configuration

Implementation Samples

For the detailed description about how to implement a function at several points in the book coding was required – either as object dependency, as BAdI or as a function module. In chapter 11.2 a BAdI and a function module are mentioned which require a more extensive coding. Examples for this coding are listed in this chapter.

• *BADI to Include Characteristics as Sorting Criteria*

As mentioned in chapter 11.2.2 it is possible to include characteristics as sorting criteria into the scheduling strategy and into the scheduling heuristic using the BAdI /SAPAPO/CDPS_ORDDATA. An example for the usage of the characteristic CBP_SIZE (taken from the output node of the order) is listed here:

```
method /SAPAPO/IF_EX_CDPS_ORDDATA~GET_ORDDATA.
```

```
DATA: lv_charact_id      TYPE /sapapo/mc01ch_id,  
      ls_gen_params      TYPE /sapapo/om_gen_params,  
      lv_simsession      TYPE /sapapo/om_simsession,  
      ls_exclude_exports TYPE /sapapo/om_getdata_options,  
      lt_orders          TYPE /sapapo/om_ordid_tab,  
      lt_outputs         TYPE /sapapo/om_io_tab,  
      lt_val             TYPE /sapapo/om_charact_val_tab,  
      lt_rc              TYPE /sapapo/om_lc_rc_tab.
```

```
FIELD-SYMBOLS: <ls_order>    LIKE LINE OF it_orders,  
               <ls_output>   LIKE LINE OF it_outputs,  
               <ls_ord_ext>  LIKE LINE OF et_orders_ext,  
               <ls_val>      LIKE LINE OF lt_val.
```

```
* get internal ID of characteristic:
```

```
CALL METHOD /sapapo/cl_mc01_ccv_struct=>charname_as_id  
  EXPORTING  
    ic_charname = 'CBP_SIZE'  
  IMPORTING  
    en_charid   = lv_charact_id  
  EXCEPTIONS  
    OTHERS      = 2.  
CHECK sy-subrc IS INITIAL.
```

```
LOOP AT it_orders
  ASSIGNING <ls_order>.
  APPEND <ls_order>-orderid
    TO lt_orders.
ENDLOOP. " AT it_orders
SORT lt_orders.
DELETE ADJACENT DUPLICATES
  FROM lt_orders.

* get charact. data of order output nodes from liveCache:
CALL FUNCTION '/SAPAPO/RRP_SIMSESSION_GET'
  IMPORTING
    ev_simsession = lv_simsession
    es_gen_params = ls_gen_params.
CLEAR ls_exclude_exports WITH 'X'.
CLEAR: ls_exclude_exports-get_charact_outnode.

CALL FUNCTION '/SAPAPO/OM_ORDER_GET_DATA'
  EXPORTING
    is_gen_params           = ls_gen_params
    iv_simsession          = lv_simsession
    it_order                = lt_orders[]
    is_exclude_exports     = ls_exclude_exports
  IMPORTING
    et_charact_val_acts    =
    * et_charact_req_inpnode =
    * et_charact_val_outnode = lt_val[]
    et_rc                  = lt_rc[]
  EXCEPTIONS
    lc_connect_failed     = 1
    lc_com_error          = 2
    lc_appl_error         = 3.
CHECK sy-subrc IS INITIAL.
SORT lt_val
  BY object_id
    object_type
    position_no
    line_no
    charact_id.

* provide sorting value for orders from characteristics:
SORT lt_outputs
  BY orderid
    position_no
    line_no.
LOOP AT et_orders_ext
  ASSIGNING <ls_ord_ext>.
* get output for order (assuming only 1 output):
READ TABLE it_outputs
  ASSIGNING <ls_output>
  WITH KEY orderid = <ls_ord_ext>-ordid
  BINARY SEARCH.
```

```

CHECK sy-subrc IS INITIAL.

*   get characteristic value for output:
READ TABLE lt_val
  ASSIGNING <ls_val>
  WITH KEY
    object_id    = <ls_output>-orderid
    position_no  = <ls_output>-position_no
    line_no      = <ls_output>-line_no
    charact_id   = lv_charact_id.
CHECK sy-subrc IS INITIAL.
<ls_ord_ext>-CBP_SIZE = <ls_val>-quan_value.
ENDLOOP. " AT et_orders_ext

endmethod.

```

Special cases as by-products are ignored in this example.

• *Function Module to Determine the Set-Up Group Identifier*

Not all fields have a simple correspondence between R/3 and APO. For the use of reference characteristics this implies that variant functions might be required to determine the APO internal identifiers for some fields. An example coding for the function module (called by the variant function) to determine the identifier for the set-up group is listed in the following as mentioned in chapter 11.2.3. In this case the set-up group is set to 'XX2' if the value of CBP_COLOUR is 'RED'.

```

FUNCTION ZXX_SETUP.
* "-----
* " "Local Interface:
* "   IMPORTING
* "     REFERENCE(GLOBALS) LIKE  CUOV_00 STRUCTURE  CUOV_00
* "   TABLES
* "     QUERY STRUCTURE  CUOV_01
* "     MATCH STRUCTURE  CUOV_01
* "   EXCEPTIONS
* "     FAIL
* "     INTERNAL_ERROR
* "-----

data:
  lv_apo_group_id TYPE  /SAPAPO/CDPS_SETUP_ID,
  lv_apo_ITEM_ID  TYPE  /SAPAPO/CDPS_SETUP_ID,
  lv_SETUP_GROUP  TYPE  /SAPAPO/CDPS_SETUP_GROUP,
  lv_SETUP_ITEM   TYPE  /SAPAPO/CDPS_SETUP_ITEM,
  ls_CUOV_01      TYPE  CUOV_01,
  lv_SETUP_ID     TYPE  /SAPAPO/CDPS_SETUP_ID.

```

```
READ TABLE QUERY
  WITH KEY VARNAM = 'CBP_COLOUR'
  INTO ls_CUOV_01.

CHECK sy-subrc = 0.

IF ls_CUOV_01-atwrt = 'RED'.
  lv_SETUP_GROUP = 'XX2'.
ENDIF.

CALL FUNCTION '/SAPAPO/DM_SETUP_ID_READ'
  EXPORTING
    i_locid      = 'LjGhTBmHSKQa3r65jI0OyW'
    i_setup_group = lv_setup_group
    i_setup_item  = lv_setup_item
  IMPORTING
    e_setup_id   = lv_setup_id
  EXCEPTIONS
    not_found    = 1
    OTHERS       = 2.

CALL FUNCTION '/SAPAPO/DM_SETUP_IDS_GET'
  EXPORTING
    i_setup_id      = lv_setup_id
  IMPORTING
    e_setup_group_id = lv_apo_group_id
    e_setup_item_id  = lv_apo_item_id
  EXCEPTIONS
    not_found      = 1
    OTHERS         = 2.

CLEAR ls_CUOV_01.
ls_CUOV_01-varnam = 'XREF_ROUTINGSETUP_GROUP'.
ls_CUOV_01-atflv  = lv_apo_group_id.
ls_CUOV_01-atfor  = 'NUM'.

APPEND ls_CUOV_01 to MATCH.

ENDFUNCTION.
```

Since the internal key for the set-up group is location dependent, the function `/SAPAPO/DM_SETUP_ID_READ` needs the GUID of the location as an input. The GUID is stored in the table `/SAPAPO/LOC`.

Transactions

For the quick access of some functions this chapter provides a list of useful transactions for planning with characteristics. Most of these have been explained in the text.

Characteristics and Classes

System	Description of the Transaction	Transaction
R/3, APO	Characteristics	CT04
R/3, APO	Class	CL02
R/3, APO	Assignment of Class to Product	CL24N
R/3, APO	Organisational Area	O1CL

Variant Configuration

System	Description of the Transaction	Transaction
R/3	Configuration Profile	CU41
R/3	Object Dependency	CU01
R/3	Object Dependencies Check	CU50
APO	PDS Display & Config. Simulation	/SAPAPO/CURTO_SIMU
R/3, APO	Variant Functions	CU65
R/3	BOM Assignment to Material Variant	CS40
R/3	Routing Assignment to Mat. Variant	CA02
R/3, APO	Variant Table – Definition	CU61
R/3, APO	Variant Table – Data Maintenance	CU60

Batch Selection and ATP with Characteristics

System	Description of the Transaction	Transaction
R/3	Batch Selection Search Strategy	VCH1
R/3	Batch Customising	OCHA
R/3	Sort Sequence for Characteristics	CU70
APO	Rules	/SAPAPO/RBA04
APO	Characteristic View (ATP)	/SAPAPO/ATPCH01

Characteristic Based Forecasting

System	Description of the Transaction	Transaction
APO	CBF- Profile Maintenance	/SAPAPO/IPM01
APO	CBF- Profile Maintenance (old)	/SAPAPO/DPC1
APO	Characteristic Value Combinations	/SAPAPO/MC62
APO	Consumption Group	/SAPAPO/CSP1
APO	Forecast Release	/SAPAPO/MC90
APO	Forecast Reorganisation	/SAPAPO/MD74
APO	Transform. of Dependent Demand	/SAPAPO/DMP2
APO	Consumption Overview	/SAPAPO/DMP1

Block Planning

System	Description of the Transaction	Transaction
APO	Resource	/SAPAPO/RES01
APO	PPM	/SAPAPO/SCC05
APO	Forecast Generation from Blocks	/SAPAPO/BLRG01

Shelf Life

System	Description of the Transaction	Transaction
R/3	Update Shelf-Life Characteristics	BMSM

Production Planning and Detailed Scheduling

System	Description of the Transaction	Transaction
APO	Product View	/SAPAPO/RRP3
APO	Pegging Overview	/SAPAPO/PEG1
APO	Global Parameters and Default Values	/SAPAPO/RRPCUST1
APO	Background Planning	/SAPAPO/CDPSB0
APO	Scheduling Strategy Profile	/SAPAPO/CDPSC1
APO	Planning Board Customising	/SAPAPO/CDPSC2
APO	PP/DS Heuristics	/SAPAPO/CDPSC11

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