

ABAP for SAP HANA Reference Scenario: Implementing Open Items Analysis using SAP Floorplan Manager

Applicable Releases:

SAP NetWeaver 7.4 SP02, SP03

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Document History

Document Version	Description
1.00	First official release of this guide

Typographic Conventions

Type Style	Description
<i>Example Text</i>	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Cross-references to other documentation
Example text	Emphasized words or phrases in body text, graphic titles, and table titles
Example text	File and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
Example text	User entry texts. These are words or characters that you enter in the system exactly as they appear in the documentation.
<Example text>	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
EXAMPLE TEXT	Keys on the keyboard, for example, F2 or ENTER.

Icons






Icon	Description
	Caution
	Important
	Note
	Recommendation or Tip
	Example

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1. Remarks before you start

This demo can be found on an SAP NetWeaver AS ABAP 7.4 running on a SAP HANA database SPS5 or higher. For more details, information and guides based on SAP NetWeaver AS ABAP and SAP HANA please visit our SCN Page: <http://scn.sap.com/docs/DOC-35518>

2. Business Scenario

For the purpose of setting the whole business context, it is relevant to mention that *Open Items Analysis* (in short OIA) represents a supplement to the NW EPM demo application—covering procurement and sales business scenarios—and enriches it with analytical use cases.

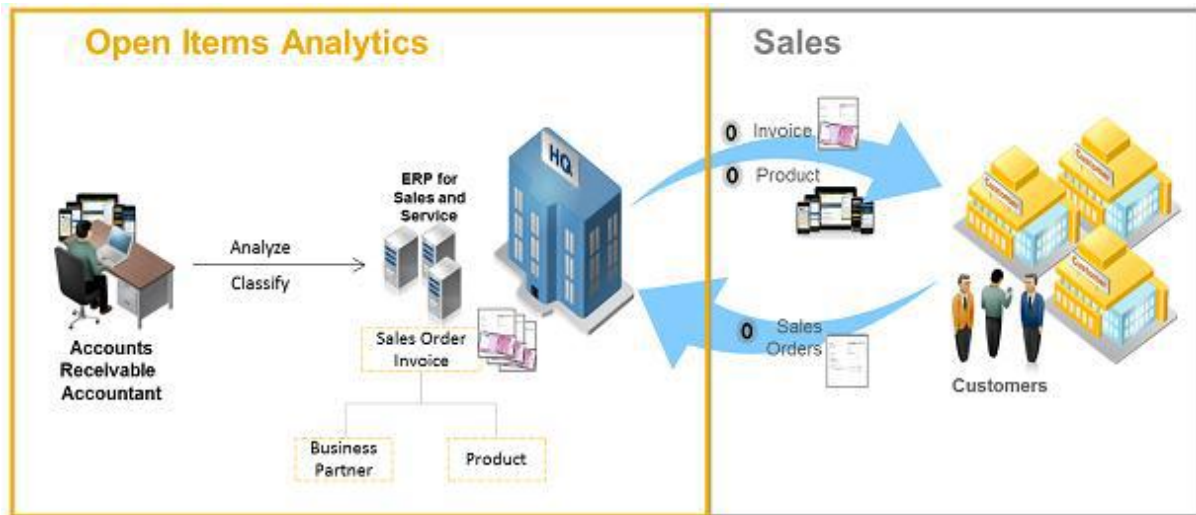
Because of the great importance of ready cash in running a business, it is in a company's best interest to collect outstanding receivables as quickly as possible. By quickly turning sales into cash, a company has the chance to put the cash to use again and ideally to reinvest and increase sales.

The Accounts Receivable accountant—responsible for cash management—typically searches, displays, and analyzes overdue orders and orders that exceed a predefined and customizable amount. The Accounts Receivable accountant also classifies buyers according to the risk of non-payment.

As an Accounts Receivable accountant, you use OIA to perform the following tasks:

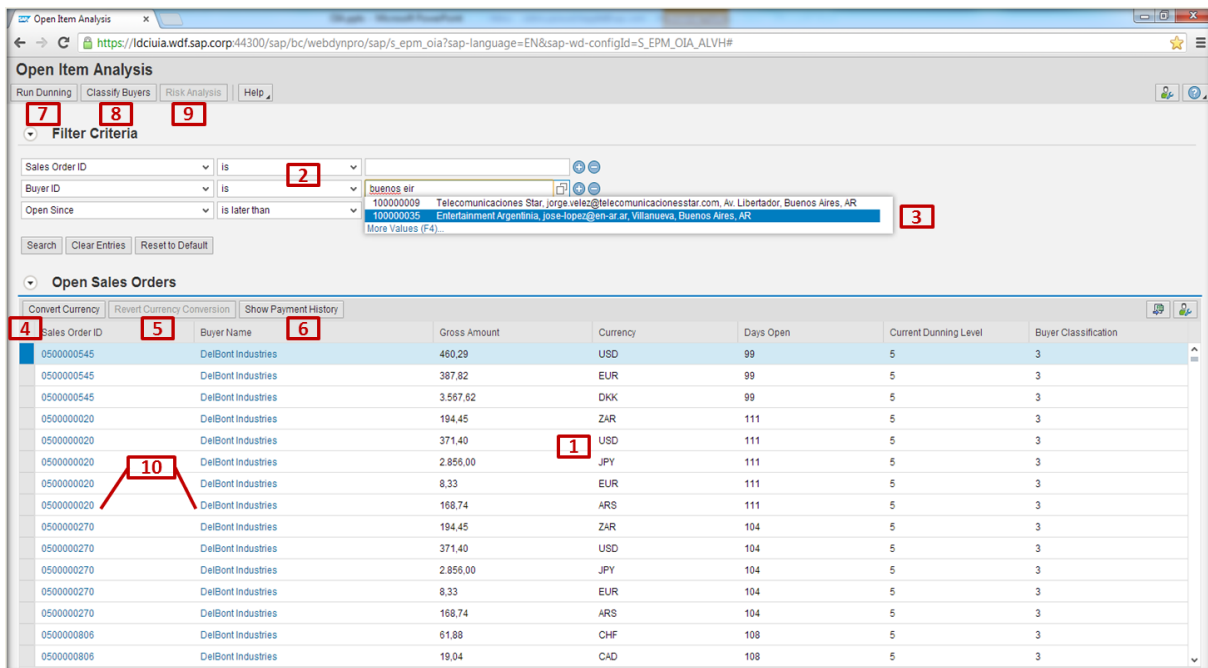
1. Check sales orders with open status.
2. Check open sales orders based on Buyer ID, Sales Order Number, and Calendar days.
3. Categorize buyers according to the time taken to clear a payment and payment history (subsequent topic contains information about payment history).
4. Perform Dunning Run (subsequent topic contains information about Dunning Run).
5. Check sales orders in common currency (This might be required if sales order items are processed in different currency units).
6. Check the payment history of a buyer.
7. Check Dunning Level of open orders (subsequent topic contains information about Dunning Level).
8. Initiate action on a sales order based on a Dunning Level – Not yet incorporated in the reference application.

The image below provides an overview of the OIA reference scenario. Only the sales scenario—and not the procurement scenario—is illustrated below for reasons of simplification.



3. Application Overview

Application developers use the Floorplan Manager to build the Open Item Analysis (OIA) application. The Open Item Analysis application interface appears as in the screenshot below. The various sections/functionality of the OIA application are marked in numerals.

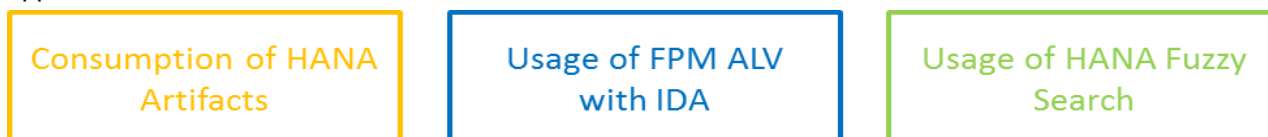


The table below provides description for each marked section/functionality:

Number	Description
1	This section displays all the open sales orders, grouped by sales order ID. This section also displays the days for which the sales order is open, current dunning level, and buyer classification.
2	As an Accounts Receivable accountant, you can use the search section to filter the open sales order with the required filter criteria. You can filter the open sales orders using sales order

Number	Description
	ID, buyer ID and by the date since the sales order is open.
3	Fault tolerant HANA fuzzy search, integrated into the application, provides type-ahead that lists the appropriate buyer ID while entering the filter criteria.
4	Convert Currency, converts all the sales order's gross amount to a common target currency for analysis.
5	Revert Currency Conversion resets the currency conversion.
6	Show Payment History, shows the payment history for the sales order from a given buyer, so that as an accountant you can make an informed decision before initiating an action for the delayed payment.
7	Run Dunning runs the dunning logic at real time so that as an account manager you can work on the sales order always assigned to the appropriate dunning level. Refer appendix for more details on the dunning level and its meaning.
8	Classify Buyers, does a buyer classification – Premium, Standard, Risky etc., so that as an accountant you can make a decision before initiating an action for the delayed payment. Refer appendix for more details on the classification level and its meaning.
9	Risk Analysis launches BEx Web Application Designer based dashboard. As an account you can use this dashboard for further analysis of the open sales orders.
10	You can directly navigate to the Sales Order details or Buyer details screens of standard EPM application from these links.

The block diagram below displays the key ABAP for SAP HANA features covered in the OIA application:



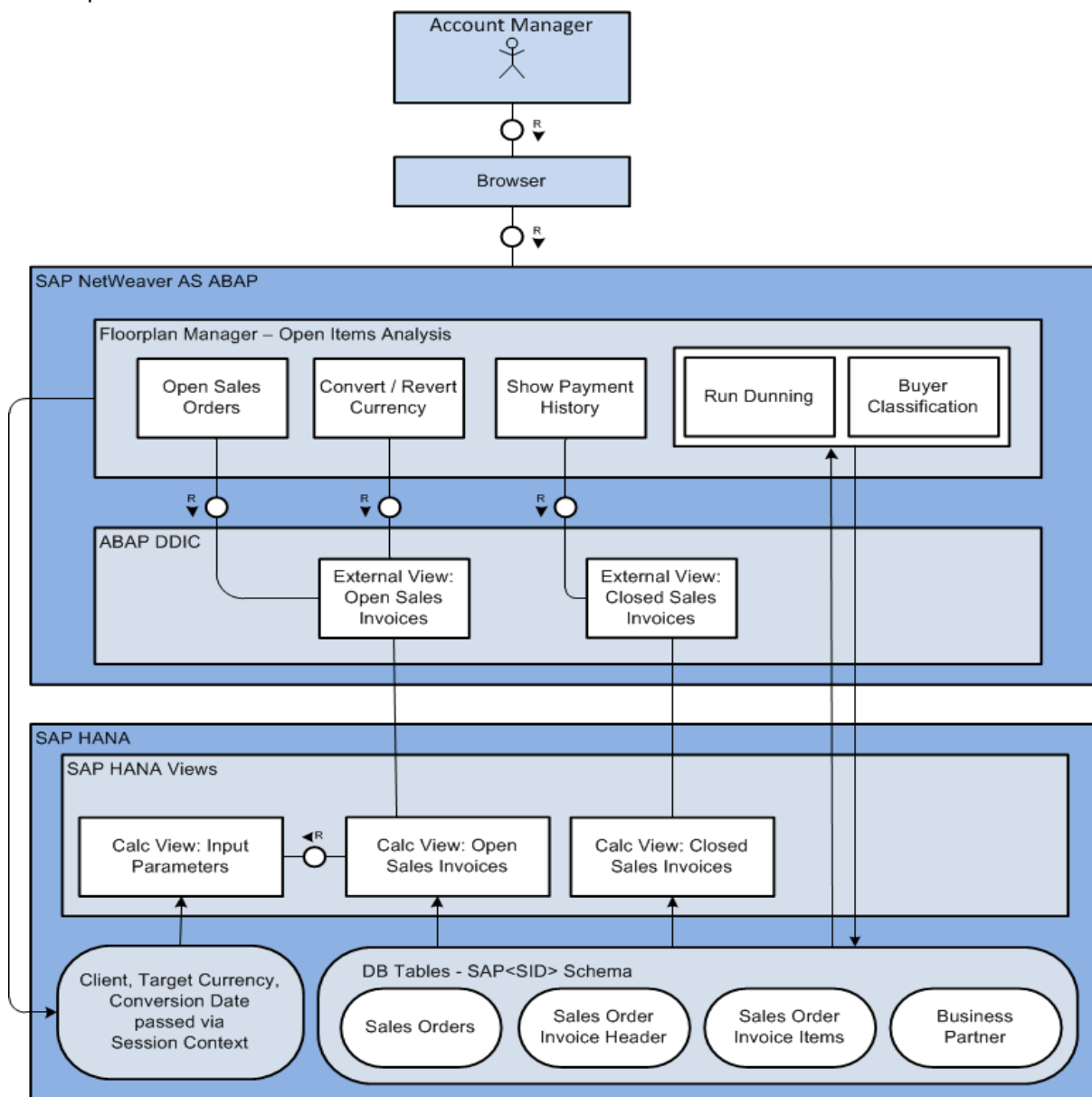
The Floorplan Manager application, which is the user interface layer for the OIA reference application, has two variants, based on the list component section in the application. The two flavors are:

- OIA with SAP ABAP List Viewer with Integrated Database Access (SALV with IDA) or the new SALV component optimized for SAP HANA. You can access this application using the following link: https://<server>:<port>/sap/bc/webdynpro/sap/s_epm_oi?sap-language=EN&sap-wd-configId=S_EPM_OIA_ALVH
- OIA with Classical SAP ABAP List Viewer (SALV). You can access this application using the following link: https://<server>:<port>/sap/bc/webdynpro/sap/s_epm_oi?sap-language=EN&sap-wd-configId=S_EPM_OIA

4. Architecture

The architecture diagram provided below defines the interactions that occur between components of the *Open Items Analysis* application. The application uses the external view—Open Sales Orders—representing the Open Sales Order calculation view in SAP HANA, to display all the Open Sales Orders. The same external view is used, when Convert/Revert currency is used by the account manager to view/reset the open sales order in common currency. In this case, while the calculation view is called, client, target currency, and conversion date is passed via the session context. As an account manager you can see the buyer payment history using the external view—Closed Sales Invoices —representing the **Calculation view Closed Sales Invoices**. You can initiate Run Dunning and Buyer Classification to assign the dunning levels to the sales order and do the classification of the buyer respectively in real-time. At the moment, the business logic for Run Dunning and Buyer Classification is implemented in the ABAP layer and will be pushed down to the database layer in the subsequent SP releases.

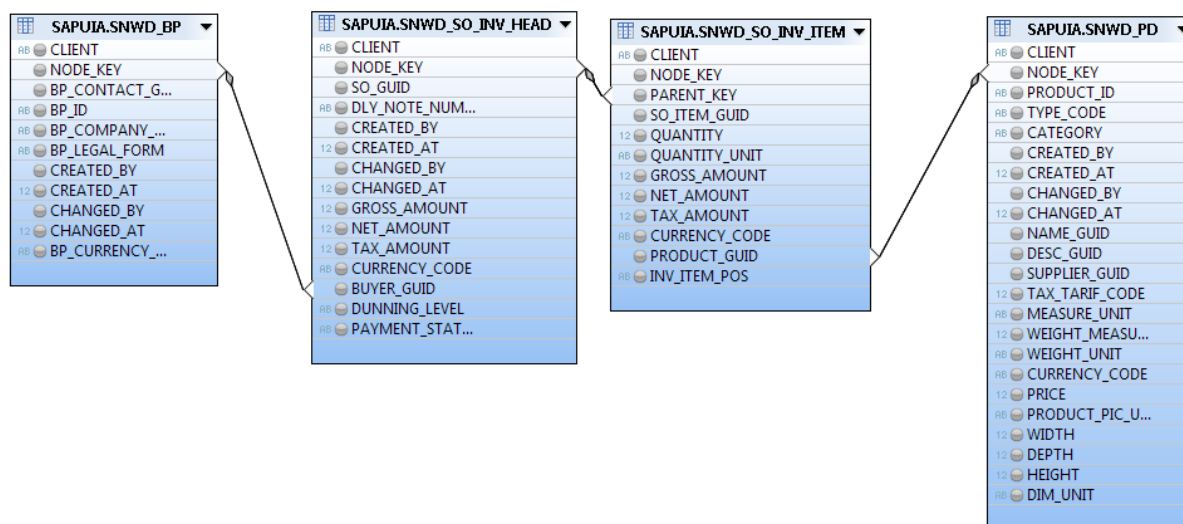
The calculation views—Open Sales Invoices and Closed Sales Invoices—itsself are built using the Sales Order, Sales Order Invoice Header, Sales Order Invoice Items and Buyer[=Business Partner] tables. More details on the artifacts and development objects forming the application can be found in the chapters below.



5. Data Model and Package Structure

5.1 Data Model

The OIA scenario is based on the EPM demo model and mainly uses three of the EPM business entities: business partner or buyer, sales order invoice (which maintains a header and items), and product. Here is a graphical overview of the 4 interrelated fact tables that make up the OIA data model:



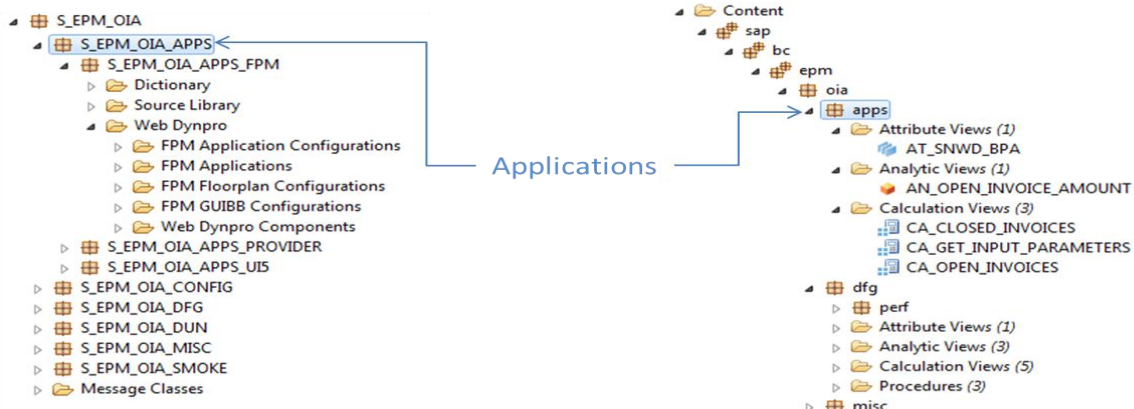
1. SNWD_BPA contains all the information about the business partner, representing the buyer, for this scenario.
2. SNWD_SO_INV_HEAD is the invoice items table containing all items of an invoice in different currencies. The PARENT_KEY contains the SNWD_INV_HEAD-NODE_KEY connecting the item and header table with a n:1 relation.
3. SNWD_SO_INV_ITEM is the Invoice Items table containing all the items of an invoice in different currencies. The PARENT_KEY contains the SNWD_INV_HEAD-NODE_KEY connecting the item and header table with a n:1 relation.
4. SNWD_PD contains all the information about a product. The NODE_KEY contains the SNWD_INV_ITEM-PRODUCT_GUID connecting the product and item table with a 1:n relation.

5.2 Package Structure

The FPM application and the HANA artifacts that the FPM application consumes are available in the packages - S_EPM_OIA_APPS_FPM [ABAP Package] and sap.bc.epm.oia.apps [HANA Package] respectively. The following screenshot displays the package structure of the application:

ABAP Content in ABAP Developer Tools

HANA Content in SAP HANA Modeler



6. Development Objects

6.1 HANA Artifacts

This section briefly explains the HANA artifacts used in the OIA application.

Calculation Views	Description								
sap.bc.epm.oia.app::CA_GET_INPUT_PARAMETERS	This is the script based calculation view used to retrieve current ABAP client, target currency and conversion date which is set by the ABAP session context. These retrieved values are later used by the sap.bc.epm.oia.app::CA_OPEN_INVOICES calculation view.								
sap.bc.epm.oia.app::CA_OPEN_INVOICES	This is the script based calculation view used to retrieve all the open sales order details along with the open days, buyer classification, and dunning level. It invokes another calculation view sap.bc.epm.oia.app::CA_GET_INPUT_PARAMETERS. Business logic is achieved using the Calculation Engine plan operator and uses the following EPM tables: <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td>snwd_so_inv_head</td> <td>contains header data for sales order invoices</td> </tr> <tr> <td>snwd_so</td> <td>Contains sales order header data</td> </tr> <tr> <td>snwd_so_inv_item</td> <td>Contains data for sales order invoice items</td> </tr> <tr> <td>snwd_bpa</td> <td>Contains buyer details</td> </tr> </table>	snwd_so_inv_head	contains header data for sales order invoices	snwd_so	Contains sales order header data	snwd_so_inv_item	Contains data for sales order invoice items	snwd_bpa	Contains buyer details
snwd_so_inv_head	contains header data for sales order invoices								
snwd_so	Contains sales order header data								
snwd_so_inv_item	Contains data for sales order invoice items								
snwd_bpa	Contains buyer details								
sap.bc.epm.oia.app::CA_CLOSED_INVOICES	This is a graphical calculation view used to view the payment history for the closed sales order for a particular buyer. Following EPM tables are used : <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td>snwd_so_inv_head</td> <td>Contains header data for sales order invoices</td> </tr> <tr> <td>snwd_so</td> <td>Contains sales order header data</td> </tr> <tr> <td>snwd_so_inv_item</td> <td>Contains header data for sales order invoice items</td> </tr> </table>	snwd_so_inv_head	Contains header data for sales order invoices	snwd_so	Contains sales order header data	snwd_so_inv_item	Contains header data for sales order invoice items		
snwd_so_inv_head	Contains header data for sales order invoices								
snwd_so	Contains sales order header data								
snwd_so_inv_item	Contains header data for sales order invoice items								

	snwd_bpa	Contains business partner header data
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6.2 ABAP Artifacts - External View

This view represents SAP HANA artifact in ABAP. As a developer, you can access SAP HANA artifacts using open SQL via this external view.

External Views	Description
SEPMAPPS_OPENINV	This external view is the ABAP DDIC representation of the corresponding SAP HANA artifacts (sap.bc.epm.oia.app::CA_OPEN_INVOICES) in the ABAP layer.
SEPMAPPS_CLSDINV	This external view is the ABAP DDIC representation of the corresponding SAP HANA artifacts [sap.bc.epm.oia.app::CA_CLOSED_INVOICES] in the ABAP layer.

6.3 ABAP Artifacts - Search Help

The fuzzy search for Buyer ID uses the search help structure H_EPM_OIA_BP.

Search Help	Description
H_EPM_OIA_BP	Fuzzy search on business partner ID involves the following fields: Buyer ID, Company Name, Email Address, Street, City, Country

6.4 ABAP Artifacts – Configuration tables

Search Help	Description
SEPM_OIA_CUST_T	This table contains Business Partner Classification customizing information such as currency code , max. gross amount , max. open days for Open Item Analysis.

6.5 ABAP Artifacts – FPM

Application

Object Type	FPM Application
Application Name	S_EPM_OIA
Description	FPM application for SALV IDA

Application Configuration

Object Type	FPM Application Configuration
Configuration Name	S_EPM_OIA_ALVH
Description	FPM application configuration for SALV IDA

OVP Configuration

Object Type	Floorplan Configuration (OVP)
Configuration Name	S_EPM_ALVH_OVP
Description	FPM application configuration for SALV IDA. This OVP configuration has four pages configured. The list of pages are: <ol style="list-style-type: none"> 1. Initial Screen 2. Main Page 3. Show Payment History 4. Currency Conversion

Application Component Configuration

Object Type	FPM Application Component Configuration
Component Name	S_EPM_OIA_OVP_APPCC
Description	OVP Page component controller for S_EPM_OIA application. This component handles toolbar actions and URL parameter actions. Various actions handled in this component controller are: <ul style="list-style-type: none"> • Check for existence of the BW component • Enable toolbar button for BW navigation • Execute Buyer classification • Execute Dunning Run • Launch Risk Analysis (BW) • Reset Buyer classification • Reset Dunning Run

Initial Screen Configuration

Object Type	OVP initial screen page configuration
Page Configuration Name	PAGE_OIA_INITIAL_SCREEN
Component Type	Form
Component Configuration Name	EPM_OIA_OVP_INIT_SCR_CFG
Feeder Class	CL_EPM_OIA_INIT_SCREEN_FEEDER
Description	Initial Screen configuration to display information message for non-HANA DB scenario. When the user tries to launch the FPM application in a non-HANA DB system the following information message is displayed: “This application works only if underlying database is SAP HANA. The system status shows that it does not have SAP HANA database. Open Items Analysis is a reference application built using FPM to showcase SAP NW AS ABAP capabilities optimized for the usage on SAP HANA.”

Main Page Configuration

Object Type	OVP main page configuration
Page Configuration Name	PAGE_OPEN_ITEM_ANALYSIS

Description	Main page contains two components: <ul style="list-style-type: none"> • Search: This component has the configuration for search fields • List: This component has the configuration for result list (SALV IDA)
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Main Page Configuration: Search Component

Object Type	Search Component Configuration
Component Type	Search
Component Configuration Name	EPM_OIA_OVP_SEARCH_ALVH_CFG
Feeder Class	CL_EPM_OIA_SEARCH_FEEDER
Description	Configuration for Search component: <ul style="list-style-type: none"> • Sales Order ID • Buyer ID • Open Since Date

Filter Criteria

Sales Order ID	is		+ -
Buyer ID	is		+ -
Open Since	is later than		+ -

Main Page Configuration: List Component

Object Type	List Component Configuration
Component Type	List
Component Configuration Name	EPM_OIA_OVP_SEARCH_ALVH_CFG
Feeder Class	CL_EPM_OIA_SEARCH_ALVH_FEEDER
Description	Configuration for List component (SALV IDA): <ul style="list-style-type: none"> • Sales Order ID • Buyer Name • Gross Amount • Currency • Days Open • Current Dunning Level • Buyer Classification

Open Sales Orders						
Sales Order ID	Buyer Name	Gross Amount	Currency	Days Open	Current Dunning Level	Buyer Classification
0500000021	DelBont Industries	99,96	CAD	79	1	3
0500000021	DelBont Industries	82,11	USD	79	1	3
0500000021	DelBont Industries	5,47	EUR	79	1	3
0500000041	Panorama Studios	709,24	EUR	59	2	3
0500000041	Panorama Studios	94,01	ARS	59	2	3
0500000054	JaTeCo	378,18	USD	46	1	3
0500000054	JaTeCo	196,35	JPY	46	1	3
0500000054	JaTeCo	186,71	EUR	46	1	3
0500000061	Pateu	35,58	ARS	39	2	3
0500000061	Pateu	103,53	EUR	39	2	3
0500000061	Pateu	65,45	JPY	39	2	3
0500000061	Pateu	121,38	MXN	39	2	3
0500000063	JaTeCo	1.802,85	USD	37	1	3
0500000063	JaTeCo	678,30	GBP	37	1	3
0500000063	JaTeCo	1.779,05	EUR	37	1	3

Dialog Page Configuration: Show Payment History

Object Type	Dialog Show Payment History page configuration
Page Configuration Name	DIALOG_SHOW_PAY_HISTORY
Description	<p>Dialog page configuration for Show Payment History. This page contains two components:</p> <ul style="list-style-type: none"> • Buyer Details: Buyer Header Data • Closed Sales Orders: List of Closed Sales Order of Buyer (SALV IDA)

Payment History

Data	Address
Business Partner ID: 100000002	Street/House Number: 1 2345 King Street 1
Company Name/Legal Form: DelBont Industries Ltd.	Zip Code/City: 19899 Wilmington, Delaware
Currency: USD	Country: US
E-Mail Address: maria.brown@delbont.com	Phone Numbers
Web Address: http://www.delbont.com	Telephonic Number: 3023352668
Business Partner Role: Customer	Fax Number:

Sales Order History

Sales Order ID	Creation Date	Closed Date	Days Open	Gross Amount	Currency	Dunning Level
500000001	09.12.2012	19.02.2013	72	3.935,33	MXN	0
500000001	09.12.2012	19.02.2013	72	1.802,85	USD	0
500000001	09.12.2012	19.02.2013	72	1.829,03	EUR	0
500000001	09.12.2012	19.02.2013	72	339,15	GBP	0
500000001	09.12.2012	19.02.2013	72	1.023,40	CAD	0

Dialog Show Payment History: Buyer Details Component

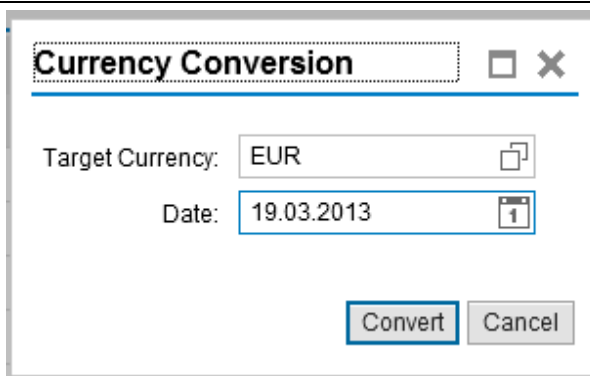
Object Type	Form Component Configuration
Component Type	Form
Component Configuration Name	EPM_OIA_SHOW_BP_DETAILS_ALVH_CFG
Feeder Class	CL_EPM_OIA_BP_DET_ALVH_FEEDER
Description	Component Configuration for Buyer Header Data.

Dialog Show Payment History: Closed Sales Orders List

Object Type	List Component Configuration
Component Type	List
Component Configuration Name	EPM_OIA_SHOW_SO_HISTORY_ALVH_CFG
Feeder Class	CL_EPM_OIA_SO_HIST_ALVH_FEEDER
Description	Component Configuration for Closed Sales Order of the Buyer (SALV IDA).

Dialog Currency Conversion Page Configuration

Object Type	Component Configuration for Currency Conversion
Page Configuration Name	DIALOG_CURR_CONV
Component Type	Form
Component Configuration Name	DIALOG_CURR_CONV_CFG
Feeder Class	CL_EPM_OIA_CURR_CONV_FEEDER
Description	Component configuration for currency conversion dialog. This has two input fields: <ul style="list-style-type: none"> • Target Currency • Conversion Date



Shared Data Class

Object Type	Shared Data Class
Class Name	CL_EPM_OIA_SHARED_DATA
Description	Shared data class for classical and SALV IDA implementation. Contains APIs to get the data from HANA artifacts for Open Sales Orders, Show Payment History, Currency Conversion.

7. Appendix

The table below describes the various Dunning Levels:

Dunning Level	Description
0/<initial>	Do not remind yet
1	Send first reminder
2	Send second reminder
3	Send third/final reminder
4	Forwarded to collection agency
5	Action for payment

The table below describes the various Buyer Classifications:

Class	Buyer Classification
1 or C	Negative payment record or Risky
2 or A	Premium
3 or B	Standard

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