

ABAP for SAP HANA Reference Scenario: Open Items Analysis FPM Application created using Application Creation Tool (ACT)

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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. Business Scenario

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

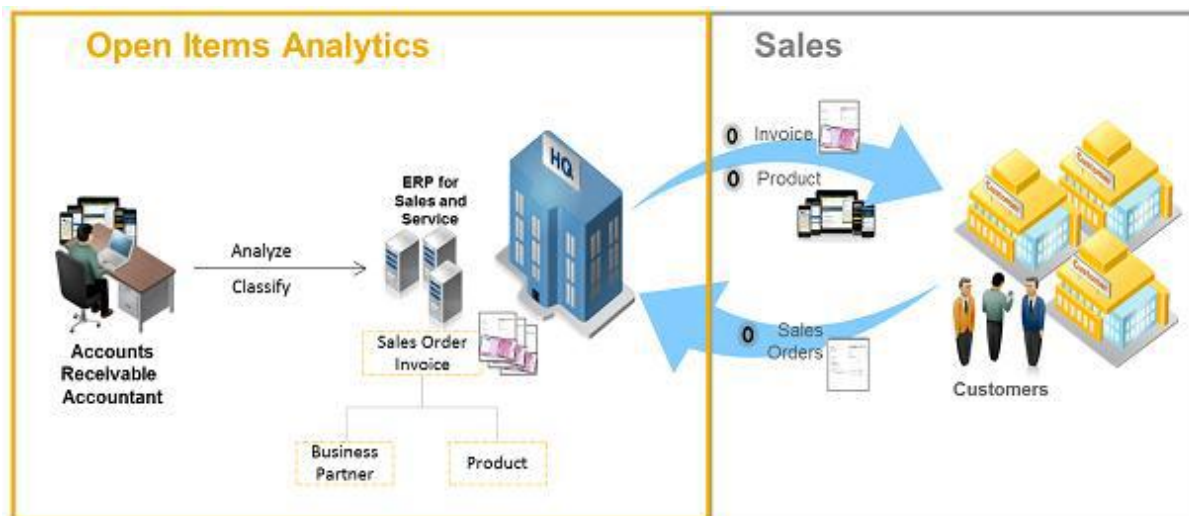
Because of the great importance of ready cash in running a business, it is in a company's best interest to collect outstanding receivables as quickly as possible. By quickly turning sales into cash, a company has the chance to put the cash to use again and ideally to reinvest and increase sales.

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

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

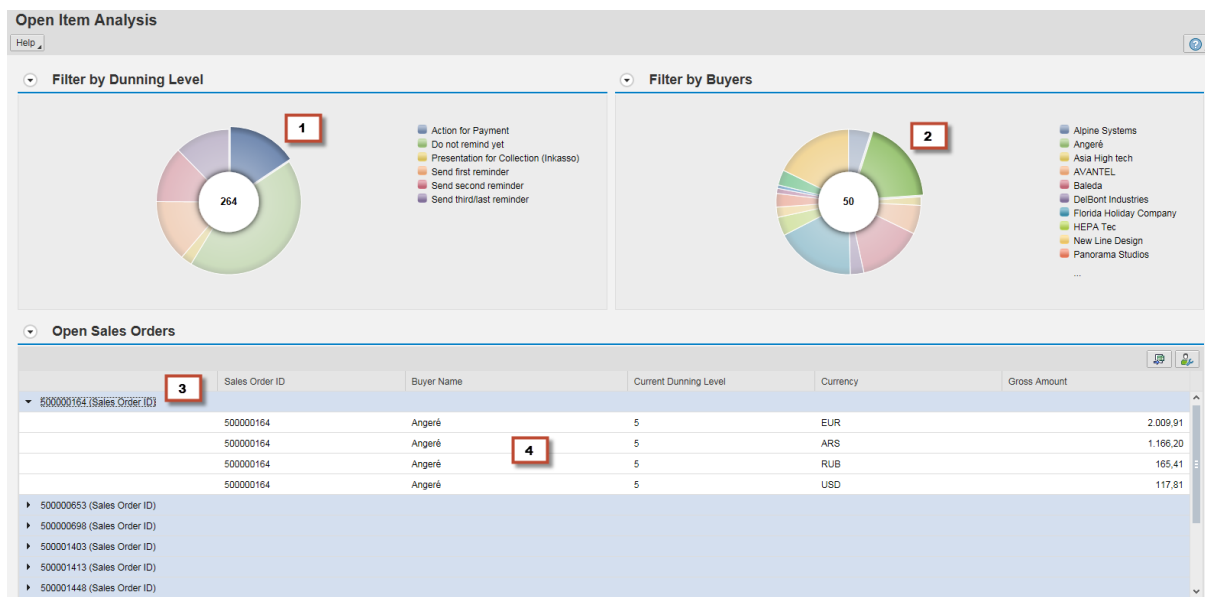
1. Check sales invoices with open status.
2. Check open sales orders based on Dunning Level and Buyer Names (subsequent topic contains information about Dunning Level).
3. Check Dunning Level of open invoices.

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.



2. Application Overview

Application Creation Tool (ACT) is used to create Open Item Analysis (OIA). ACT uses FPM while creating OIA. The Open Item Analysis application interface appears as in the screenshot below. The various sections/functionalities of the OIA application are marked in numerals.



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

Number	Description
1	This panel displays a pie chart showing the number of open sales orders for each of the dunning levels. You can drill down to find more details for a given Dunning level. To filter buyers with Open Sales Orders as displayed in section 2 in the screenshot above, you must select a particular dunning level in section 1. It also filters all the Open Sales Order as displayed in section 3.
2	This panel displays a pie chart showing the Buyers with Open Sales Orders of the dunning level selected in section 1. On initial load, only the chart with dunning level as in section 1 is displayed. When you, as an Account Receivable Accountant, click on any slice of the dunning level pie chart, this chart is displayed. It displays only those buyers who have Open Sales Orders with the selected dunning level. It is also used to further filter the Open Sales Order list. When you select any buyer from this chart, the list displays only those Open Sales Orders that belong to the selected buyer as shown in section 3.
3	This section displays all the Open Sales Orders, grouped by sales order ID. This section also displays Buyer Name, Current Dunning Level, Currency and Gross Amount. A Sales Order can have one or more sales order items in different currencies. The list displays the total overdue amount grouped by currency for a given Sales Order ID.
4	This list displays the Open Sales Orders grouped by Sales Order ID and hence only Sales Order ID is displayed by default. Expand the list to see more details such as Buyer Name, Currency, and Gross Amount. Also, as explained above the sales order list is controlled by the filtering as applied in section 1 and/or section 2.

When the OIA application is initially launched the following information is displayed:

- The pie chart displaying the number of Open Sales Orders grouped by Dunning Level
- The list displaying all the Open Sales Orders

When one of the sectors of the dunning level pie chart is selected, the application enables the following drill down:

- The pie chart displaying all the buyers with the Open Sales Order of the selected dunning level
- The list displaying only the Open Sales Orders with the selected dunning level

When one of the sectors of the pie chart displaying buyers is selected, further drill down is enabled:

- The Open Sales Orders in the list is further filtered based on the selected buyer
- The list displays only those Open Sales Orders with the selected dunning level and for the selected Buyer.

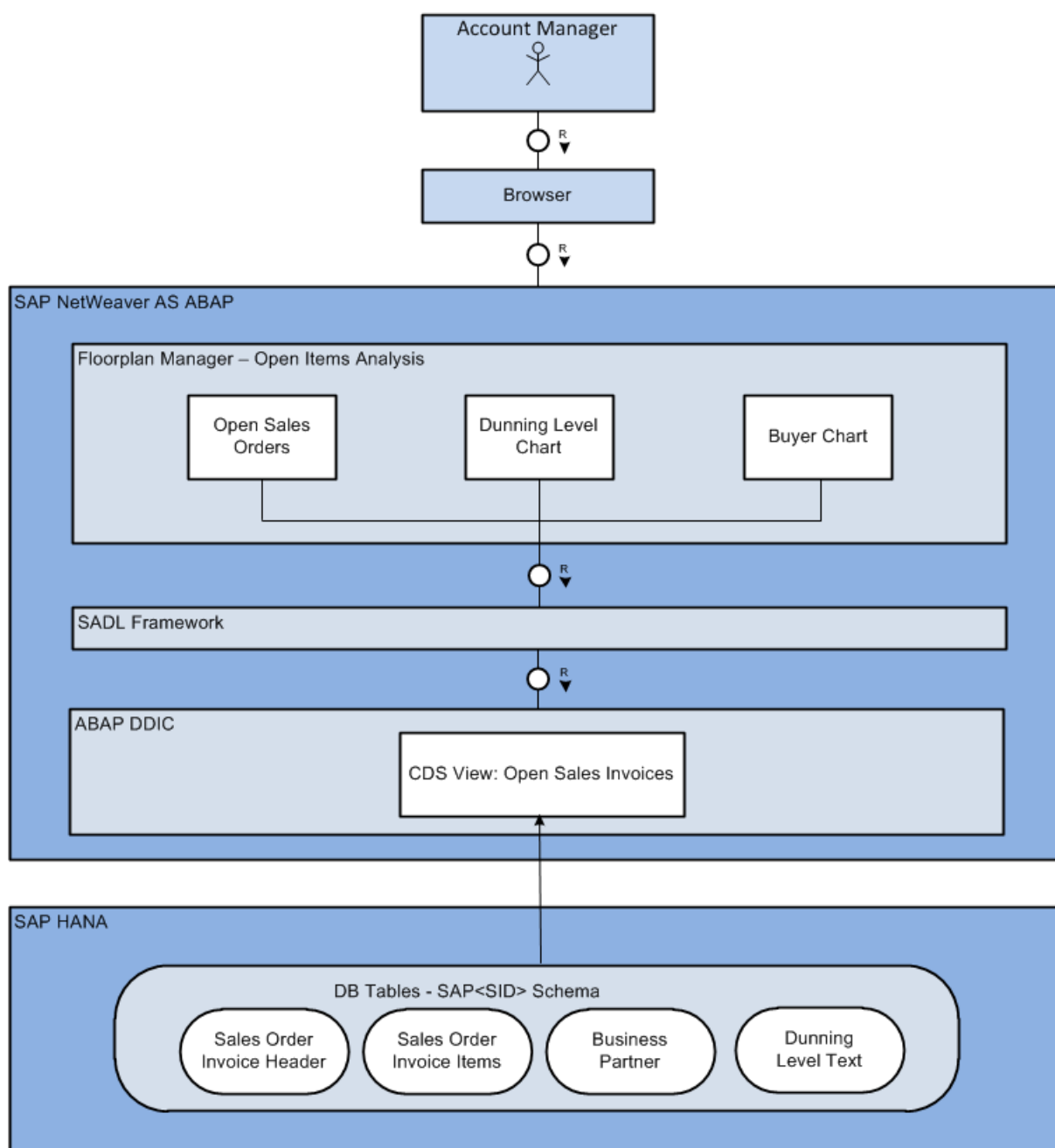
The key features covered in this OIA application:



The Floorplan Manager application based on SADL entities created using ACT can be accessed using the URL https://<server>:<port>/sap/bc/webdynpro/sap/s_epm_oia_sadl?sap-wd-configId=S_EPM_OIA_SADL

3. Architecture Overview with Technical Brief

The architecture diagram provided below defines the interactions between components of the *Open Items Analysis* application. The application uses the Core Data Services (CDS) view—Open Sales Invoices. CDS view returns back all the open sales orders. Open Sales Orders are those whose invoices have not yet been closed or paid or settled by the Buyers. For each of the Open Sales Order, the result gives the Business Partner Name, current Dunning Level, pending invoice amount in different currencies (Each Sales Order can have one or more Sales Order Items and the invoice amount can be in different currencies. For a given Sales Order ID, the data is grouped by Currency and the aggregated invoice amount is displayed.). FPM UI backend renders the data based on Service Adaptation Definition Language (SADL) Framework.



FPM application was created using Application Creation Tool (ACT). FPM application is based on the SADL Framework. The details of ACT, SADL and CDS are as follows:

3.1 Application Creation Tool (ACT)

The Floorplan Manager (FPM) Application Creation Tool (ACT) significantly reduces the effort involved in creating a new FPM application.

The tool itself is a Web Dynpro application, provided by FPM, which allows application developers to create FPM applications and their corresponding configurations for all available Floorplans (OIF, GAF, and OVP).

The ACT also allows you to create applications for adaptable FPM components, that is, it allows you to create context-based adaptations for your application.

3.2 Service Adaptation Definition Language (SADL) and Business Entities

The Floorplan Manager (FPM) framework contains several application wizards to create various types of FPM applications. There is a wizard for creating FPM applications based on Service Adaptation Definition Language (SADL) entities. This wizard creates a simple application consisting of a search page, that is, a page containing a section for the search criteria and a section for the search results. The wizard also helps the FPM developer to add charts to the UI.

SADL is a framework, which enables consumption of different business object models, and other entity-based models, in particular DDIC tables and views, in a uniform way. Detailed knowledge of the modeling frameworks, such as Business Object Process Framework (BOPF) or (Business Object Layer) BOL is not required; the SADL entity model provides all the required information to the UI. In ACT, SADL entities are known to be Business Entities.

With SADL, it is possible to push down queries directly to the database itself, thereby improving response cycle times, and, with suitable databases, very large amounts of data (millions of records) can be retrieved and displayed quickly.

3.3 Core Data Services (CDS) for ABAP

Core Data Services (CDS) enhance SQL to allow defining and consuming semantically rich data models, thereby improving consumption, performance and interoperability. CDS simplifies and harmonizes the way you define and consume your data models, regardless of the consumption technology. CDS in ABAP provides you with a data definition language (DDL) for defining semantically rich database tables/views (CDS entities) and user-defined types in the database.

For several years for now, it is possible to define views in the ABAP Dictionary, but these views are quite restricted. For example, you can only define inner join for database views. Outer joins are available only for help and maintenance views. However, it is not possible to perform aggregations in views or define nested views. With ABAP 7.4 SP05, a new editor is available to define views directly in the Eclipse-based ABAP development environment. With this Source-based editor you can define CDS entities, which can be consumed in ABAP programs using Open SQL.

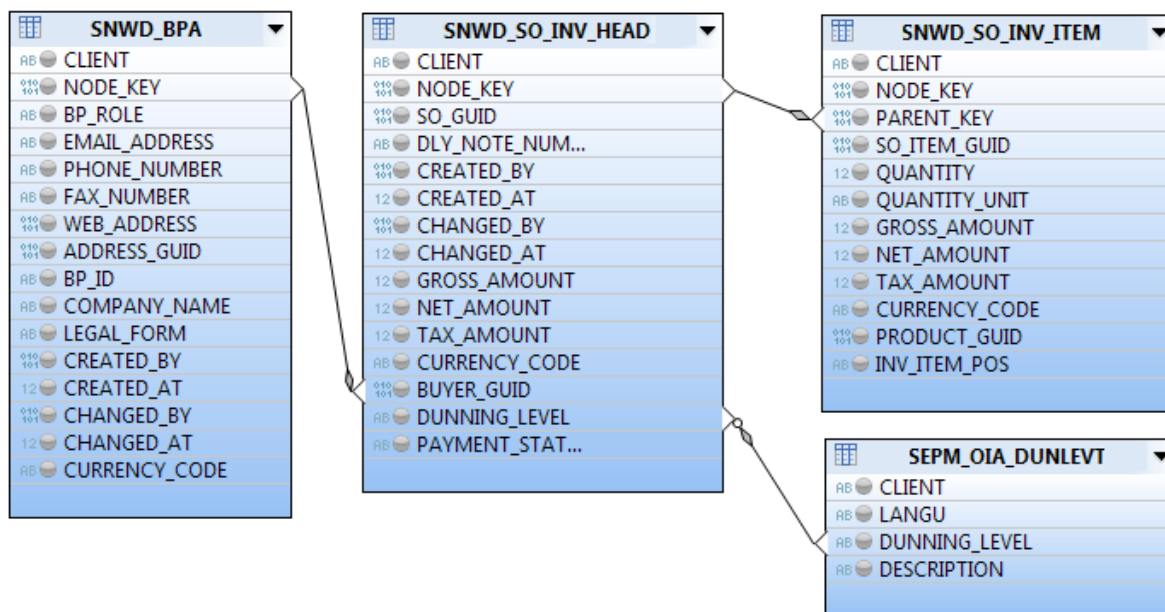
The CDS View building provides another way of code pushdown using features that are similar as in Open SQL. With CDS View building it is possible to define

1. Projections, aggregations, and groupings
2. Use expressions (like CASE), SQL built-in functions
3. UNION and UNION ALL and non-equivalent INNER JOINs
4. Nesting of Views with associations between the View entities (associations can be consumed in the WHERE clause as well as in expression in Open SQL queries)

4. Data Model and Package Structure

4.1 Data Model

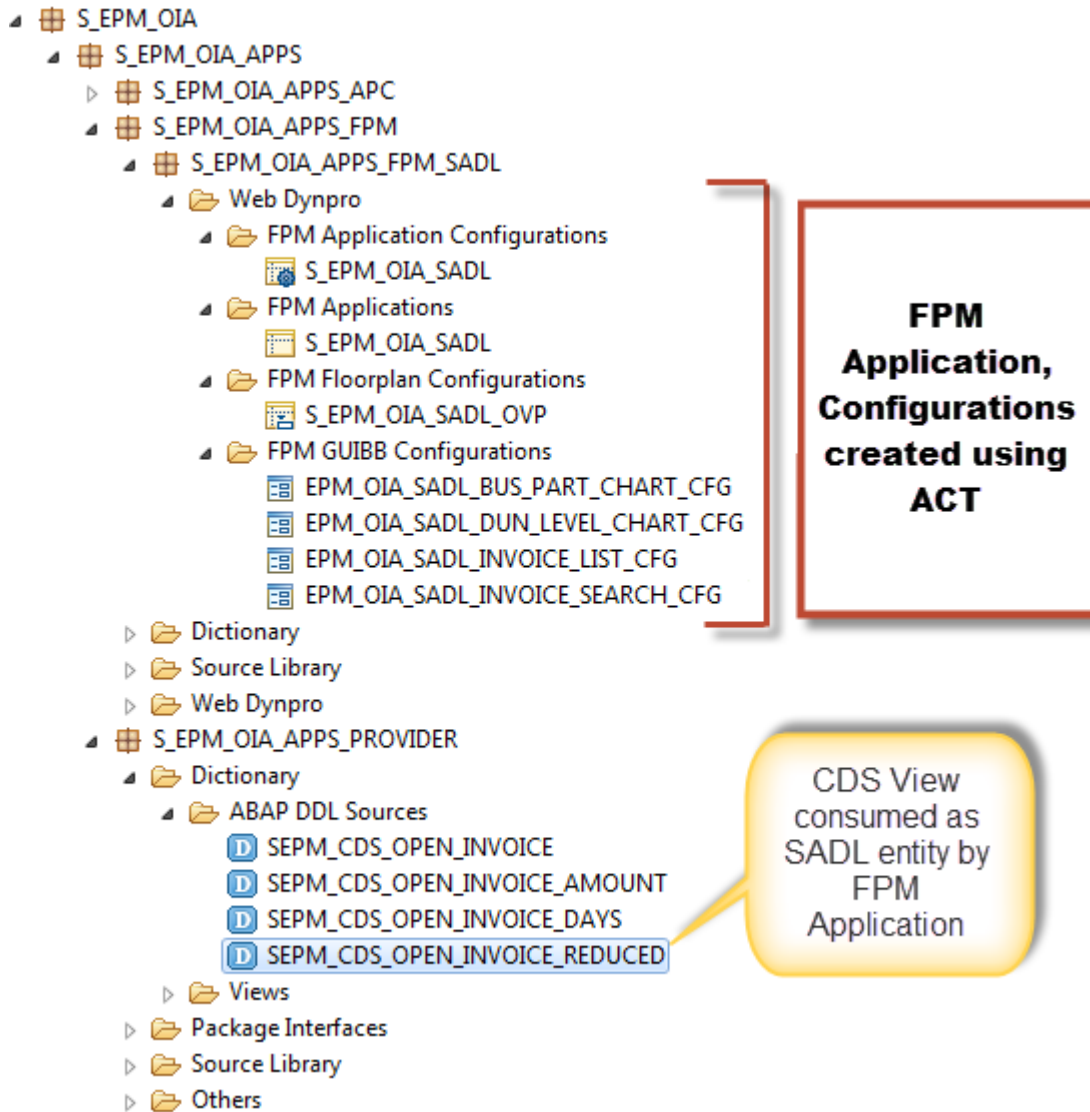
The OIA scenario is based on the EPM demo model and mainly uses two of the EPM business entities: business partner and sales order invoice (which maintains a header and items). Also it takes text information from dunning level text table, which is maintained as part of OIA model. Here is a graphical overview of the four 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 header table containing Sales Order Invoice details. The BUYER_GUID refers to SNWD_BPA-NODE_KEY connecting the business partner and invoice header in 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. SEPM_OIA_DUNLEVT is the text table for the dunning level.

4.2 Package Structure

The FPM application is available in the ABAP package - S_EPM_OIA_APPS_FPM_SADL. The CDS view SEPM_CDS_OPEN_INVOICE_REDUCED is part of the ABAP package S_EPM_OIA_APPS_PROVIDER. The following screenshot displays the package structure of the application:



5. Development Objects

5.1 ABAP Artifacts - CDS View

This section briefly explains the CDS entities used in the OIA application.

CDS View	Description
SEPM_CDS_OPEN_INVOICE_REDUCED	This CDS view fetches all the Open Sales Orders – whose payment is yet to be made by the Buyers. Buyer Name, Dunning Level, Overdue Invoice Amount, Currency are some of the details retrieved for each of the Sales Order. Each Sales Order can have one or more Sales Order Items and the invoice amount can be in different currencies. For a given Sales Order ID the data is grouped by Currency and the aggregated invoice amount is displayed. The CDS view uses the following EPM tables:

	snwd_bpa	Contains business partner header data
	snwd_so_inv_head	Contains header data for sales order invoices
	snwd_so_inv_item	Contains data for sales order invoice items
	sepm_oia_dunlevt	Text table for dunning level description

5.2 ABAP Artifacts – FPM

Application

Object Type	FPM Application
Application Name	S_EPM_OIA_SADL
Description	FPM Application created using ACT

Application Configuration

Object Type	FPM Application Configuration
Configuration Name	S_EPM_OIA_SADL
Description	FPM application configuration for app S_EPM_OIA_SADL

OVP Configuration

Object Type	Floorplan Configuration (OVP)
Configuration Name	S_EPM_OIA_SADL_OVP
Description	Floorplan configuration for the application. This OVP configuration is a single page configuration.

Initial Page Configuration

Object Type	OVP initial page configuration
Page Configuration Name	PAGE_EPM_OIA_SADL
Description	<p>The page contains two sections:</p> <ul style="list-style-type: none"> • SECTION_EPM_OIA_SADL_CHARTS This section holds two pie charts. Open Sales Orders that can be filtered by: <ul style="list-style-type: none"> ○ Dunning Level ○ Buyer/ Business Partner • SECTION_EPM_OIA_SADL_LIST This section holds the list for Open Sales Order Invoices

Chart Component: Dunning Level

Object Type	Chart Component Configuration
-------------	--------------------------------------

Component Type	Chart
Component Configuration Name	EPM_OIA_SADL_DUN_LEVEL_CHART_CFG
Feeder Class	CL_FPM_SADL_CHART – This is a generic feeder class which is automatically registered to the pie chart component when FPM application is created using ACT. This generic feeder class is complete in itself and there is no need to write explicit code in the feeder classes.
Description	<p>Configuration for Chart component:</p> <ul style="list-style-type: none"> • Dimension: DUNLEV_DESCR field of the CDS view which provides descriptive text to the Dunning Level. This field gives the descriptive text to Sales Order Invoice Header (SNWD_SO_INV_HEAD)'s field CURRENT_DUNNING_LEVEL. In the CDS view, the descriptive text is fetched from dunning level text table SEPM_OIA_DUNLEVT. • Measure: FPM_SADL_CHART_COUNT. This is an auto generated field, which helps to determine the count of a particular field in the output structure. In this case it helps to determine the number of Open Sales Orders with a given Dunning Level.

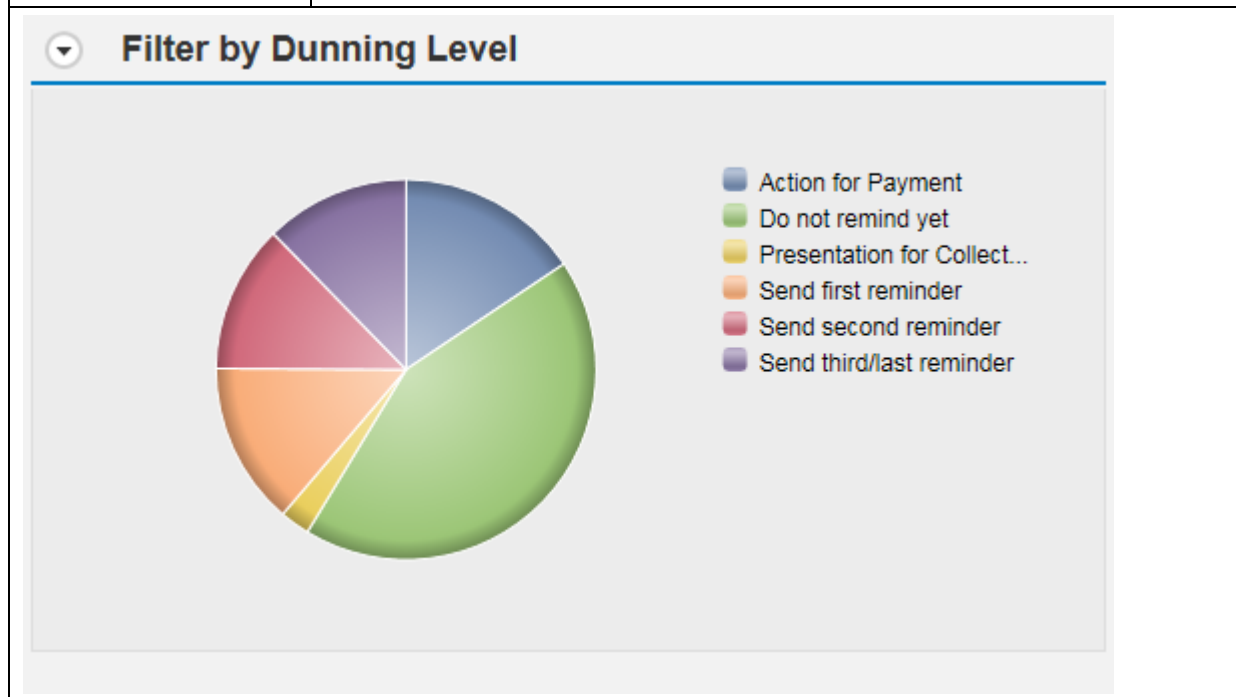
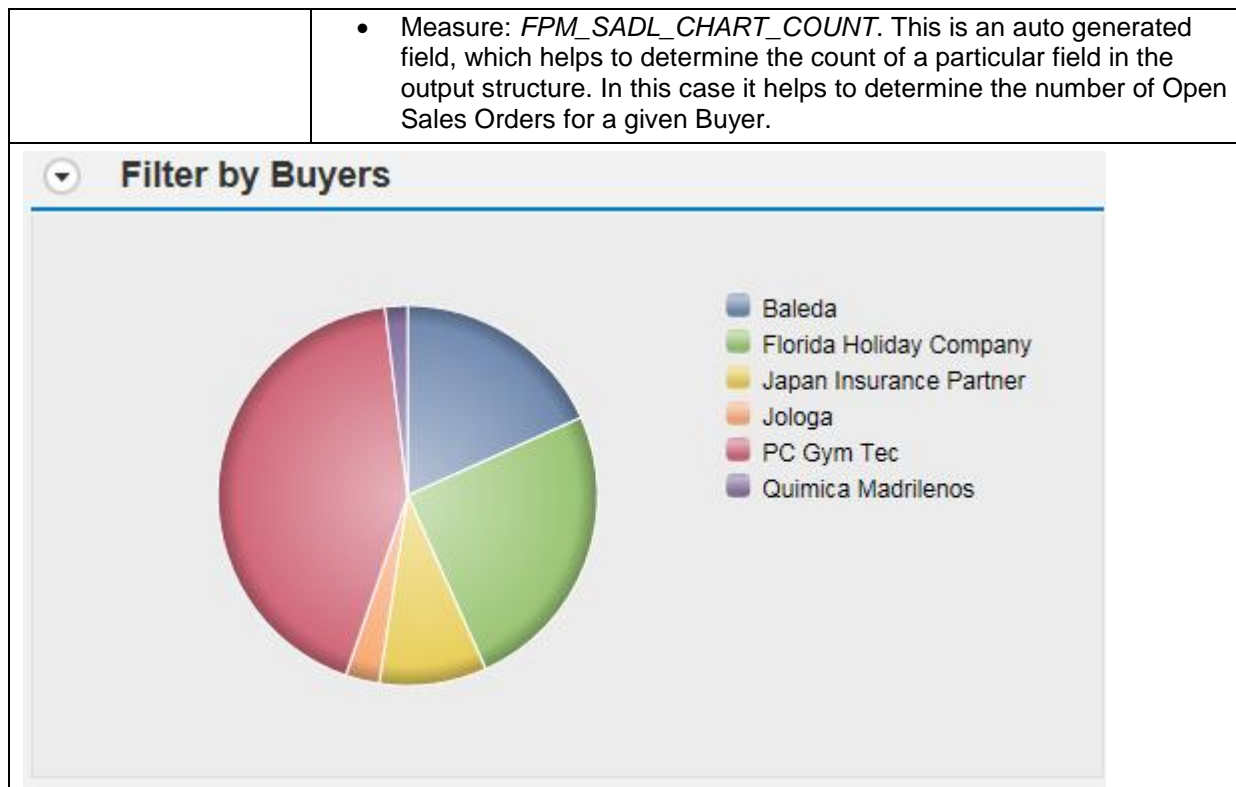


Chart Component: Dunning Level

Object Type	Chart Component Configuration
Component Type	Chart
Component Configuration Name	EPM_OIA_SADL_BUS_PART_CHART_CFG
Feeder Class	CL_FPM_SADL_CHART – This is a generic feeder class which is automatically registered to the chart component when FPM application is created using ACT. This generic feeder class is complete in itself and there is no need to write explicit code in the feeder classes.
Description	<p>Configuration for Chart component:</p> <ul style="list-style-type: none"> • Dimension: COMPANY_NAME



List Component: Open Sales Orders

Object Type	List Component Configuration
Component Type	List
Component Configuration Name	EPM_OIA_SADL_INVOICE_LIST_CFG
Feeder Class	CL_FPM_SADL_SEARCH_RESULT - This is a generic feeder class, which is automatically registered to the list component when FPM application is created using ACT. This generic feeder class is complete in itself there is no need to write explicit code in the feeder classes.
Description	<p>List consists of following fields:</p> <ul style="list-style-type: none"> Sales Order ID (As the Sales Order can have one or more Sales Order Items in different currencies the invoice amount is aggregated grouped by Currency and the data is hence grouped by Sales Order ID on load) Buyer Name Current Dunning Level Currency Gross Amount

Open Sales Orders					
	Sales Order ID	Buyer Name	Current Dunning Level	Currency	Gross Amount
▼	500000156 (Sales Order ID)				
	500000156	Japan Insurance Partner	3	EUR	103,53
	500000156	Japan Insurance Partner	3	MXN	40,46
	500000156	Japan Insurance Partner	3	ARS	106,74
▶	500000165 (Sales Order ID)				
▶	500000315 (Sales Order ID)				
▶	500000323 (Sales Order ID)				
▶	500000328 (Sales Order ID)				
▶	500000402 (Sales Order ID)				
▶	500000406 (Sales Order ID)				

6. Appendix

6.1 Appendix A – Abbreviations

Abbreviation	Description
ADT	ABAP Development Tools
EPM	Enterprise Procurement Model
NW	NetWeaver
ABAP AS	ABAP Application Server
FPM	Floorplan Manager
SADL	Service Adaptation Definition Language
ACT	Application Creation Tool
CDS	Core Data Services

6.2 Appendix B – Dunning Level Description

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/last reminder
4	Presentation for Collection agency
5	Action for payment

6.3 Appendix C – Link to ABAP for SAP HANA Reference Scenarios

- ABAP for SAP HANA Reference Scenario - <http://scn.sap.com/docs/DOC-35518>
- ABAP for SAP HANA Reference Scenario: Implementing Open Items Analysis using SAP Floorplan Manager - <http://scn.sap.com/docs/DOC-47390>
- ABAP for SAP HANA Reference Scenario: Implementing Mobile based Open Items Analysis Using SAP UI5 and SAP Gateway Foundation Component - <http://scn.sap.com/docs/DOC-47388>

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