Using ABAP-OO in BI-Transformations through Custom Class

Applies to:
BI 7.0 BW 3.5. For more information, visit the Business Intelligence homepage.

Summary:
In BI 7.0, BI Transformation routines must use ABAP-OO. Going a step further, using custom class gives not only tremendous advantages of OO, but also through a logical segregation of ABAP code from BI design. This is illustrated with a practical application. Custom classes can also be used on earlier versions of BI.

Author: Varad Desikan
Company: Capgemini(US) LLC
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Author Bio
Varad Desikan is Manager, BI with the East Business Unit of Capgemini (US) LLC
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1. Introduction

In BI 7.0, BI Transformation routines must use ABAP-OO and all new constructs by SAP follow ABAP-OO. Indeed, as per the methodology promoted by SAP, ABAP-OO should be the right path for any ABAP development whether in ECC or BI. It has been a common practice to use function modules (standard and custom) within start routines to avoid repetitive code. Going further in this process, using custom class gives tremendous advantage not only in terms of advantages of OO viz., reliability, re-usability, information hiding etc. but also in the speed of development and advantage of segregation of code and BI Modelling. This is illustrated with a real application approach. Indeed, custom classes can also be used on earlier versions of BI, such as BW 3.5.

2. Case Application

The application is: Custom validation of flat file inputs to load GL DSO for balances from different companies of a multi-national, into the Acquisition Layer. There are different flat files for Actual, and Plan (of different types). The file is accepted or rejected in this layer and only accepted files move into the Integration layer. This necessitates building exhaustive and complex validation routines, within the transformation for each type of transaction. The process is off-loaded into a custom class, which is instantiated in the Transformation. The custom class takes the source-package as the input and returns the modified source-package with error codes or success codes and the uploaded request is processed subsequently by a separate ABAP error-handler. The development of the custom class and usage in the different transformations is illustrated in the following.

3. Calling the Custom Class in the Transformation:

The build in the Transformation to call the custom class is illustrated here:

3.1 Start Routine:

In the Global Area, define the Class under Data: definition
Using ABAP-OO in BI-Transformations through Custom Class

Screen 1: Global Area definition of class

In the Transformation Method, where the user code is written,

First, ‘Instantiate’ the class by ‘Create Object’.

When you instantiate, the Constructor method of the Class is invoked (if it is included as a method)

Screen 2: Instantiation of the Class & calling the methods
Then, Call the methods of the Class as required; referring to Screen 2, the entire source_package is passed to the Class-method and it returns with the 'Changed' source_package besides the controls updated in a defined structure.

The first Call is made to the method LINE_ITEM_VALIDATION passing the parameters vtype = '010' for value type for actual (transformation to Actuals DSO) and version which specifies type of actual (eliminated, uneliminated), the datapakid to address special treatment for the last datapack.

The second call to method TOTALS_VALIDATION invokes validation of the totals (at end of the last package), where accumulated totals are validated for various criteria.

### 3.2 End Routine:
In the End Routine, the class is used to transform the Result_Package. In the case, period value for each line is computed from Totals for Current period and previous period.

![Screen 3 Call to a method in the End Routine](image)

### 4. Construction of the Custom Class Object:
This case example involves passing the entire package: source_package or result_package to the Class and getting back the changed package

#### 4.1 Communication between Transformation and Class
Create 2 structures which map to the source structure of the data source and the DSO (or Cube) structure to which the data is loaded by the Data source; the source structure is for use in the Start Routine and the DSO structure for the End Routine.
Screen 4 Source Structure

For the DSO structure, the DSO dictionary structure can also be used.
Screen 5: DSO structure

Create 2 table types based on the 2 structures.
Dictionary: Maintain Table Type

Table Type: ZTRANSTYP
Short Text: Table Type for Data Source Structure

Attributes

Screen 6: Source table-type

Dictionary: Maintain Table Type

Table Type: ZDSOSTRUC
Short Text: Table Type for DSO STRUC

Attributes

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Screen 7: DSO table type

**4.2 Class Attributes**
In the Class Object, define your Data objects within Attributes after defining custom local type within Types; this is the Global data that is accessed by the different Methods.

Screen 8: Class Attributes

**4.3 Methods**
Private Methods are built for processes which are sub-processes(similar to function modules which carry out specific tasks) that can be carried out within the Class.
Screen 9 Class Methods

Public Methods are built for all the processes that are required to be carried out on the Source Package (Start routine) or the Result Package (End Routine) (or even Transfer Routines between fields) from the Transformation. They receive and pass data between the Transformation and the Class.

4.4 Parameters

The Public methods use the parameters based on structures and table types as stated in 4.1, for Source Structure and Source package, to pass the contents of the package or a line of the package as required. There can be additional parameters which identify the source and specific characteristics within the transformation. Parameter Types for the public method should be known outside the class in the Data dictionary.
Screen10 Public method Parameters(associated type must be known outside the class)

Parameter types of the Private class may be defined within the class only.

4.5 Brief on methods used in the case example
To get an idea of the advantage and usage of the custom class, here is a brief on the different methods in the example

<table>
<thead>
<tr>
<th>Method</th>
<th>Type of method</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTRUCTOR</td>
<td>Public</td>
<td>Calls the Private method STORE_MASTER_DATA</td>
</tr>
<tr>
<td>STORE_MASTER_DATA</td>
<td>Private</td>
<td>Stores master data as internal tables</td>
</tr>
<tr>
<td>GET_PSA_NAME</td>
<td>Private</td>
<td>Gets the PSA table name based on value type &amp; version</td>
</tr>
<tr>
<td>GET_REQUID</td>
<td>Private</td>
<td>Gets the max. Request id and max. datapakid of the PSA table</td>
</tr>
<tr>
<td>GET_INT_DSONAME</td>
<td>Private</td>
<td>Composes the DSO table name of integration layer based on value type and version</td>
</tr>
<tr>
<td>LINE_ITEM_VALIDATION</td>
<td>Public</td>
<td>Carries out validation at the line item level</td>
</tr>
<tr>
<td>TOTALS_VALIDATIONS</td>
<td>Public</td>
<td>Carries out validation on the totals at the end of the request</td>
</tr>
<tr>
<td>STORE_PREVIOUS_PERIOD</td>
<td>Private</td>
<td>Stores the previous period cumulative values from the Integration layer</td>
</tr>
<tr>
<td>CHECK_PREVIOUS_PERIOD</td>
<td>Private</td>
<td>Checks if previous period exists in the Integration layer</td>
</tr>
<tr>
<td>COMPUTE_PERIOD_VALUE</td>
<td>Public</td>
<td>Computes period value based on cumulative values of current and previous period</td>
</tr>
<tr>
<td>CREATE_ZERO_PERIOD</td>
<td>Private</td>
<td>Creates zero period values for next year at end of year</td>
</tr>
</tbody>
</table>
Testing: you can debug the class using DTP debugging feature or you may also build a simple Test report program which uses the custom structure and custom table and calls the custom class, to test.

5. Conclusion

The Custom class can be used for any Transformation routines. As they are maintained independent of the transformations, any changes to the routines are handled independent of the BI-Workbench build. The structure of the class itself provides considerable self-documentation, if it is split into small self contained private and public methods. For e.g. there can be one class object which manages all transformation routines for a Logistics application; separate methods are built for specific transformations while common methods are used by all transformations within the application.
Related Content

How to Routines within Transformations
https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/6090a621-c170-2910-c1ab-d9203321ee19

Simulating and Debugging DTP Requests

ABAP Objects

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