# Purchase Order: Create OData Service in the SAP NetWeaver Gateway System for CRUDQ Operations

## Applies to:

Duet Enterprise 2.0 SP01

## Summary

This guide describes in detail how to create and test OData service for CRUDQ operations in the SAP NetWeaver Gateway system for Purchase Order scenario. This guide explains the creation of the service using SAP NetWeaver Gateway Service Builder tool and the RFCs for Purchase Order.

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**Created on:** 12 February 2013

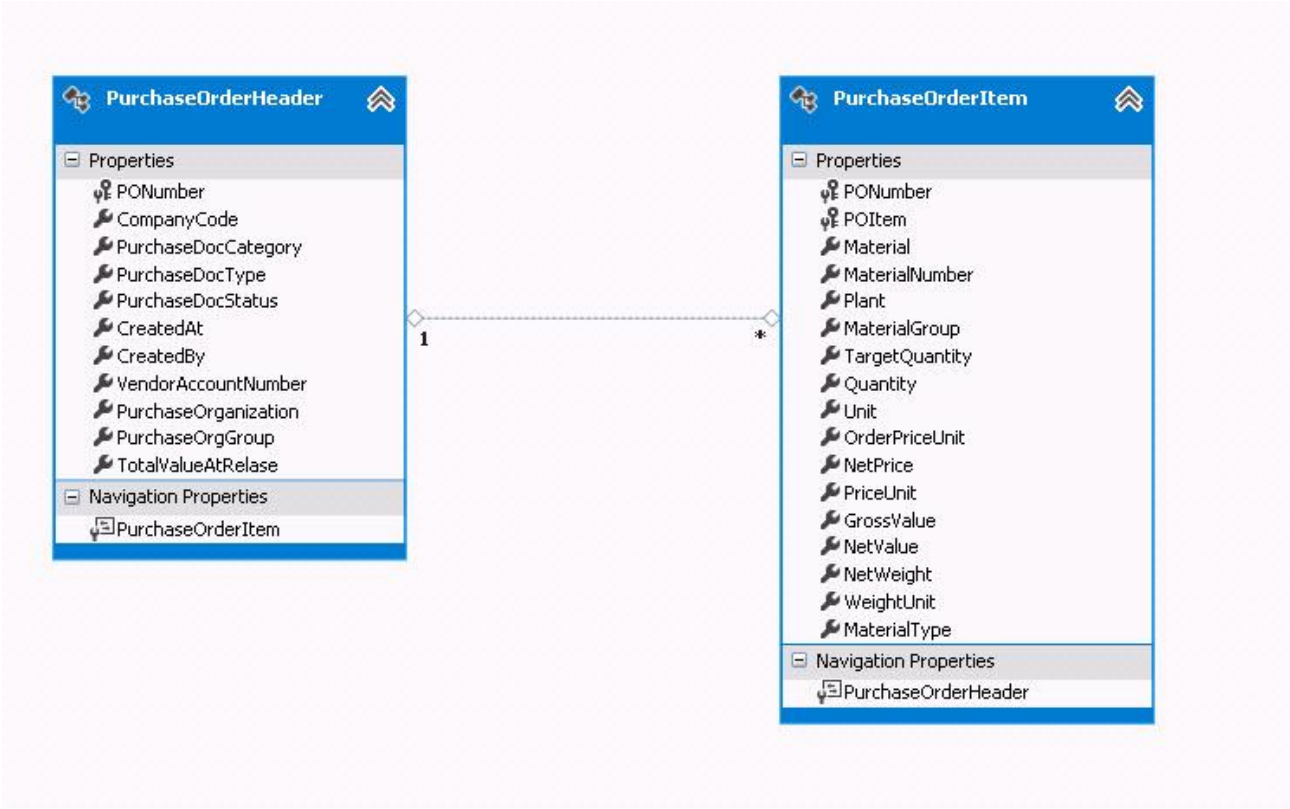
## Author Bio

Monisha Victor is working as a Developer with the Duet Enterprise 2.0 team at SAP Labs India.

## Table of Contents

## 1. Introduction

This guide describes the Purchase Order scenario for CRUDQ calls. The sample scenario used in this guide has two entities: purchase order header and purchase order item. The following diagram shows the Entity data model used in this guide:




The OData service is generated using the SAP NetWeaver Gateway Service Builder in the SAP NetWeaver Gateway system. Using this, the metadata and data provider classes, the model and the service is generated. In the OData Channel based development, the entities of the data model are defined in the metadata provider class. The run time behavior of the OData service is handled by the data provider class that is assigned to the object models. The methods in the metadata and data provider extension classes can be redefined according to the requirements.

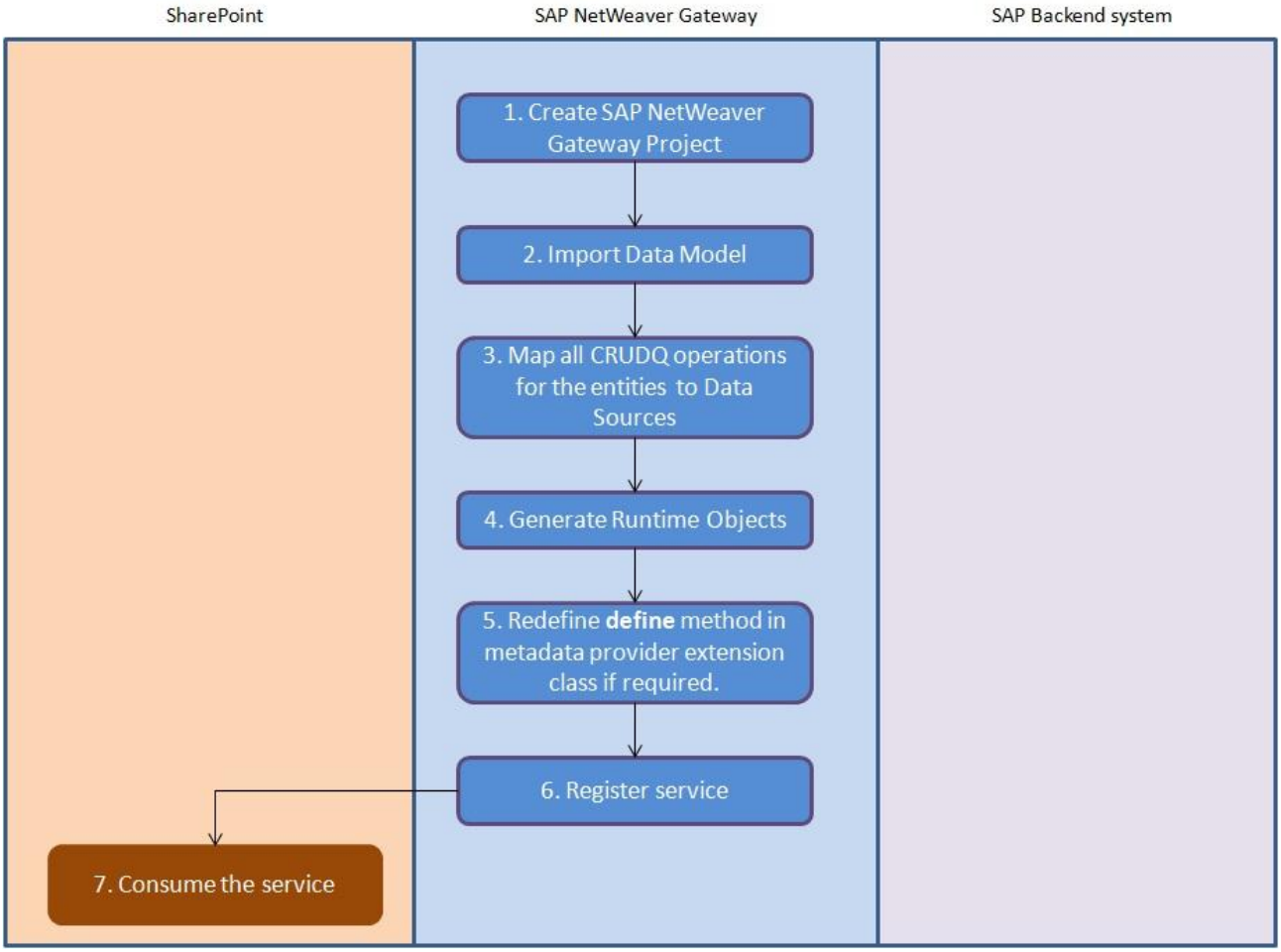
This document describes in detail the procedure to create the OData service and also steps to test it.

## 2. Prerequisites

1. SAP NetWeaver Gateway 2.0 SP5 (or higher) installed and configured. For more information, refer to How to Install and Configure Duet Enterprise 2.0 guide.
2. IW_BEP software component installed in the SAP NetWeaver Gateway system.
3. SAP backend system is connected to the SAP NetWeaver Gateway system.
4. Purchase Order scenario should be configured in the SAP system and it should be possible to create Purchase Order from the transaction me21n.
5. Minimum knowledge of ABAP Object Oriented programming is required.

## 3. Procedure

The following diagram gives an overview of the steps to be performed in the creation of the OData service:




### 3.1 Creating SAP NetWeaver Gateway Project

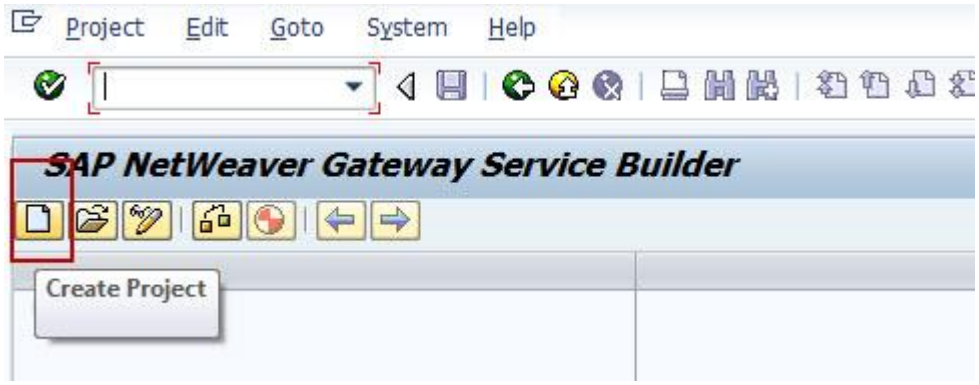
In this step, we will be creating a new SAP NetWeaver Gateway project to build the OData service.

Ensure the following authorization object required to create a -project is assigned to the user in the SAP NetWeaver Gateway system:

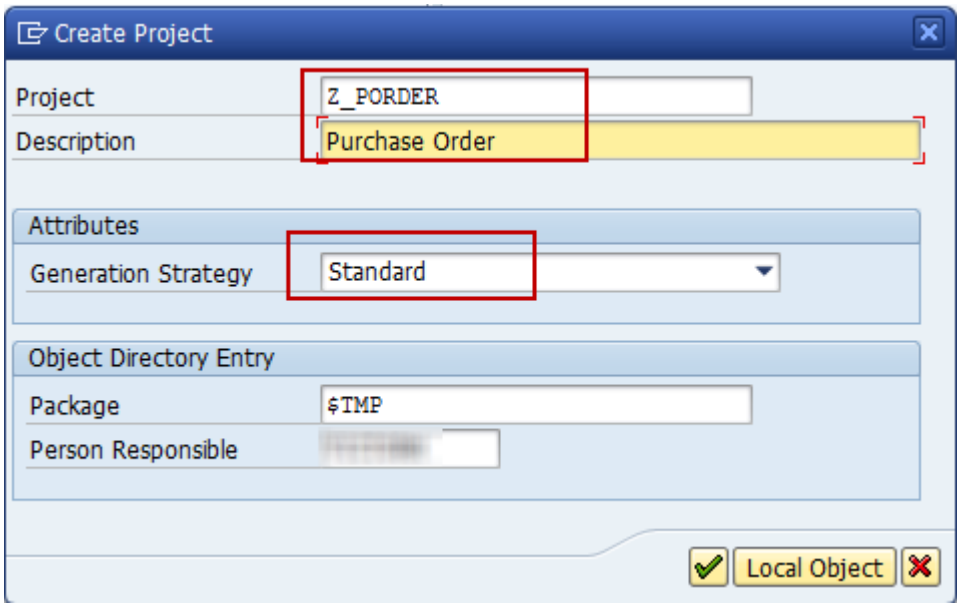
| Authorization Object | Authorization Field | Value |
|---|---|---|
| /IWBEP/SB | /IWBEP/PRJ | * |
| | ACTVT | 01, 02, 03, 07, 60 |
| | DEVCLASS | $tmp |

Refer to Duet Enterprise 2.0 Security Guide for more information on how to create a role and assign to users.

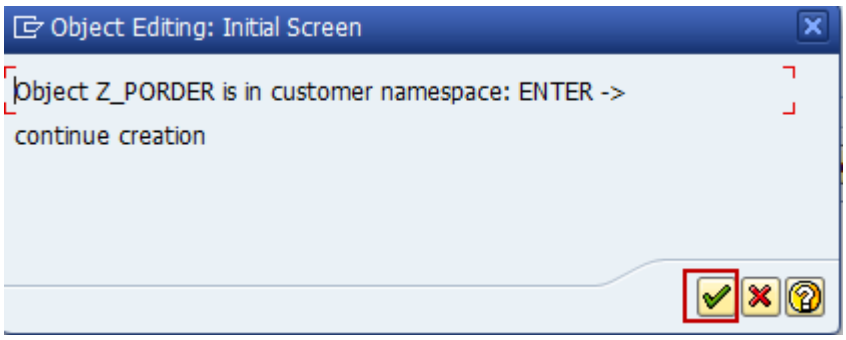
1. In the SAP system where IW_BEP component is installed, go to transaction **segw**.
2. Create a new project by clicking the **Create Project** option.



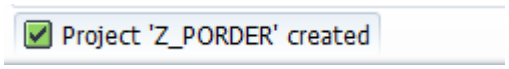

3. Enter the following details and click on **Local Object:**
   - Project: Z_PORDER
   - Description: Purchase Order
   - Generation Strategy: Standard



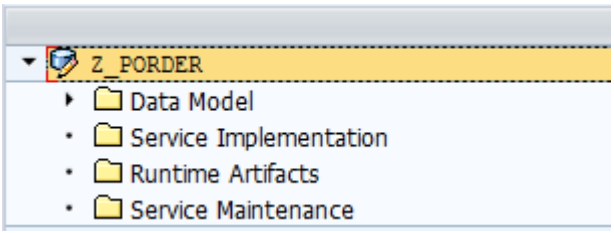

4. Click on the tick mark in the next screen.




5. The following success message is displayed.




6. Click on Save.
7. The project created will contain the folders as shown below:

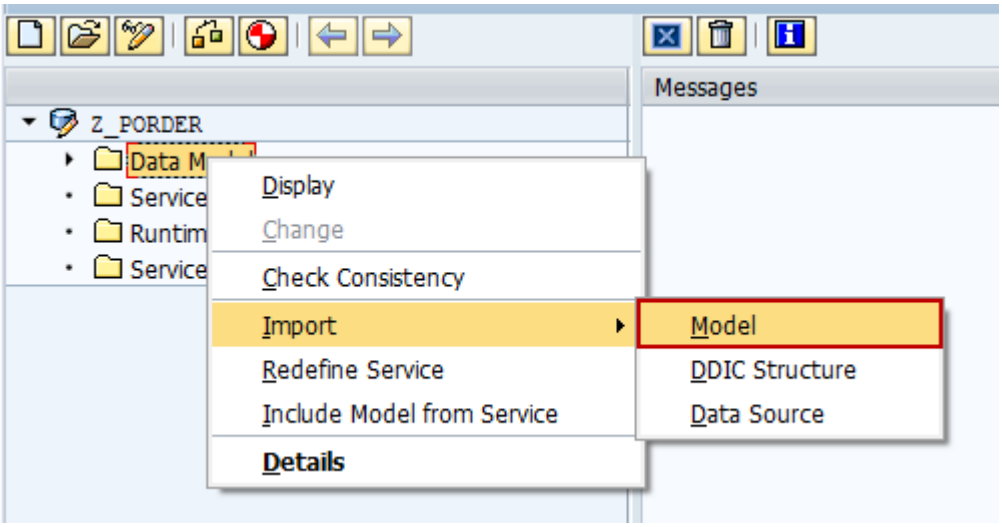



### 3.2 Import Data Model

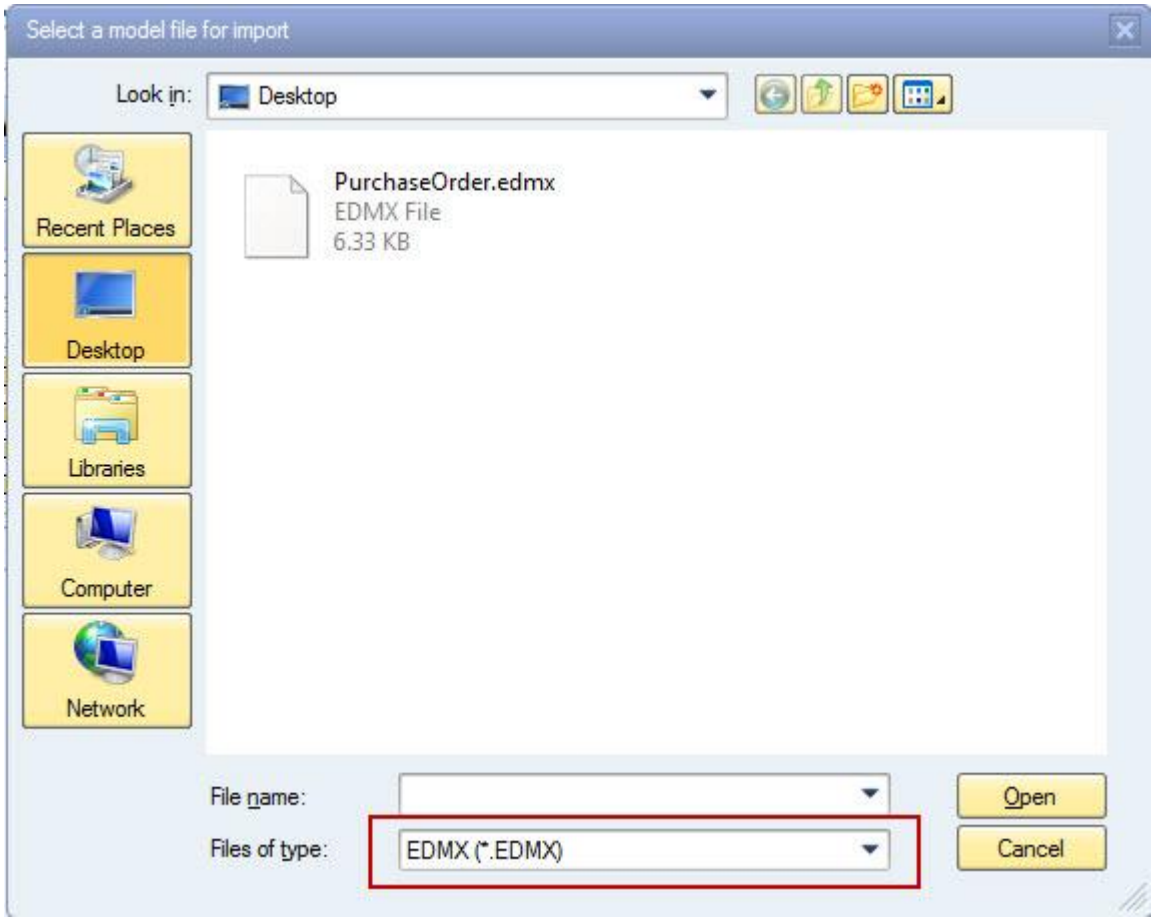
This step involves importing the edmx data model and creating the data model. An edmx file is an xml file that defines a data model and is used as a common interface between the SharePoint developer and the SAP developer. This data model was created using Visual Studio.

Refer to the model file POrder.txt that is used as a sample in this guide. Copy the contents into a file and save it as a .edmx file.

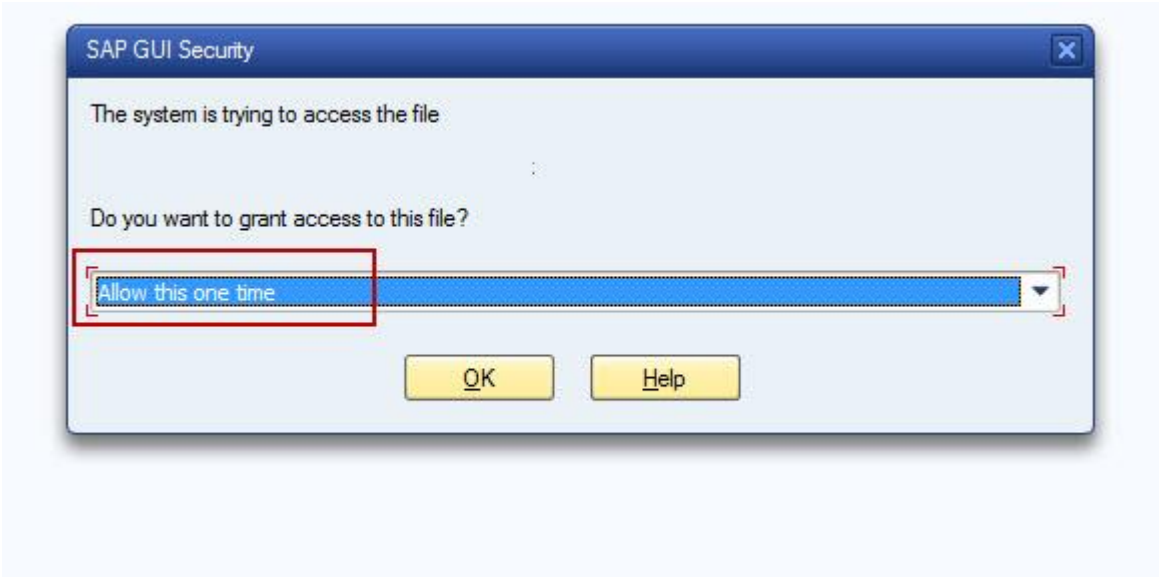
1. From the project folder in the service builder transaction **segw**, right click on the Data Model folder and click on **Import**-> **Data model**. Browse for the edmx file and import the file.



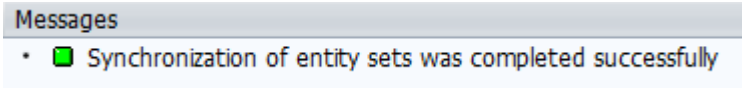

2. In the browse screen, choose EDMX as the files of type and browse for the edmx file and click on Open.



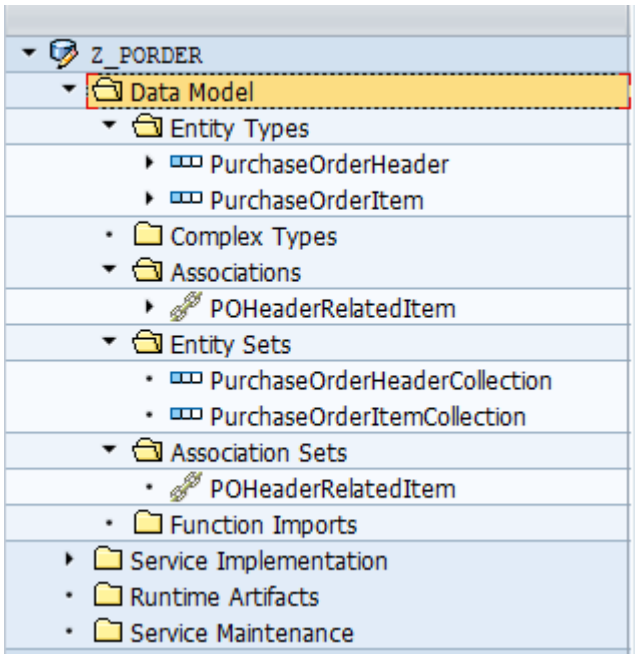

3. In the SAP GUID Security screen, choose **Allow this one time** and click on OK.

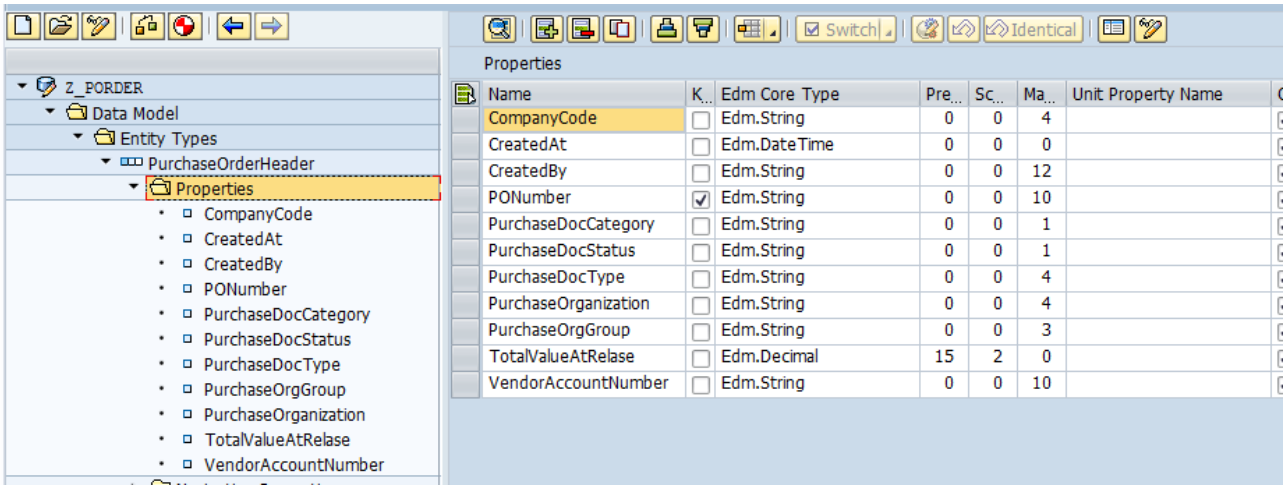



4. The following success message is displayed.



5. The entities and their properties can be viewed from the Data Model folder.



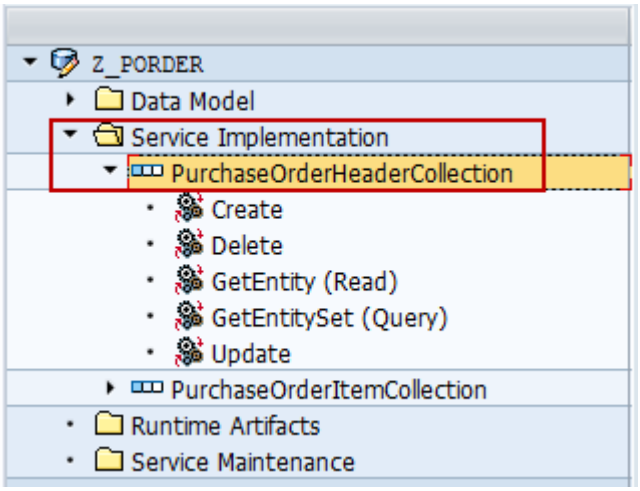

## 3.3 Map Data Source for the Query, Read, Update and Delete Operations

### 3.3.1 Query Operation

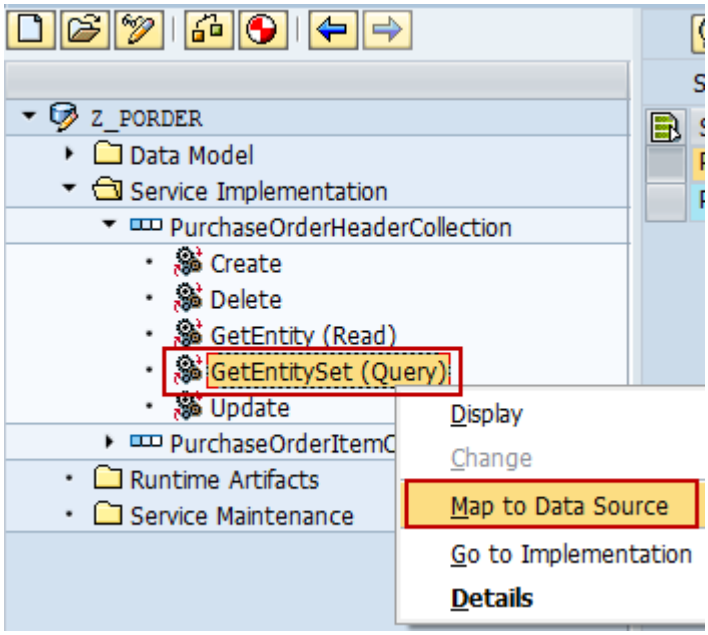
In this section, we shall see how to map the data source to the Query Operation for Purchase Order Header and Purchase Order Item.

**Purchase Order Header:**

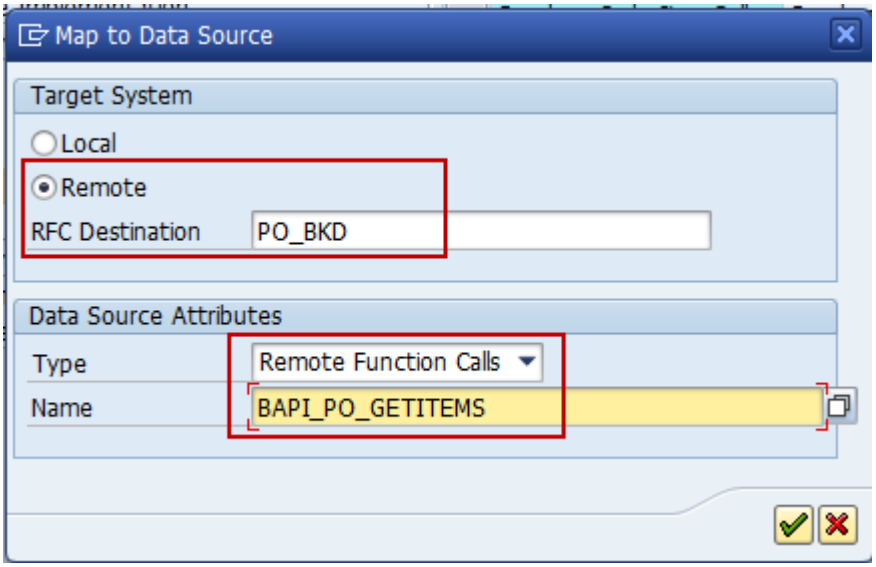
1. Expand the node **Service Implementation-> PurchaseOrderHeaderCollection**



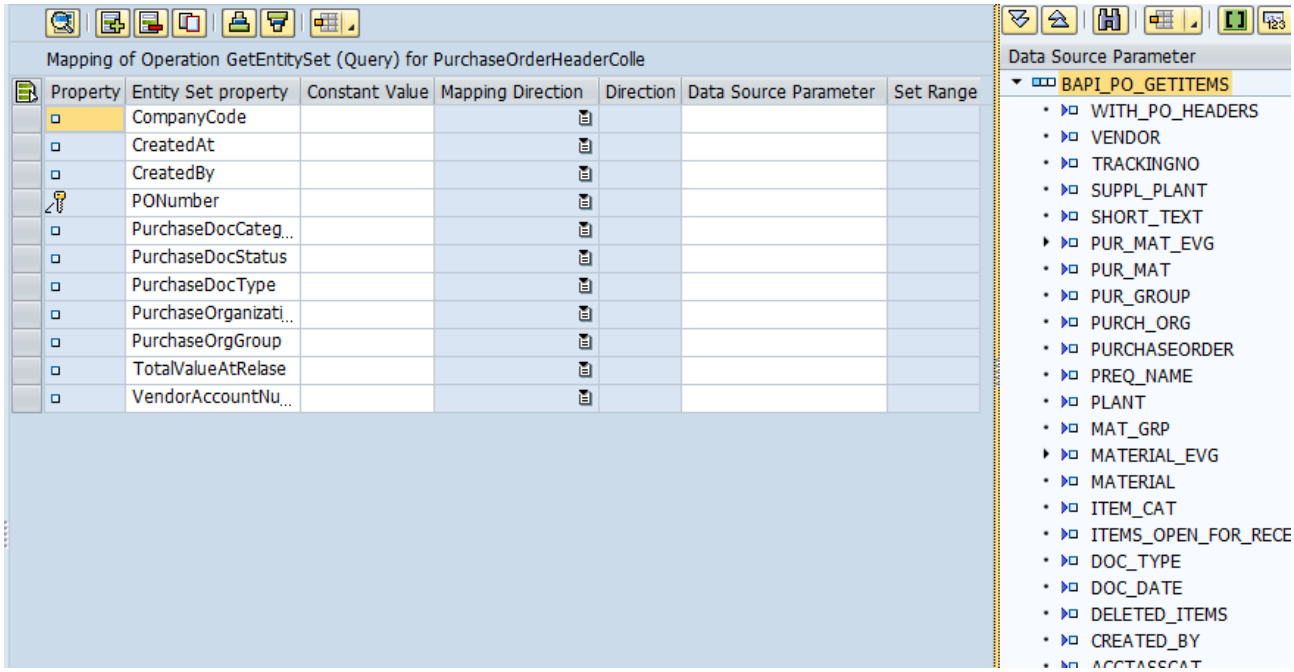

2. Right click on **GetEntitySet (Query)** and click on **Map to Data Source**.



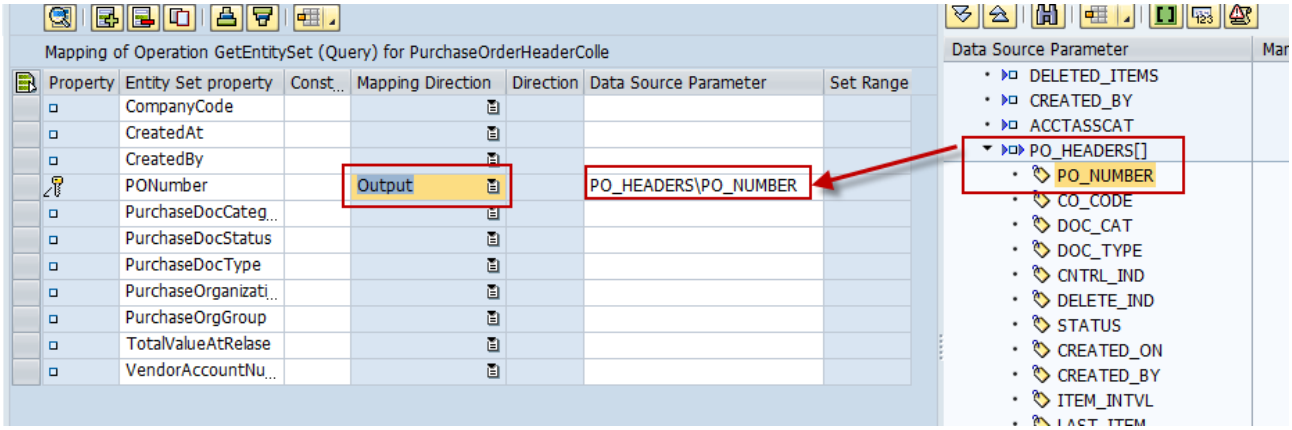

3. Select **Remote** under the Target System if the SAP system where Purchase Order is configured a different system. Enter the rfc destination of the SAP System in the RFC Destination field. Select the type to be **Remote Function Calls** and the **Name** as **BAPI_PO_GETITEMS**.



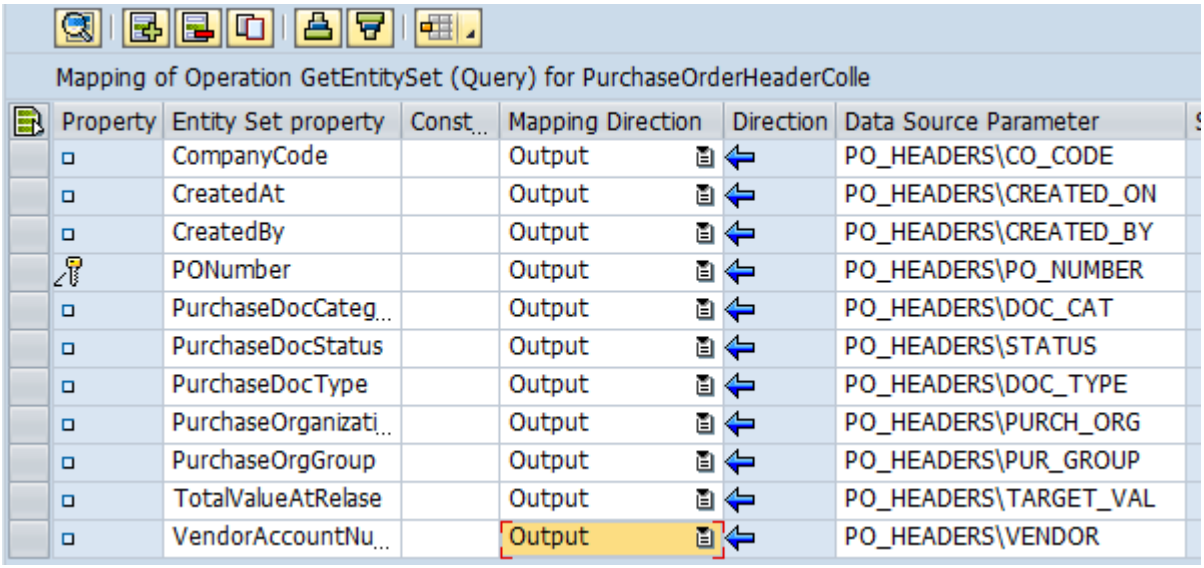

4. The following screen appears after clicking on the tick mark.



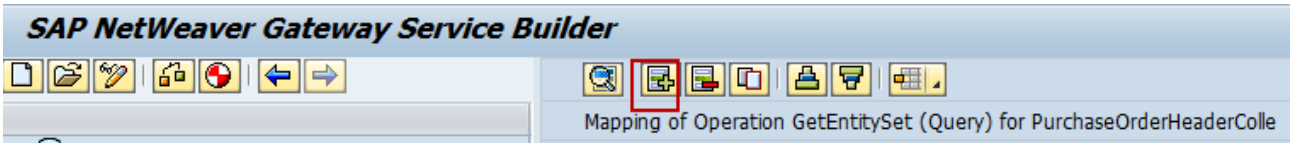

5. After this, from the **Data Source Parameter** tab on the right hand side, drag and drop the output parameters to the **Mapping of Operation** screen on the left hand side. The Data Source Parameter can also be selected using the F4 help. Ensure the **Mapping Direction** is selected as Input or Output for all the mappings based on the import or export parameter of the Function Module.



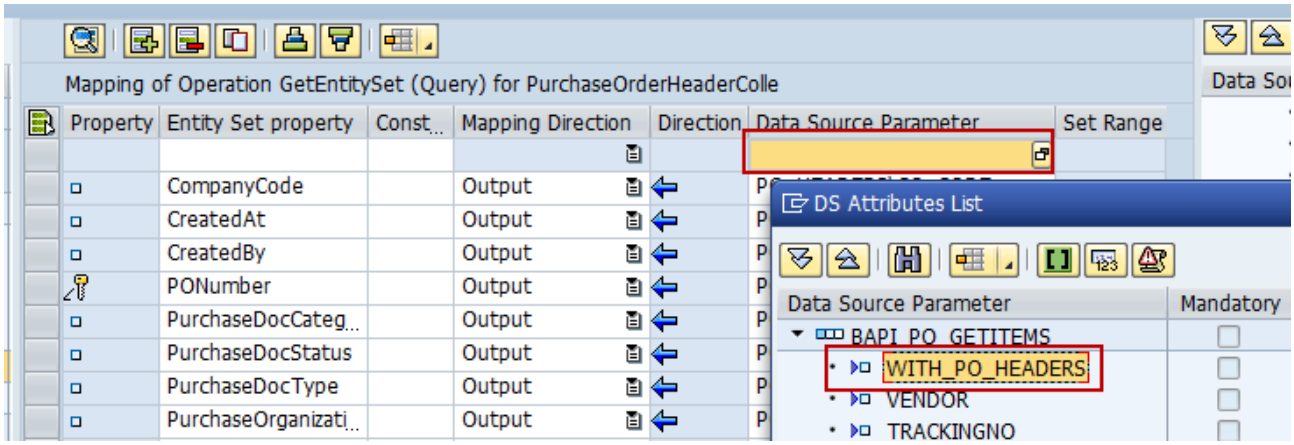

6. This way, we map the other parameters as well from the Data Source Parameter tab to the entity set property. The mapping looks as below.

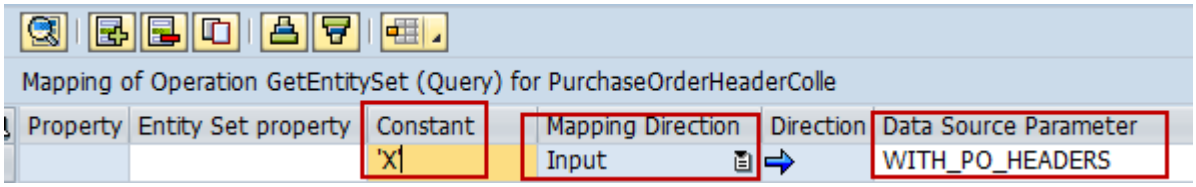



7. To indicate any Input parameter to the function module, click on the **Insert Row** option.




8. An empty row appears in the **Mapping of operation** screen.
9. Using the **F4 help**, double click on the required parameter for the **Data Source Parameter**. Choose the Mapping Direction as **Input** from the drop down option. And enter the required value in the Constant column as shown below.




10. Click on **Save**.
11. The table below gives the mapping required for the Purchase Order Header Query operation.

| Entity Set Property | Constant Value | Mapping Direction | Data Source Parameter |
|---|---|---|---|
| | 'NB' | Input | DOC_TYPE |
| | 'X' | Input | WITH_PO_HEADERS |
| CompanyCode | | Output | PO_HEADERS\CO_CODE |
| CreatedAt | | Output | PO_HEADERS\CREATED_ON |
| CreatedBy | | Output | PO_HEADERS\CREATED_BY |
| PONumber | | Output | PO_HEADERS\PO_NUMBER |
| PurchaseDocCategory | | Output | PO_HEADERS\DOC_CAT |
| PurchaseDocStatus | | Output | PO_HEADERS\STATUS |
| PurchaseDocType | | Output | PO_HEADERS\DOC_TYPE |
| PurchaseOrganization | | Output | PO_HEADERS\PURCH_ORG |
| PurchaseOrgGroup | | Output | PO_HEADERS\PUR_GROUP |
| TotalValueAtRelase | | Output | PO_HEADERS\TARGET_VAL |
| VendorAccountNumber | | Output | PO_HEADERS\VENDOR |

12. The below screenshot shows the final mapping of Data source parameter to the entity set property for the Purchase Order Header Query operation.

Mapping of Operation GetEntitySet (Query) for PurchaseOrderHeaderColle

| Property | Entity Set property | Constant Value | Mapping Direction | Direction | Data Source Parameter | Set Range |
|---|---|---|---|---|---|---|
| | | 'NB' | Input | → | DOC_TYPE | |
| | | 'X' | Input | → | WITH_PO_HEADERS | |
| ▫ | CompanyCode | | Output | ← | PO_HEADERS\CO_CO... | |
| ▫ | CreatedAt | | Output | ← | PO_HEADERS\CREATE... | |
| ▫ | CreatedBy | | Output | ← | PO_HEADERS\CREATE... | |
| 🔑 | PONumber | | Output | ← | PO_HEADERS\PO_NU... | |
| ▫ | PurchaseDocCateg... | | Output | ← | PO_HEADERS\DOC_C... | |
| ▫ | PurchaseDocStatus | | Output | ← | PO_HEADERS\STATUS | |
| ▫ | PurchaseDocType | | Output | ← | PO_HEADERS\DOC_T... | |
| ▫ | PurchaseOrganizati... | | Output | ← | PO_HEADERS\PURCH_... | |
| ▫ | PurchaseOrgGroup | | Output | ← | PO_HEADERS\PUR_GR... | |
| ▫ | TotalValueAtRelase | | Output | ← | PO_HEADERS\TARGE... | |
| ▫ | VendorAccountNu... | | Output | ← | PO_HEADERS\VENDOR | |

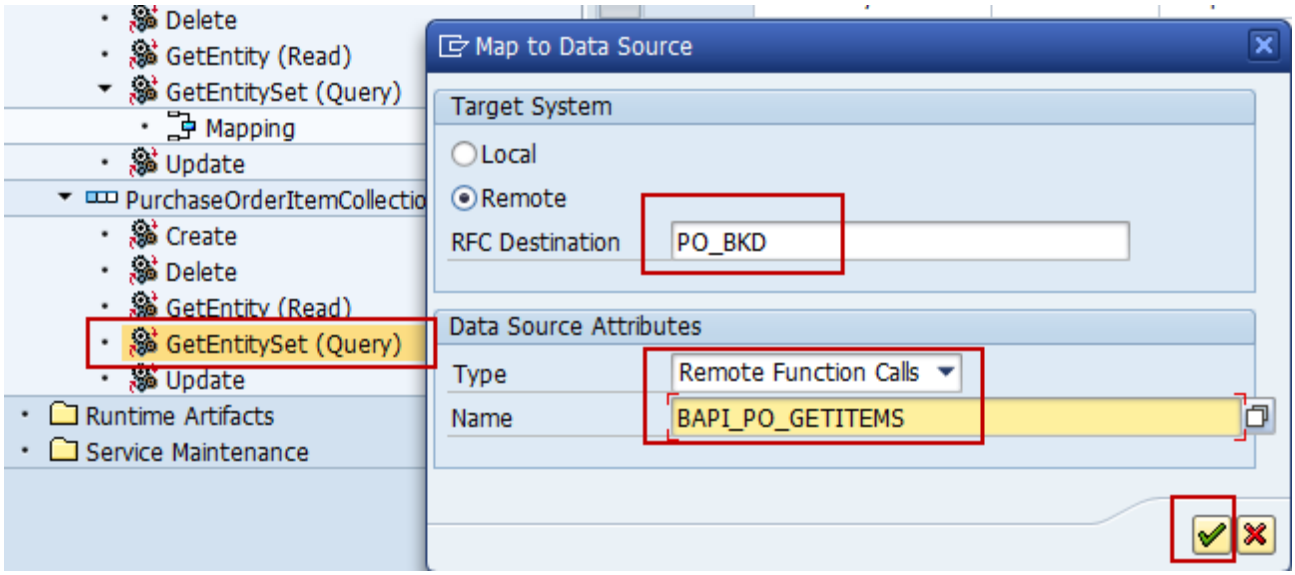
This completes the steps to map the data source parameters and the property of the entity set.

**Purchase Order Item:**

1. Similarly for Purchase Order Item, expand **Service Implementation -> PurchaseOrderItemCollection**. Right click on **GetEntitySet (Query)** option, select **Map to Data Source** and enter the required fields as below and click on the tick mark.

Type: Remote Function Calls

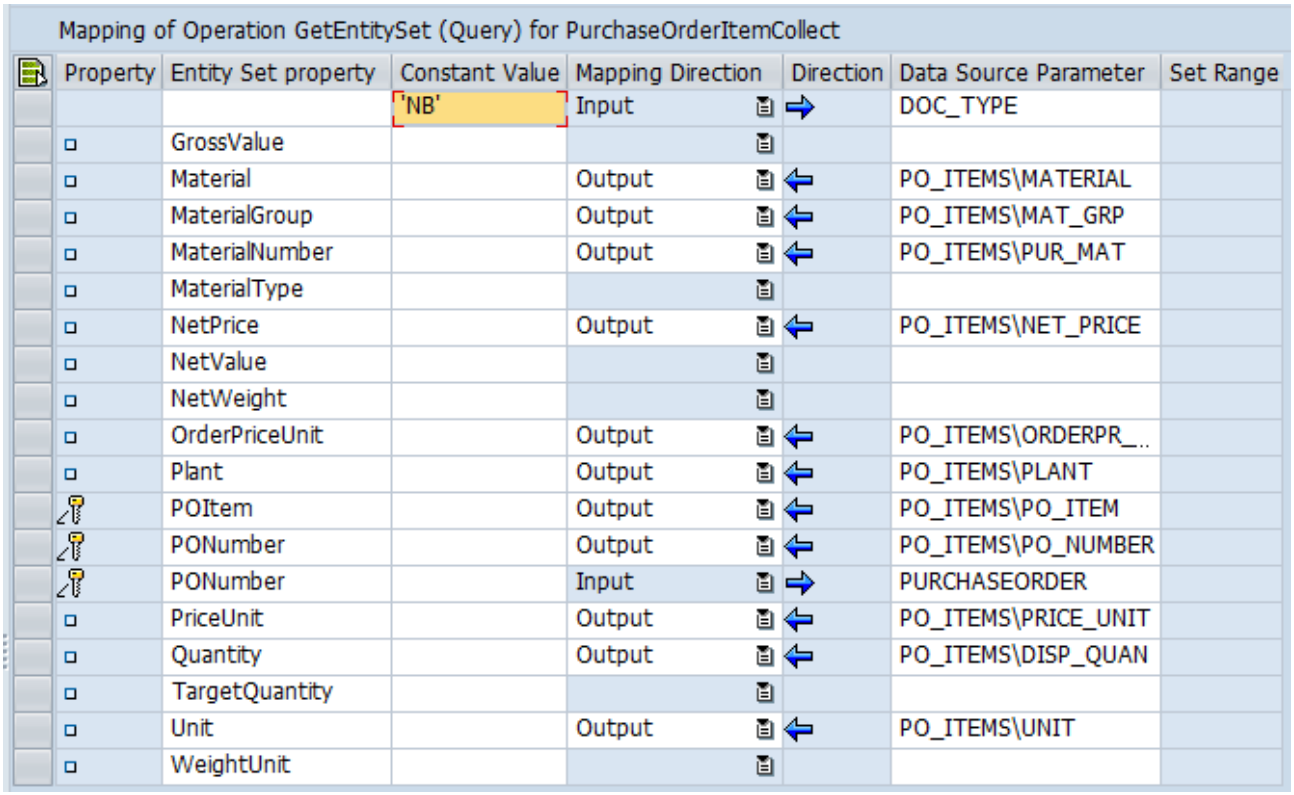
Name: BAPI_PO_GETITEMS



2. The table below gives the mapping required for the Purchase Order Item Query operation.

| Entity Set Property | Constant Value | Mapping Direction | Data Source Parameter |
|---|---|---|---|
| | 'NB' | Input | DOC_TYPE |
| GrossValue | | | |
| Material | | Output | PO_ITEMS\MATERIAL |
| MaterialGroup | | Output | PO_ITEMS\MAT_GRP |
| MaterialNumber | | Output | PO_ITEMS\PUR_MAT |
| MaterialType | | | |
| NetPrice | | Output | PO_ITEMS\NET_PRICE |
| NetValue | | | |
| NetWeight | | | |
| OrderPriceUnit | | Output | PO_ITEMS\ORDERPR_UN |
| Plant | | Output | PO_ITEMS\PLANT |
| POItem | | Output | PO_ITEMS\PO_ITEM |
| PONumber | | Output | PO_ITEMS\PO_NUMBER |
| PONumber | | Input | PURCHASEORDER |
| PriceUnit | | Output | PO_ITEMS\PRICE_UNIT |
| Quantity | | Output | PO_ITEMS\DISP_QUAN |
| TargetQuantity | | | |
| Unit | | Output | PO_ITEMS\UNIT |
| WeightUnit | | | |

3. The final mapping for the Purchase Order Item Query operation looks as shown below.



Mapping of Operation GetEntitySet (Query) for PurchaseOrderItemCollect

| Property | Entity Set property | Constant Value | Mapping Direction | Direction | Data Source Parameter | Set Range |
|---|---|---|---|---|---|---|
| | | 'NB' | Input | → | DOC_TYPE | |
| ▫ | GrossValue | | | | | |
| ▫ | Material | | Output | ← | PO_ITEMS\MATERIAL | |
| ▫ | MaterialGroup | | Output | ← | PO_ITEMS\MAT_GRP | |
| ▫ | MaterialNumber | | Output | ← | PO_ITEMS\PUR_MAT | |
| ▫ | MaterialType | | | | | |
| ▫ | NetPrice | | Output | ← | PO_ITEMS\NET_PRICE | |
| ▫ | NetValue | | | | | |
| ▫ | NetWeight | | | | | |
| ▫ | OrderPriceUnit | | Output | ← | PO_ITEMS\ORDERPR_.. | |
| ▫ | Plant | | Output | ← | PO_ITEMS\PLANT | |
| 🔑 | POItem | | Output | ← | PO_ITEMS\PO_ITEM | |
| 🔑 | PONumber | | Output | ← | PO_ITEMS\PO_NUMBER | |
| 🔑 | PONumber | | Input | → | PURCHASEORDER | |
| ▫ | PriceUnit | | Output | ← | PO_ITEMS\PRICE_UNIT | |
| ▫ | Quantity | | Output | ← | PO_ITEMS\DISP_QUAN | |
| ▫ | TargetQuantity | | | | | |
| ▫ | Unit | | Output | ← | PO_ITEMS\UNIT | |
| ▫ | WeightUnit | | | | | |

4. Click on **Save**.

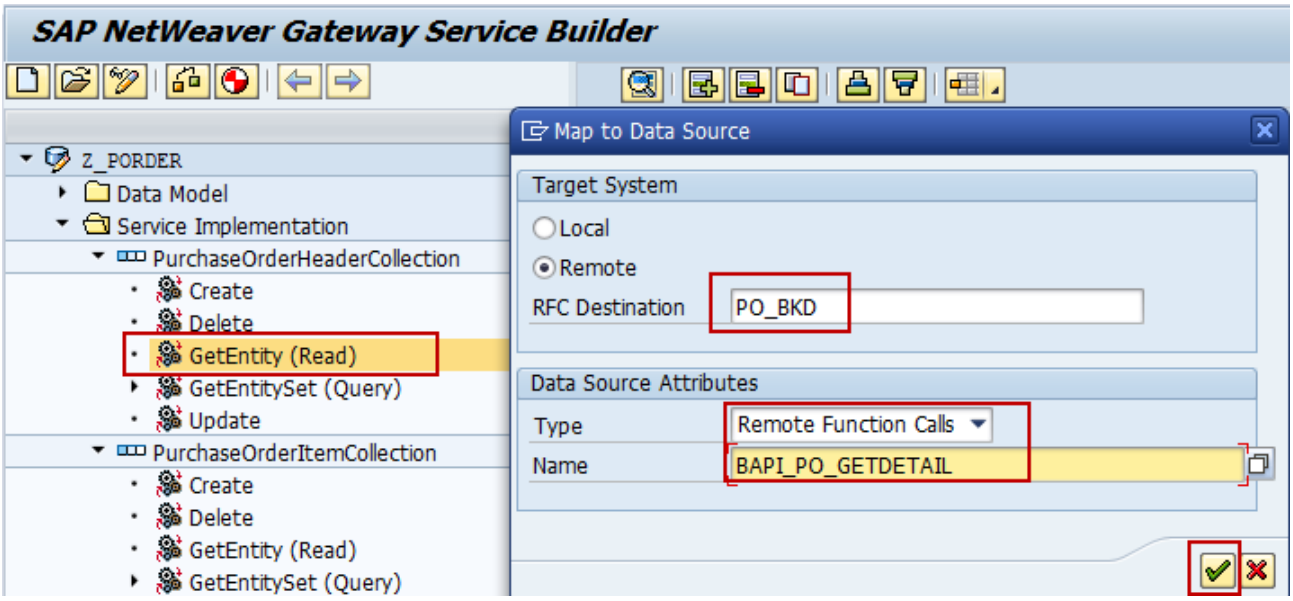
### 3.3.2 Read operation

**Purchase Order Header**

1. Expand **Service Implementation -> PurchaseOrderHeaderCollection**. Right click on **GetEntity (Read)** option, select **Map to Data Source** and enter the required fields as below and click on the tick mark.

Type: Remote Function Calls

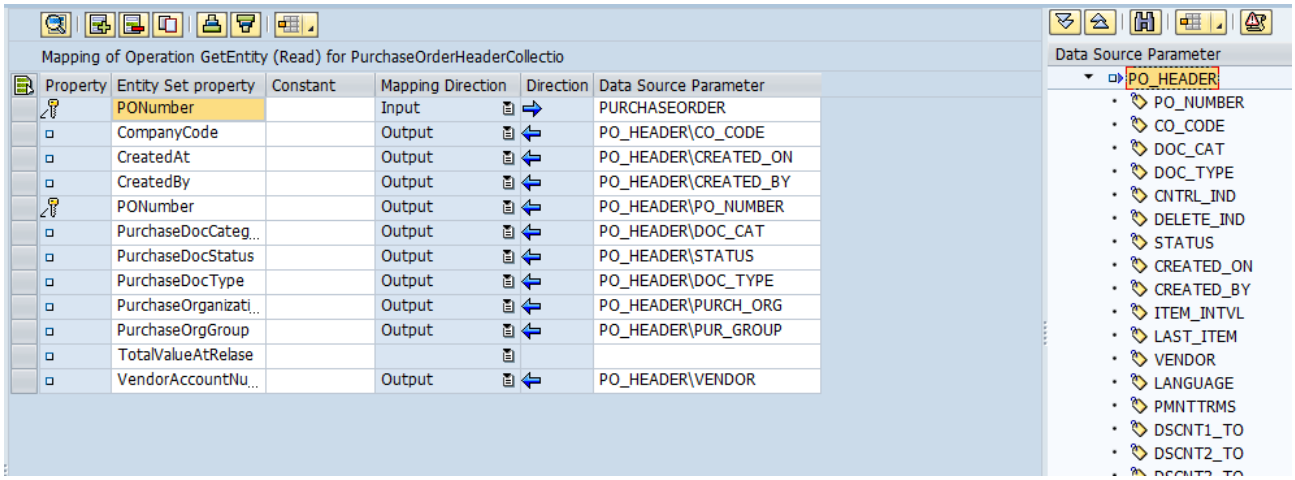
Name: BAPI_PO_GETDETAIL




2. The table below gives the mapping required for the Purchase Order Header Read operation.

| Entity Set Property | Constant Value | Mapping Direction | Data Source Parameter |
|---|---|---|---|
| CompanyCode | | Output | PO_HEADER\CO_CODE |
| CreatedAt | | Output | PO_HEADER\CREATED_ON |
| CreatedBy | | Output | PO_HEADER\CREATED_BY |
| PONumber | | Output | PO_HEADER\PO_NUMBER |
| PONumber | | Input | PURCHASEORDER |
| PurchaseDocCategory | | Output | PO_HEADER\DOC_CAT |
| PurchaseDocStatus | | Output | PO_HEADER\STATUS |
| PurchaseDocType | | Output | PO_HEADER\DOC_TYPE |
| PurchaseOrganization | | Output | PO_HEADER\PURCH_ORG |
| PurchaseOrgGroup | | Output | PO_HEADER\PUR_GROUP |
| TotalValueAtRelase | | | |
| VendorAccountNumber | | Output | PO_HEADER\VENDOR |

3. Below is the screenshot showing the mapping of the data source parameter and the entity set property for the Purchase Order Header Read operation.



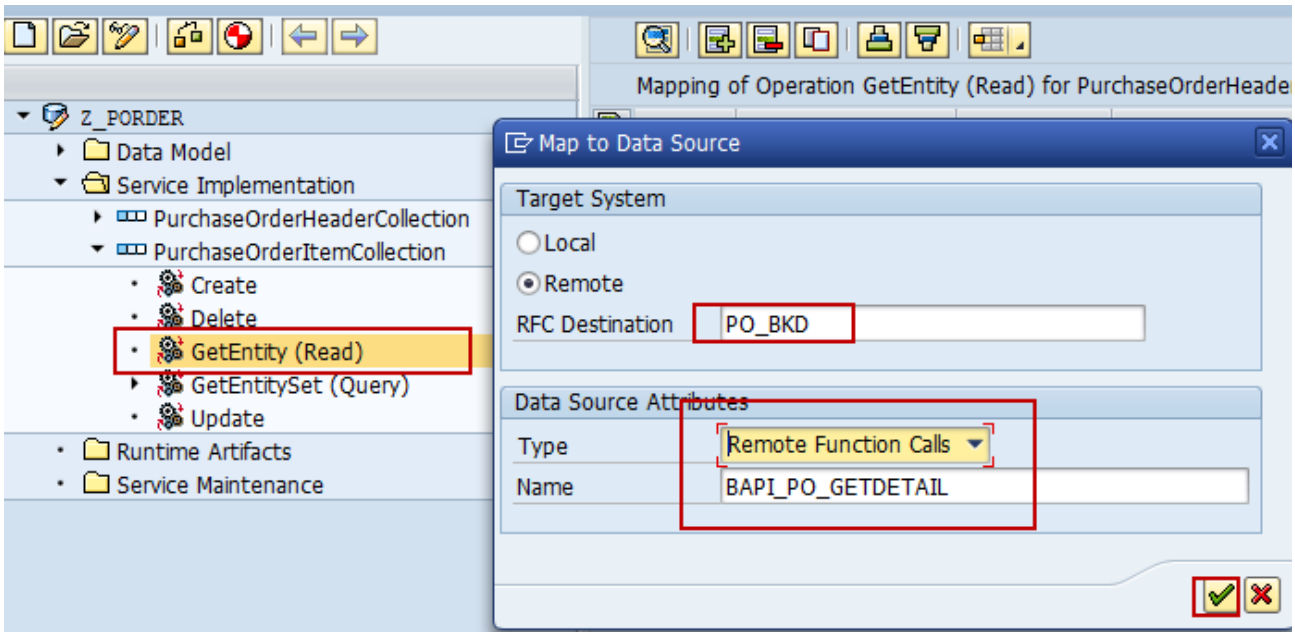

4. Click on **Save**.

**Purchase Order Item**

1. Expand **Service Implementation -> PurchaseOrderItemCollection**. Right click on **GetEntity (Read)** option, select **Map to Data Source** and enter the required fields as below and click on the tick mark.

Type: Remote Function Calls

Name: BAPI_PO_GETDETAIL




2. The table below gives the mapping required for the Purchase Order Item Read operation.

| Entity Set Property | Constant Value | Mapping Direction | Data Source Parameter |
|---|---|---|---|
| | X' | Input | ITEMS |
| GrossValue | | Output | PO_ITEMS\GROS_VALUE |
| Material | | Output | PO_ITEMS\MATERIAL |

| | | | |
|---|---|---|---|
| MaterialGroup | | Output | PO_ITEMS\MAT_GRP |
| MaterialNumber | | Output | PO_ITEMS\PUR_MAT |
| MaterialType | | Output | PO_ITEMS\MAT_TYPE |
| NetPrice | | Output | PO_ITEMS\NET_PRICE |
| NetValue | | Output | PO_ITEMS\NET_VALUE |
| NetWeight | | Output | PO_ITEMS\NET_WEIGHT |
| OrderPriceUnit | | Output | PO_ITEMS\ORDERPR_UN |
| Plant | | Output | PO_ITEMS\PLANT |
| POItem | | Input | PO_ITEMS\PO_ITEM |
| POItem | | Output | PO_ITEMS\PO_ITEM |
| PONumber | | Output | PO_ITEMS\PO_NUMBER |
| PONumber | | Input | PURCHASEORDER |
| PriceUnit | | Output | PO_ITEMS\PRICE_UNIT |
| Quantity | | Output | PO_ITEMS\QUANTITY |
| TargetQuantity | | Output | PO_ITEMS\TARGET_QTY |
| Unit | | Output | PO_ITEMS\UNIT |
| WeightUnit | | Output | PO_ITEMS\WEIGHTUNIT |

3. The screenshot below shows the final mapping of the Data Source Parameters to the entity set properties for the Purchase Order Item Read operation.

Mapping of Operation GetEntity (Read) for PurchaseOrderItemCollection

| Property | Entity Set property | Constant | Mapping Direction | Direction | Data Source Parameter |
|---|---|---|---|---|---|
| | | 'X' | Input | → | ITEMS |
| ◻ | GrossValue | | Output | ← | PO_ITEMS\GROS_VALUE |
| ◻ | Material | | Output | ← | PO_ITEMS\MATERIAL |
| ◻ | MaterialGroup | | Output | ← | PO_ITEMS\MAT_GRP |
| ◻ | MaterialNumber | | Output | ← | PO_ITEMS\PUR_MAT |
| ◻ | MaterialType | | Output | ← | PO_ITEMS\MAT_TYPE |
| ◻ | NetPrice | | Output | ← | PO_ITEMS\NET_PRICE |
| ◻ | NetValue | | Output | ← | PO_ITEMS\NET_VALUE |
| ◻ | NetWeight | | Output | ← | PO_ITEMS\NET_WEIGHT |
| ◻ | OrderPriceUnit | | Output | ← | PO_ITEMS\ORDERPR_UN |
| ◻ | Plant | | Output | ← | PO_ITEMS\PLANT |
| 🔑 | POItem | | Input | → | PO_ITEMS\PO_ITEM |
| 🔑 | POItem | | Output | ← | PO_ITEMS\PO_ITEM |
| 🔑 | PONumber | | Output | ← | PO_ITEMS\PO_NUMBER |
| 🔑 | PONumber | | Input | → | PURCHASEORDER |
| ◻ | PriceUnit | | Output | ← | PO_ITEMS\PRICE_UNIT |
| ◻ | Quantity | | Output | ← | PO_ITEMS\QUANTITY |
| ◻ | TargetQuantity | | Output | ← | PO_ITEMS\TARGET_QTY |
| ◻ | Unit | | Output | ← | PO_ITEMS\UNIT |
| ◻ | WeightUnit | | Output | ← | PO_ITEMS\WEIGHTUNIT |

4. Click on **Save**.

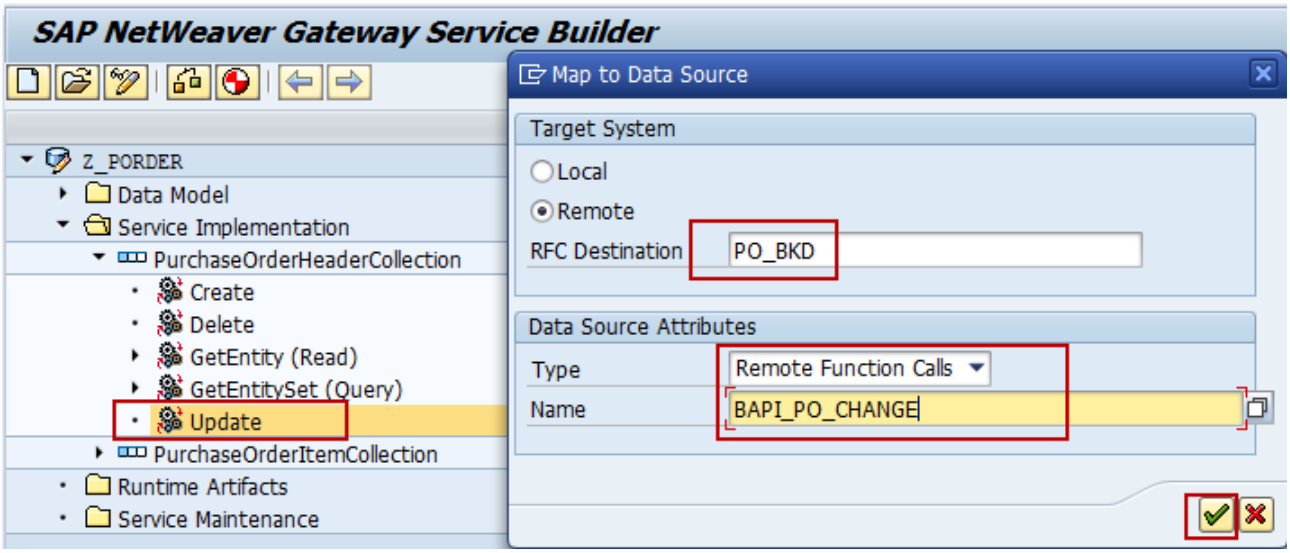
### 3.3.3 Update operation

**Purchase Order Header**

1. Expand **Service Implementation -> PurchaseOrderHeaderCollection**. Right click on **Update** option, select **Map to Data Source** and enter the required fields as below and click on the tick mark.

Type: Remote Function Calls

Name: BAPI_PO_CHANGE




2. The table below gives the mapping required for the Purchase Order Header Update operation.

| Entity Set Property | Constant Value | Mapping Direction | Data Source Parameter |
|---|---|---|---|
| | X' | Input | POHEADERX\PO_NUMBER |
| | X' | Input | POHEADERX\PUR_GROUP |
| CompanyCode | | | |
| CreatedAt | | | |
| CreatedBy | | | |
| PONumber | | Input | PURCHASEORDER |
| PurchaseDocCategory | | | |
| PurchaseDocStatus | | | |
| PurchaseDocType | | | |
| PurchaseOrganization | | | |
| PurchaseOrgGroup | | Input | POHEADER\PUR_GROUP |
| TotalValueAtRelase | | | |
| VendorAccountNumber | | | |

3. The screenshot below shows the final mapping of the Data Source Parameters to the entity set properties for the Purchase Order Header Update operation.

Mapping of Operation Update for PurchaseOrderHeaderCollection

| Property | Entity Set property | Constant | Mapping Direction | Direction | Data Source Parameter |
|---|---|---|---|---|---|
| | | 'X' | Input | → | POHEADERX\PO_NUMBER |
| | | 'X' | Input | → | POHEADERX\PUR_GROUP |
| | CompanyCode | | | | |
| | CreatedAt | | | | |
| | CreatedBy | | | | |
| | PONumber | | Input | → | PURCHASEORDER |
| | PurchaseDocCateg... | | | | |
| | PurchaseDocStatus | | | | |
| | PurchaseDocType | | | | |
| | PurchaseOrganizati... | | | | |
| | PurchaseOrgGroup | | Input | → | POHEADER\PUR_GROUP |
| | TotalValueAtRelase | | | | |
| | VendorAccountNu... | | | | |

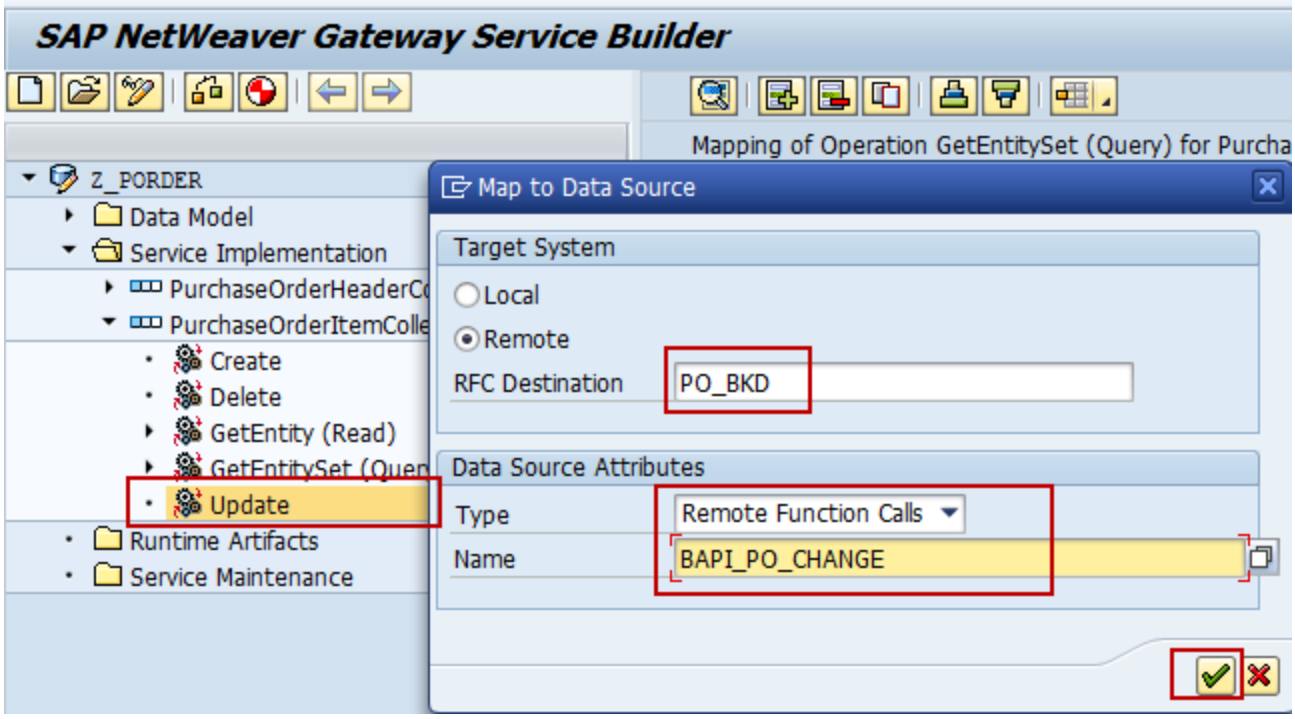
4. Click on **Save**.

**Purchase Order Item**

1. Expand **Service Implementation -> PurchaseOrderItemCollection**. Right click on **Update** option, select **Map to Data Source** and enter the required fields as below and click on the tick mark.

Type: Remote Function Calls

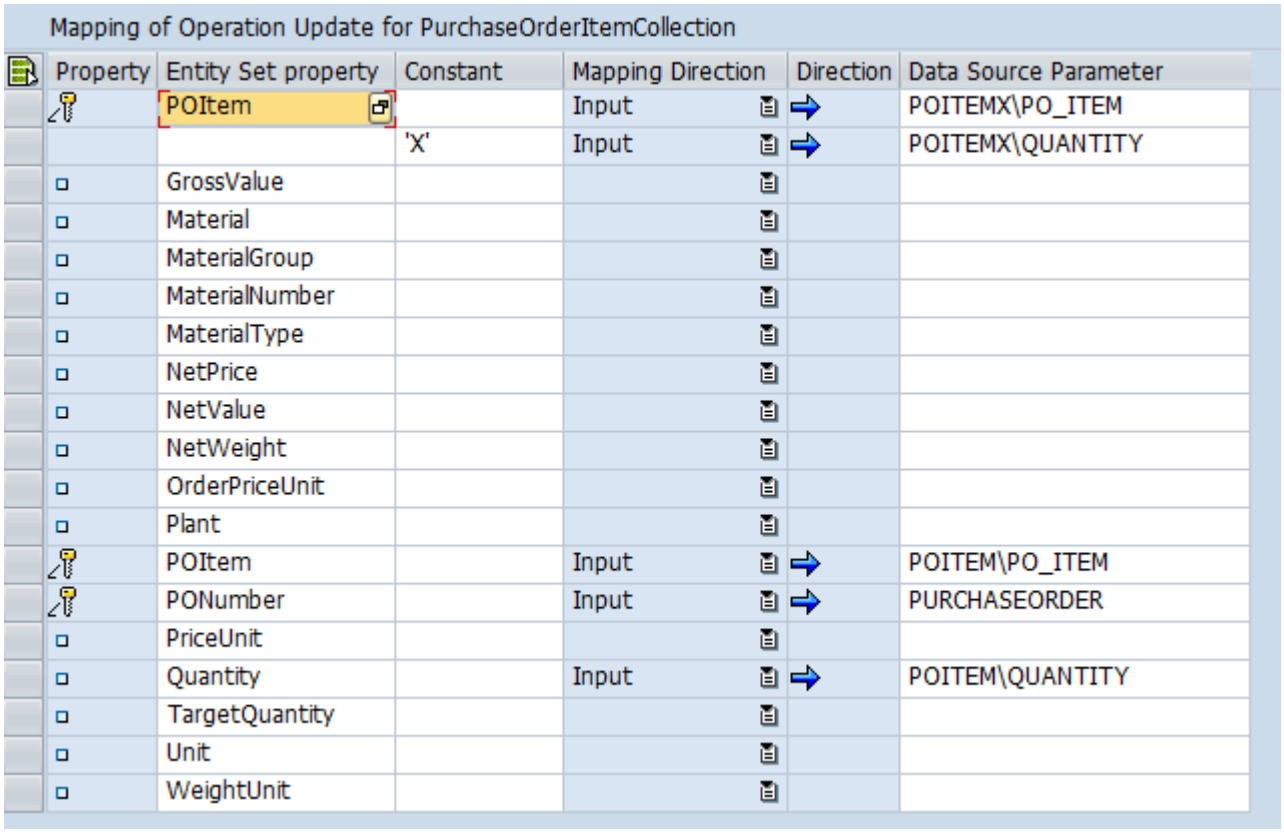
Name: BAPI_PO_CHANGE




2. The table below gives the mapping required for the Purchase Order Item Update operation.

| Entity Set Property | Constant Value | Mapping Direction | Data Source Parameter |
|---|---|---|---|
| | X' | Input | POITEMX\QUANTITY |
| GrossValue | | | |
| Material | | | |
| MaterialGroup | | | |
| MaterialNumber | | | |
| MaterialType | | | |
| NetPrice | | | |
| NetValue | | | |
| NetWeight | | | |
| OrderPriceUnit | | | |
| Plant | | | |
| POItem | | Input | POITEM\PO_ITEM |
| POItem | | Input | POITEMX\PO_ITEM |
| PONumber | | Input | PURCHASEORDER |
| PriceUnit | | | |
| Quantity | | Input | POITEM\QUANTITY |
| TargetQuantity | | | |
| Unit | | | |
| WeightUnit | | | |

3. The screenshot below shows the final mapping of the Data Source Parameters to the entity set properties for the Purchase Order Item Update operation.



Mapping of Operation Update for PurchaseOrderItemCollection

| Property | Entity Set property | Constant | Mapping Direction | Direction | Data Source Parameter |
|---|---|---|---|---|---|
| | POItem | | Input | → | POITEMX\PO_ITEM |
| | | 'X' | Input | → | POITEMX\QUANTITY |
| | GrossValue | | | | |
| | Material | | | | |
| | MaterialGroup | | | | |
| | MaterialNumber | | | | |
| | MaterialType | | | | |
| | NetPrice | | | | |
| | NetValue | | | | |
| | NetWeight | | | | |
| | OrderPriceUnit | | | | |
| | Plant | | | | |
| | POItem | | Input | → | POITEM\PO_ITEM |
| | PONumber | | Input | → | PURCHASEORDER |
| | PriceUnit | | | | |
| | Quantity | | Input | → | POITEM\QUANTITY |
| | TargetQuantity | | | | |
| | Unit | | | | |
| | WeightUnit | | | | |

4. Click on **Save**.

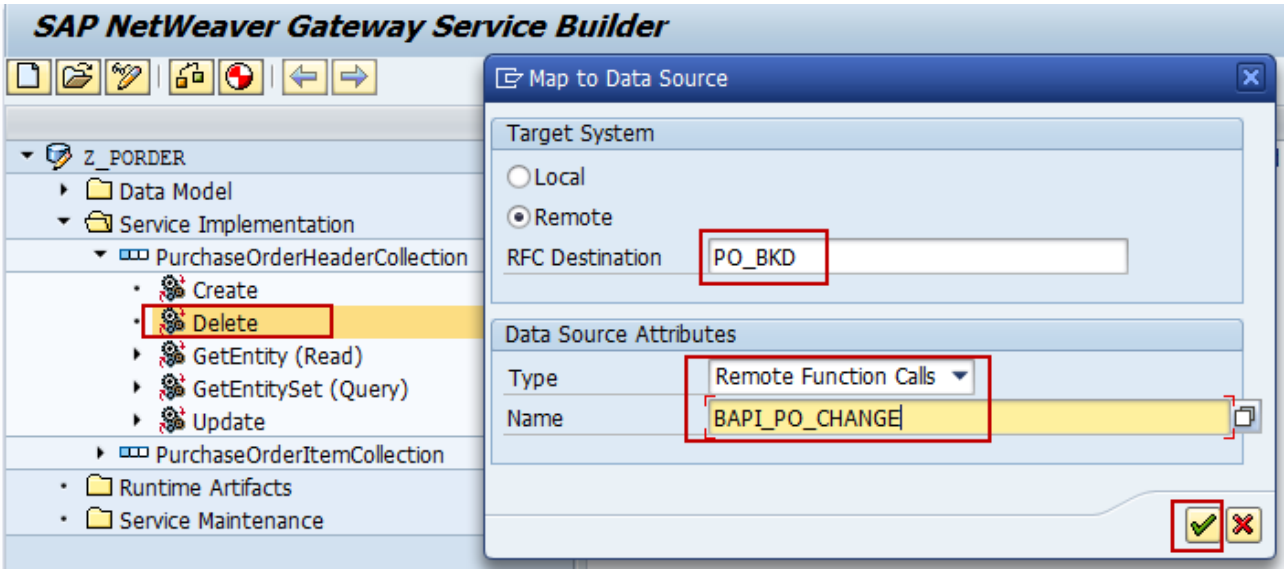
### 3.3.4 Delete operation

**Purchase Order Header**

1. Expand **Service Implementation -> PurchaseOrderHeaderCollection**. Right click on **Delete** option, select **Map to Data Source** and enter the required fields as below and click on the tick mark.

Type: Remote Function Calls

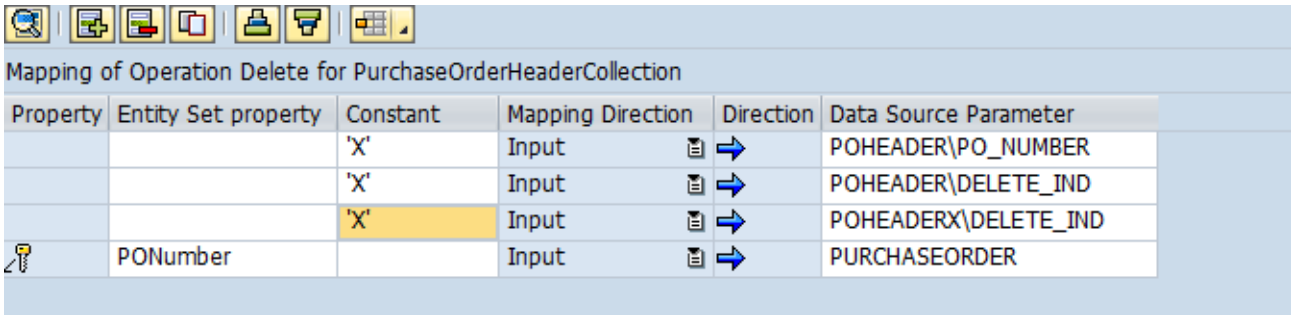
Name: BAPI_PO_CHANGE




2. The table below gives the mapping required for the Purchase Order Header Delete operation.

| Entity Set Property | Constant Value | Mapping Direction | Data Source Parameter |
|---|---|---|---|
| | 'X' | Input | POHEADER\DELETE_IND |
| | 'X' | Input | POHEADER\PO_NUMBER |
| | 'X' | Input | POHEADERX\DELETE_IND |
| PONumber | | Input | PURCHASEORDER |

3. The screenshot below shows the final mapping of the Data Source Parameters to the entity set properties for the Purchase Order Header Delete operation.



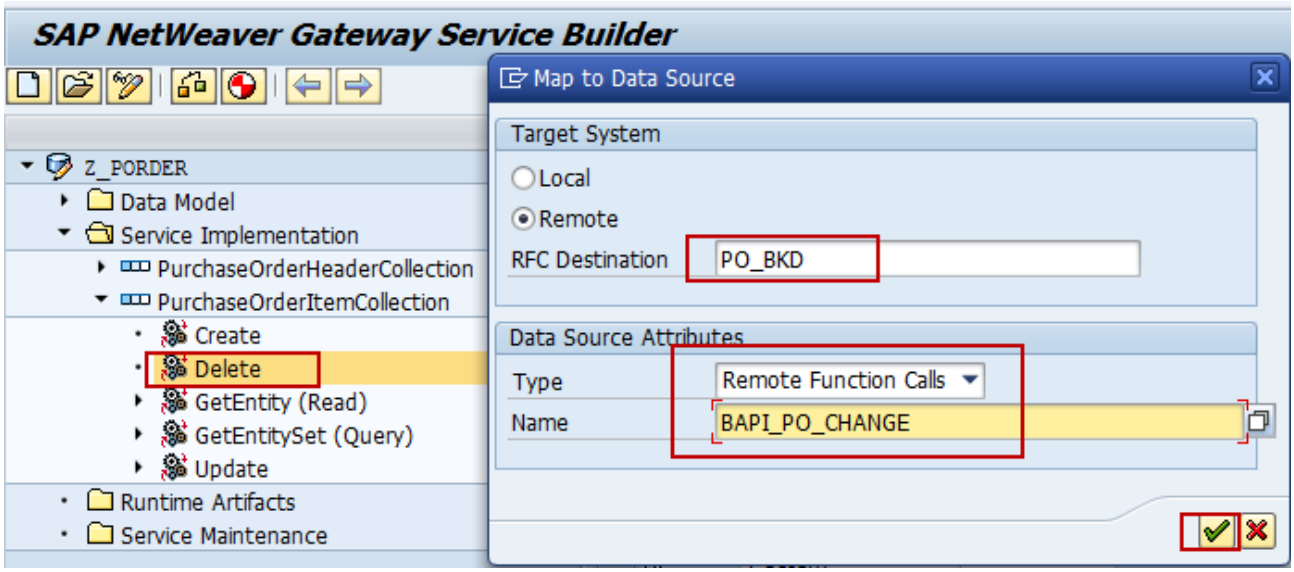

4. Click on **Save**.

**Purchase Order Item**

1. Expand **Service Implementation -> PurchaseOrderItemCollection**. Right click on **Delete**, select **Map to Data Source** option and enter the required fields as below and click on the tick mark.

Type: Remote Function Calls

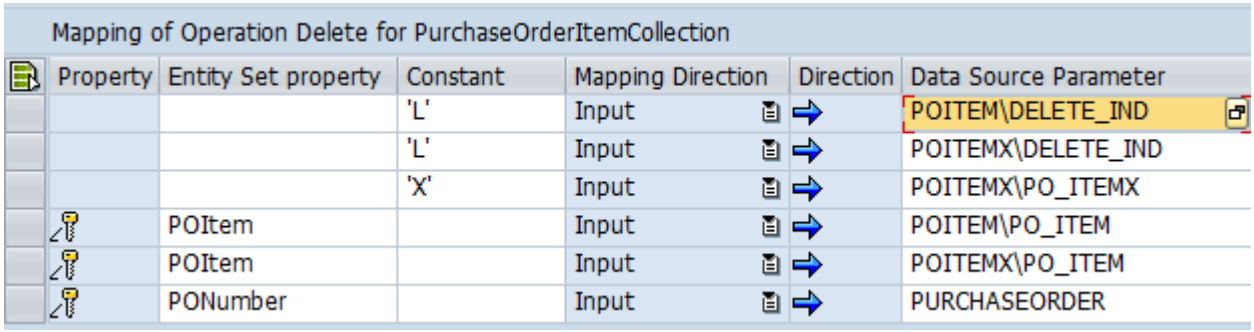
Name: BAPI_PO_CHANGE




2. The table below gives the mapping required for the Purchase Order Item Delete operation.

| Entity Set Property | Constant Value | Mapping Direction | Data Source Parameter |
|---|---|---|---|
| | 'L' | Input | POITEM\DELETE_IND |
| | 'L' | Input | POITEMX\DELETE_IND |
| | 'X' | Input | POITEMX\PO_ITEMX |
| POItem | | Input | POITEM\PO_ITEM |
| POItem | | Input | POITEMX\PO_ITEM |
| PONumber | | Input | PURCHASEORDER |

3. The screenshot below shows the final mapping of the Data Source Parameters to the entity set properties for the Purchase Order Item Delete operation.

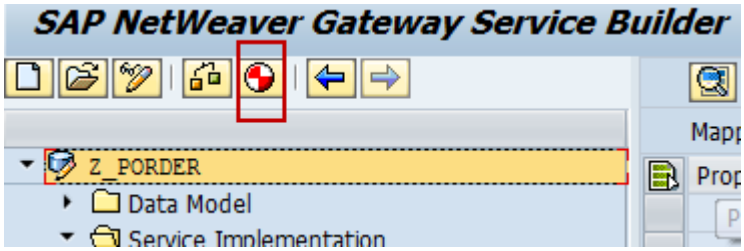



4. Click on **Save**.

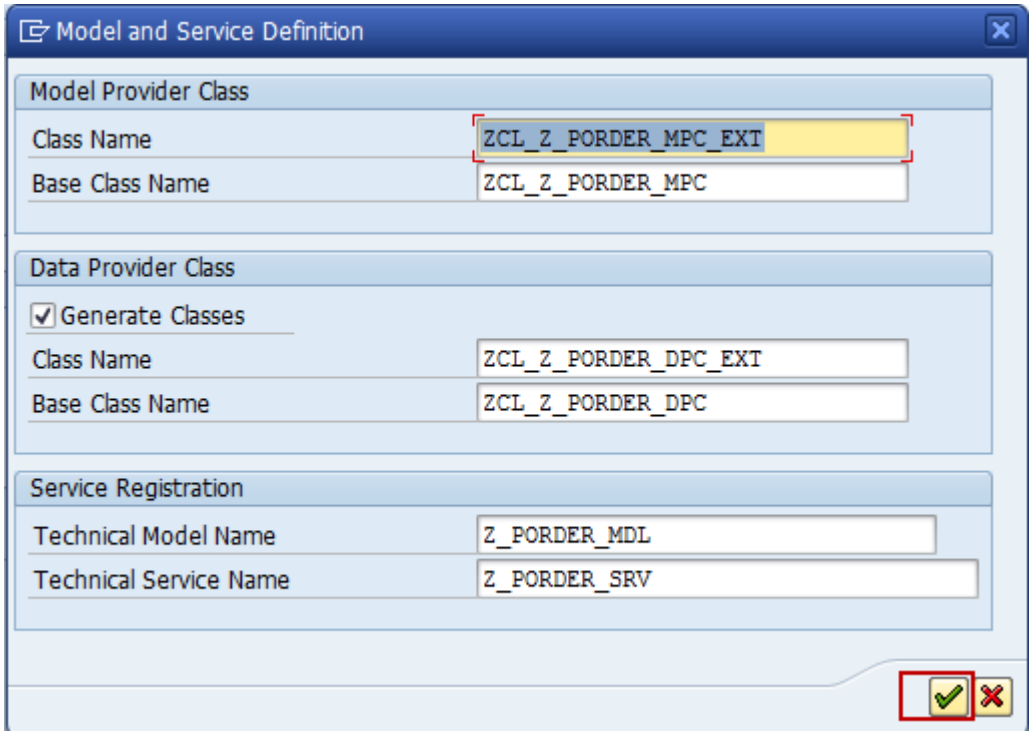
### 3.4 Generate OData service

The run time objects – model, service, metadata provider class and the data provider class are generated at the end of this step. The service maintenance is also done at the end of this step.

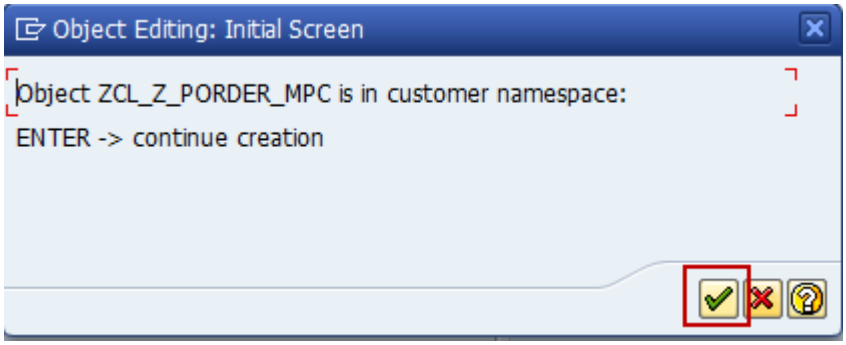
1. The OData service is generated by clicking on the **Generate Runtime Objects** option.



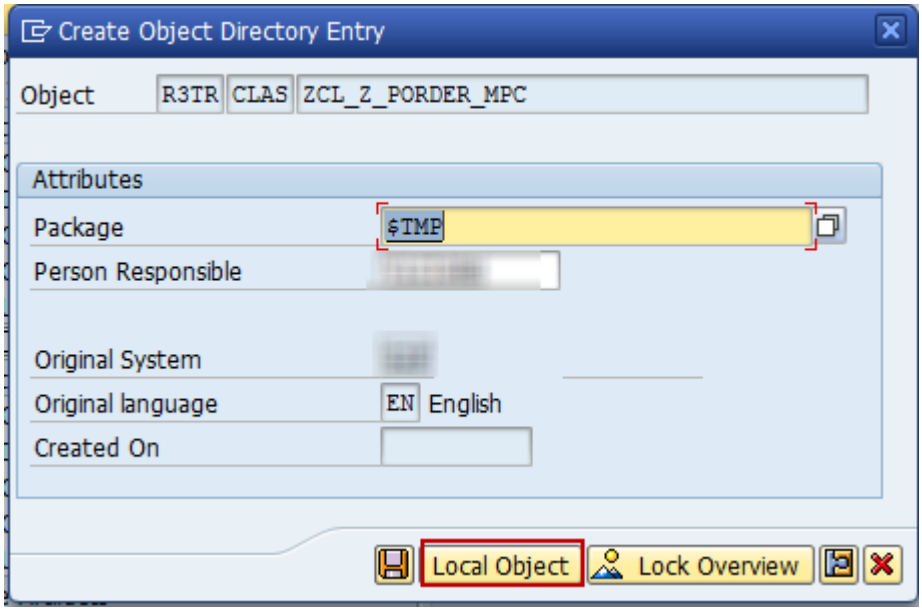

2. In the Model and Service Definition screen, press enter.



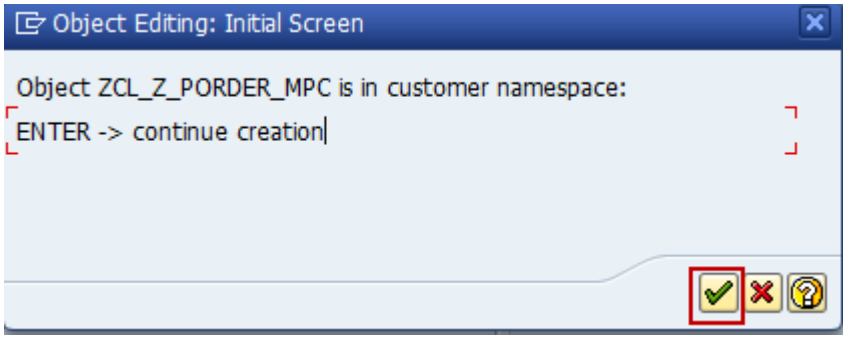

3. Click on the tick mark in the next screen.

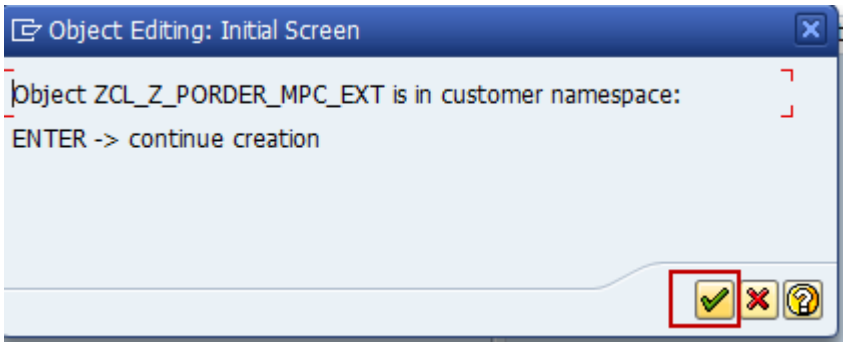


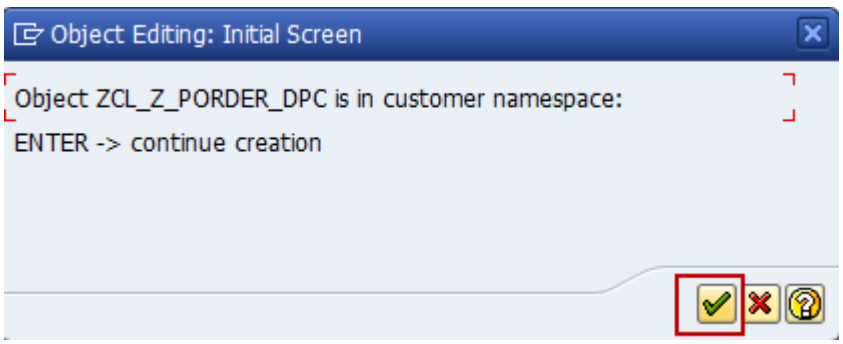

4. Choose **Local Object** in the Create Object Directory Entry screen.

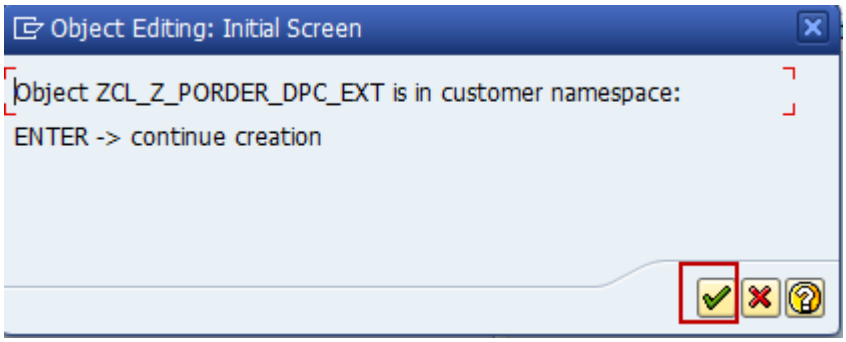



5. Click on the tick mark in the further screens.

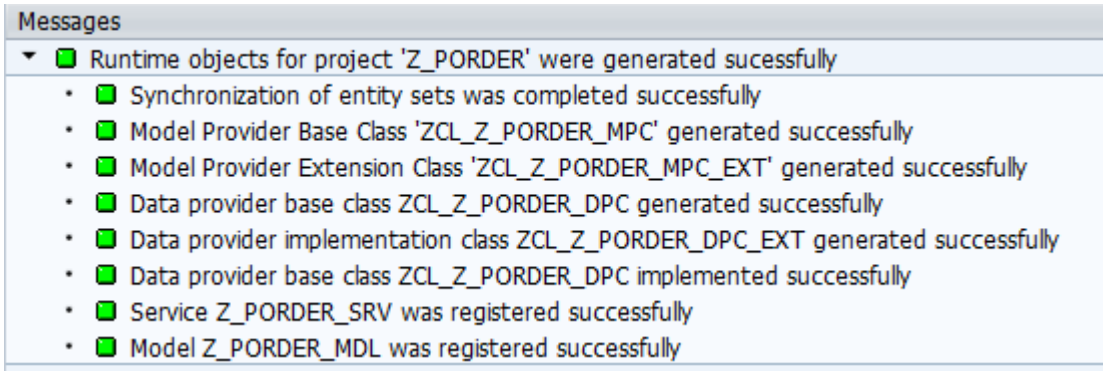


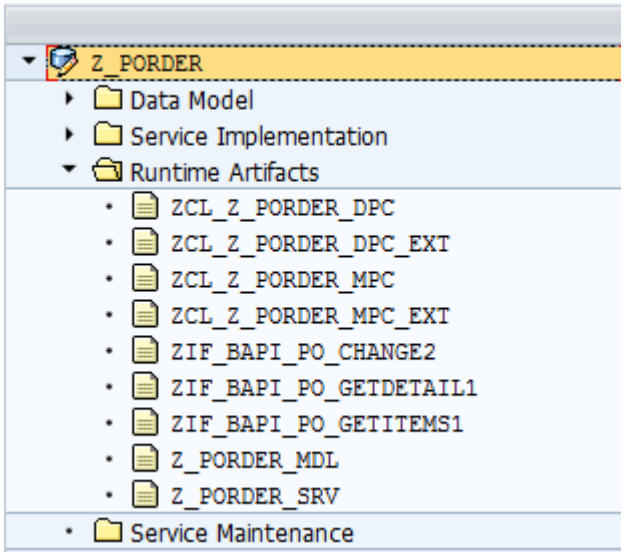






6. The success message of all the runtime artifacts generated is shown as below.




7. The runtime artifcats can also be seen in the project folder by expanding the **Runtime Artifacts** folder.



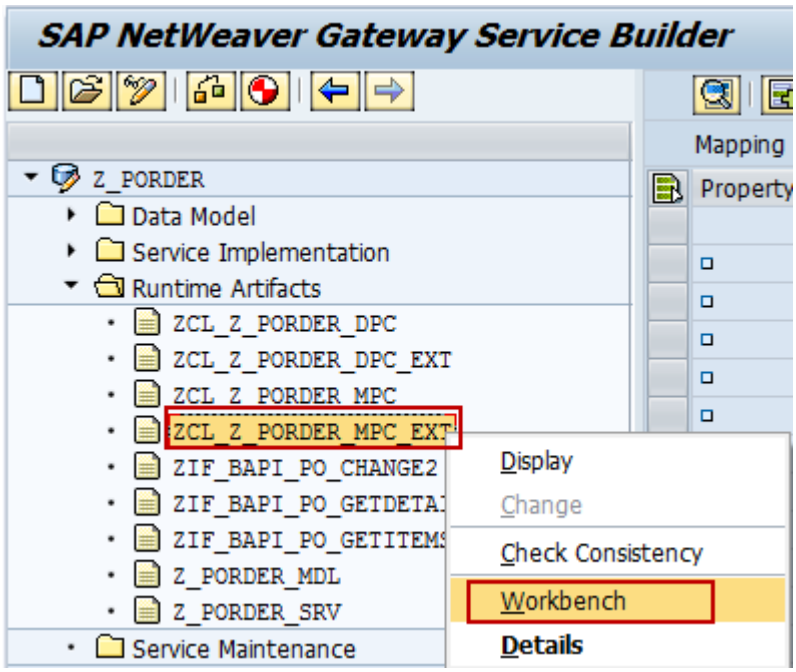

8. The code generated can be viewed in the classes shown in the Runtime Artifacts folder. The MPC class zcl_z_porder_mpc has the model definition and the DPC class zcl_z_porder_dpc has the run time implementation (mapping of the existing RFC). In this case any modifications or customization of the code for runtime can be done in the DPC class.

### 3.5 Modifying the Metadata Provider Class

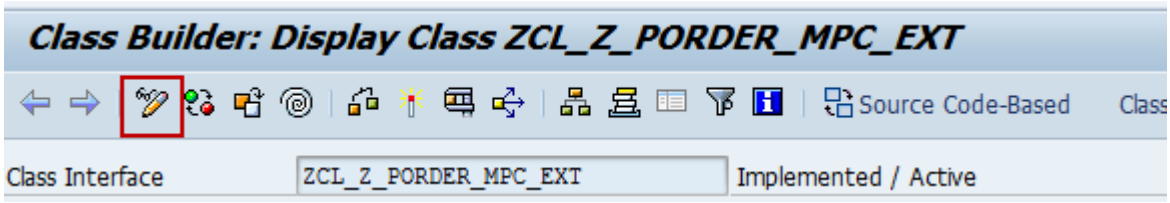
This section describes customizing the metadata provider class.

The runtime artifacts generated contains two MPC (metadata provider class) classes zcl_z_porder_mpc and zcl_z_porder_mpc_ext. To make changes to the model, the DEFINE method in the extension class zcl_z_porder_mpc_ext has to be re-defined.

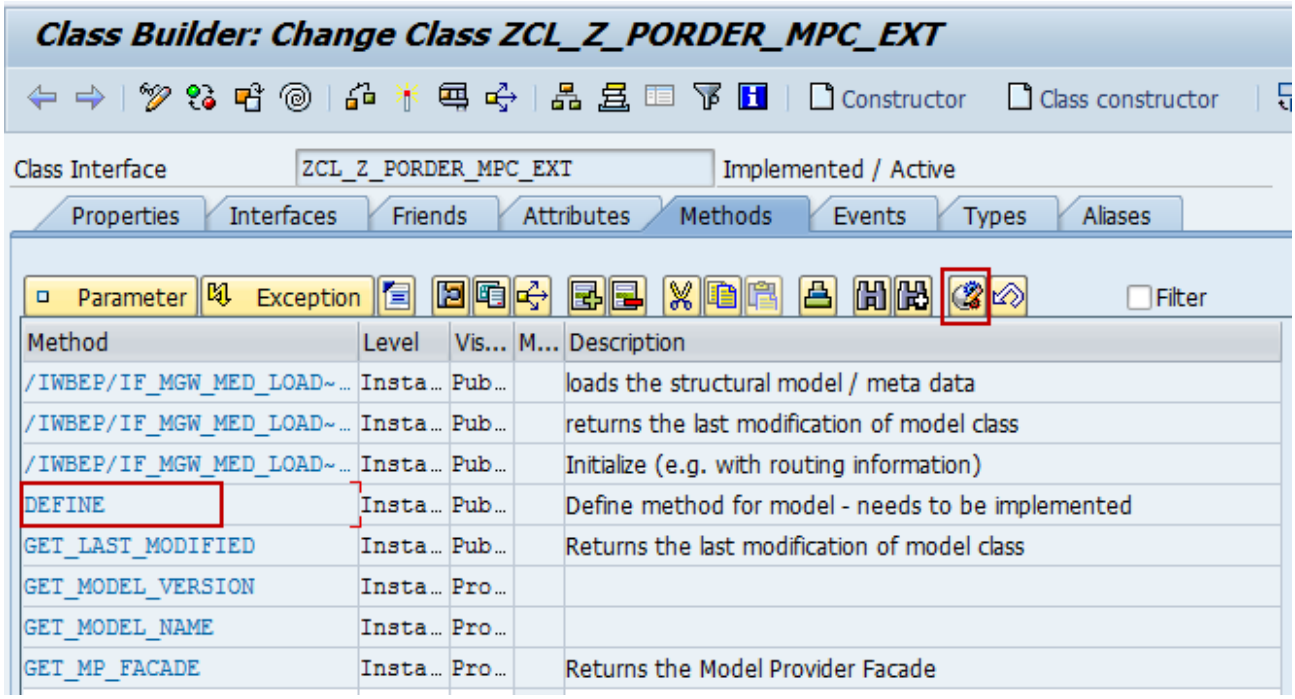
1. Go to the runtime artifacts folder in the project folder.
2. Right click on the MPC_EXT class and click on **Workbench** from the options.




3. Click on **Edit** option for the class.



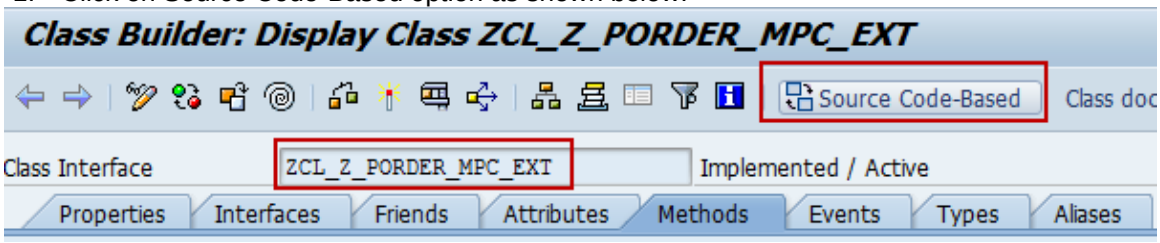

4. Select the DEFINE method and click on **Redefine** option.



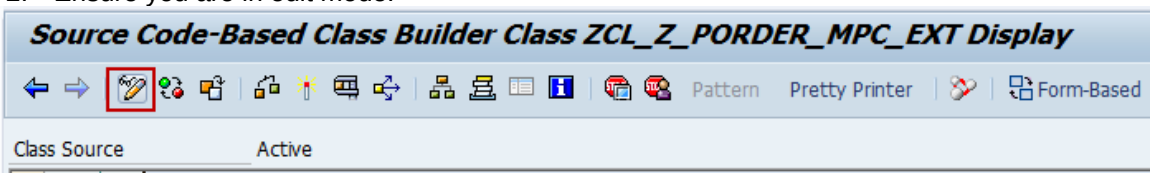
5. Write suitable code here to include filterable properties for the properties or setting the creatable, updatable, deletable flags for the entities. The creatable, updatable, deletable flags on the entities have to be set to true to enable the Create, Update and Delete operations on these entities. Sample code can be found from define_method.txt
6. Activate the MPC_EXT class.
7. Select all the inactive objects in the MPC_EXT class and click enter.
8. Click on back and navigate back to Service Builder screen.

Follow the steps below to create proxies required for implementing deep create functionality.

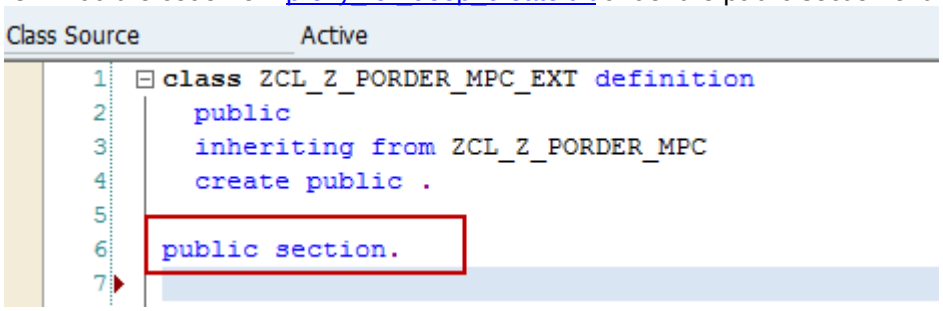
1. Click on Source Code-Based option as shown below.




2. Ensure you are in edit mode.




3. Add the code from proxy_for_deep_create.txt under the public section of the class shown below.

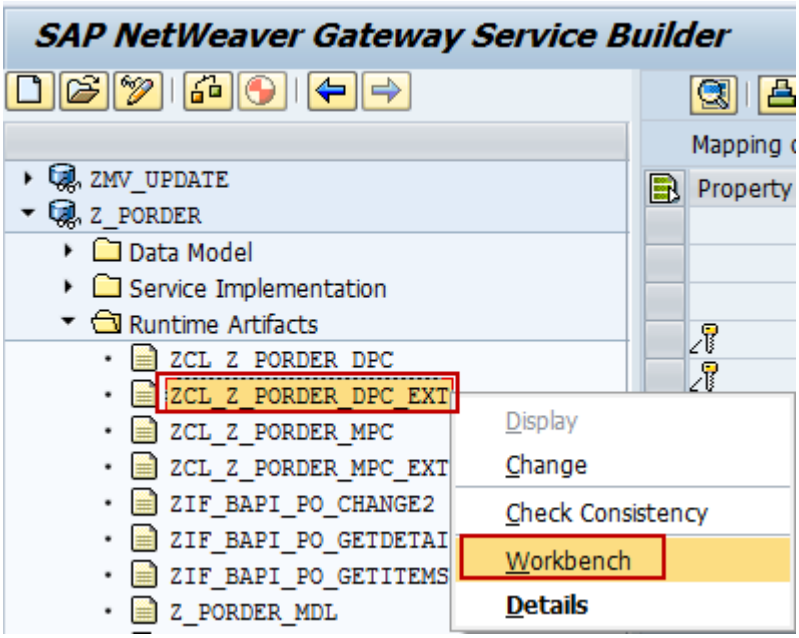



4. Click on Save and Activate.

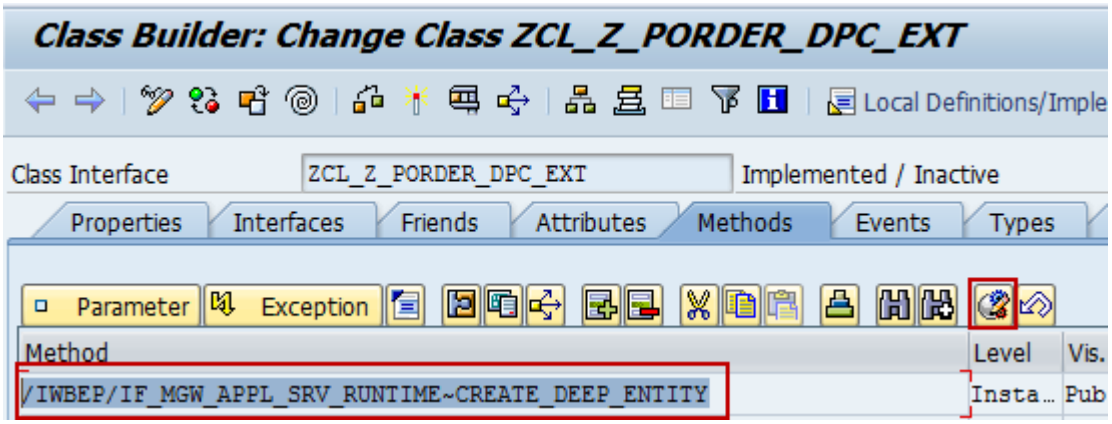
### 3.6 Implementing Data Provider Class

Deep Create functionality is used to create an entity with deep or nested data provided in an inline format. SAP NetWeaver Gateway Service Builder tool does not support Deep Create implementation. Hence this has to be implemented after the runtime artifacts are generated. The method that needs to be redefined in the Data Provider extension class to implement the deep create functionality is **/IWBEP/IF_MGW_APPL_SRV_RUNTIME~CREATE_DEEP_ENTITY** in ZCL_Z_PORDER_DPC_EXT class.

1. From the project folder, expand **Runtime Artifacts.**
2. Right click on ZCL_Z_PORDER_DPC_EXT and choose **Workbench**.



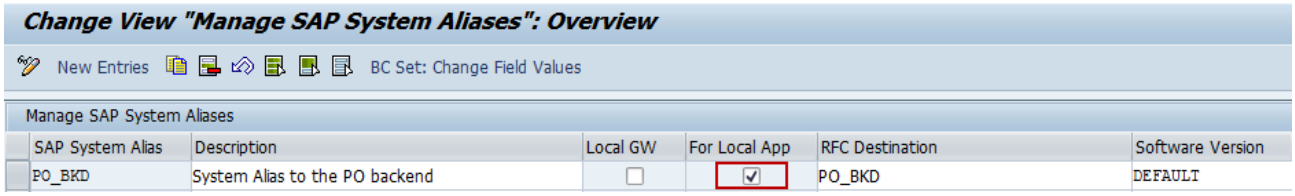

3. Ensure you are in edit mode.
4. Select the method /IWBEP/IF_MGW_APPL_SRV_RUNTIME~CREATE_DEEP_ENTITY and choose redefine.




5. Replace the method with the code from the file deep_create.txt

## 3.7 Register Service in SAP NetWeaver Gateway system

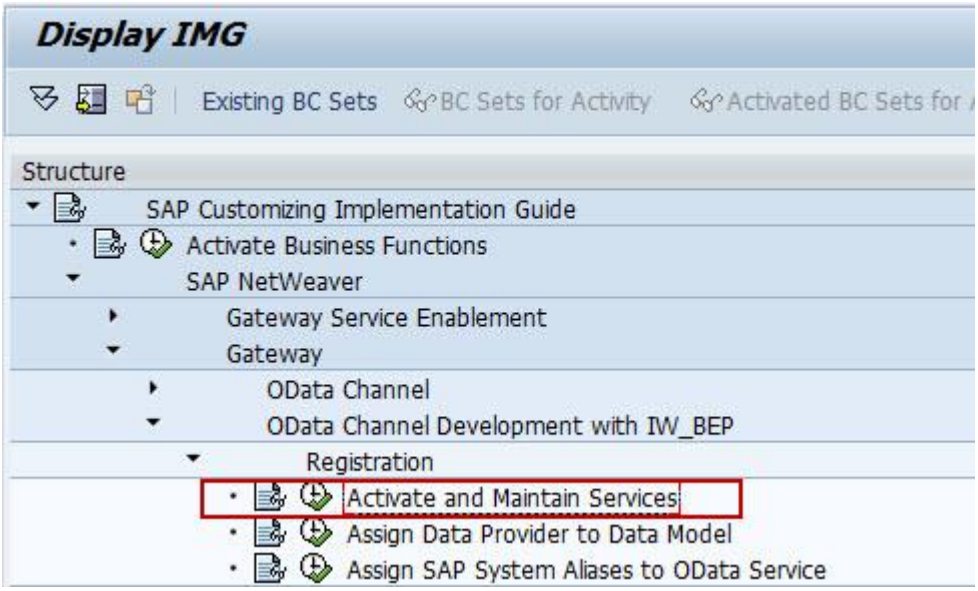
Before registering the service in the SAP NetWeaver Gateway system, ensure you create system alias to the SAP system with the **For Local App** checked as shown below. This can be created by the following navigation **SAP NetWeaver -> Gateway -> Former Development -> Generic Channel -> Configuration -> Connection Settings -> SAP NetWeaver Gateway to SAP System -> Manage SAP System Aliases** in the SAP NetWeaver Gateway system.




This section describes the steps in registering the service in the SAP NetWeaver Gateway system.

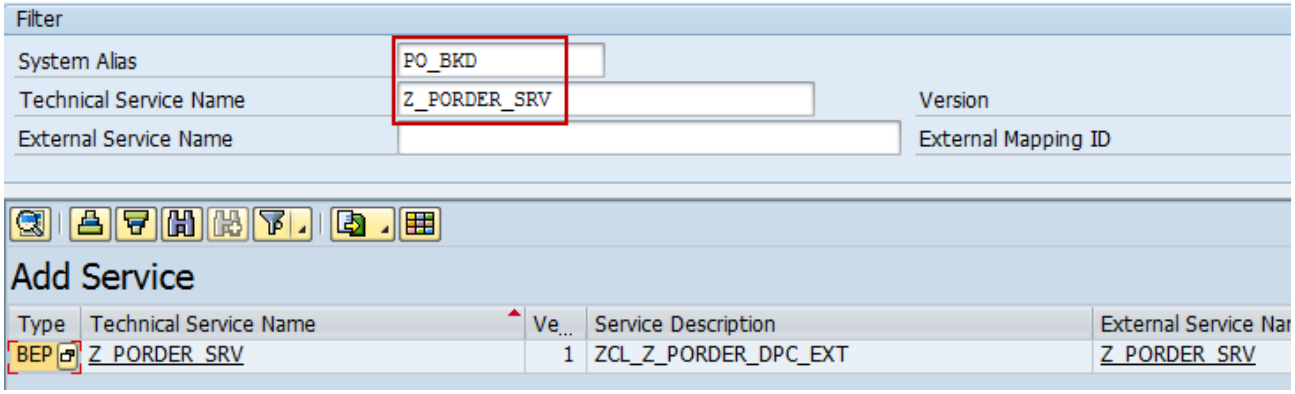
1. Go to transaction **SPRO** in the SAP NetWeaver Gateway system.

2. Navigate to the path **SAP NetWeaver → Gateway → OData Channel Development with IW_BEP → Registration → Activate and Maintain Services**.

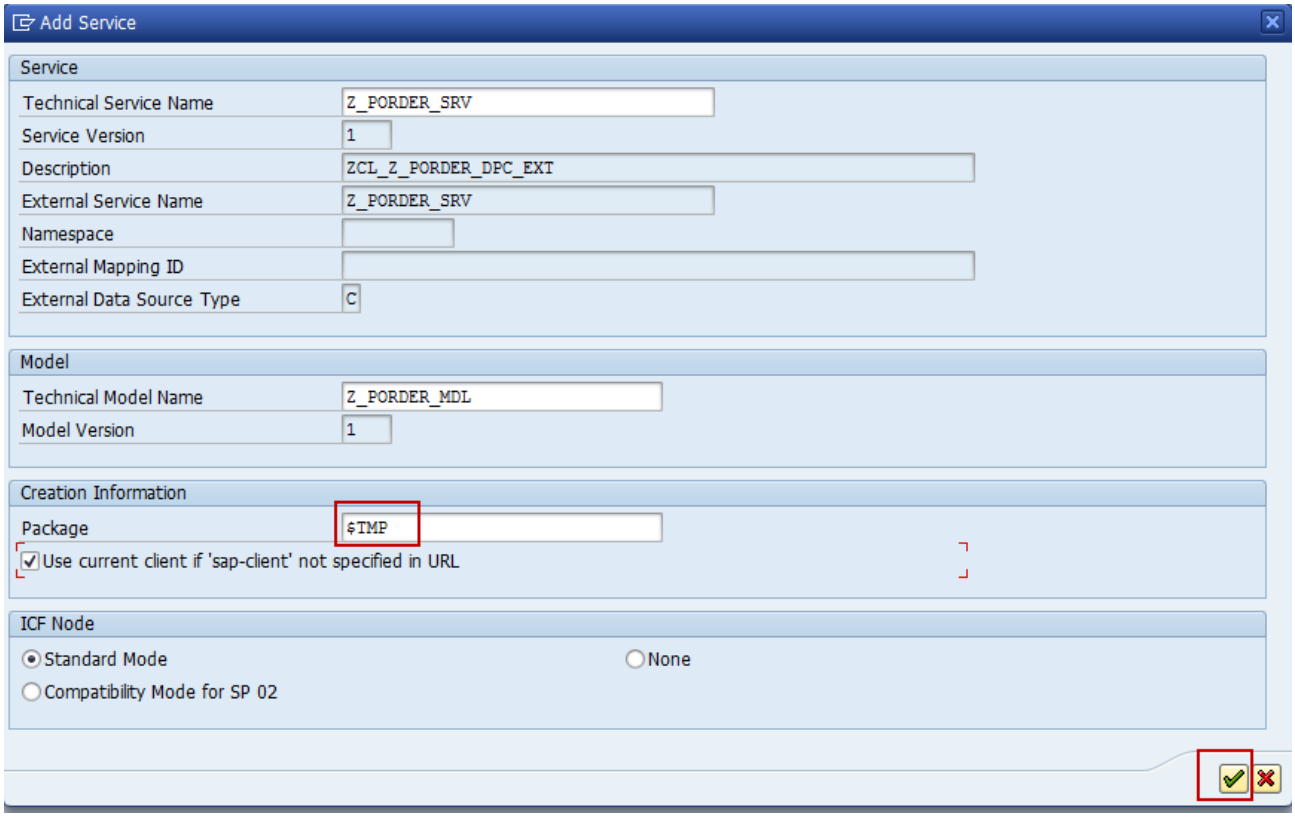



3. Click on **Add service**.

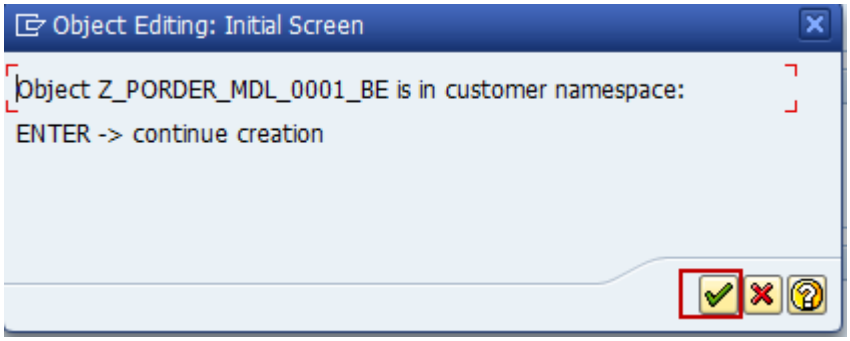

4. Use the System Alias created for the SAP system and the Technical Service Name and add the service. Technical Service Name: Z_PORDER_SRV.

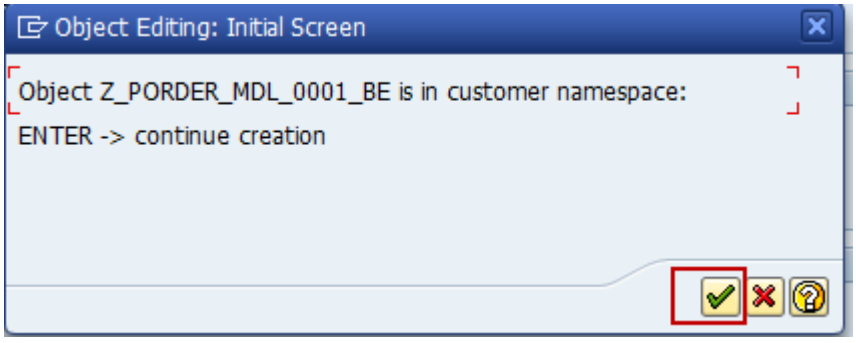


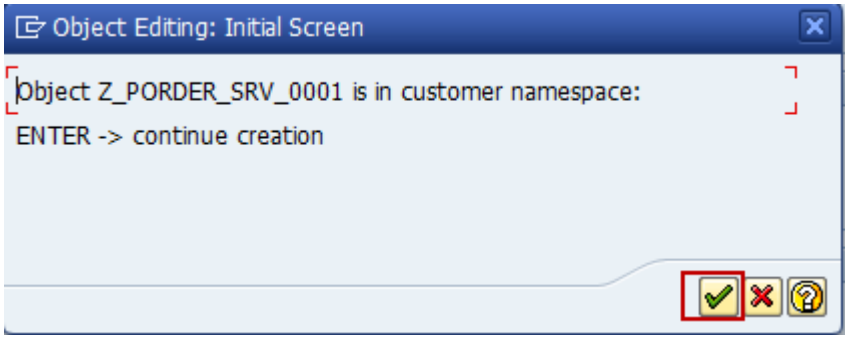

5. Click on service name.
6. Enter $tmp in the package and click on enter.



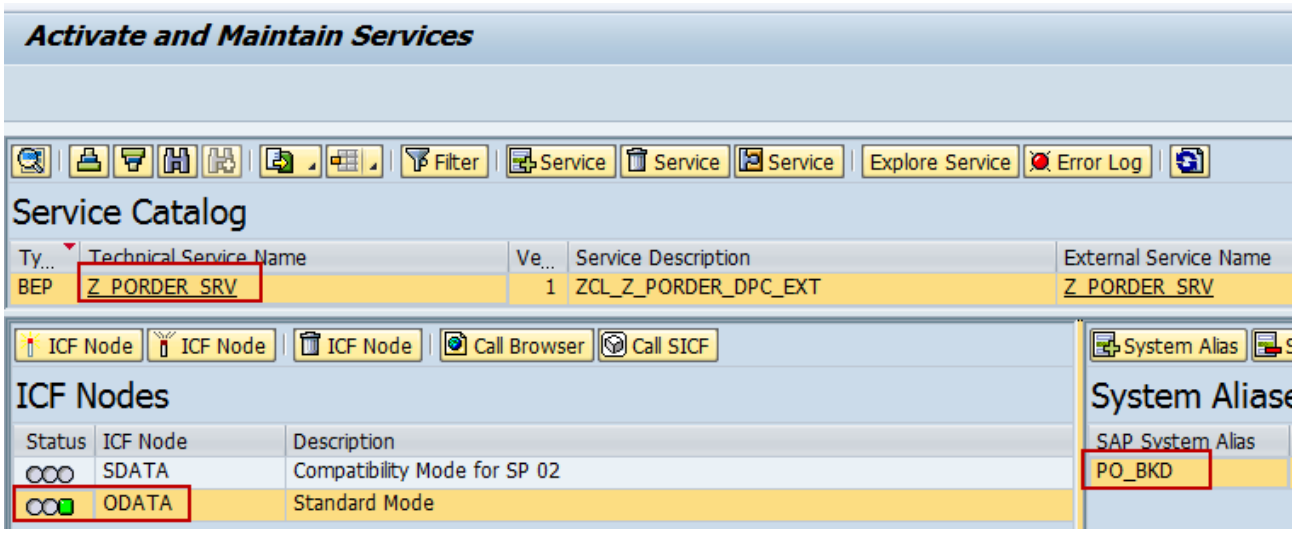

7. Click on the tick mark in the following screens.






8. Click on back. The OData Service created can be found in the service catalogue list.




This completes the creating, implementing and registering the OData service for Purchase Order CRUDQ calls.

## 4 Test OData Service

This section describes the steps to test the various calls in the service. In this document, we will consume the OData service using a SharePoint application. Customers can also build similar applications to use the service according to their requirements.

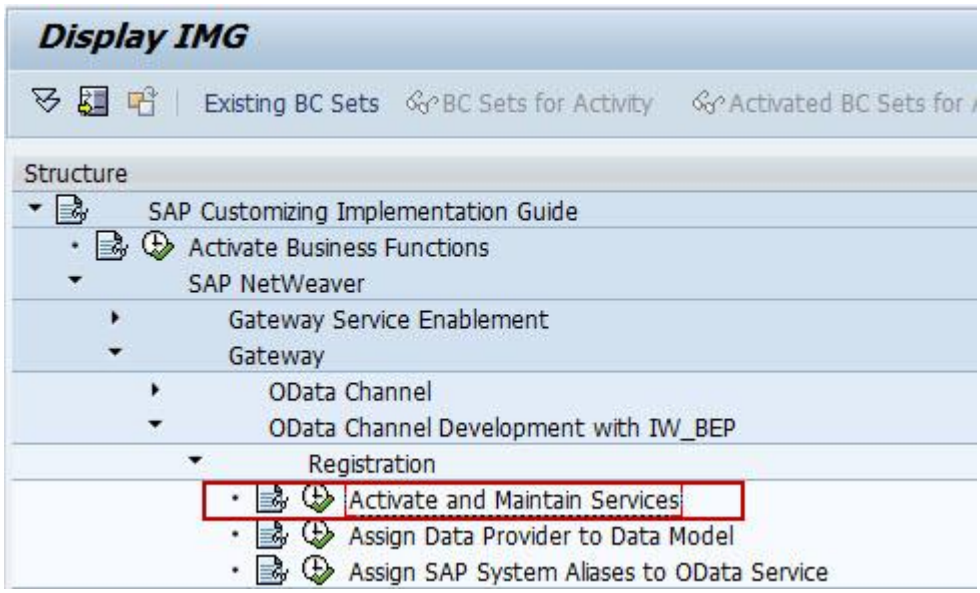
**Note: 1.** Replace <host> and <port> with the actual values in the request URLs.

### 4.1 Service Document

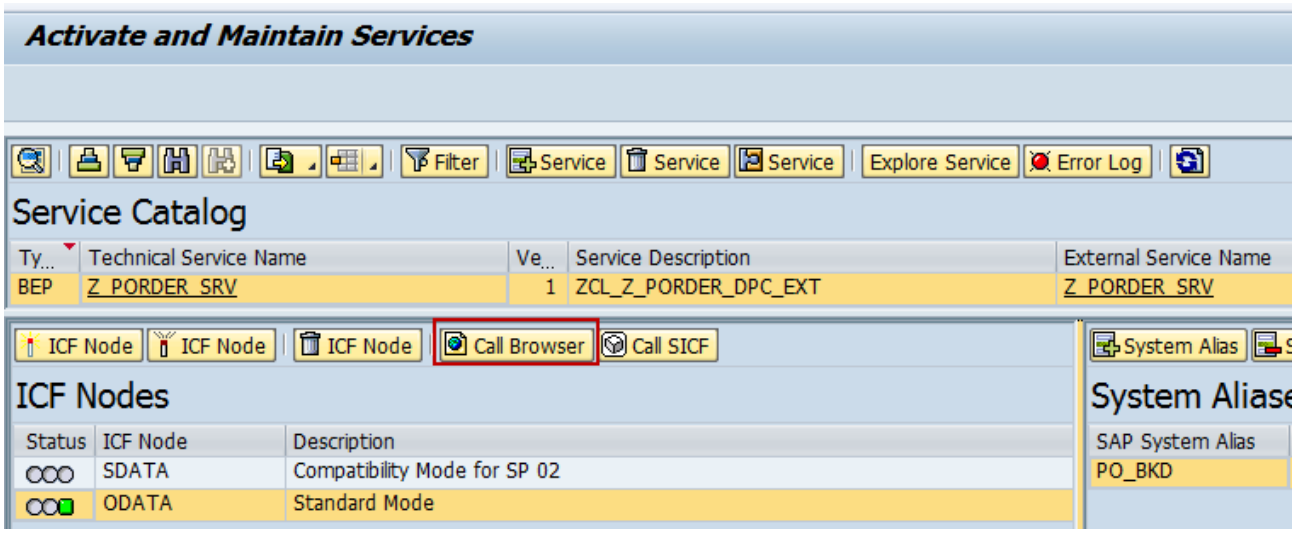
Service document lists all the available entities and collections. It describes the underlying data model.

Steps to view the Service document:

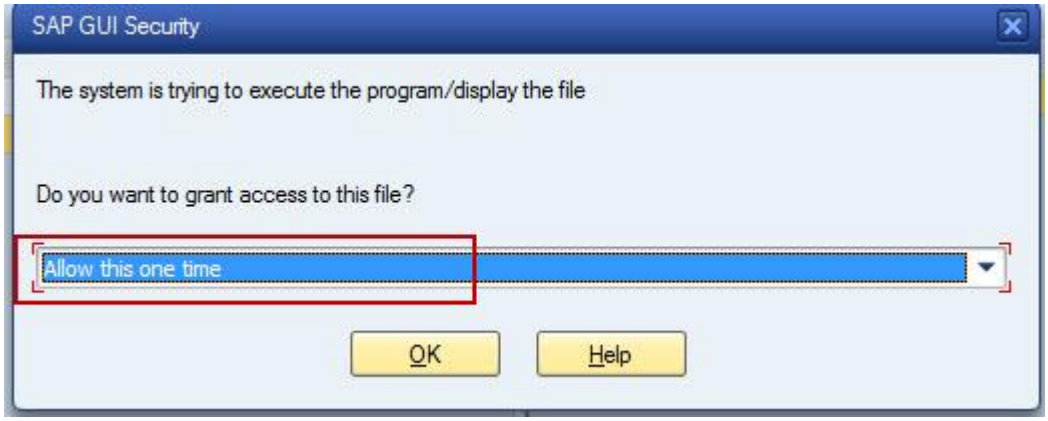
1. Go to transaction **spro** in the SAP NetWeaver Gateway system.
2. Navigate to the path ***SAP NetWeaver*** → ***Gateway*** → ***OData Channel Development with IW_BEP*** → ***Registration*** → ***Activate and Maintain Services***



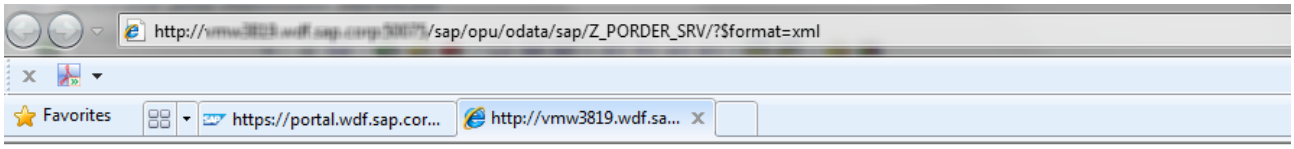

3. Select the row with the Technical Service Name Z_PORDER_SRV.
4. Click on the Call Browser option in the ICF node area for the service.




5. Select **Allow this one time** in the SAP GUI Security screen and click on OK.




6. The service Document is now displayed in the browser. Enter the user credentials of the SAP NetWeaver Gateway system when prompted.




```
<?xml version="1.0" encoding="utf-8" ?>
- <app:service xml:base="http://vmw3819.wdf.sap.corp:50075/sap/opu/odata/sap/Z_PORDER_SRV/" xmlns:app="http://
    xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata" xmlns:sap="http://www.sap.com/Pr
  - <app:workspace>
      <atom:title type="text">Data</atom:title>
    - <app:collection sap:requires-filter="true" sap:content-version="1" href="PurchaseOrderHeaderCollection">
        <atom:title type="text">PurchaseOrderHeaderCollection</atom:title>
        <sap:member-title>PurchaseOrderHeader</sap:member-title>
      </app:collection>
    - <app:collection sap:requires-filter="true" sap:content-version="1" href="PurchaseOrderItemCollection">
        <atom:title type="text">PurchaseOrderItemCollection</atom:title>
        <sap:member-title>PurchaseOrderItem</sap:member-title>
      </app:collection>
    </app:workspace>
    <atom:link rel="self" href="http://vmw3819.wdf.sap.corp:50075/sap/opu/odata/sap/Z_PORDER_SRV/" />
    <atom:link rel="latest-version" href="http://vmw3819.wdf.sap.corp:50075/sap/opu/odata/sap/Z_PORDER_SRV/" />
  </app:service>
```

The Service document can be accessed through the URL
http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/?$format=xml

### 4.2 Metadata

The format of the URL is http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/$metadata.

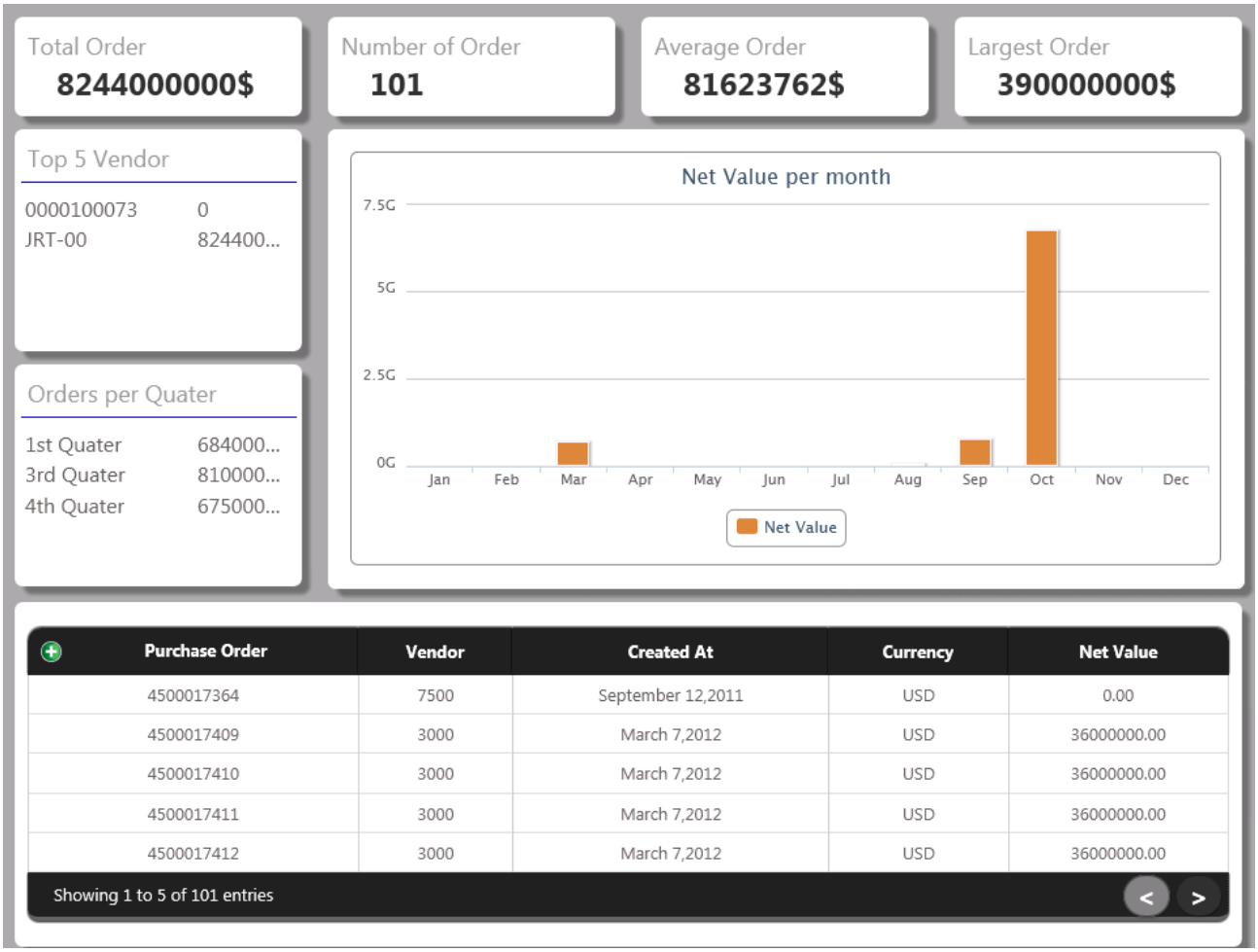
The screenshot below shows the Purchase order header and Purchase order item entities in the metadata along with the properties.

```
- <EntityType Name="PurchaseOrderHeader" sap:content-version="1">
  + <Key>
    <Property Name="TotalValueAtRelase" Type="Edm.Decimal" Precision="15" Scale="2" />
    <Property Name="PurchaseOrgGroup" Type="Edm.String" MaxLength="3" />
    <Property Name="PurchaseOrganization" Type="Edm.String" MaxLength="4" />
    <Property Name="VendorAccountNumber" Type="Edm.String" MaxLength="10" />
    <Property Name="CreatedBy" Type="Edm.String" MaxLength="12" />
    <Property Name="CreatedAt" Type="Edm.DateTime" />
    <Property Name="PurchaseDocStatus" Type="Edm.String" MaxLength="1" />
    <Property Name="PurchaseDocType" Type="Edm.String" MaxLength="4" />
    <Property Name="PurchaseDocCategory" Type="Edm.String" MaxLength="1" />
    <Property Name="CompanyCode" Type="Edm.String" MaxLength="4" />
    <Property Name="PONumber" Type="Edm.String" Nullable="false" MaxLength="10" />
    <NavigationProperty Name="PurchaseOrderItem" Relationship="Z_PORDER_SRV.POHeaderRelatedItem"
      FromRole="FromRole_POHeaderRelatedItem" ToRole="ToRole_POHeaderRelatedItem" />
  </EntityType>
- <EntityType Name="PurchaseOrderItem" sap:content-version="1">
  + <Key>
    <Property Name="MaterialType" Type="Edm.String" MaxLength="4" />
    <Property Name="WeightUnit" Type="Edm.String" MaxLength="3" />
    <Property Name="NetWeight" Type="Edm.Decimal" Precision="13" Scale="3" />
    <Property Name="NetValue" Type="Edm.Decimal" Precision="23" Scale="4" />
    <Property Name="GrossValue" Type="Edm.Decimal" Precision="23" Scale="4" />
    <Property Name="PriceUnit" Type="Edm.Decimal" Precision="5" Scale="0" />
    <Property Name="NetPrice" Type="Edm.Decimal" Precision="23" Scale="4" />
    <Property Name="OrderPriceUnit" Type="Edm.String" MaxLength="3" />
    <Property Name="Unit" Type="Edm.String" MaxLength="3" />
    <Property Name="Quantity" Type="Edm.Decimal" Precision="13" Scale="3" />
    <Property Name="TargetQuantity" Type="Edm.Decimal" Precision="13" Scale="3" />
    <Property Name="MaterialGroup" Type="Edm.String" MaxLength="9" />
```

### 4.3 SharePoint Purchase Order Application

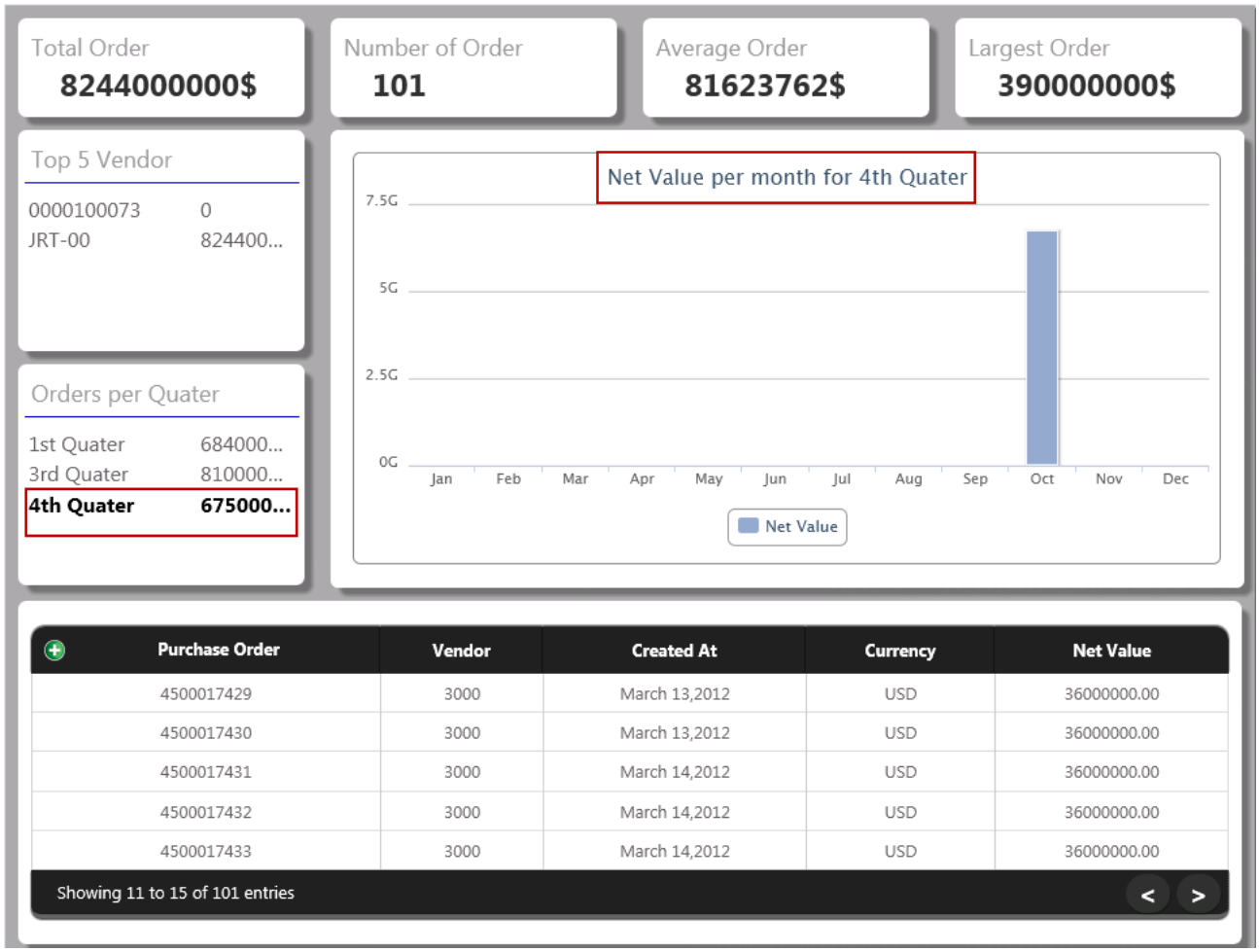
**Note:** The SharePoint application mentioned in this guide is just for showcasing how we can consume the Purchase Order service. However, this document doesn't contain steps to build a SharePoint 2013 application.

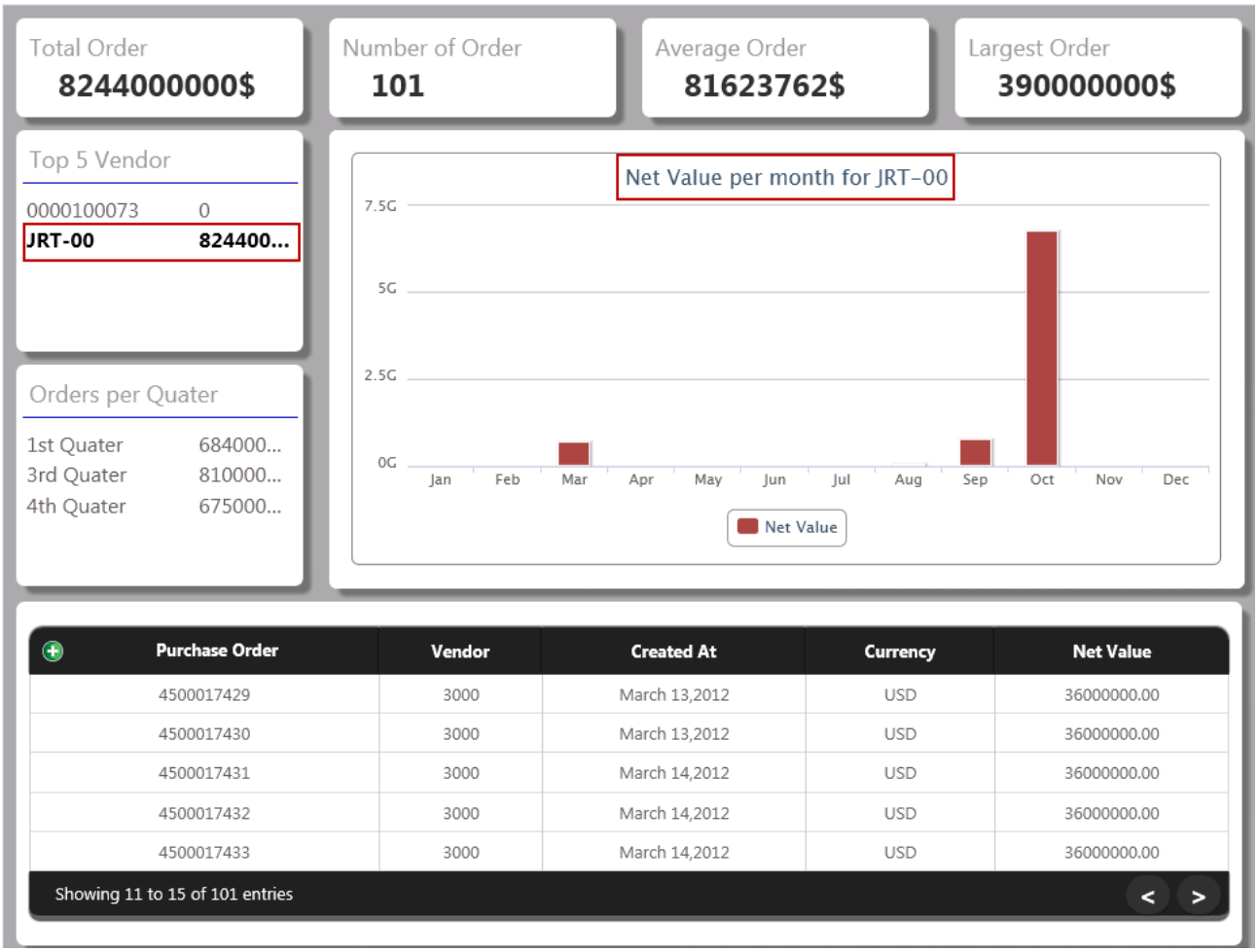
Following is the screen-shot of the Purchase Order SharePoint Application using which we will be testing the service. The application has been built to consume the Purchase Order service created in this guide using Duet Enterprise 2.0 as a platform




The application showcases the various purchase orders in the SAP system along with the details for each purchase order including Vendor, Created At, Currency etc.

The application also lists the Total Order, Number of Order, Average Order, Largest Order, etc. The top 5 Vendors as well as the Orders per Quarter are also retrieved and showcased in the application both in a list as well as in a graphical format.

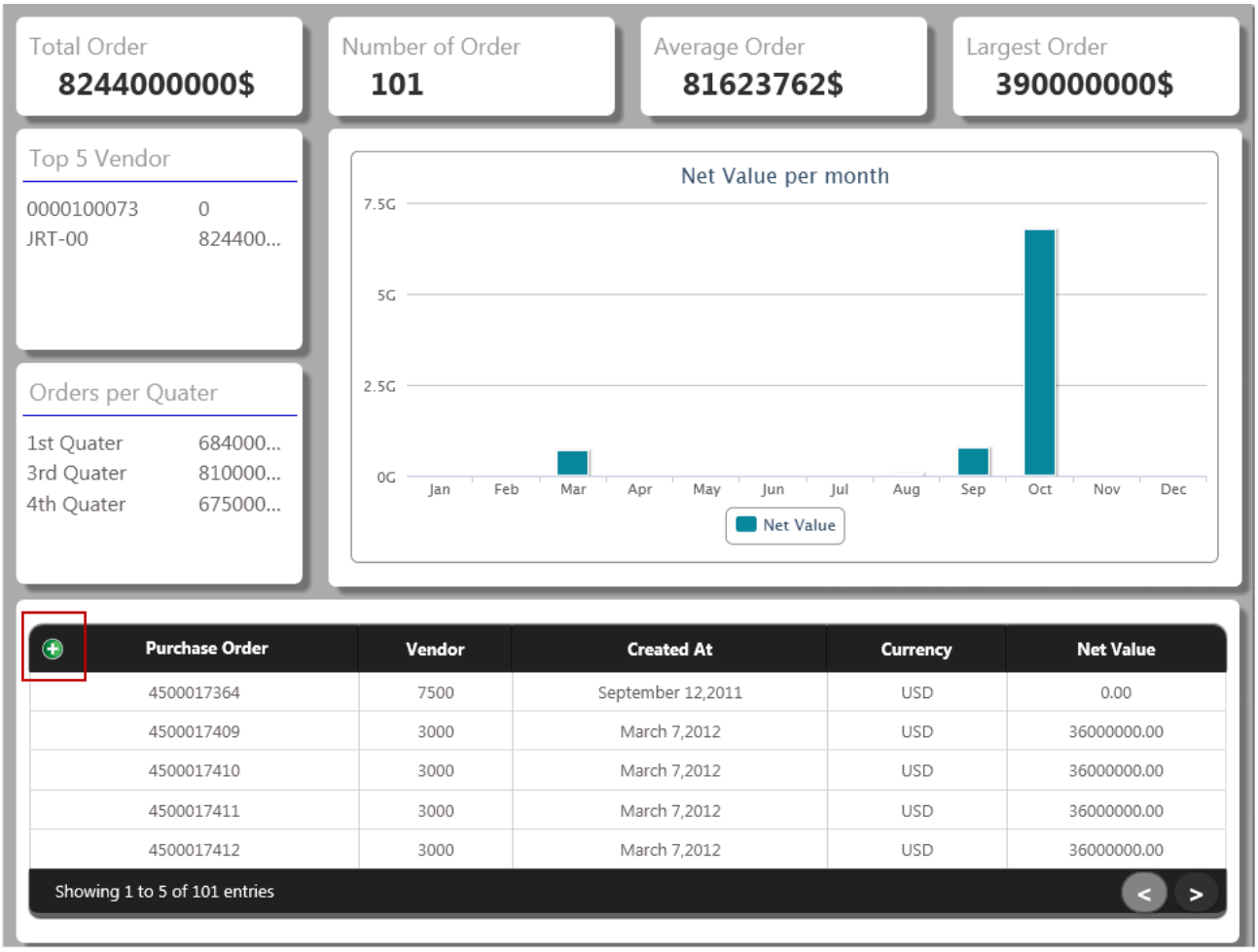

Total Order
8244000000$
Number of Order
101
Average Order
81623762$
Largest Order
390000000$
Top 5 Vendor
0000100073 0
JRT-00 824400...
Orders per Quater
1st Quater 684000...
3rd Quater 810000...
4th Quater 675000...
Net Value per month for 4th Quater
7.5G
5G
2.5G
0G
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Net Value
Purchase Order Vendor Created At Currency Net Value
4500017429 3000 March 13,2012 USD 36000000.00
4500017430 3000 March 13,2012 USD 36000000.00
4500017431 3000 March 14,2012 USD 36000000.00
4500017432 3000 March 14,2012 USD 36000000.00
4500017433 3000 March 14,2012 USD 36000000.00
Showing 11 to 15 of 101 entries
< >



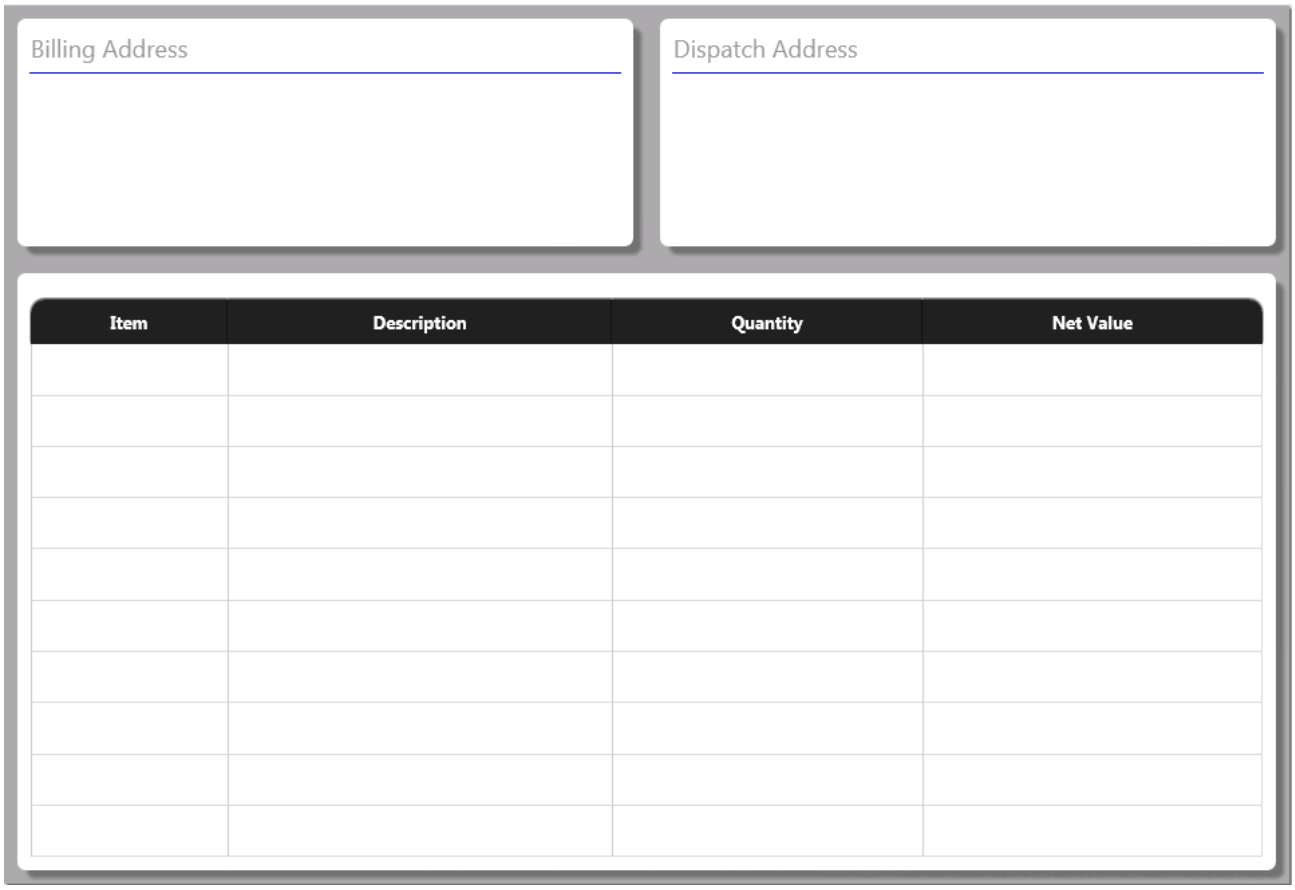

## 4.4 Create (Deep Insert) operation

### 4.4.1 Execute the Create operation

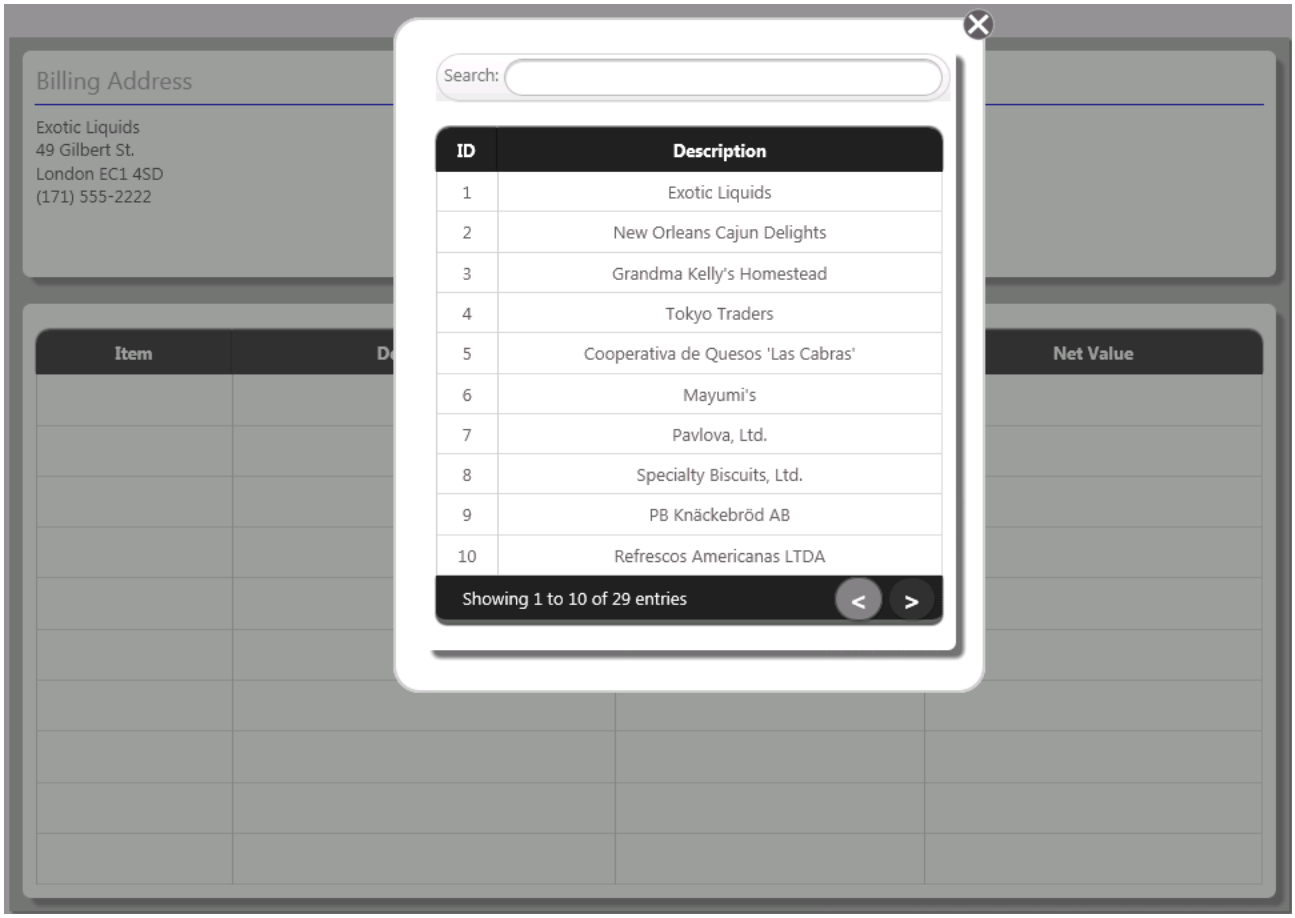
1. In order to create a Purchase Order, click on the “Add” button.



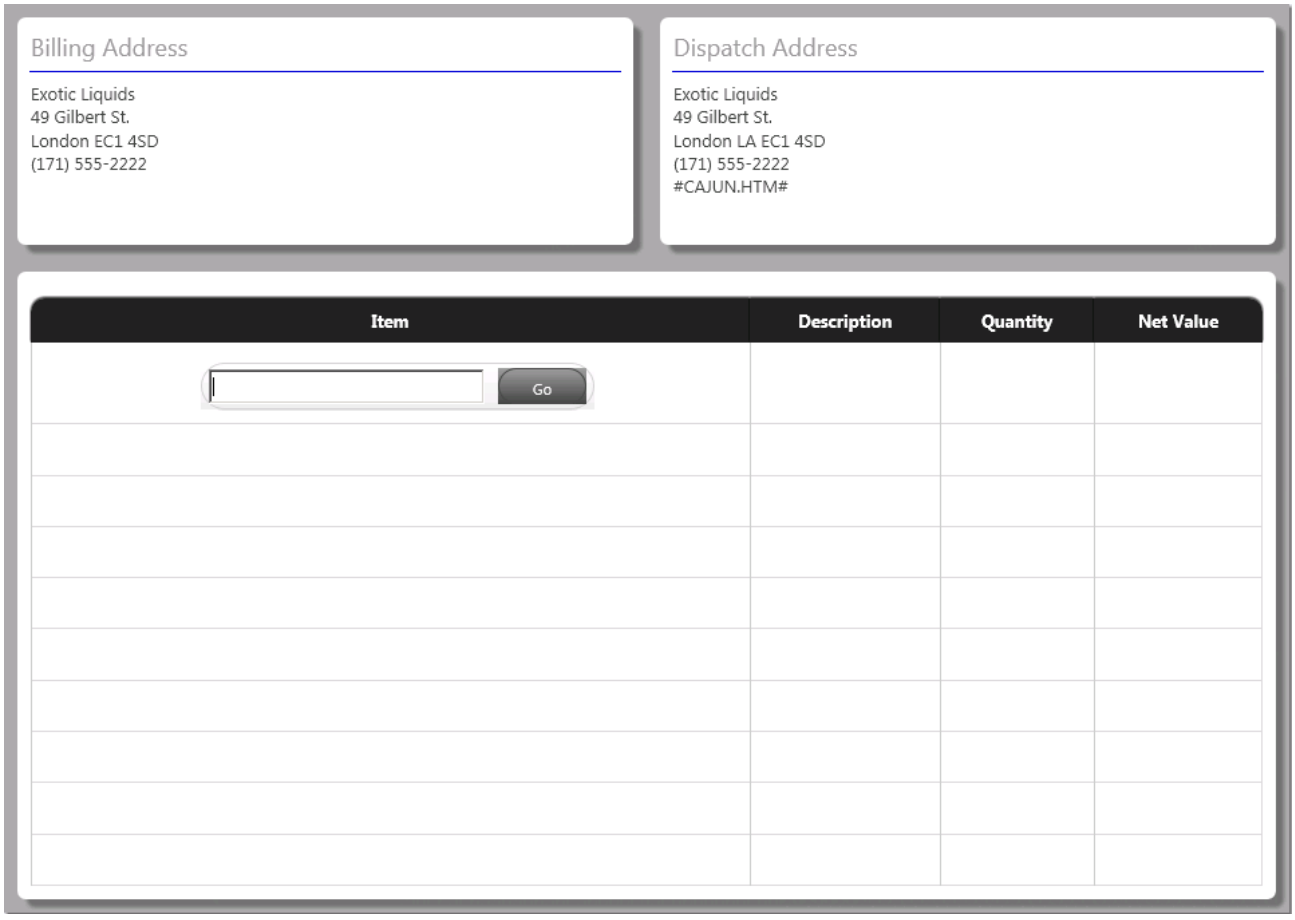

2. This opens up a form in the application in which the details of the Purchase Order to be created has to be entered.



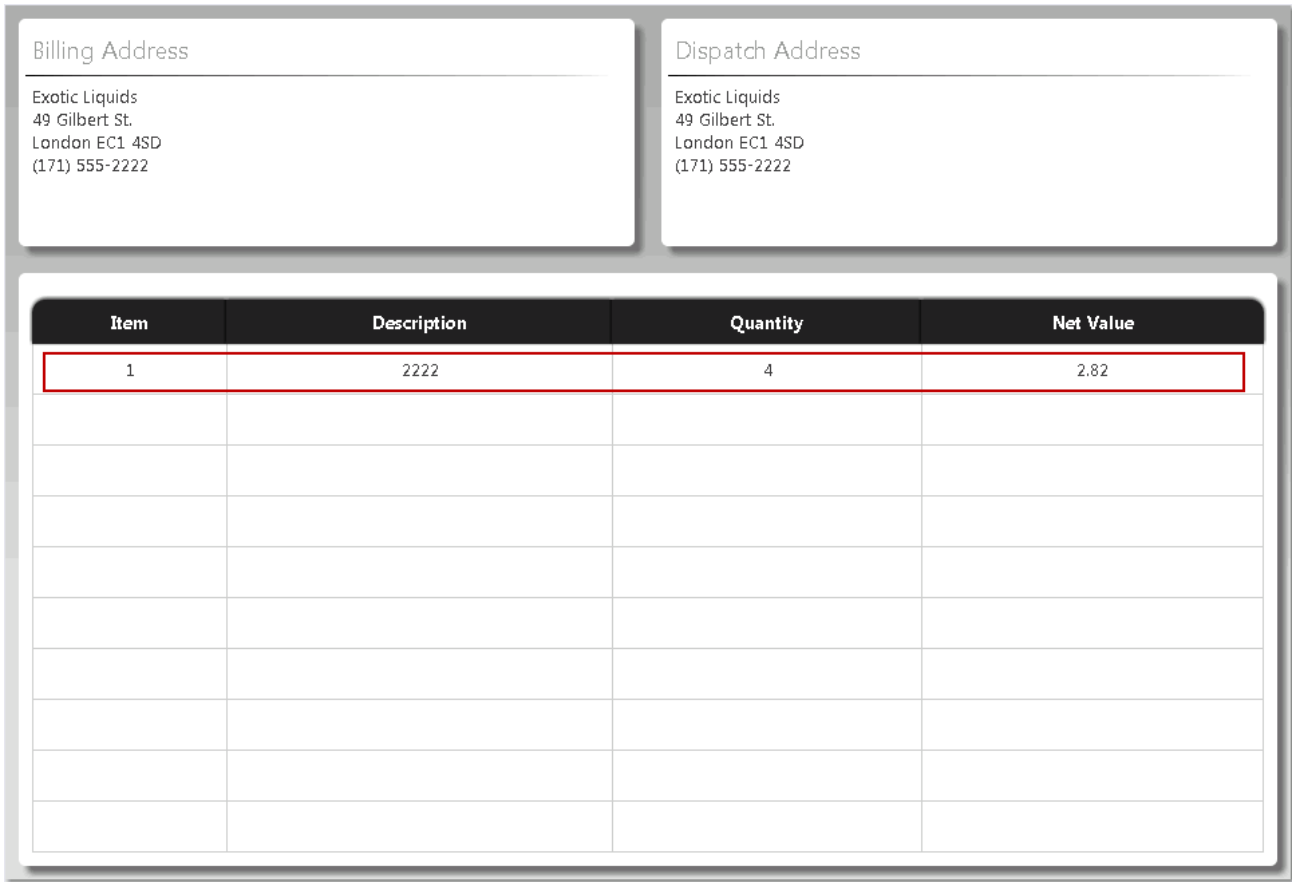

3. In order to enter the Billing Address of the Purchase Order, click on the Billing Address which opens up a list of addresses from which the Billing Address can be selected. Similarly the Dispatch Address can be chosen.



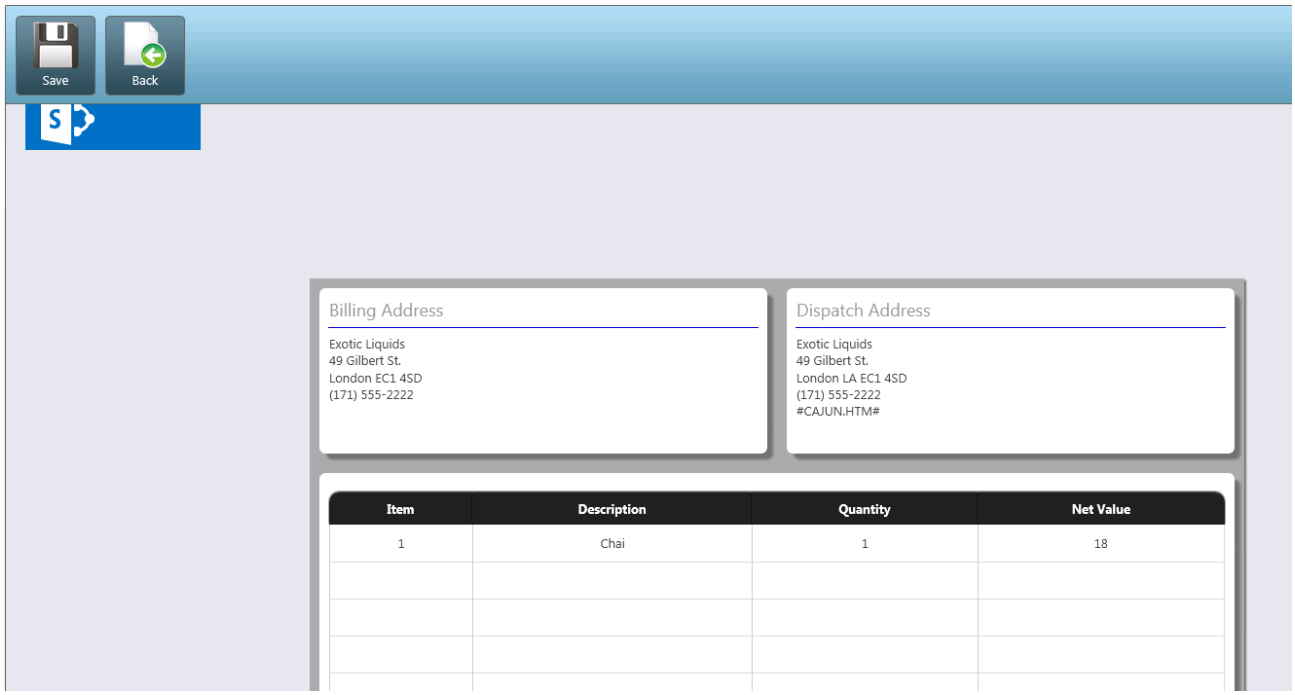

4. In order to enter the Item, Description, Quantity and Net Value details, click on the Item column. This displays a form from which you can choose the Item ID and the description.


Billing Address
Exotic Liquids
49 Gilbert St.
London EC1 4SD
(171) 555-2222
Dispatch Address
Exotic Liquids
49 Gilbert St.
London LA EC1 4SD
(171) 555-2222
#CAJUN.HTM#
Item
Description
Quantity
Net Value
Go

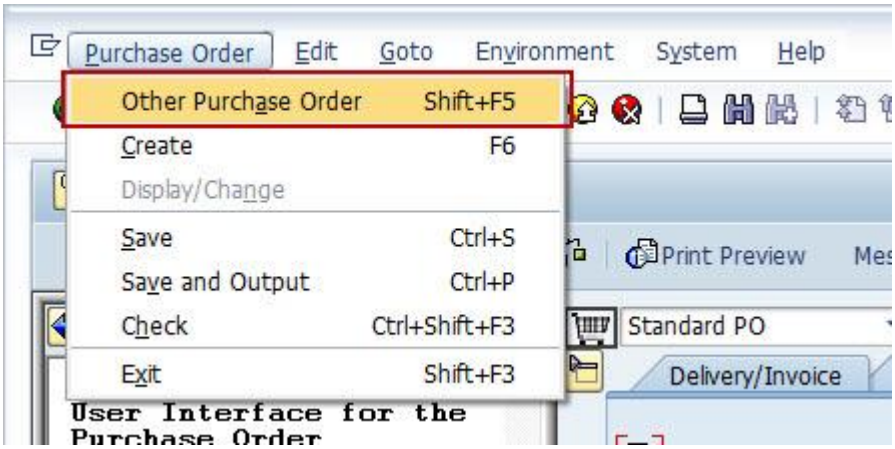

Similarly, you can also enter the Quantity and the Net Value.



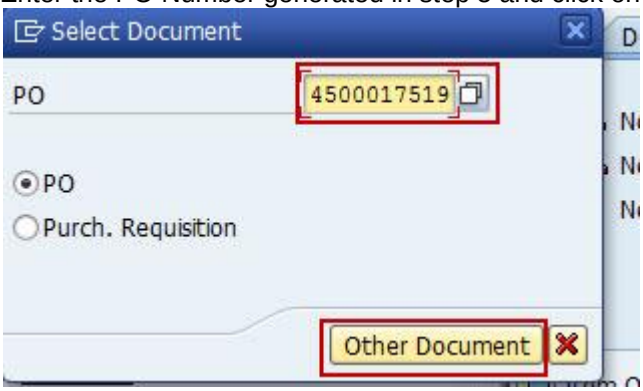

5. Now we have to select the “SAVE” button at the top which will create the Purchase Order in the SAP system using the Purchase Order service.



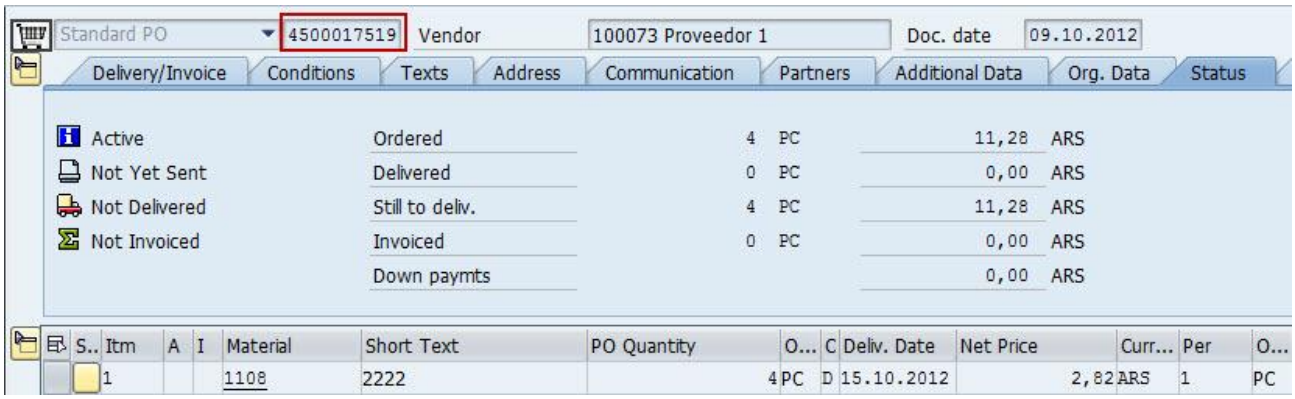
6. The SharePoint application should use the following URL and make a HTTP POST call in this case http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderHeaderCollection
7. The details of the Purchase Order to be created should be passed as xml value to the SAP system. The file create.txt gives a sample deep create request body which can be used to create a purchase order.
8. To check the Purchase Order created in the SAP backend system, go to transaction **me21n** in the SAP backend system.
9. Choose **Purchase Order**-> **Other Purchase Order**.




10. Enter the PO Number generated in step 5 and click on **Other Document**.




11. This displays the Purchase Order created in this section.



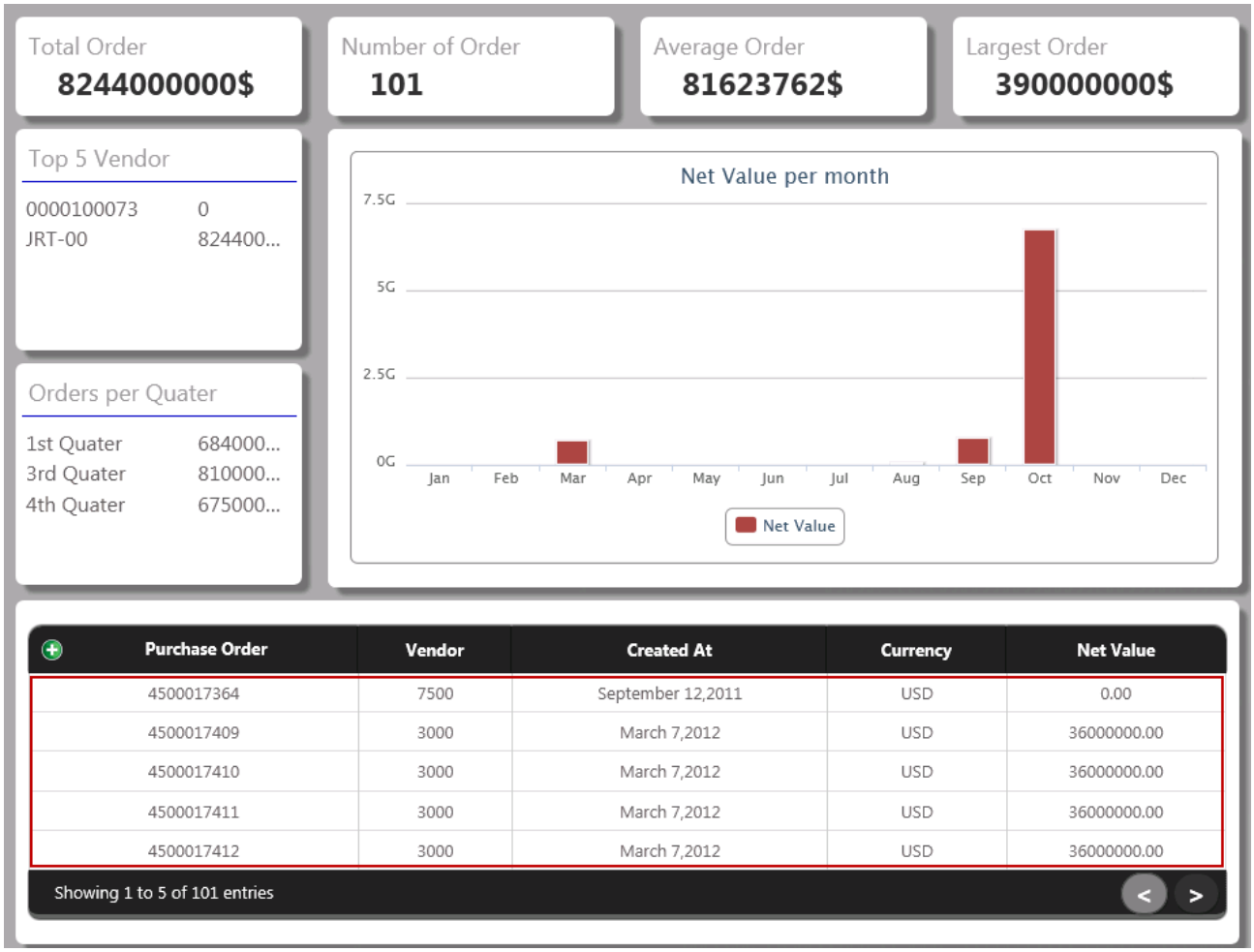

## 4.5 Query operation

**Note:** Ensure you change the host and port values in the Request URL.

### 4.5.1 Read all Purchase Order Header entries

1. In case of the Query operation, the SharePoint application uses the URL http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderHeaderCollection

To fetch the list of all the Purchase Orders (for the particular user in whose context the call is fired) from the SAP system through the SAP NetWeaver Gateway system.




### 4.5.2 Read all Purchase Order Item entries

1. Similarly, in order to fetch all the Purchase Order items from the SAP system, the application should use the URL http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderItemCollection

This will fetch the list of the Purchase Order items from the SAP system.

## 4.6 Read operation

### 4.6.1 Read specific Purchase Order Header entry

1. In order to read a specific Purchase Order Header entry the SharePoint application should use the following URL http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderHeaderCollection('4500017519') In this case, the Header details of a specific Purchase Order (4500017519 in this case) is fetched.
2. In order to view a specific Purchase Order entry from the SharePoint application, click on any of the Purchase Orders from the list which will show the details of the order in a new window.

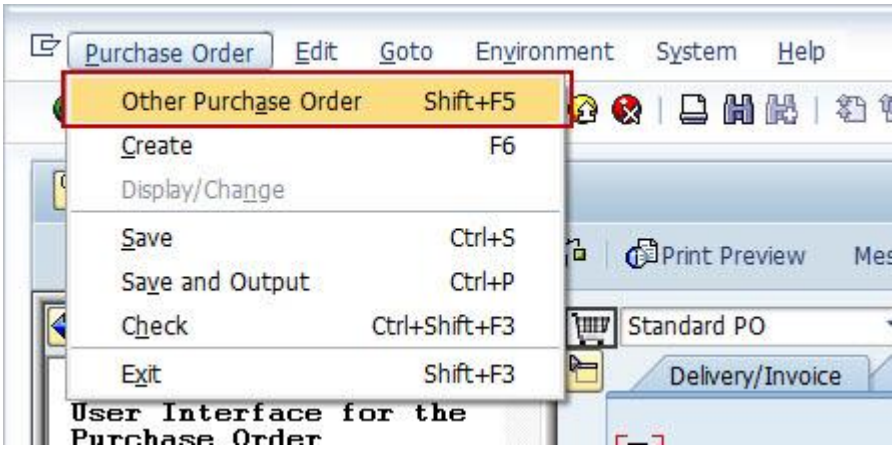
### 4.6.2 Read specific Purchase Order Item entry

1. In order to read a specific Purchase Order Item entry the SharePoint application should use the following URL http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderItemCollection(POItem='00001',PONumber='4500017519') In this case, the details of Item '0001' of the Purchase Order 4500017519 is fetched.

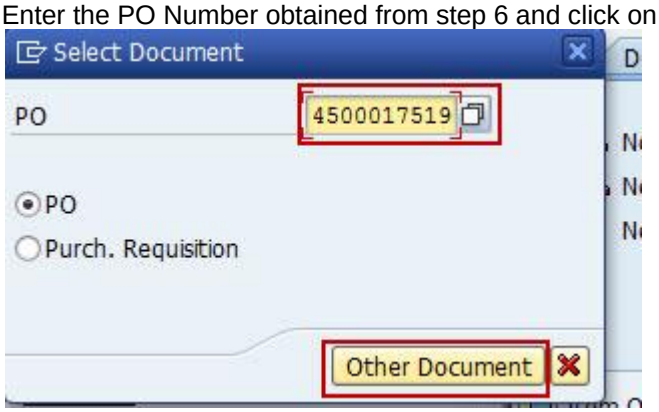
## 4.7 Update operation

### 4.7.1 Purchase Order Header Update

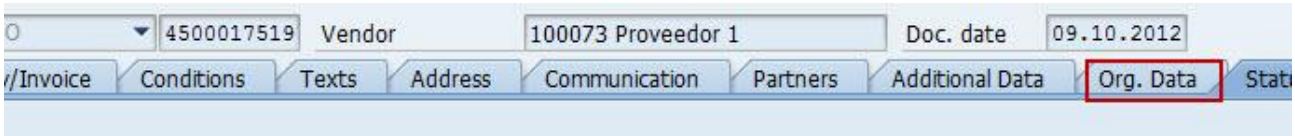
1. The SharePoint application can also be used to update an existing Purchase Order Header in the SAP system. In this case, the application should use the following URL http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderHeaderCollection('4500017519') as a HTTP PUT call (Here the Purchase Order 4500017519 is being updated).
2. A sample request body for the Purchase Order Header update call is at POHeaderUpdate.txt.
3. To check the updated Purchase Order go to transaction me21n in the SAP backend system.
4. Choose **Purchase Order**-> **Other Purchase Order**.




5. Enter the PO Number obtained from step 6 and click on Other Document.



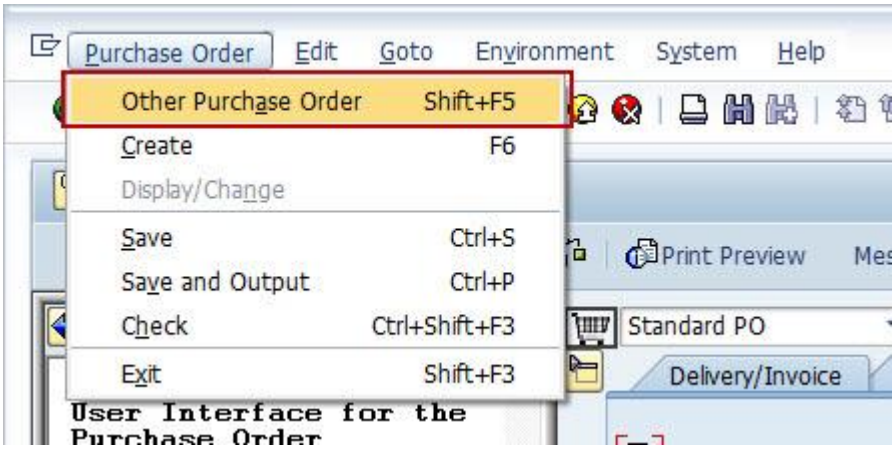

6. This displays the Purchase Order.
7. Choose the **Org.Data** tab in the screen.



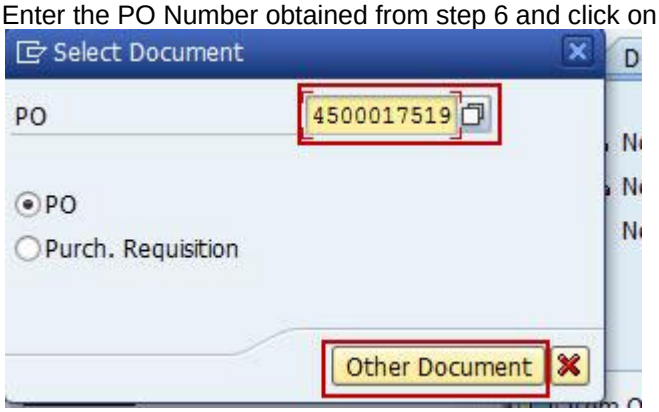

8. The updated Purchase Organization Group can be found here if we tried to update the organisation group for the Purchase Order from the SharePoint application.


### 4.7.2 Purchase Order Item update

1. Similarly, the SharePoint application can also be used to update an existing Purchase Order Item in the SAP Business Suite system. In this case, the application should use the following URL http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderItemCollection(POItem='00001',PONumber='4500017519') as a HTTP PUT call (Here the item 00001 of the Purchase Order 4500017519 is being updated).
2. A sample request body for the Purchase Order Item update is at POItemUpdate.txt.
3. To check the updated Purchase Order go to transaction **me21n** in the SAP backend system.
4. Choose **Purchase Order**-> **Other Purchase Order**.

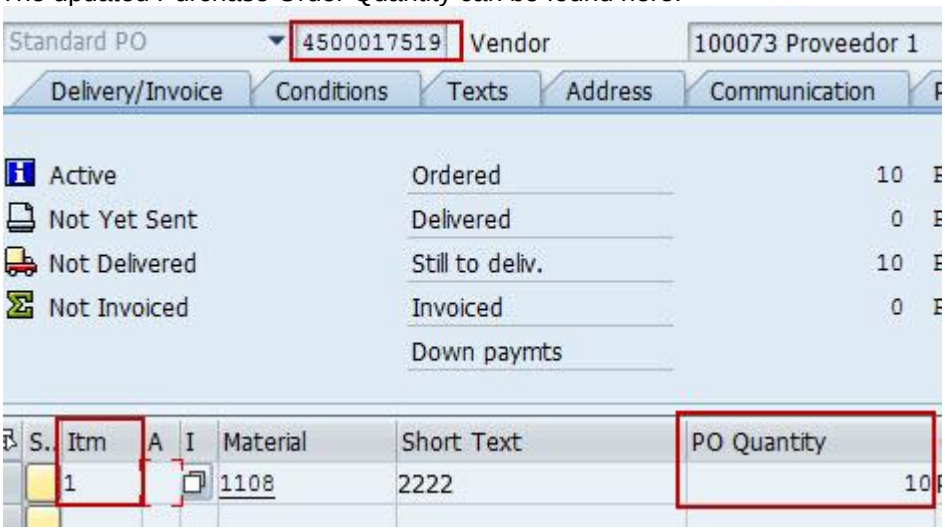



5. Enter the PO Number obtained from step 6 and click on **Other Document**.




6. This displays the Purchase Order.
7. Choose the **Status** tab in the screen.

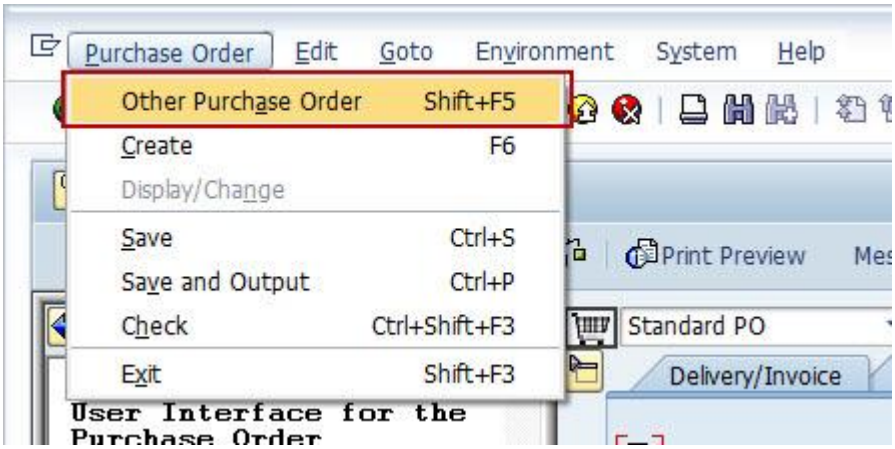

8. The updated Purchase Order Quantity can be found here.



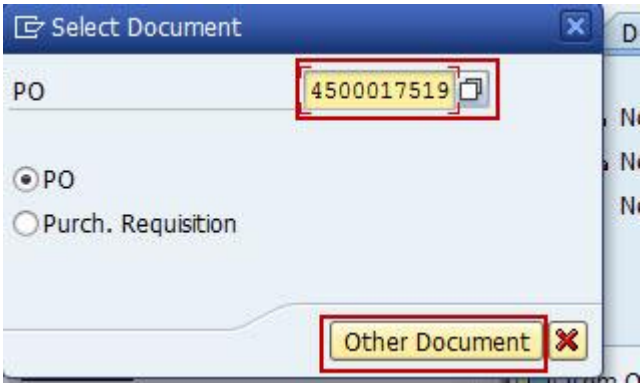

## 4.8 Delete operation

### 4.8.1 Purchase Order Item Delete

1. Similarly, the application can be used to delete an already existing Purchase Order entry in the SAP Business Suite system. A DELETE HTTP call should be used in this case : http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderItemCollection(POItem='00001',PONumber='4500017519') (The call will delete the Item 00001 of the Purchase Order 4500017519 in this case).
2. To check the deleted Purchase Order Item, go to transaction **me21n** in the SAP backend system.
3. Choose **Purchase Order**-> **Other Purchase Order**.

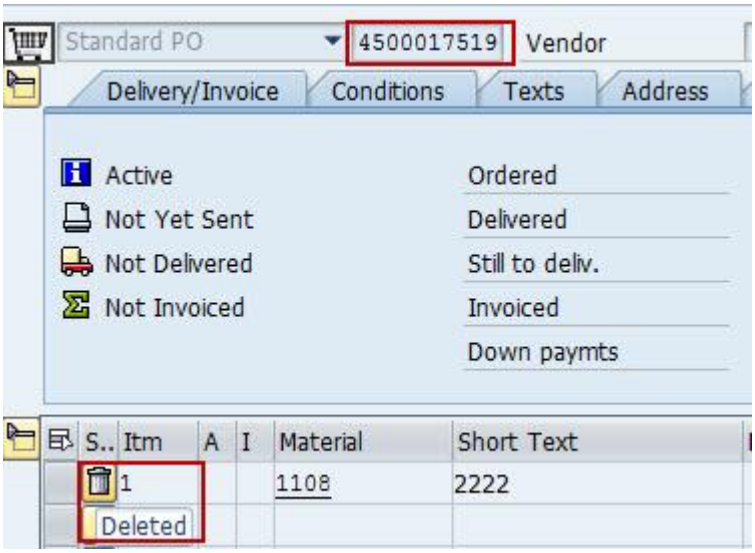



4. Enter the PO Number obtained from step 6 and click on **Other Document**.




5. This displays the Purchase Order.
6. Choose the **Status** tab in the screen.


7. The information of the deleted Purchase Order item can be found here.




### 4.8.2 Purchase Order Header Delete

1. In order to delete a Purchase Order Header entry, the URL call to the SAP system should be similar to the following http://<host>:<port>/sap/opu/odata/sap/Z_PORDER_SRV/PurchaseOrderHeaderCollection('4500017519') (This call will delete the Purchase Order Header 4500017519 in this case)

## 5. Glossary

**Metadata Provider Class**: A runtime object that is created when the OData service is generated. This class contains the generated metadata definition of the OData service.

**Metadata Provider Extension Class**: A runtime object that is created when the OData service is generated. This is an extension class of the Model Provider Class and additional code to refine the model has to be written in the metadata provider extension class.

**Data Provider Class**: A runtime object that is created when the OData service is generated. This is called during the runtime when the OData service is being executed.

**Data Provider Extension Class**: A runtime object that is created when the OData service is generated. This is an extension class for the Data Provider Class. For each of the entities, the methods corresponding to CRUD operations can be implemented in the data provider extension class.

## Related Content

How to Install and Configure Duet Enterprise 2.0

OData service in the SAP backend system for CRUDQ operations in Purchase Order scenario

Video: Developing a Purchase Order

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