Extending HANA-based Analytics for SAP Master Data Governance – Integrating Object Counters

Make use of counting the number of objects contained in change requests for your analytical scenarios

Applicable Releases:

From MDG 7.0 SP05 (only available in ECC)

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Document History

Document Version	Description
1.0	First official release of this guide (May 2015)
1.1	Adapt current template (November 2024)

Table of contents

1. Introduction

SAP Master Data Governance (MDG) provides business processes to find, create, change, and mark master data for deletion. It supports the governance of master data in a central hub and the distribution to connected operational and business intelligence systems. The processes are workflow-driven and can include several approval and revision phases, and the collaboration of all users participating in the master data maintenance. MDG offers change request (CR)-based processing of master data with integrated workflow, staging, approval, activation, and distribution.

With SAP Master Data Governance 7.0 SP02 (Feature Pack), HANA-Based analytical functions have been delivered to monitor as well as to analyze process related KPIs regarding change request information. With SAP Master Data Governance 8.0 as well as with SAP Master Data Governance 7.0 SP05, the scope of analytics for Master Data Governance processes was enhanced by linking change request data to additional data such as master data attributes (for example material master, vendor master), change documents, or SAP Business Workflow information. Now you can analyze change request data can be as well as additional data that is directly linked to the change request data. This additional data that can be combined with change request data for analytical purposes includes the following:

- **Analysis of Change Requests Based on Objects**
  Combines change request data with its contained master data business objects and entities
- **Analysis of Change Requests Based on Change Documents**
  Combines change request data with change document information related to the contained master data objects/entities
- **Analysis of Change Requests Based on Workflow**
  Combines change request data with information about the workflow that is assigned to the change request.

2. Business Scenario

By default, a set of Measures as well as Counters is provided based upon the mentioned scenarios in the introduction. These Measures/Counters allow the definition of KPIs to monitor process related Change Request information like (e.g.) *Total Change Requests*, *Average Process Time*, *Average Delay Time* or *Erroneous Change Requests*.

As soon as scenarios are used where the change request data is combined with its contained master data business objects and entities, also counters and measures are of

interest that refer to the contained master data business objects. In this case, it is especially of interest to analyze and get informed about the number of objects contained within change requests.

To support this analytical scenario, it is required to add additional counters to our provided HANA-based query views in addition to the already existing ones. This guide describes in detail how to add the following types of counters and measures:

- **Total Number of Objects in Change Requests**
- **Average Number of Objects Within a Change Request**

In the next sections the required prerequisites as well as the necessary steps are described in detail to add the two types of counters and measures to the corresponding query views. This includes the manual steps to add the counters and measures from a technical point of view but also domain-specific (for example, material, business partner) information to adapt the counters and measures to your business requirements.

3. Prerequisites

3.1. Technical Prerequisites

To extend the HANA-Based Analytics for SAP Master Data Governance, it needs to be ensured that specific technical requirements are met. In general, this means that the HANA-Based Analytics for SAP Master Data Governance process is up and running as described in the SCN-based Guide according to your deployment scenario (*Replication Scenario or Integrated Scenario, respectively*).

3.2. Content-Related Prerequisites and Background Information

If the technical prerequisites are fulfilled, you also need to take into account as a mandatory precondition content-related prerequisites. As the counters and measures (that should be added using the steps in this guide) are related to the counting of business objects, the following content-related prerequisites must be fulfilled in the order that the steps described in this guide:

- The HANA-Based Analytics for SAP Master Data Governance links change request information with object related information based on the business object type code. A corresponding HANA-Based query view always restricts the view on the data to the change request and the objects contained in the object list by a filter on the business object type code.

- This behavior is reflected in the generation report which is described in detail in the information contained under *Technical Prerequisites*.
- Consequently, adding an object-specific counter as described in this document is always only valid and possible for a specific business object type code.
- Therefore, if you want to analyze and count business objects that are contained in a change request a scenario must be generated using the generation report `MDG_ANA_HDB_GEN_REPO_CONTENT` according to the corresponding business object type code.

Generation of HANA Repository Content for MDG Smart Business

HANA Database Connection	
DB Connection Name	[CONNECTION NAME]
Schema Name	

HANA Repository Package	
Package	[PACKAGE NAME]
☑ Create Package	

HANA Objects to Be Created
☑ Create .xs Files

Generation of Change Request Header and Edition Data
☑ Create Calculation Views
☑ Create Queries
☑ Create OData Service

Generation of Business Object-based Views
Business Object Type
Search View

Generation of Workflow Views
☐ Create Workflow Views

- Examples for business object type codes are:
    - 194, Data Model: MM, Entity Type: Material
    - 147, Data Model: BP, Entity Type: BP_HEADER
    - 154, Data Model: 0G, Entity Type: Company
- After the generation of a business object type code related scenario, the relevant query views (that are the basis for the enhancements described in this guide) are generated in a subpackage (that corresponds to the data model of your selected business object type code).

Every query view that has a business object type code (for example: 194) in its name, provides the information which is required for the enhancements described in this guide. If the pattern [Optional: XYZ][Business Object Type Code][Optional: XYZ] Query applies to the view name, adding the described measures and queries can be done as the required information is present in the query view.

4. Generally required configuration steps

Before executing the mentioned steps below, you need to adhere to the technical as well as to the content-related prerequisites described in the chapter before. To enhance the HANA-Based query views according to the described scenario, the following steps are required.

Note: The following description is independent from a domain-specific use case and focuses on the technical steps. Nevertheless, to make the steps easier to understand, the guide refers to a material-based scenario.

4.1. Open Query View

- Logon the SAP HANA Studio
- Navigate to your HANA content package and select the corresponding query view which should be enhanced.
 Example: Package tmp.enhancement.MM, Query View CRHeaderFor[OTC]Query (CRHeaderFor194Query in our example)
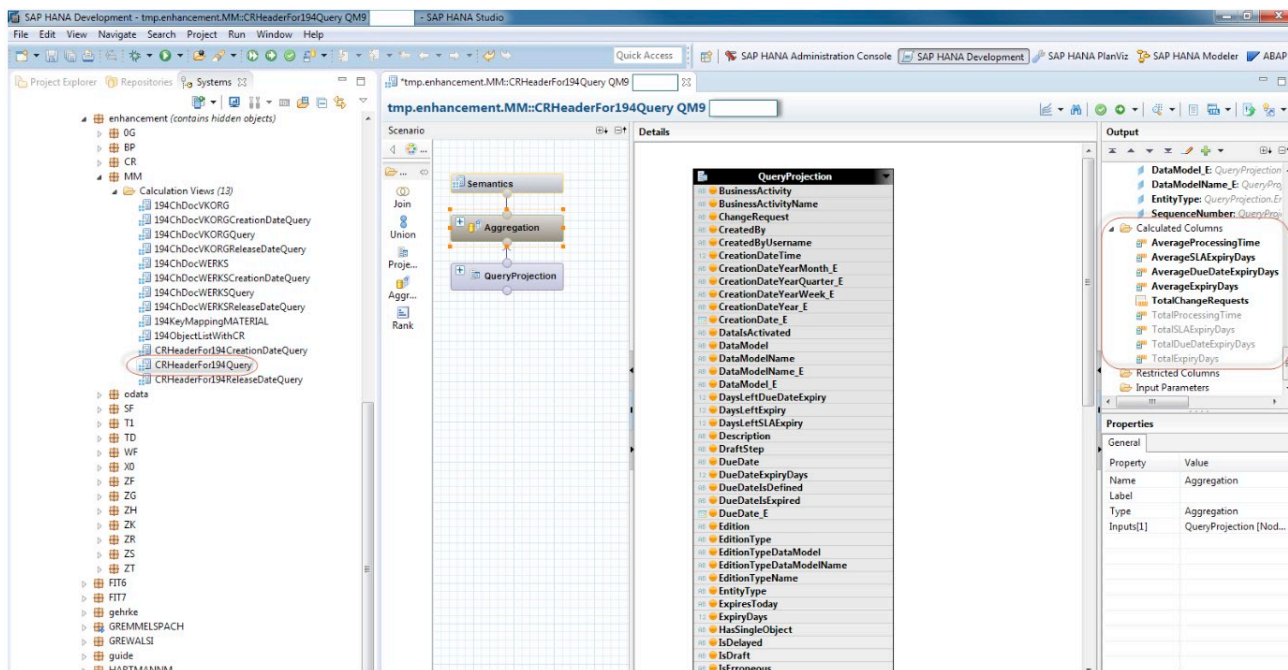

- Selecting the aggregation node, you can see the calculated columns on the right hand side which show the available counters and measures.

4.2. Add Calculated Column: Counter for Total Objects in Change Requests

- In the next step you add a counter that sums up the number of objects in change requests.
- Right-click on the field *Calculated Columns* and select *New Counter*
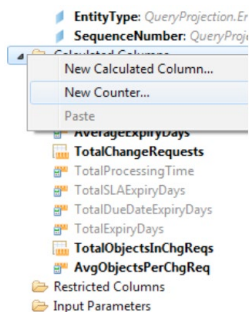
- In the upcoming dialog box, enter the following information (Remark: Name as well as field are only a recommendation and can be freely chosen):
  - Name: TotalObjectsInChgReqs
  - Label: Total Objects in Change Requests
  - Column Type: Measure (predefined)
 - Exception Aggregation Type: COUNT_DINSTINCT (predefined)
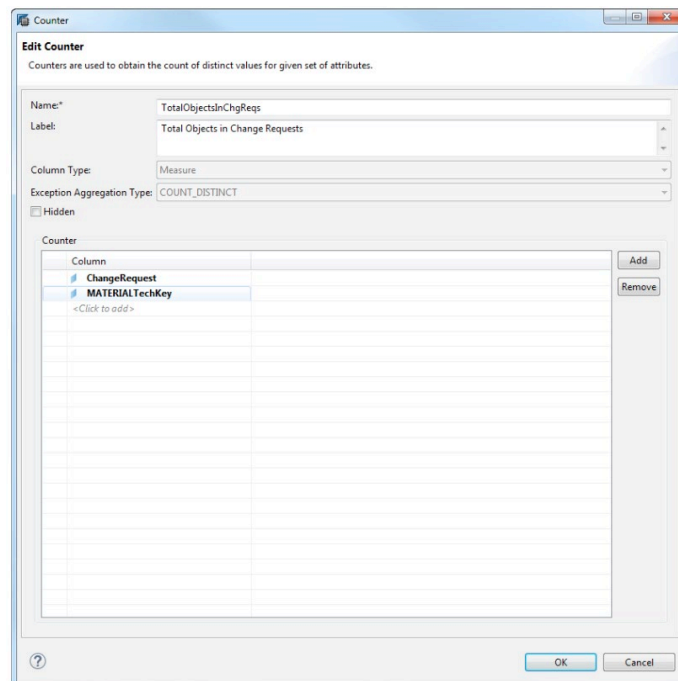
- With the table *Counter,* you can add the columns that are basis for the counter. For each unique combination of the defined columns one (=1) is added to the counter. In our example this means that for each combination "Change Request – Material Technical Key" one (= 1) is added to the counter.

- o Example: If Material *ABC-123* was part of three change requests three (= 3) is added to the Counter.
- The defined columns need to represent the following pattern to correctly calculate and count the number of objects contained in the view generated for a specific business object type code:
  - o Change Request
  - o [KeyComponent1]
  - o [KeyComponent2]
  - o [KeyComponent3]

  In case that technical key information exists in the list of available columns (this happens if the data model supports technical keys) the technical key information should be preferred in comparison to real key/key component information as this information is unique.
- Save and activate the query view.
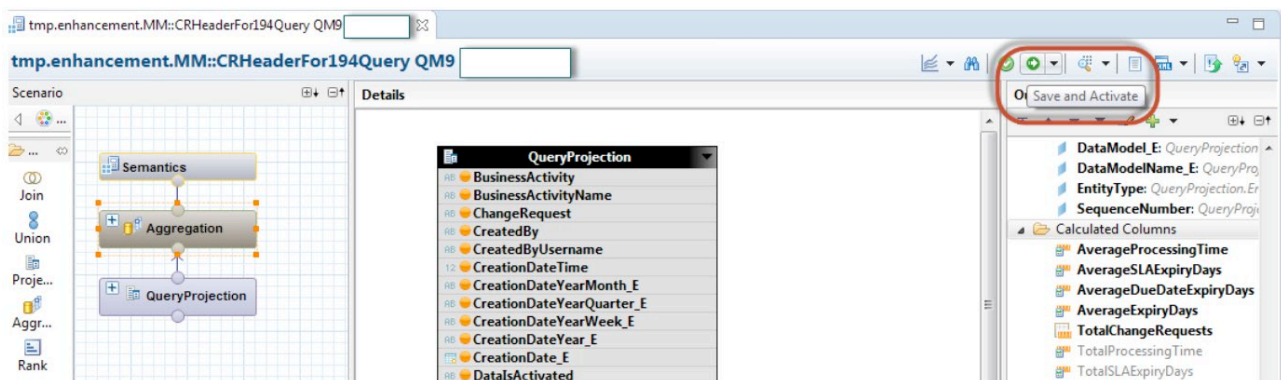
4.3. Test the Calculated Column/Counter for Total Objects in Change Requests Using the Data Preview Function

The newly created counter for the *Total Objects in Change Requests* can be easily tested using the Data preview function.
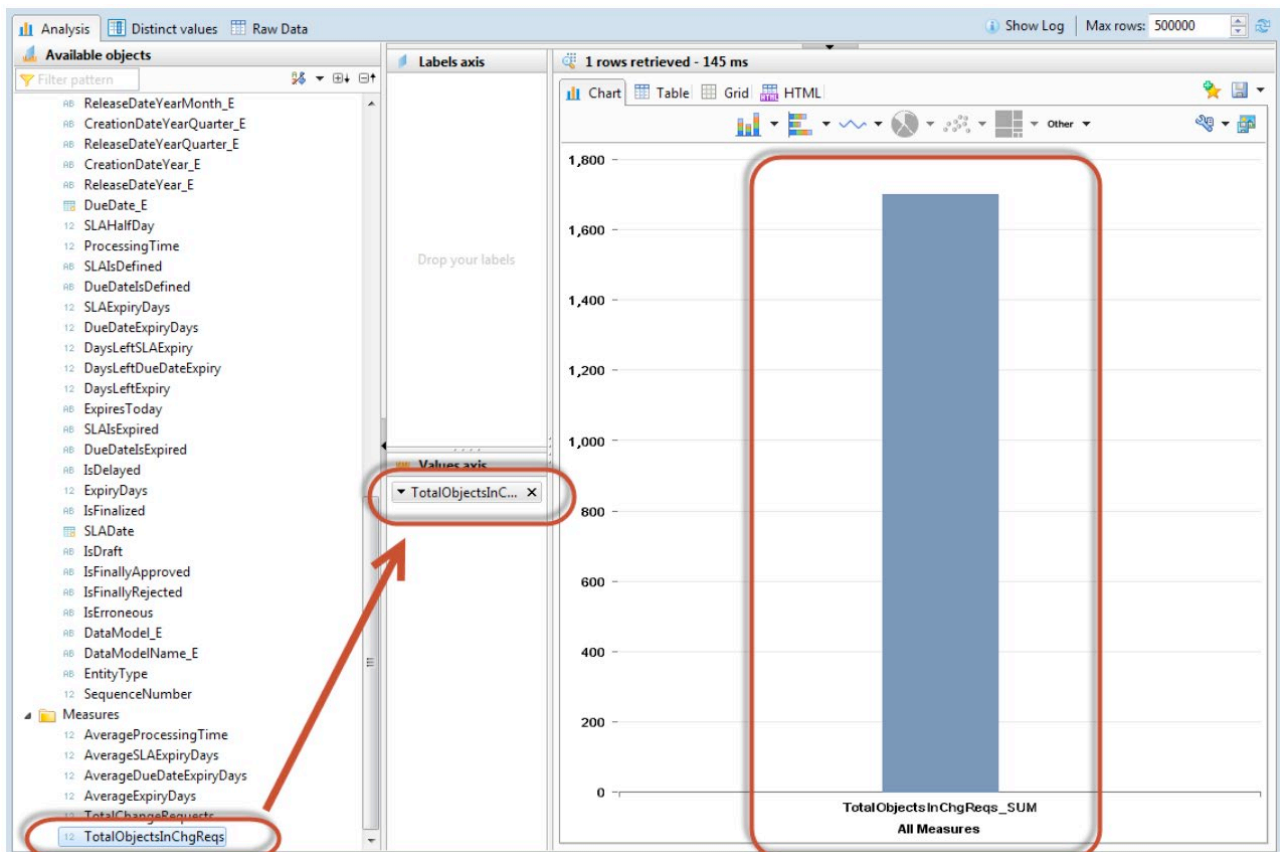
- Open the query view as described in step 1.
- Start the Data Previewby choosing *Open in Data Preview Editor*
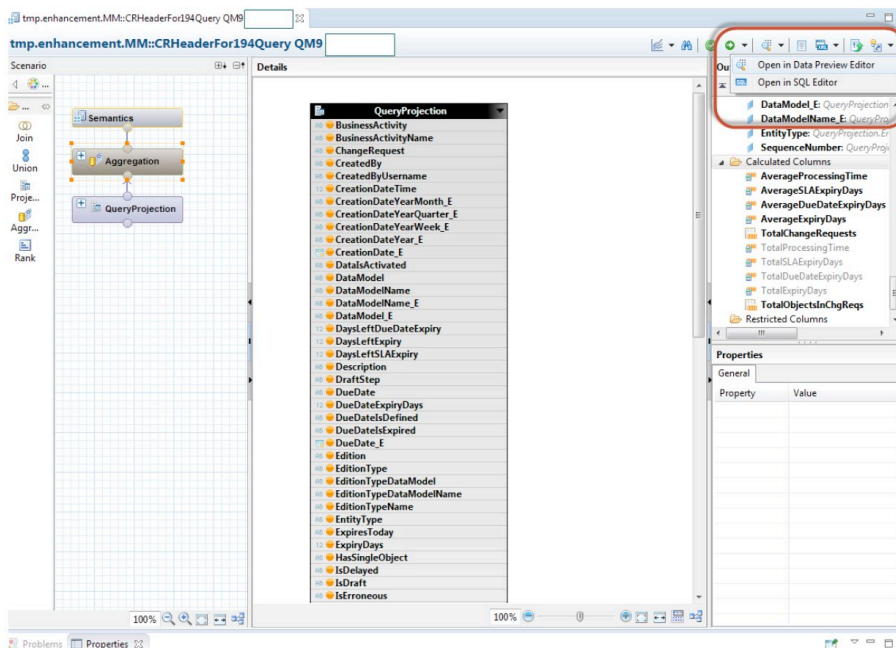
- Select the corresponding SAPClient that has been defined as a mandatory variable in the query view:
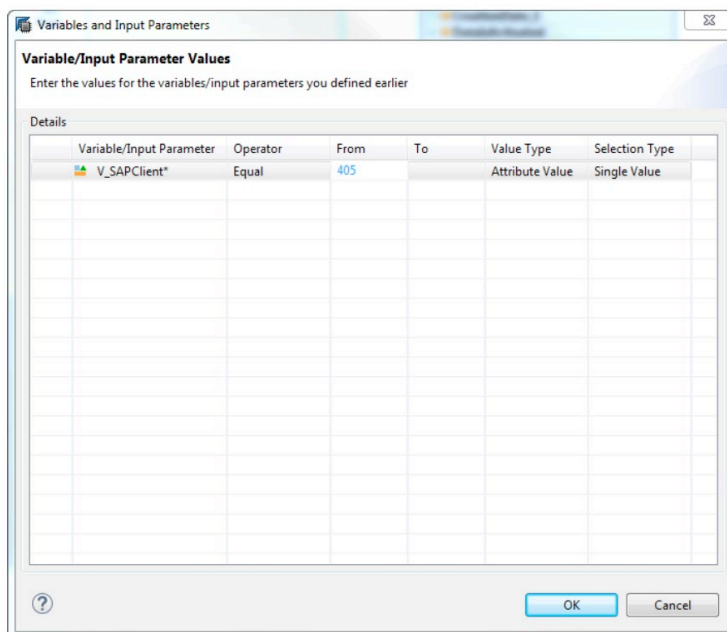
- In the Analysis tab move the recently added measure to the value axis section:

- The number of objects contained in change requests is calculated according to the defined columns for the counter calculation.

4.4. Add Calculated Column: Measure for Average Number of Objects per Change Request

For adding the new Measure for the *Average Number of Objects per Change Request,* the same steps need to be executed.

- Open the query view as described in step 1.
- Right-click on the field *Calculated Columns* and select *New Calculated Column*
- In the upcoming dialog box, enter the following information
  (Note: Name as well as field are only a recommendation and can be freely chosen):
    - Name: AvgObjectsPerChgReq
    - Field: Average Objects per Change Request
    - Data Type: Decimal
    - Length: 26
    - Scale: 2
    - Column Type: Measure
    - Exception Aggregation Type: FORMULA
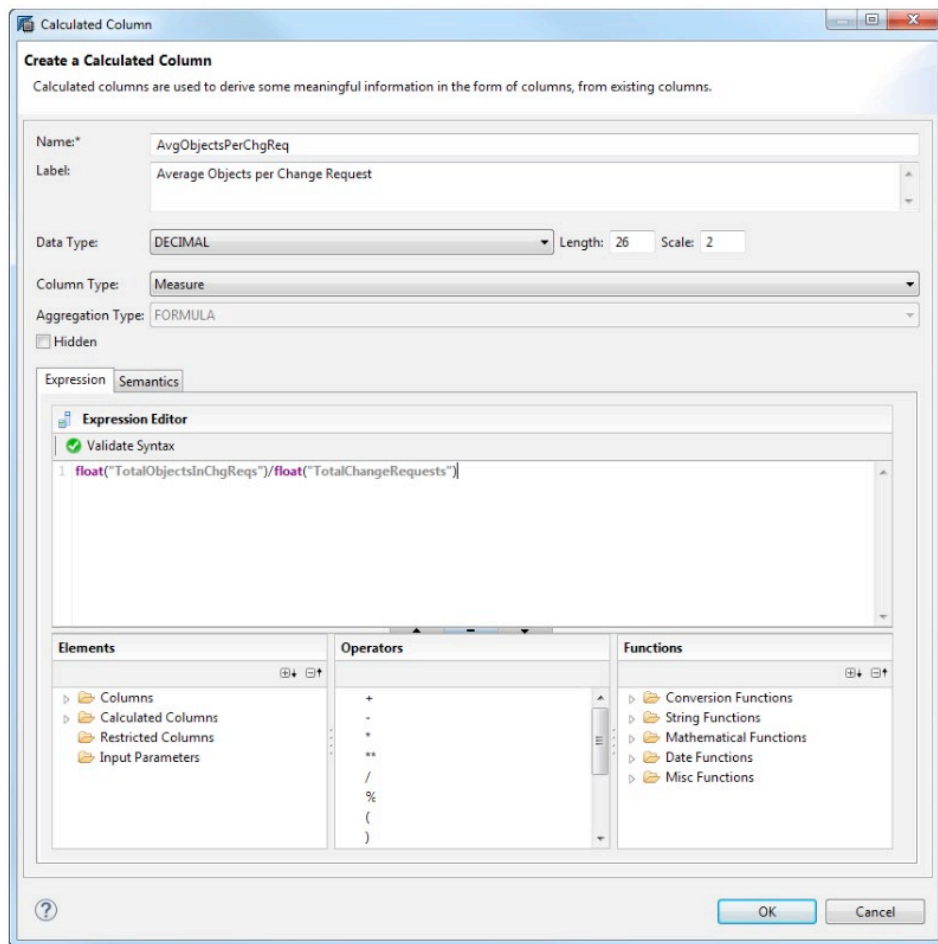
- With the Expression Editor you can define the expression which is the basis for the measure calculation. The formula defines in detail what the result for the newly created measure is. To calculate the *Average Number of Objects per Change Request*, the following expression is required:

$$\text{float}(\text{"TotalObjectsInChgReqs"})/\text{float}(\text{"TotalChangeRequests"})$$

- It is important that the column names used for the expression are identical with the ones existing in the view (if you have named the new objects counter differently it needs to be adapted accordingly in the expression).
- Save and activate the query view.
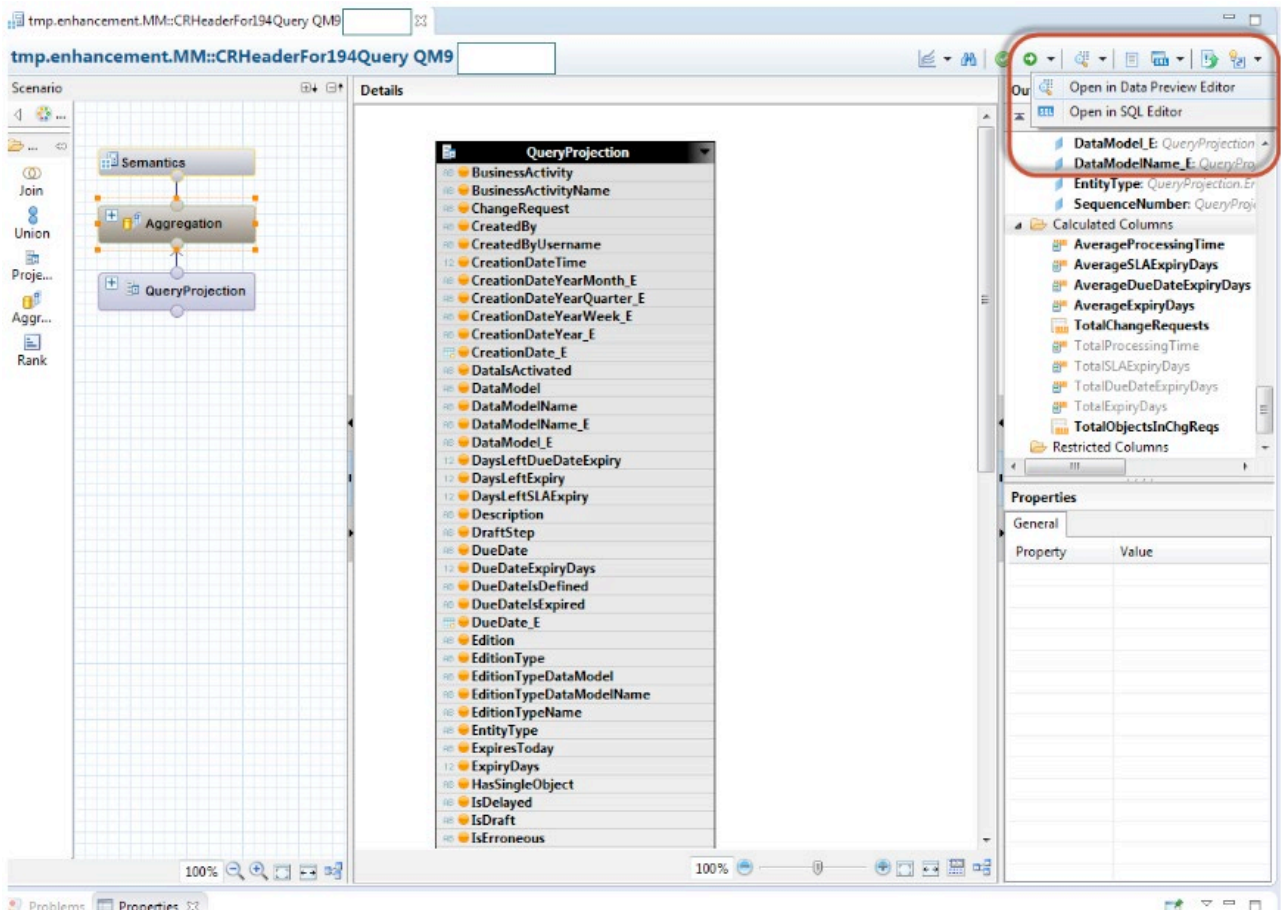
4.5. Test the new Calculated Column/Measure for _Average Objects per Change Request_ Using the Data Preview Function

The newly created measure for the _Average Objects per Change Request_ can be easily tested using the Data preview function.

- Open the query view as described in step 1.
- Start the Data Preview-function by choosing _Open in Data Preview Editor_.

- Select the corresponding SAPClient that has been defined as a mandatory variable in the query view:
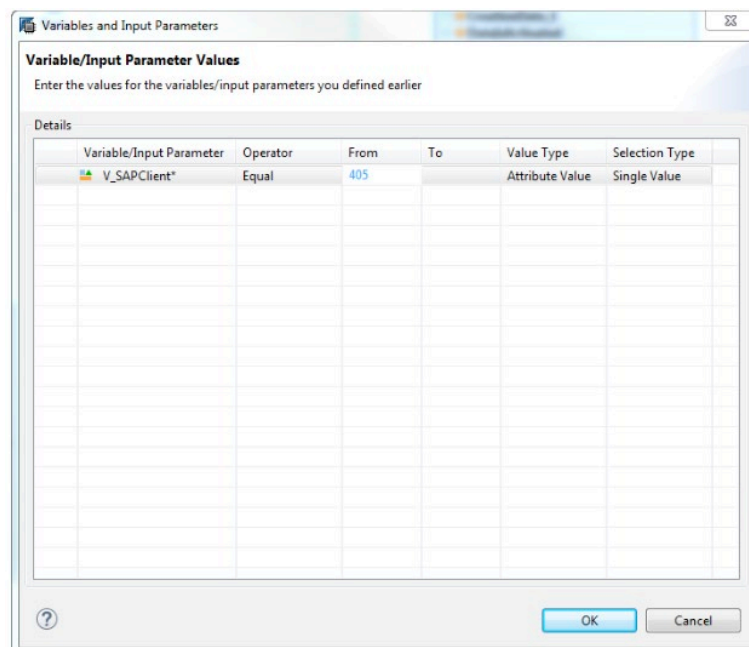
- In the Analysis tab, move the recently added measure to the value axis section:
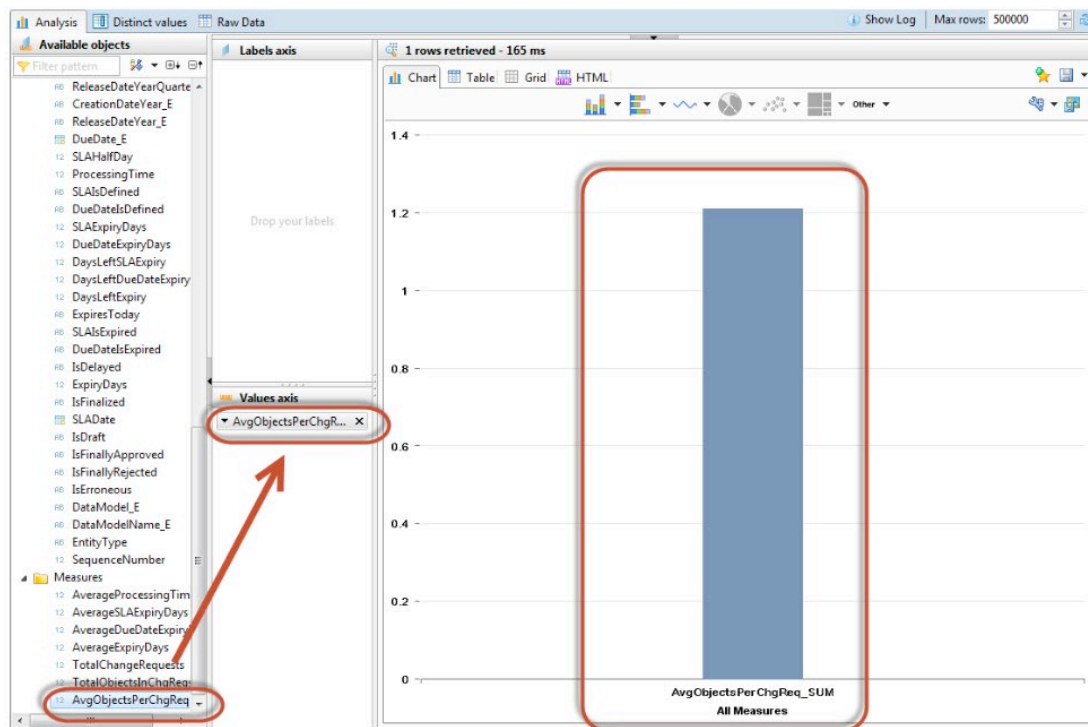
- The average number of objects contained in a change request is calculated according to the defined formula in the expression editor.
- If required, you can also recalculate this figure according to a grouping like the quarter in which the change requests have been created (Column CreationDateYearQuarter_E)
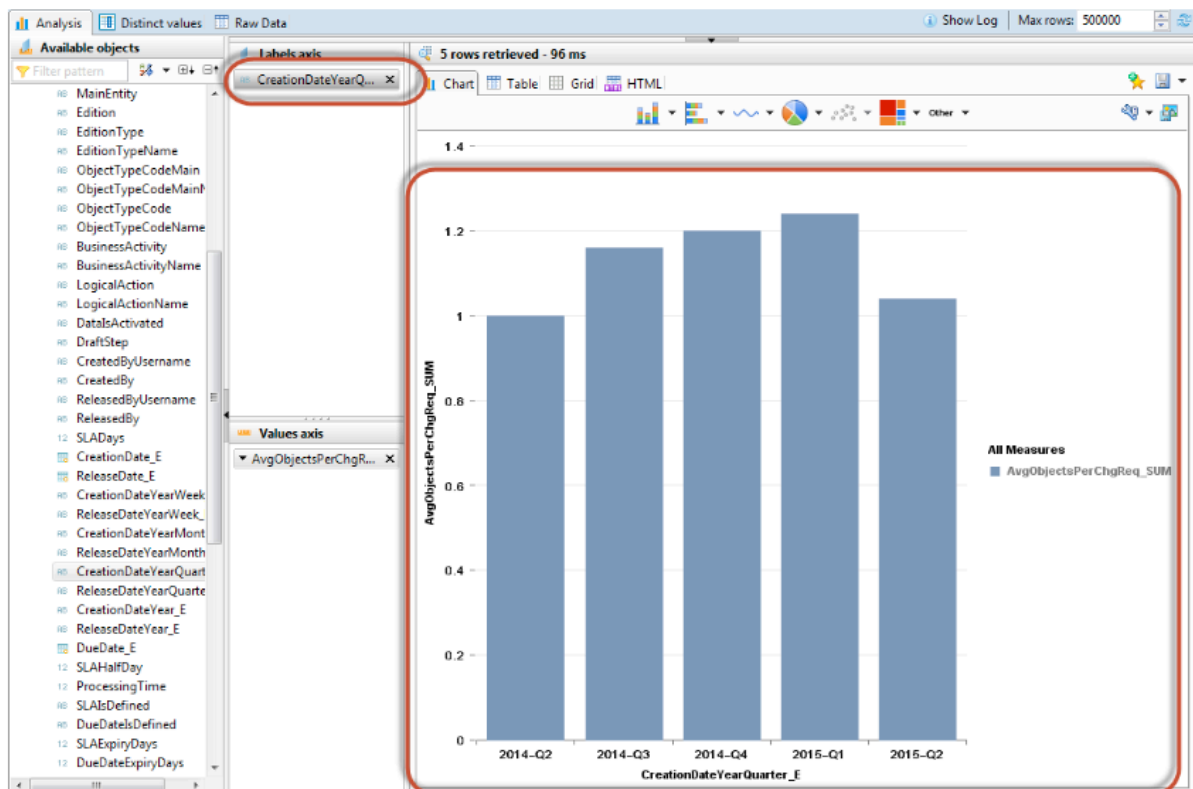
5. Domain-specific Scenarios

In the previous chapter, the basic steps are described to add the new counter respectively the new measure to a query view that is related to a business object type code.

Note: For this query view, the content-related preconditions have to be fulfilled described in the chapter *Content-Related Prerequisites/Background Information.*

As the steps described before are generic in the following subchapters, it is explained in more detail how the corresponding column definition for the counter needs to be configured according to domain-specific scenarios so that the number of objects is calculated correctly.

5.1.   Data Model MM

5.1.1. Business Object Type Code 194 (Material)

Data Model: MM

Entity Type: MATERIAL

Relevant Key Information/Columns for the Counter *TotalObjectsInChgReqs*:

- ChangeRequest
- MATERIALTechKey

5.2.   Data Model BP

5.2.1. Business Object Type Code 147 (Business Partner)

Data Model: BP

Entity Type: BP_HEADER

Relevant Key Information/Columns for the Counter *TotalObjectsInChgReqs*:

- ChangeRequest
- BP_HEADERTechKey

5.2.2. Special Information Regarding Entity Type BP_HEADER

The entity type BP_HEADER of data model BP represents or can represent three Business Object Types at the same time:

- 147: Business Partner
- 266: Supplier

- 159: Customer

This means that, for example a supplier is also a business partner, a customer is also a business partner, a supplier can also be a customer, and so on. Technically, in the query views only entities of type BP_HEADER are listed and therefore only BP_HEADER are counted.

In case you want to differentiate and count only suppliers or customers, additional information has to be taken into consideration according to the underlying defined business logic or data modelling in your system. Information that can be taken into consideration (for example) can be the following:

- Change Request Type information:
- If the change request types are modelled in the system in a way that they only contain customers a filter on the appropriate change request type leads to the fact that all counted BP_HEADERs are customers by definition.
  Example Filter: *TYPE = 'ZACB123'*
- Attribute information of the data model:
  If (e.g.) a supplier can clearly be identified by the presence or absence of specific attributes/values a filtering on attribute level can reduce the number of datasets provided by the query view to a level where only suppliers are remaining in the list. Then the new object counter will then (as a consequence) count only suppliers. With the generation report MDG_ANA_HDB_GEN_REPO_CONTENT, also a search view needs to be taken into consideration which contains the attributes on which the filters should then be set (for more details about this please refer to the SCN-based How-To-Guide linked in the Appendix).
  Example Filter (Assumption: if a purchasing organization is maintained ⮕ business partner is a supplier): *PRCH_ORG IS NOT INTIAL*

All this additional information can be used as a filter on the data provided by the query view. If the datasets are filtered correctly according to the underlying business logic than the BP_HEADER entities (which are counted by the new measure) will then represent only pure business partners, suppliers or customers or a mixture of these three.

5.2.3. Business Object Type Code 1405 (Business Partner Relationship)

Data Model: BP

Entity Type: BP_REL

Relevant key information and columns for the counter *TotalObjectsInChgReqs*:

- ChangeRequest

- BP_REL
- PARTNER1TechKey
- PARTNER2TechKey

5.3. Data Model 0G

5.3.1. Business Object Type Code 154 (Company)

Data Model: 0G

Entity Type: COMPANY

Relevant key information and columns for the counter *TotalObjectsInChgReqs*:

- ChangeRequest
- COMPANY

5.3.2. Business Object Type Code 158 (Cost Center)

Data Model: 0G

Entity Type: COST CENTER

Relevant key information and columns for the counter *TotalObjectsInChgReqs*:

- ChangeRequest
- CCTR
- COAREA

5.3.3. Business Object Type Code 901 (Financial Accounting Financial Reporting Structure)

Data Model: 0G

Entity Type: Financial Accounting Financial Reporting Structure

Relevant key information and columns for the counter *TotalObjectsInChgReqs*:

- ChangeRequest
- FRS
- COA

6. Additional Information

6.1. Further Reading

6.1.1. Information on SAP MDG on SAP S/4HANA

- Exchange knowledge: SAP Community | Q&A | Blog
- Try SAP Master Data Governance on S/4HANA for free: Trial Version
- Try SAP Master Data Governance on S/4HANA on the SAP Cloud Appliance Library: S/4HANA 2022 FPS1
- Learn more: Latest Release | Help Portal | How-to Information | Key Presentations

6.1.2. SAP Roadmap Explorer

- Please see the roadmap for SAP Master Data Governance

6.1.3. Related Information

- Learn more: Floorplan Manager for Web Dynpro ABAP | How to Adapt FPM | FPM Blog | How-to Information | Service Mapping Tool | SAP S/4HANA Cookbook CVI

6.2. SAP Notes

In addition to the detailed explanations written in this document, please see the following SAP Notes for further important information.

Note	Description
2221398	MDG-BP/C/S/CA: (Un-)Supported Fields in Data Model BP
3134600	MDG-M: Supported fields in Data Model MM
1806108	Functional restrictions in MDG-M in MDG7 (incl. SP02)
2129261	Functional restrictions in MDG-M in MDG8
2284745	Functional Restrictions in MDG for Material with SAP Master Data Governance 9.0
2461516	Functional Restrictions in MDG for Material with SAP Master Data Governance 9.1
2656693	Functional Restrictions in MDG for Material in SAP Master Data Governance 9.2 and on SAP S/4HANA 1809
2561461	Scope of support for SAP Master Data Governance (MDG)