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/* Freek Keijzer, myBrand, 16.09.2020
Loosely based on standard SAP cube-view I_MaterialStockTimeSeries.
Source of transaction data is table MATDOC.
Standard SAP view only has Stock Level Quantities.

Custom enhancements:
- Stock Level as Amount
- Stock Changes as Quantity and Amount
- Besides period types Day, Weel, Month, ... also Period LFWIM
  (Last Full Week In Month))
- Stock Changes in "Rolling Year" till end of time period
- Counter for Material Document Items
- Master data associations for Material Group and Material Type
  (not working properly in standard SAP view)
- Characteristic to discriminate between Receipt and Issue
- Bin Location from table MARD MARD

Resulting set of key figures:
MatlWrhsStkQtyInMatlBaseUnit - Stock Level Quantity at end of period
MatlStkChangeQtyInBaseUnit   - Stock Change Quantity in period
GoodsIssueQty                - Issued Quantity in period
GoodsReceiptQty              - Received Quantity in period
GoodsIssueQtyRolYear         - Issued Quantity in Rolling Year till end of period
StockValueInCCCrcy           - Stock Level Value at end of period
StockChangeValInCCCrcy       - Stock Change Value in period
GoodsIssueVal                - Issued Value in period
GoodsReceiptVal              - Received Value in period
GoodsIssueValRolYear         - Issued Value in Rolling Year till end of period
CountMatDocPos               - No Material Document Items contributing to Stock Change in period
NDays                        - No Days within period
NDaysRolYear                 - No Days within Rolling Year till end of period (365 or 366)

Only the first key figure was available in the standard SAP view.
The others are results of the custom enhancements.

Layered structure of SAP-delivered CDS-views from query down to table ...
  C_MaterialStockTimeSeries                        - Query-view
  |- I_MaterialStockTimeSeries                     - Cube-view
     |- P_MaterialStockTimeSeries                  - Aggregation
        |- P_MaterialStockTimeSeries1 (union)      - Link stock to time series
           |- I_MaterialStockPeriodsSingle (2x)    - Period type as parameter
           |  |- P_MaterialStockPeriods (union)    - Periods (F,Y,Q,M,W,D) based on parameters start/end date
           |     |- I_FiscalCalendarDate (1x:F)
           |     |- P_MaterialStockFYVariant
           |     |- I_SAPClient (dummy,5x)
           |     |- I_CalendarDate (5x:Y,Q,M,W,D)
           |- I_MaterialStock_Aggr                  - Stock increase since start of 1st period
           |  |- I_MaterialDocumentRecord          - Basic view with mapping of field names
           |     |- matdoc                         - Source table Material Documents
           |- P_MaterialStockByKeyDate1            - Stock level at start of 1st period
              |- I_MaterialStock_Aggr
                 |- ...

... has been modified to following structure
  ZQ_MM_INV_STOCK_TS                               - Query-view
  |- ZC_MM_INV_STOCK_TS                            - Cube-view
     |- ZP_MM_INV_STOCK_TS                         - Aggregation, enrichment
        |- ZP_P_MaterialStockTimeSeries1 (union)   - Link stock to time series
           |- ZP_I_MaterialStockPeriodsSingle (4x) - Period type as parameter
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           |  |- ZP_P_MaterialStockPeriods (union) - Periods (F,Y,Q,M,W,D,P) based on parameters start/end date
           |     |- I_FiscalCalendarDate (1x:F)
           |     |- P_MaterialStockFYVariant
           |     |- I_SAPClient (dummy,6x)
           |     |- I_CalendarDate (5x:Y,Q,M,W,D)
           |     |- ZP_CA_DATE_PLFWIM (P)
           |- ZP_I_MaterialStock_Aggr (3x)         - Stock increase since start of 1st period
           |  |- ZB_I_MaterialDocumentRecord       - Basic view with mapping of field names
           |     |- matdoc                         - Source table Material Documents
           |- ZP_P_MaterialStockByKeyDate1         - Stock level at start of 1st period
              |- ZP_I_MaterialStock_Aggr
                 |- ...

Most custom enhancements are in view ZP_P_MaterialStockTimeSeries1 (union).
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Change-log:
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@AbapCatalog: {
                sqlViewName: 'ZCMMINVSTOCKTS',
                compiler.compareFilter: true
              }
@AccessControl: {
                 authorizationCheck: #CHECK,
                 personalData.blocking: #NOT_REQUIRED   --there are no BP references in table MATDOC with an EndOfPurpose state
               }
@EndUserText.label: 'MM: Stock Time Series'
@ObjectModel: {
                usageType:{
                            sizeCategory: #XXL,
                            serviceQuality: #D,
                            dataClass:#TRANSACTIONAL
                          }
              }
@ClientHandling.algorithm: #SESSION_VARIABLE
@VDM: {
         viewType: #COMPOSITE,
         private: false
      }
@Analytics.dataCategory:#CUBE
@Metadata.ignorePropagatedAnnotations: true

/*+[hideWarning] { "IDS" : [ "KEY_CHECK" ] } */


define view ZC_MM_INV_STOCK_TS
  with parameters
    P_StartDate  : vdm_v_start_date,
    P_EndDate    : vdm_v_end_date,
    P_PeriodType : nsdm_period_type
  as select from ZP_MM_INV_STOCK_TS(P_StartDate:  :P_StartDate,
                                    P_EndDate:    :P_EndDate,
                                    P_PeriodType: :P_PeriodType)

//--Associations from standard SAP view
  association [1..1] to I_Material                as _Material                on  $projection.Material = _Material.Material
  association [1..1] to I_CompanyCode             as _CompanyCode             on  $projection.CompanyCode = _CompanyCode.CompanyCode
  association [1..1] to I_Plant                   as _Plant                   on  $projection.Plant = _Plant.Plant
  association [0..1] to I_StorageLocation         as _StorageLocation         on  $projection.Plant           = _StorageLocation.Plant
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                                                                                                  and $projection.StorageLocation = _StorageLocation.StorageLocation
  association [0..1] to I_Supplier                  as _Supplier                  on  $projection.Supplier = _Supplier.Supplier
  association [0..1] to I_Customer                  as _Customer                  on  $projection.Customer = _Customer.Customer
  association [1..1] to I_InventoryStockType        as _InventoryStockType        on  $projection.InventoryStockType =
_InventoryStockType.InventoryStockType
  association [1..1] to I_InventorySpecialStockType as _InventorySpecialStockType on  $projection.InventorySpecialStockType =
_InventorySpecialStockType.InventorySpecialStockType
  association [1..1] to I_UnitOfMeasure             as _UnitOfMeasure             on  $projection.MaterialBaseUnit = _UnitOfMeasure.UnitOfMeasure
  association [0..1] to I_FiscalYearVariant         as _FiscalYearVariant         on  $projection.FiscalYearVariant =
_FiscalYearVariant.FiscalYearVariant
  association [0..1] to I_InvtryPrcBasicByKeyDate   as _InvtryPrcByPeriodEndDate  on  $projection.CostEstimate =
_InvtryPrcByPeriodEndDate.CostEstimate
  association [0..1] to I_CurrentMatlPriceByCostEst as _CurrentInvtryPrice        on  $projection.CostEstimate = _CurrentInvtryPrice.CostEstimate

//--Additional associations
  association [0..1] to I_MaterialType  as _MaterialType    on $projection.materialtype    = _MaterialType.MaterialType
  association [0..1] to I_MaterialGroup as _MaterialGroup   on $projection.materialgroup   = _MaterialGroup.MaterialGroup
  association [0..1] to mard                                on $projection.Material        = mard.matnr and
                                                               $projection.Plant           = mard.werks and
                                                               $projection.StorageLocation = mard.lgort
{

key PeriodType,

    @Semantics.businessDate.at: true
    @Semantics.businessDate.to: false  -- switch of semantic inherited from one of the lower view in the stack
key EndDate,

key YearPeriod,

    @ObjectModel.foreignKey.association: '_Material'
key Material,

    @ObjectModel.foreignKey.association: '_Plant'
key Plant,

    @ObjectModel.foreignKey.association: '_StorageLocation'
key StorageLocation,

key Batch,

    @ObjectModel.foreignKey.association: '_Supplier'
key Supplier,

key SDDocument,

key SDDocumentItem,

key WBSElementInternalID,

    @ObjectModel.foreignKey.association: '_Customer'
key Customer,

    @ObjectModel.foreignKey.association: '_InventoryStockType'
key InventoryStockType,

    @ObjectModel.foreignKey.association: '_InventorySpecialStockType'
key InventorySpecialStockType,
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```
    @Semantics.fiscal.yearVariant: true
key FiscalYearVariant,

    @Semantics.unitOfMeasure
key MaterialBaseUnit,

key StockChangeCategory,                        //Stock Change Category = 'GR','GI'

//KEY FIGURES, UNITS, CURRENCIES
//--Quantities
    @Semantics.quantity.unitOfMeasure: 'MaterialBaseUnit'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Stock Level Qty'
    MatlWrhsStkQtyInMatlBaseUnit,

    @Semantics.quantity.unitOfMeasure: 'MaterialBaseUnit'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Stock Change Qty'
    MatlStkChangeQtyInBaseUnit,

    @Semantics.quantity.unitOfMeasure: 'MaterialBaseUnit'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Issued Qty'
    cast( case when StockChangeCategory = 'GI' then MatlStkChangeQtyInBaseUnit * -1 end
      as nsdm_gi_qty) as GoodsIssueQty,

    @Semantics.quantity.unitOfMeasure: 'MaterialBaseUnit'
    @DefaultAggregation : #SUM
     @EndUserText.label: 'Received Qty'
    cast( case when StockChangeCategory = 'GR' then MatlStkChangeQtyInBaseUnit end
      as nsdm_gr_qty) as GoodsReceiptQty,

   @Semantics.quantity.unitOfMeasure: 'MaterialBaseUnit'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Received Qty in RY'
    cast( case when StockChangeCategory = 'GI' then MatlStkChangeQtyRolYearInBU * -1 end
      as nsdm_gi_qty) as GoodsIssueQtyRolYear,

//--Amounts using current price, logic copied from P_MatStkQtyValCur2
    @Semantics.amount.currencyCode: 'CompanyCodeCurrency'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Stock Level Value'
    cast( round( cast(MatlWrhsStkQtyInMatlBaseUnit as abap.dec( 18, 3 )) * division( cast(_CurrentInvtryPrice.InventoryPrice as abap.dec( 11, 2 )),
        cast(_CurrentInvtryPrice.MaterialPriceUnitQty as abap.dec( 5, 0 )), 5 ), 3 ) as nsdm_stock_value_in_cccrcy )
    as StockValueInCCCrcy,

    @Semantics.amount.currencyCode: 'CompanyCodeCurrency'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Stock Change Value'
    cast( round( cast(MatlStkChangeQtyInBaseUnit as abap.dec( 18, 3 )) * division( cast(_CurrentInvtryPrice.InventoryPrice as abap.dec( 11, 2 )),
        cast(_CurrentInvtryPrice.MaterialPriceUnitQty as abap.dec( 5, 0 )), 5 ), 3 ) as nsdm_stock_value_in_cccrcy )
    as StockChangeValInCCCrcy,

    @Semantics.amount.currencyCode: 'CompanyCodeCurrency'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Issued Value'
    case when StockChangeCategory = 'GI' then
      cast( round( cast(MatlStkChangeQtyInBaseUnit as abap.dec( 18, 3 )) * division( cast(_CurrentInvtryPrice.InventoryPrice as abap.dec( 11, 2 )),
        cast(_CurrentInvtryPrice.MaterialPriceUnitQty as abap.dec( 5, 0 )), 5 ), 3 ) as nsdm_stock_value_in_cccrcy ) * -1
```

```
    end as GoodsIssueVal,

    @Semantics.amount.currencyCode: 'CompanyCodeCurrency'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Received Value'
    case when StockChangeCategory = 'GR' then
      cast( round( cast(MatlStkChangeQtyInBaseUnit as abap.dec( 18, 3 )) * division( cast(_CurrentInvtryPrice.InventoryPrice as abap.dec( 11, 2 )),
        cast(_CurrentInvtryPrice.MaterialPriceUnitQty as abap.dec( 5, 0 )), 5 ), 3 ) as nsdm_stock_value_in_cccrcy )
    end as GoodsReceiptVal,

    @Semantics.amount.currencyCode: 'CompanyCodeCurrency'
    @DefaultAggregation : #SUM
    @EndUserText.label: 'Issued Value RY'
    case when StockChangeCategory = 'GI' then
      cast( round( cast(MatlStkChangeQtyRolYearInBU as abap.dec( 18, 3 )) * division( cast(_CurrentInvtryPrice.InventoryPrice as abap.dec( 11, 2 )),
        cast(_CurrentInvtryPrice.MaterialPriceUnitQty as abap.dec( 5, 0 )), 5 ), 3 ) as nsdm_stock_value_in_cccrcy ) * -1
    end as GoodsIssueValRolYear,

    CompanyCodeCurrency,

    @DefaultAggregation : #SUM
    @EndUserText.label: 'No Mat.Doc.Items'
    CountMatDocPos,

    @DefaultAggregation : #MAX
    @EndUserText.label: 'Days'
    NDays,

    @DefaultAggregation : #MAX
    @EndUserText.label: 'Days in "Rolling Year"'
    NDaysRolYear,

//CHARACTERISTICS
//--Additional characteristics compared to SAP standaard
//----Material attributes as dimension
    @ObjectModel.foreignKey.association: '_MaterialGroup'
    _Material.MaterialGroup,

    @ObjectModel.foreignKey.association: '_MaterialType'
    _Material.MaterialType,

//----Additional field from table MARD
    mard.lgpbe as StorageBin,                   //Bin Location (mard.lgpbe)

    @EndUserText.label: 'Start of time period'
    StartDate,
    @EndUserText.label: 'Start of "Rolling Year" period'
    StartDateRolYear,                           // Start Date of "Rolling Year" till end of time period, e.g. 25.09.2020 -> 26.09.2019

//--From SAP standard view
    CostEstimate,
    @ObjectModel.foreignKey.association: '_CompanyCode'
    CompanyCode,

//--Additional associations
    _MaterialType,
    _MaterialGroup,

      // Associations for names and descriptions
```

```
    _UnitOfMeasure,
    _Material,
    _CompanyCode,
    _Plant,
    _StorageLocation,
    _Supplier,
    _Customer,
    _InventoryStockType,
    _InventorySpecialStockType,
    _FiscalYearVariant,
    _InvtryPrcByPeriodEndDate,
    _CurrentInvtryPrice
}
where PeriodType = :P_PeriodType
```