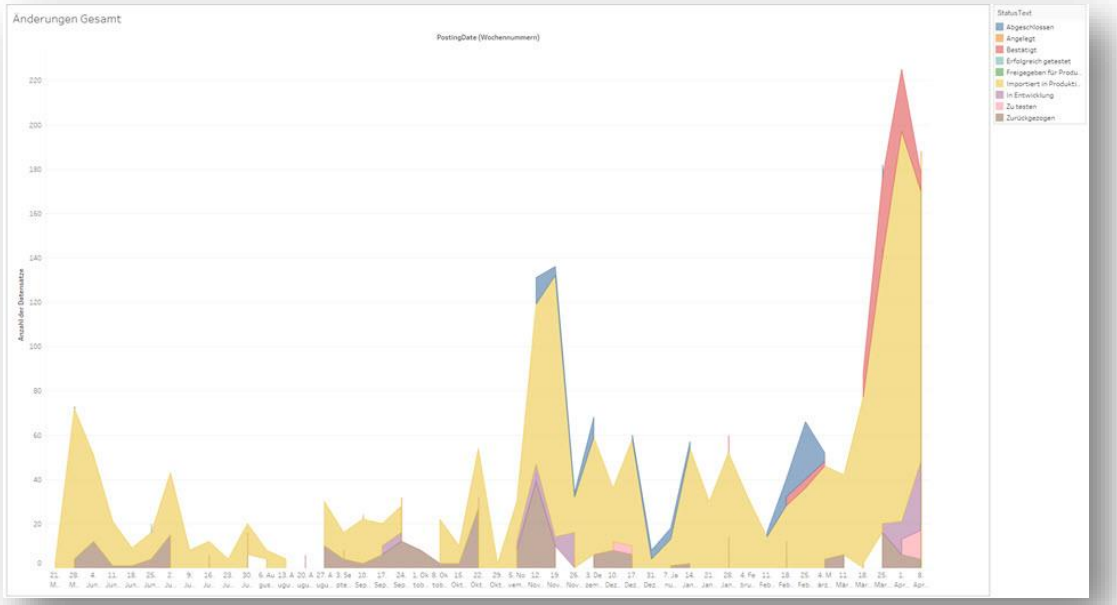
#vSAPCDSStarterSet - Workshop Basics I

Presentation Part I

From #SAPCommunity to #SAPCommunity

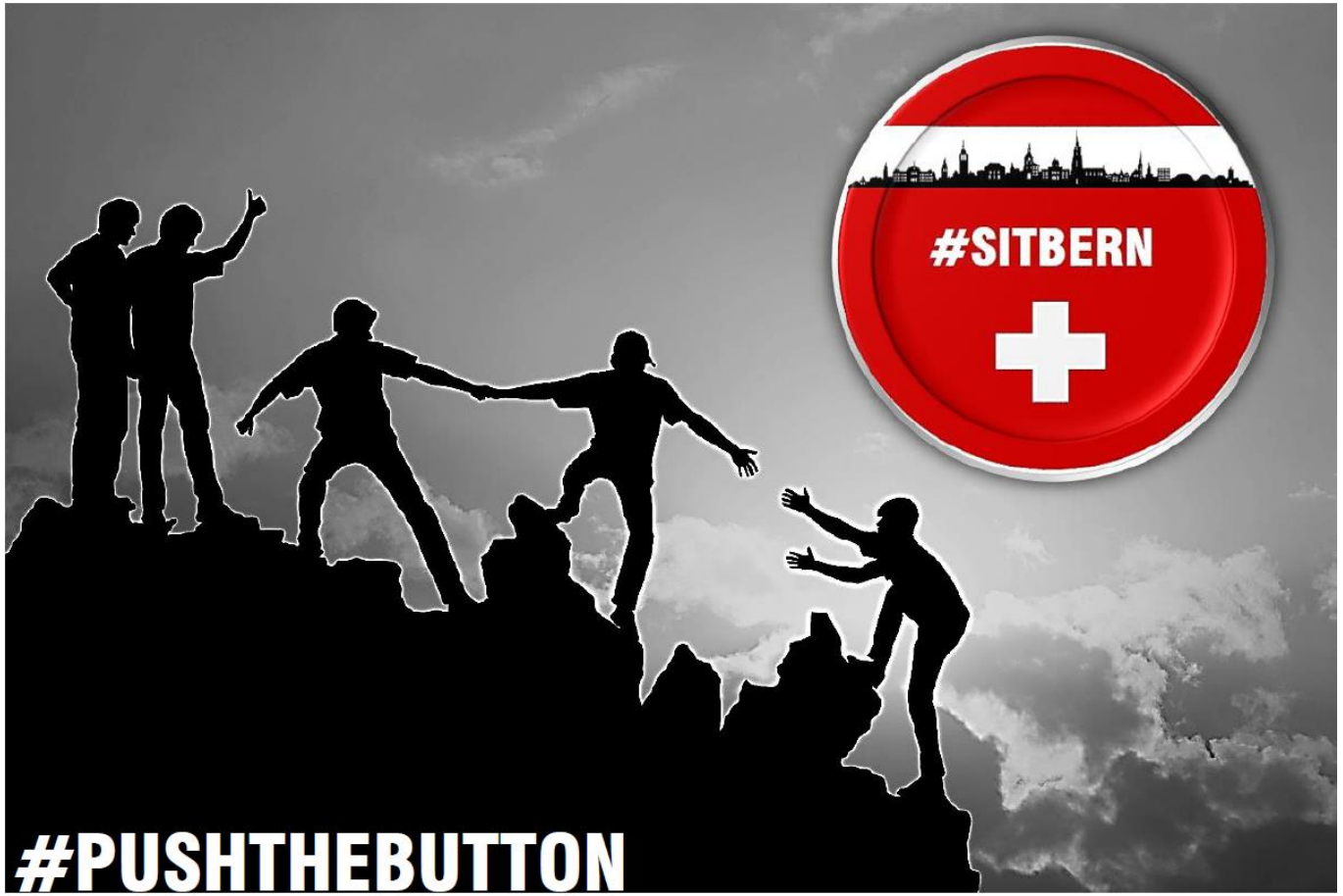
Core Data Services (CDS) as base for modern systemarchitectures

- Practical application scenario from S/4 implementation project „SAP Solution Manager Data Analysis“
  - CDS based data model for „Incidents“, „Changes“, „Knowledge articles“
  - Export via OData and evaluation with Tableau Public
  - Export via RFC API and realtime monitoring
  - (ALV based reporting)



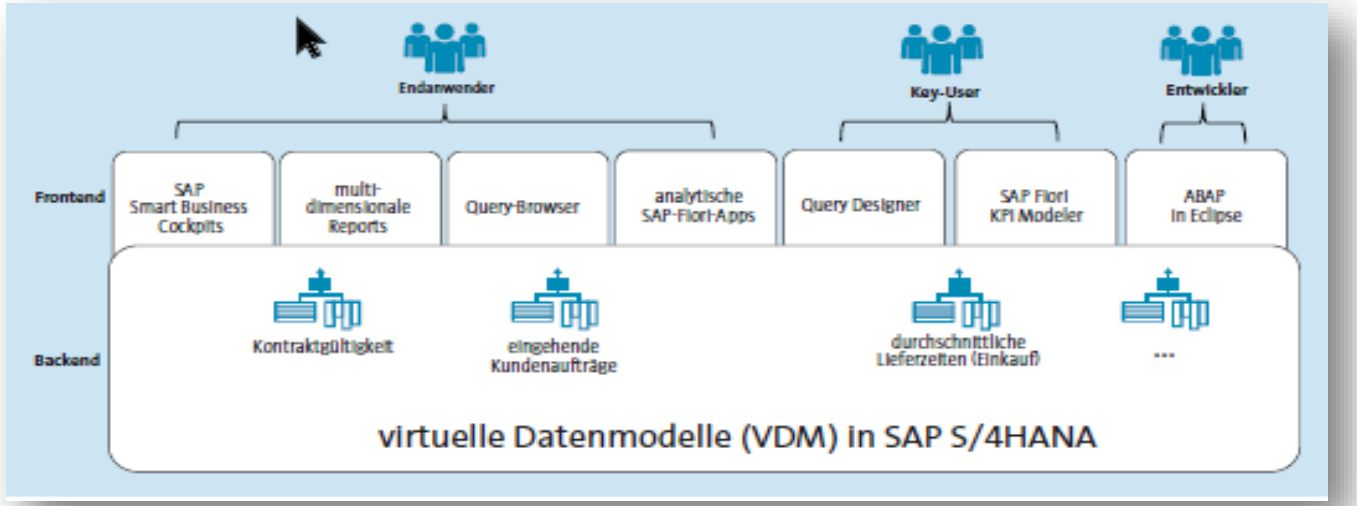
Motivation

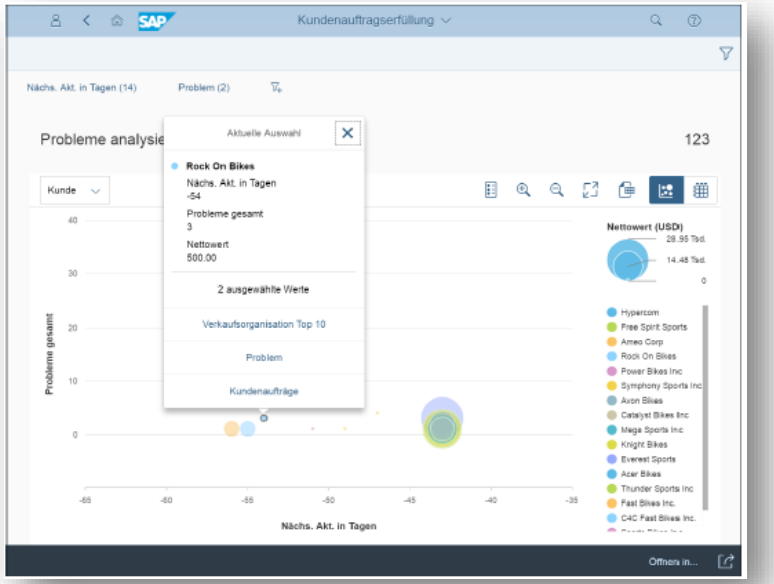
Why should you know about CDS before S/4 Implementation



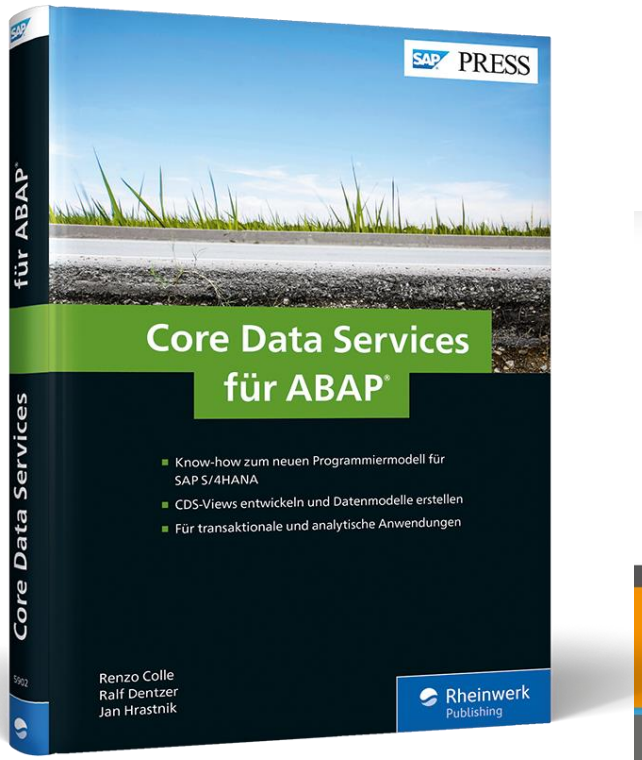
Motivation 1: Virtual Data model (S/4) under S/4

- HANA DB enables fast access to previously rather unperformant data sources
- Operative reporting benefits from this
- Additional Data Warehouse systems are not obsolete
- Appropriate FIORI apps and tools in SAP backend (e.g. CDS views) enable the creation of „Analytical Apps“
- S/4 Embedded Analytics

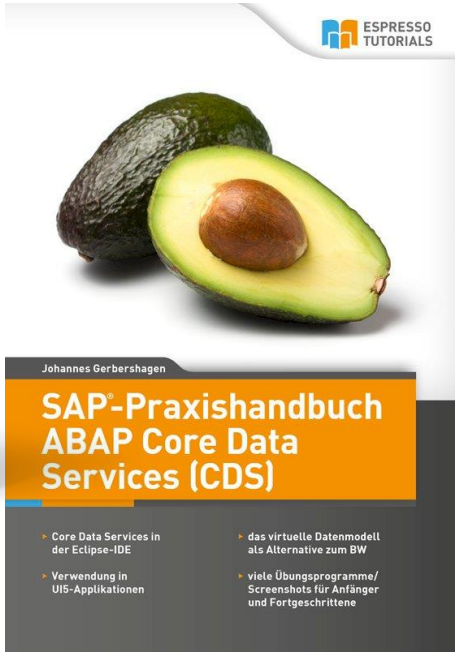


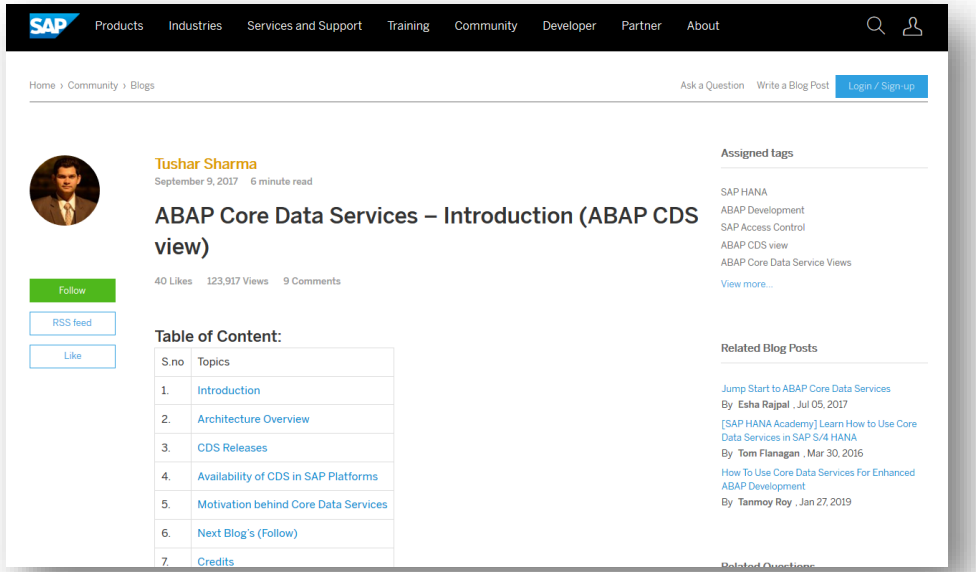


Motivation 2: CDS is documented

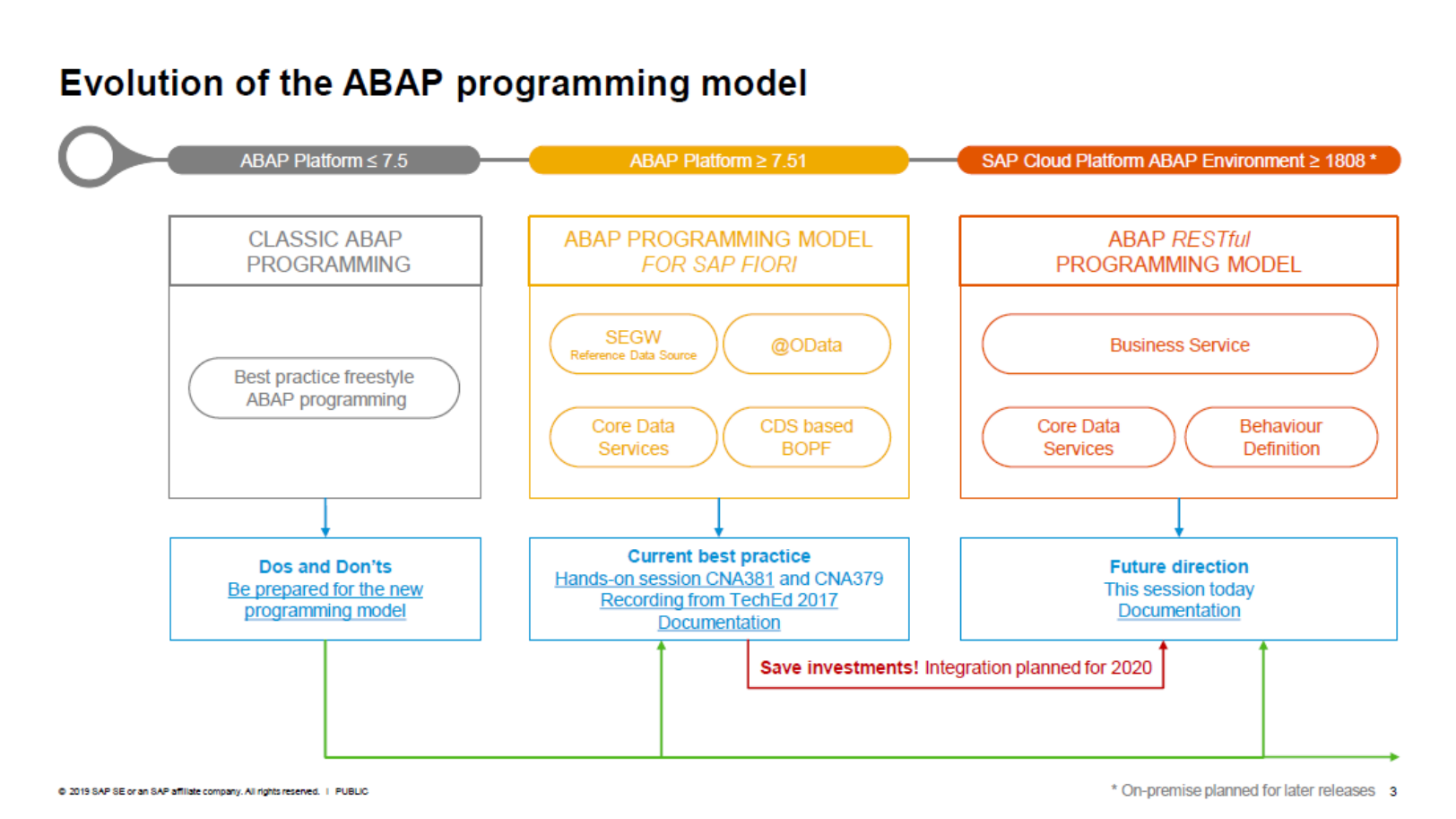


https://www.rheinwerk-verlag.de/core-data-services-fur-abap_4487/
https://www.espresso-tutorials.de/produkt/sap-praxishandbuch-abap-core-data-services-cds/
https://blogs.sap.com/2017/09/09/abap-core-data-services-introduction-abap-cds-view/





Motivation 3: CDS is SAP ABAP Future – already there



Motivation 4: CDS is available in the „Old World“

Availability of CDS in SAP Platforms

The Core Data services are available in below mentioned SAP Platforms:

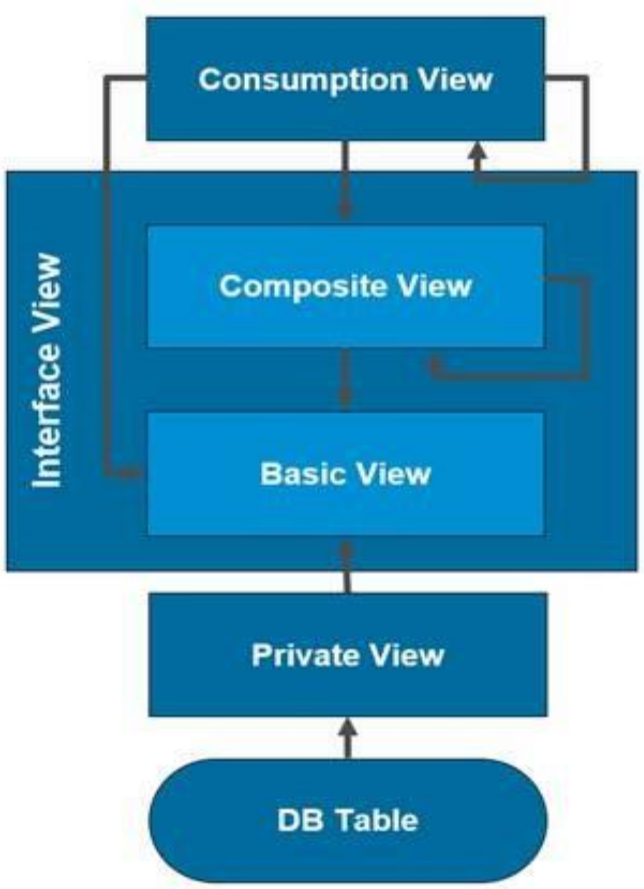
1. SAP NetWeaver 7.50, SP01, or higher.
2. SAP NetWeaver 7.4 SP05
3. SAP HANA SPS6
4. SAP Business Suite EHP7 (Suite on HANA)
5. S/4HANA
6. SAP Business Warehouse 7.3

https://blogs.sap.com/2017/09/09/abap-core-data-services-introduction-abap-cds-view/#ACDS

Concept

Basics

Advantages of CDS



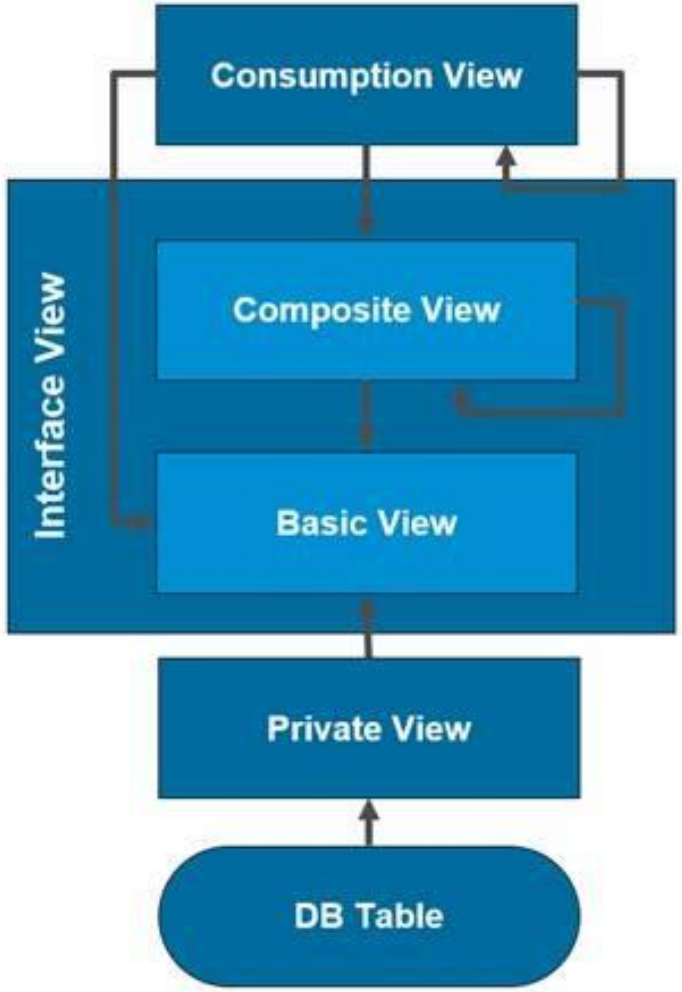
The data model perceived by users often does not correspond to the physical data model. Many fields are not used at all in practice

The field names do not have meaningful names ("VBAK-CMGST" "Overall status of credit checks")The object dependencies are not visible or are only created by the project configuration (e.g. texts for customizing codes, SD partner functions)The user expects further fields, which do not come from the SAP data model (e.g. Z-fields, Z-tables, classification)The physical SAP object contains several objects (e.g. VBAK: inquiry, offer, order)

CDS Benefits – Reusable blocks like Lego.

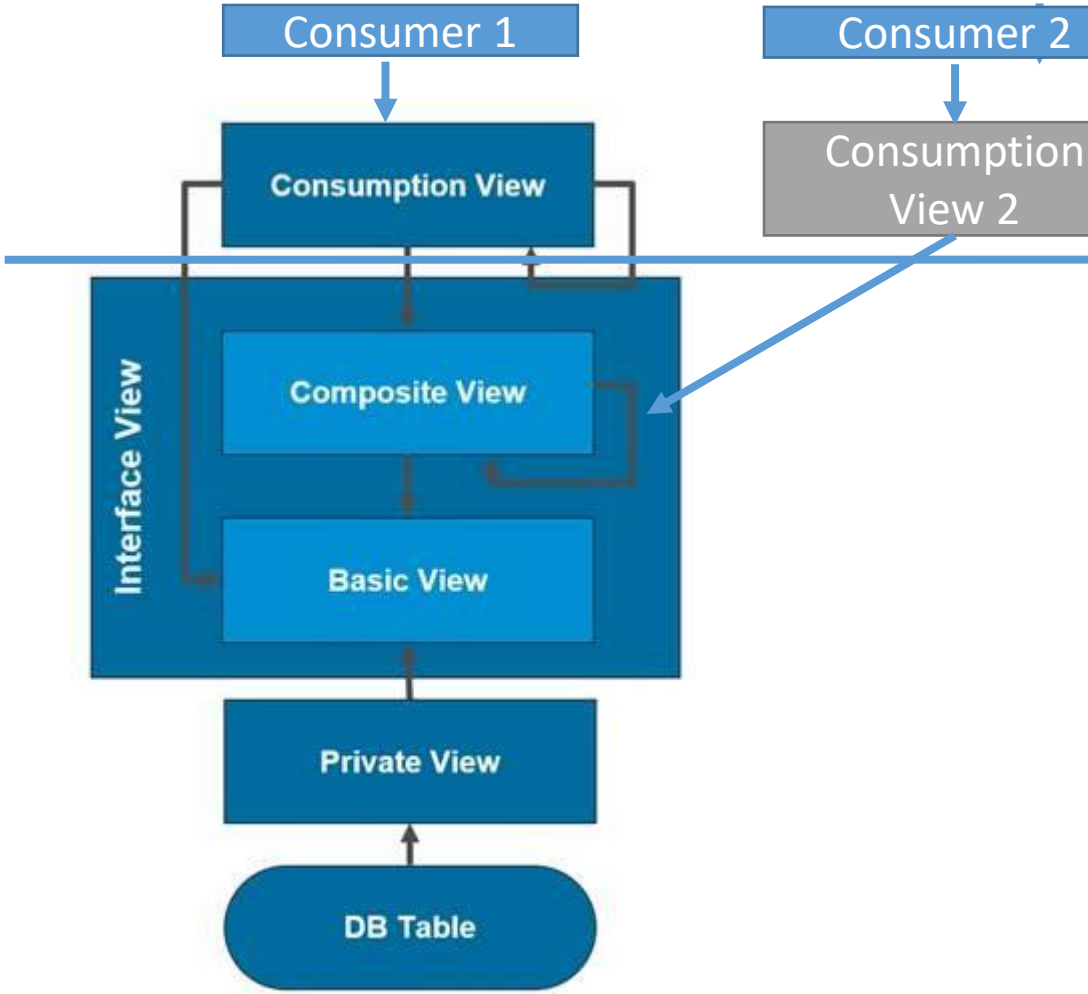
Creation of views of the physical data model according to its meaning and customer-specific perception (including Z-data model and "virtual columns") The views can be broken down into artifacts ("building blocks") and are therefore reusable. There are predefined architecture layers, rules and extension options CDS can be used as a basis for different application requirements (e.g. SQL View for report, OData for external, architecture module) Expert knowledge (e.g. filters, transformations etc.) can already be stored in the CDS

CDS terms



- **"Consumption“ layer**
  - Is the visible layer from the view of the user or the requirement
  - Each concrete requirement has its own consumption layer and is therefore stable even if changes occur
  - The Consumption layer uses a "building set" of predefined data models "Interface layer”
- **„Interface“ layer**
  - The interface layer represents the "modular system" and thus the reusability
  - Here the basic data models of the customer are mapped, e.g. a typical customer order
  - The physical tables are transformed into "semantic objects" with different properties (e.g. DB table VBAK object "sales order" + object "customer quotation").
  - ***„Composite Views“***
    - Semantic objects with the (maximum) available fields and relationships to other objects
  - ***„Basic Views“***
    - Intermediate layer to define the essential fields, their names and properties
    - Complex JOIN connections may already be stored
- „Private Views“
    - Optional intermediate layer, which is not officially available

CDS reusability



Report ZSD_RP_OIR

ZC_SD_OrderReportingGermany

ZI_*SalesOrderItemReporting*

ZI_*SalesPartner*

ZI_*VBPA*, ZI_*KNA1*

VBAK, VBAP, VBPA, KNA1 …

Use cases

CDS as base for reusable objects --> Think about Lego. Take it as a base is perfect!

Previous SAP approach vs. CDS as basis to start from

Typical SAP Report

- Presentation (e.g. display as list/ALV)
- Process logic (e.g. evaluate parameters)
- Transforming data (e.g. Loop at)
- Select data (if applicable JOIN and aggregates)
- *… Often copied, requested, reproduced*

Report

- Presentation
- Process logic

Form

- Data acquisition

FIORI App

- Presentation
- Process logic

external API

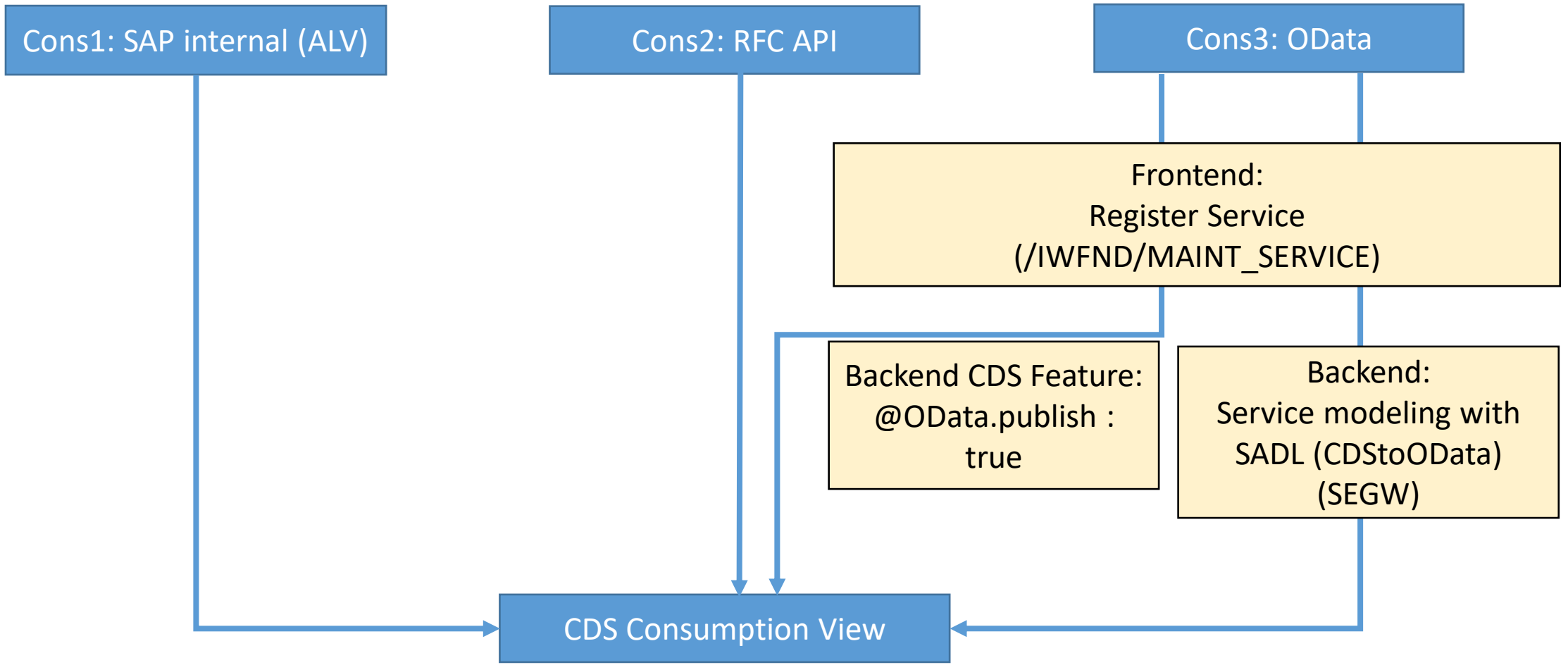
- OData
- JSON/Rest

Virtual data model from a users viewpoint

- **C**onsumption Views (concrete requirements)
- **I**nterface Views (reusable)
  - Composite Views
  - Basic View
  - Private Views

physical data model
and functions

CDS as basis for different scenarios



Example: small SAP ALV Report using CDS

Customer template with some benefits - Framework


```
REPORT zsd_rp_ssr_oir.

TABLES: zc_sdrpssr_oir.
SELECT-OPTIONS: so_vkorg  FOR zc_sdrpssr_oir-salesorganization.
SELECT-OPTIONS: so_vtweg  FOR zc_sdrpssr_oir-distributionchannel.
SELECTION-SCREEN: ULINE.
SELECT-OPTIONS: so_odate  FOR zc_sdrpssr_oir-orderdate.
SELECT-OPTIONS: so_vbeln  FOR zc_sdrpssr_oir-salesdocument.
SELECT-OPTIONS: so_kunnr  FOR zc_sdrpssr_oir-customernumber.
SELECT-OPTIONS: so_shipt  FOR zc_sdrpssr_oir-shiptonumber.
INCLUDE /swt/cmu_sg_ralv_interface.

INITIALIZATION.
  INCLUDE /swt/cmu_sg_ralv_init.

* --------- configure
  set_view 'ZC_SDRPSSR_OIR'.

START-OF-SELECTION.
  INCLUDE /swt/cmu_sg_ralv_exec.
END-OF-SELECTION.
```

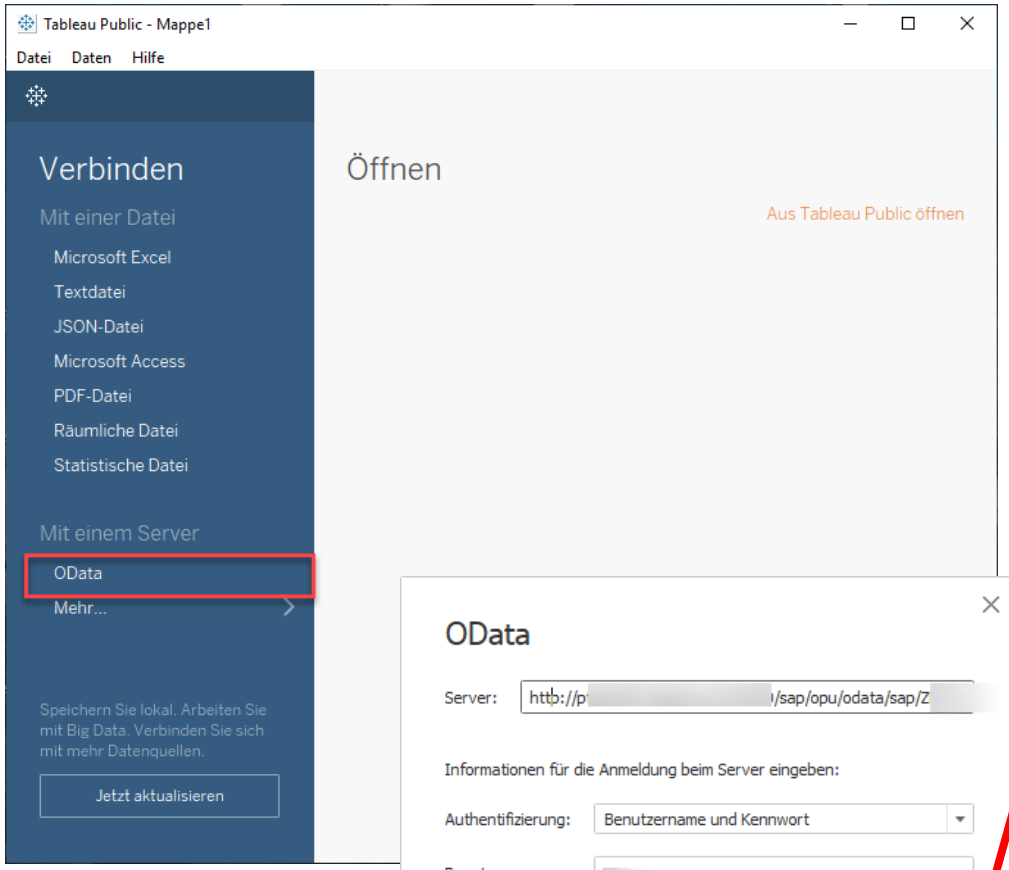
Example: Minimal RFC API with OLAP features on CDS

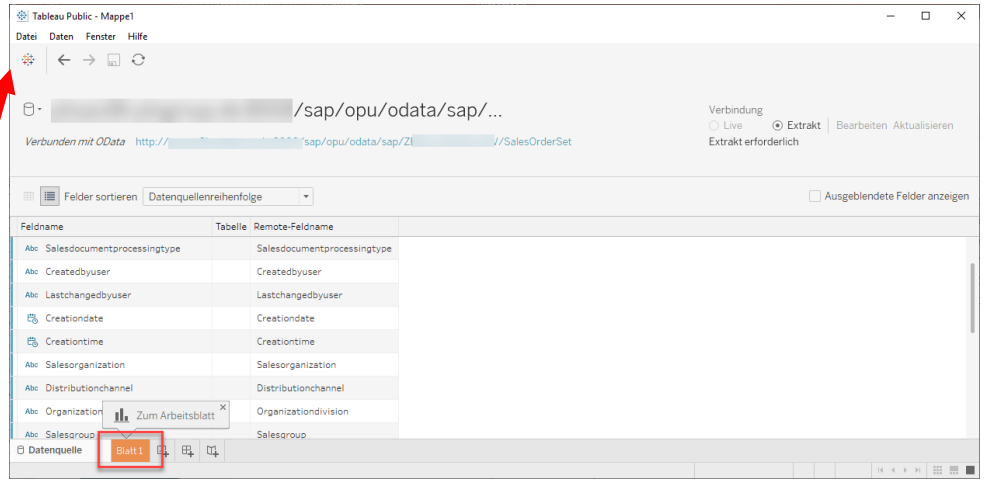

```
FUNCTION Z_SM_IMA_API_ADELE_EXP_IMC.
*"----------------------------------------------------------------------
*"*"Lokale Schnittstelle:
*"  IMPORTING
*"     VALUE(IV_MAX) TYPE  SYTABIX OPTIONAL
*"     VALUE(IS_SELOPT) TYPE  ZC_SMIMA_IMC OPTIONAL
*"     VALUE(IV_DIM) TYPE  STRING OPTIONAL
*"     VALUE(IV_FCT) TYPE  STRING OPTIONAL
*"  TABLES
*"      ET_DATA STRUCTURE  ZC_SMIMA_IMC OPTIONAL
*"      IT_SELOPT STRUCTURE  AQDBOS OPTIONAL
*"  EXCEPTIONS
*"      WRONG_INTERFACE
*"      WRONG_SQL
*"      ERRORS_OCCURED
*"----------------------------------------------------------------------
include ZSM_IMA_ADELE_EXPORT_API.
```

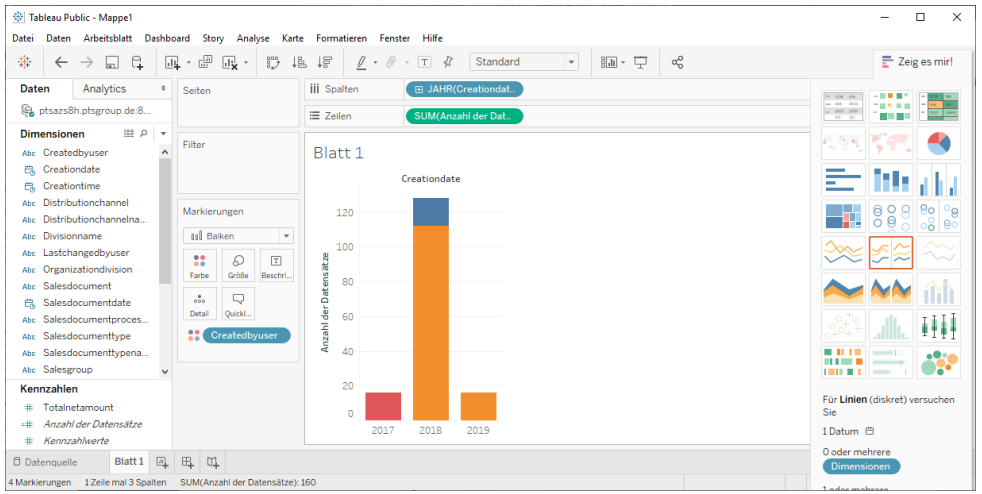
```
TRY.
* ------------ check every field of structure is_selopt
      ade_prepare_where_selopt.
* -------------
      IF lv_ade_lin GT 0.
        ade_check_selopt GUID.
…

        ade_check_selopt CREATED_AT.
        ade_check_selopt CREATED_BY.
        ade_check_selopt CHANGED_AT.
        ade_check_selopt CHANGED_BY.
      ENDIF.
* ------------ process
      ade_process ZC_SMIMA_IMC.
* ------------ process errors
    CATCH cx_sy_dynamic_osql_semantics.
      RAISE wrong_sql.
  ENDTRY.

ENDFUNCTION.
```

based on framework https://github.com/MDJoerg/adele

Connect external non-SAP tools via OData (Tableau Public)



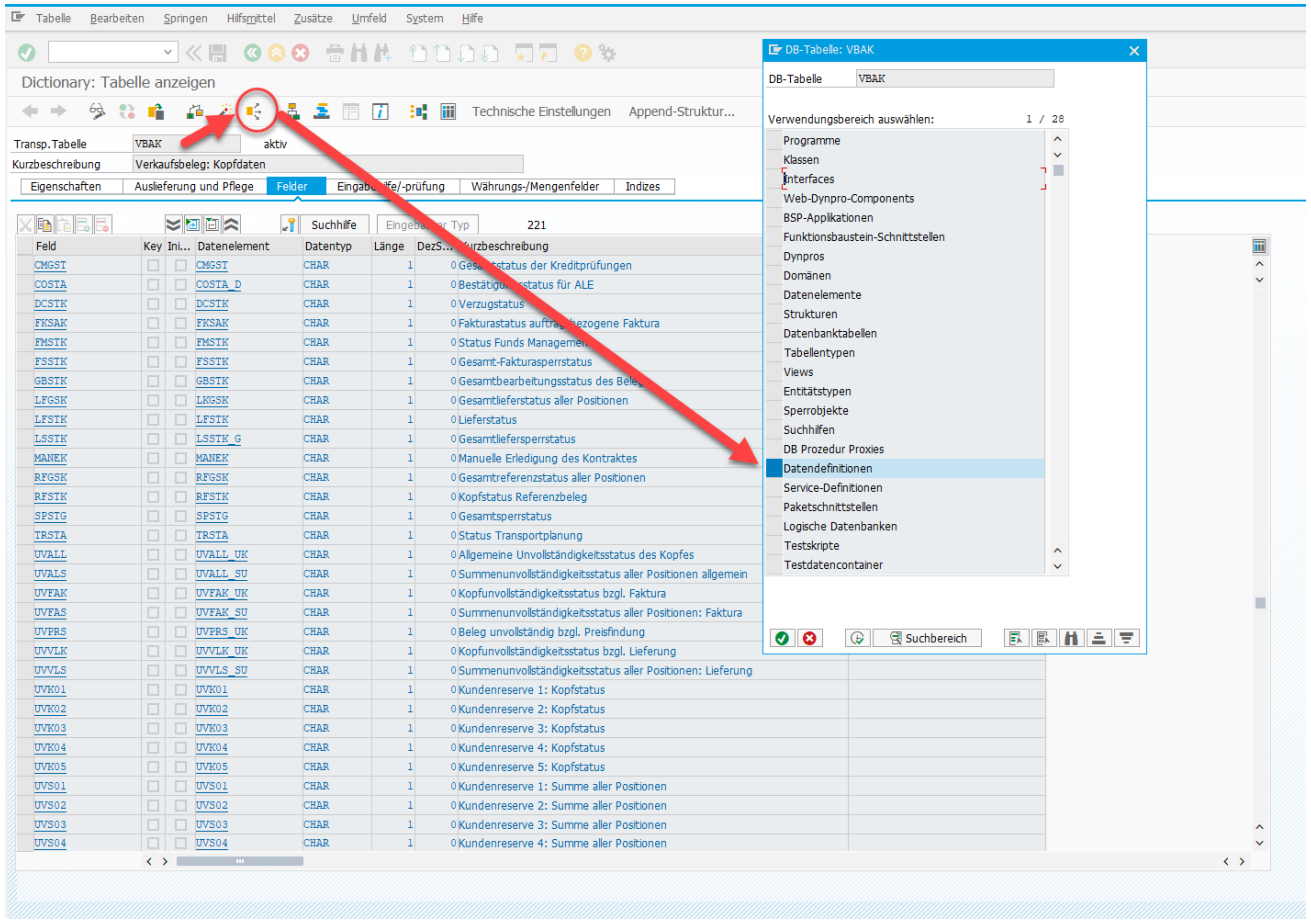




HowTo

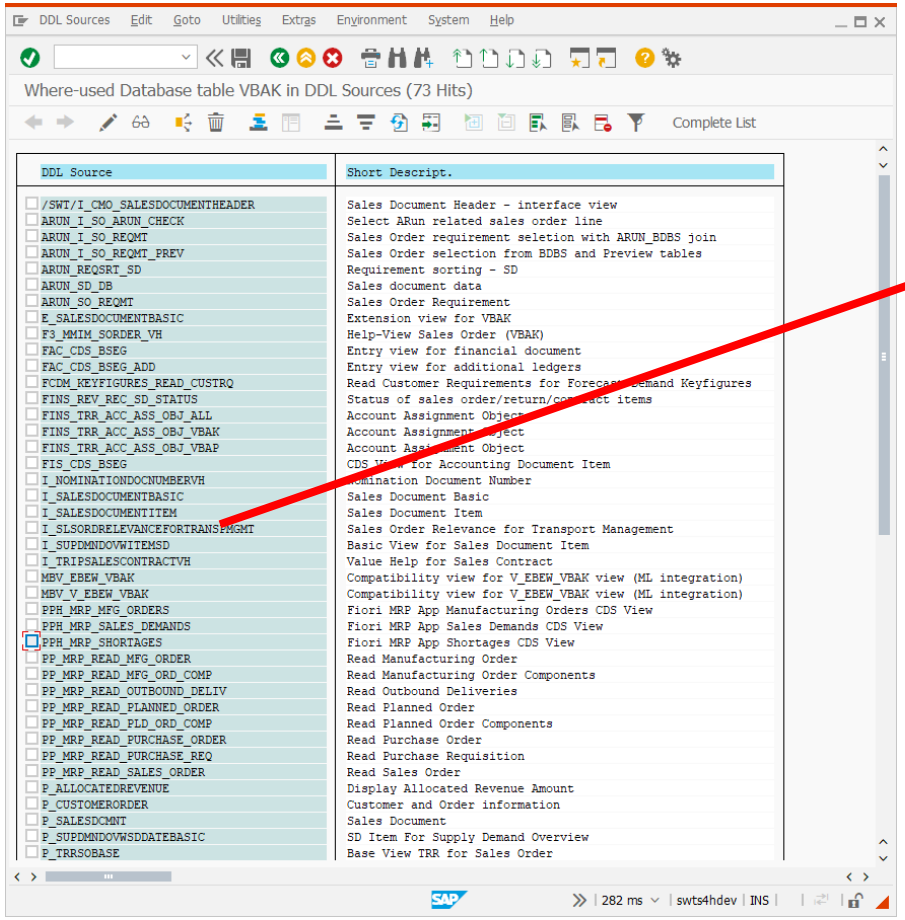
From the «Old World» to the «new brave World»

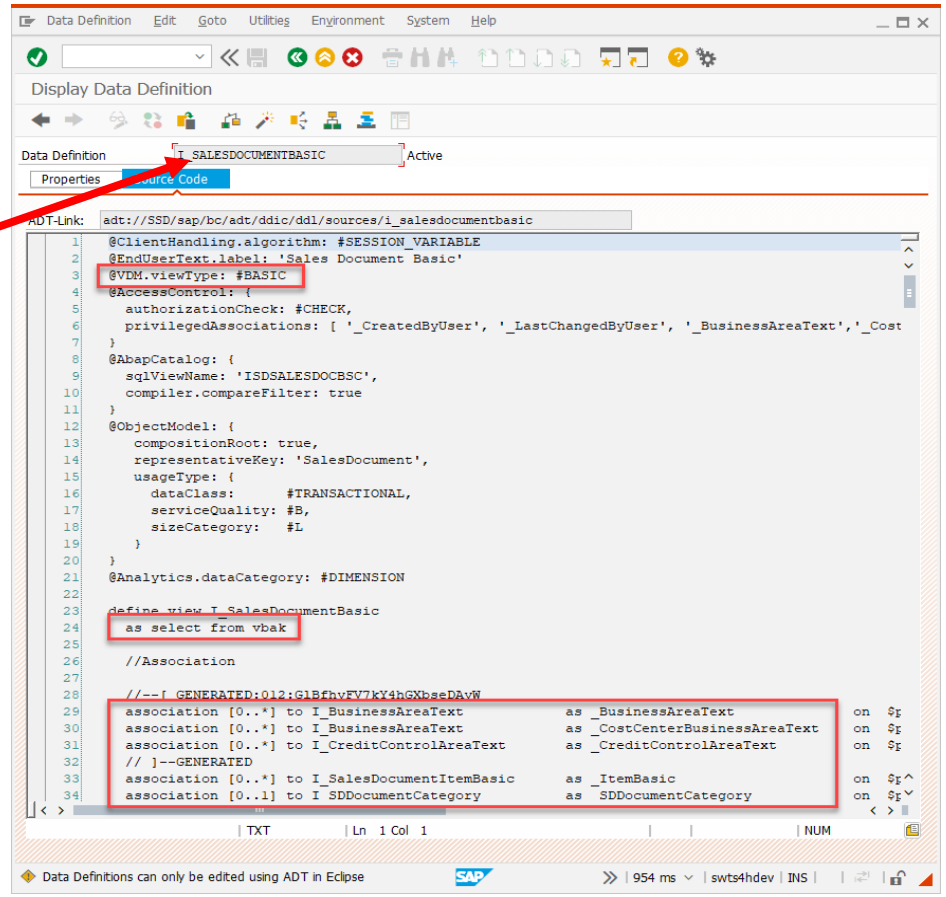
HowTo: from Dbtable to the CDS View



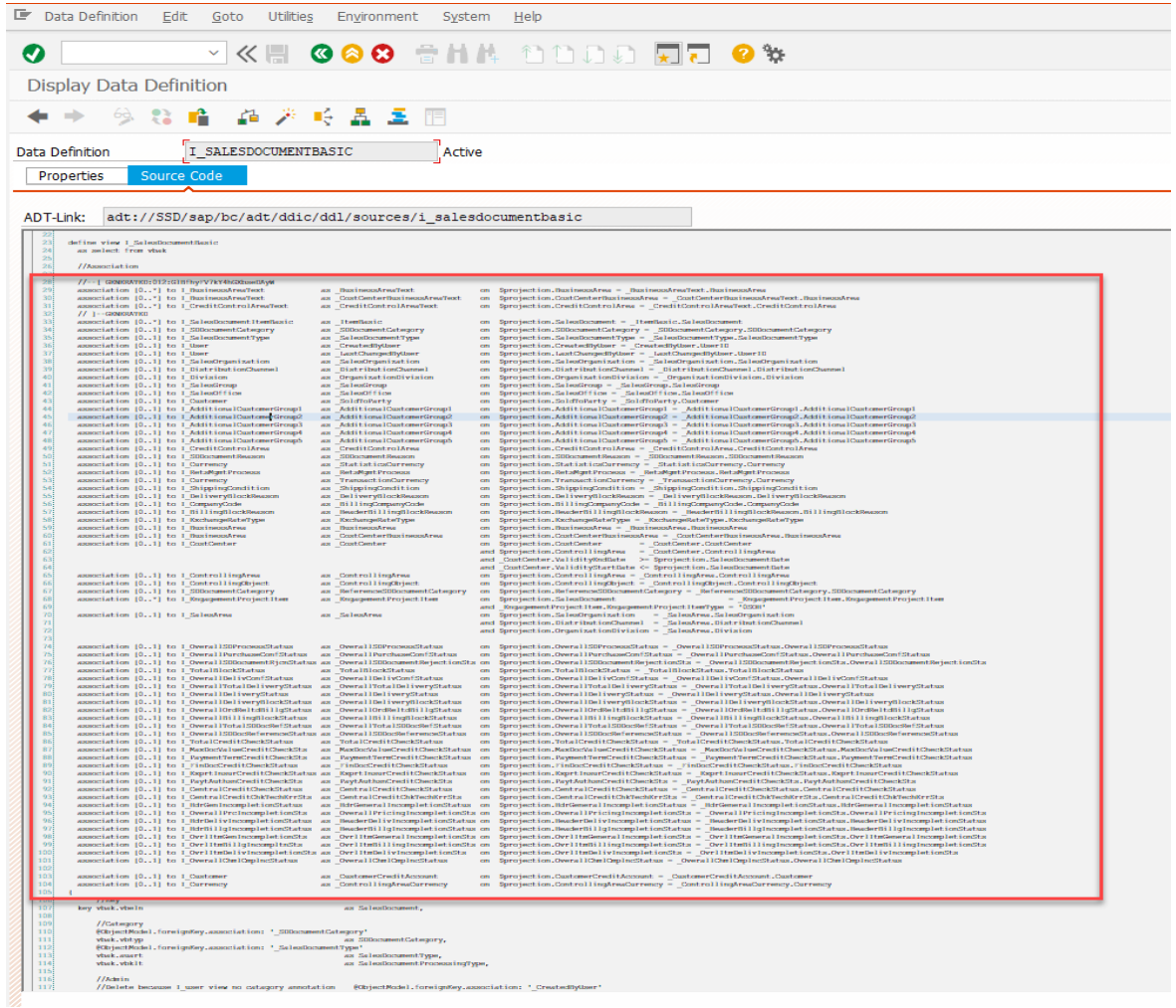
- SE11 with SAP table
- **Where-used list** via table or table field Selection "Data definitions"

HowTo: "read only" existing CDS views





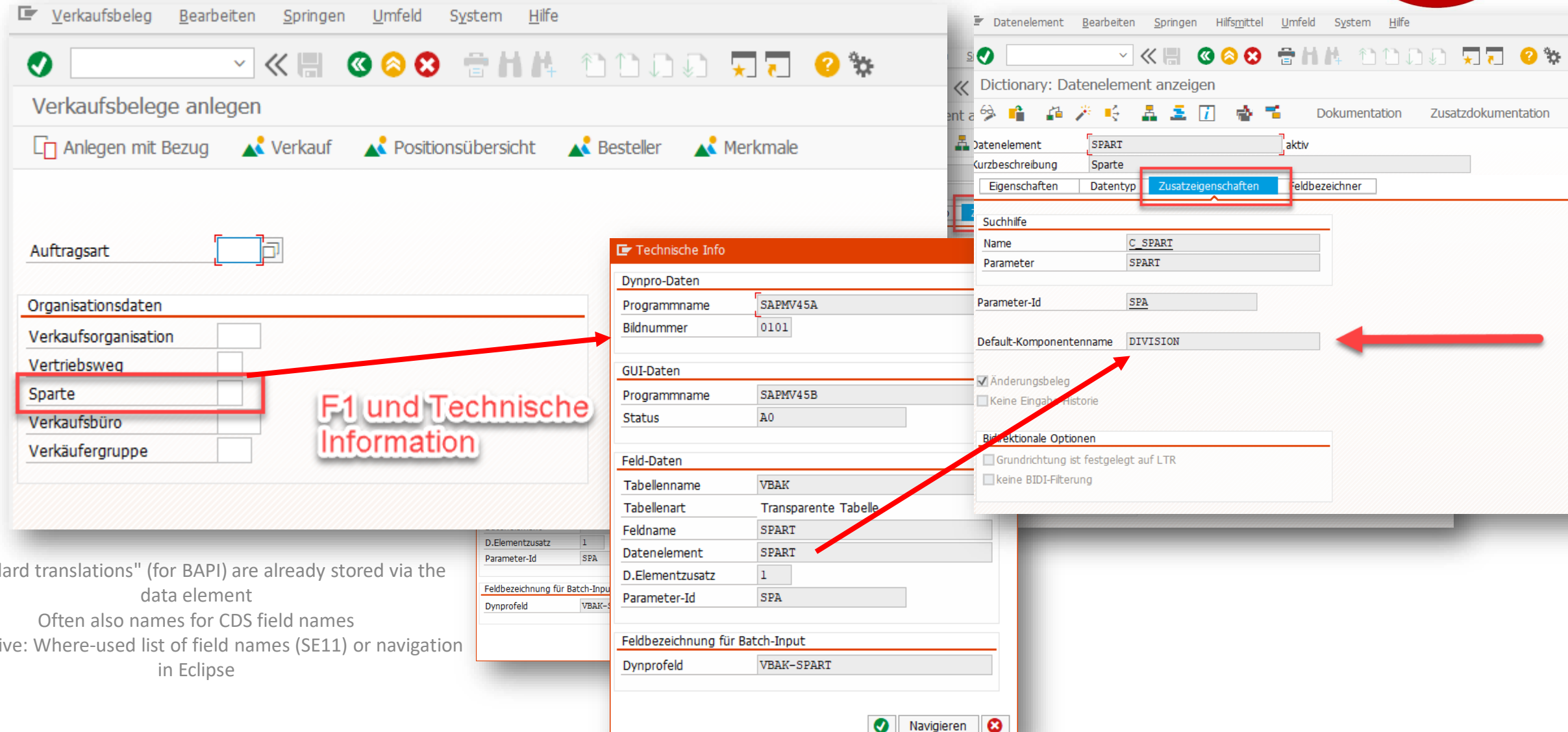
HowTo: Available object dependencies in CDS



Example: I_SalesDocumentBasic

- The existing CDS views already provide access to different dependent views
- These can be optionally used, extended or hidden from the components viewpoint
- Knowledge about Datamodel and Business process – In BW Context we are Calling "Business Content"

HowTo: "translate" known field names



"Standard translations" (for BAPI) are already stored via the data element

Often also names for CDS field names

Alternative: Where-used list of field names (SE11) or navigation in Eclipse

Implementation

- From CDS to OData Service

Step 1- Consumption View details


```
@AbapCatalog.sqlViewName: 'ZC_DMORD_SEL'
@AbapCatalog.compiler.compareFilter: true
@AbapCatalog.preserveKey: true
@AccessControl.authorizationCheck: #CHECK
@EndUserText.label: 'Demo Order Select - consumption'

@VDM.viewType: #CONSUMPTION
@OData.publish: true

define view ZC_DEMO_ORDER_SELECT
  as select from I_SalesDocumentBasic
{
    //I_SalesDocumentBasic
    key SalesDocument,
    TotalNetAmount,
    TransactionCurrency,
    CreatedByUser,
    CreationDate,
    CreationTime,
    SalesOrganization,
    _SalesOrganization._Text.SalesOrganizationName,
    SalesOffice,
    _SalesOffice._Text.SalesOfficeName

} where SDDocumentCategory = 'C'  // only Orders
```

View for the access from Standard ABAP (SE16N)

Role „Consumption“ in the Virtual Data Model

Annotation to automatically generate an OData Service (only since 7.5x)

Name of the CDS view (for Eclipse)

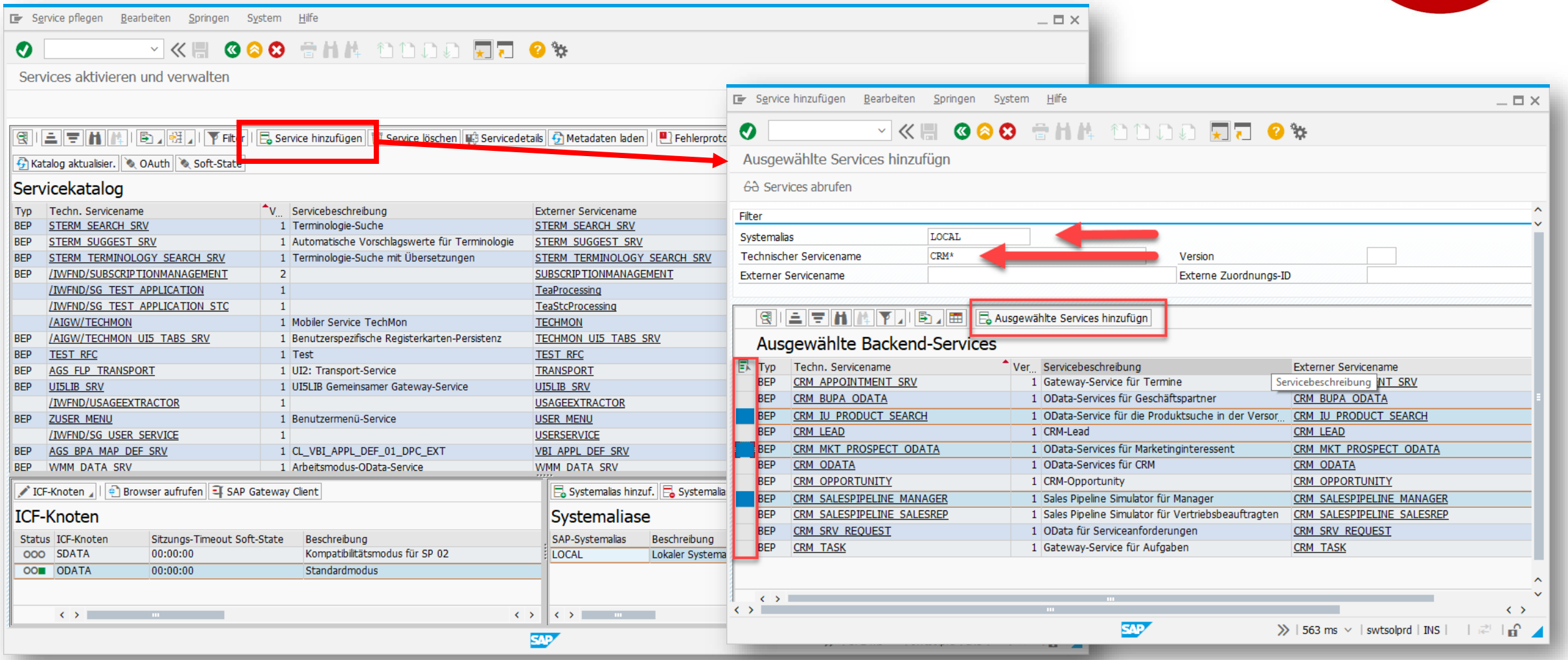
Name of the called CDS view resp. table

Available field list and origin

Fields from the object depender (Associations)

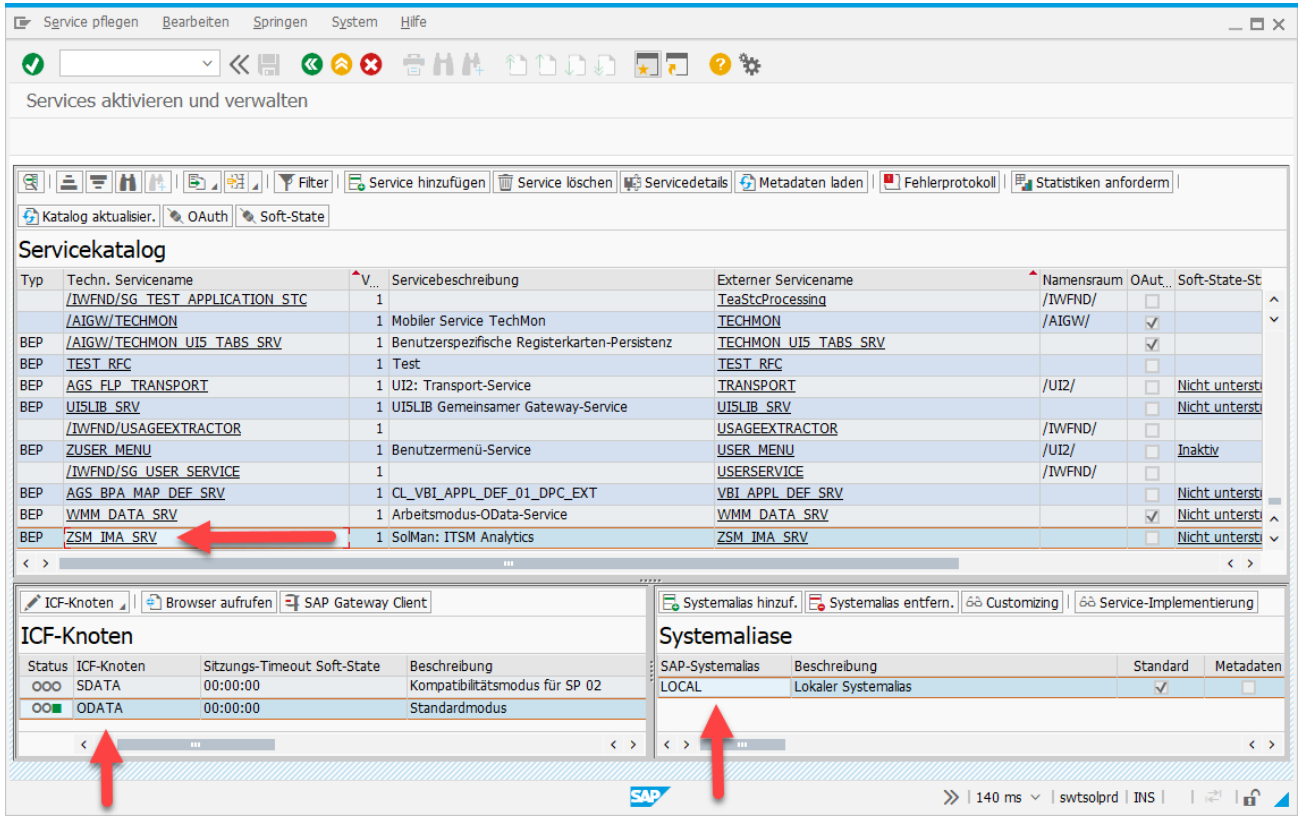
Pre-defined filter

Step 2: Register OData Service in Frontend Server –starting external access (minimum :))



Transaction /IWFND/MAINT_SERVICE

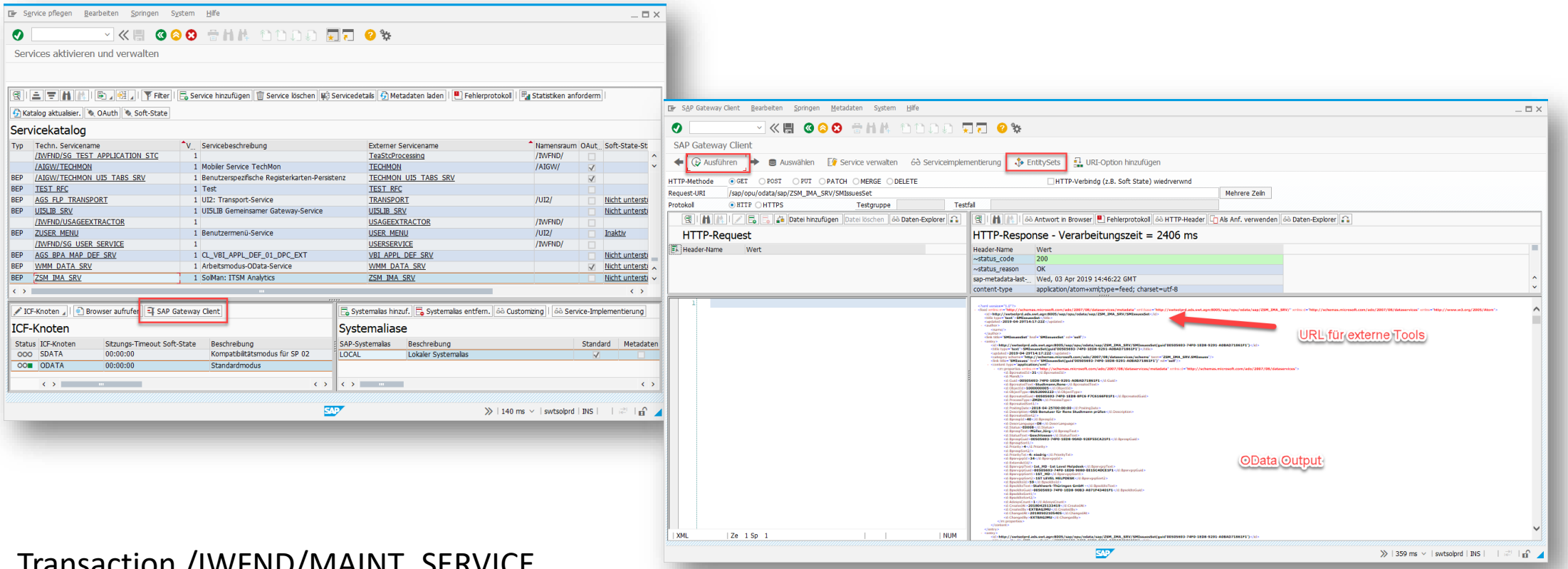
Step 3: Check and configure OData



Transaction /IWFND/MAINT_SERVICE
Service must be available here in upper list (click)
A connection to the backend must be configured (bottom right)
An OData Service is visible in the lower lfet corner
The related SICF node is active

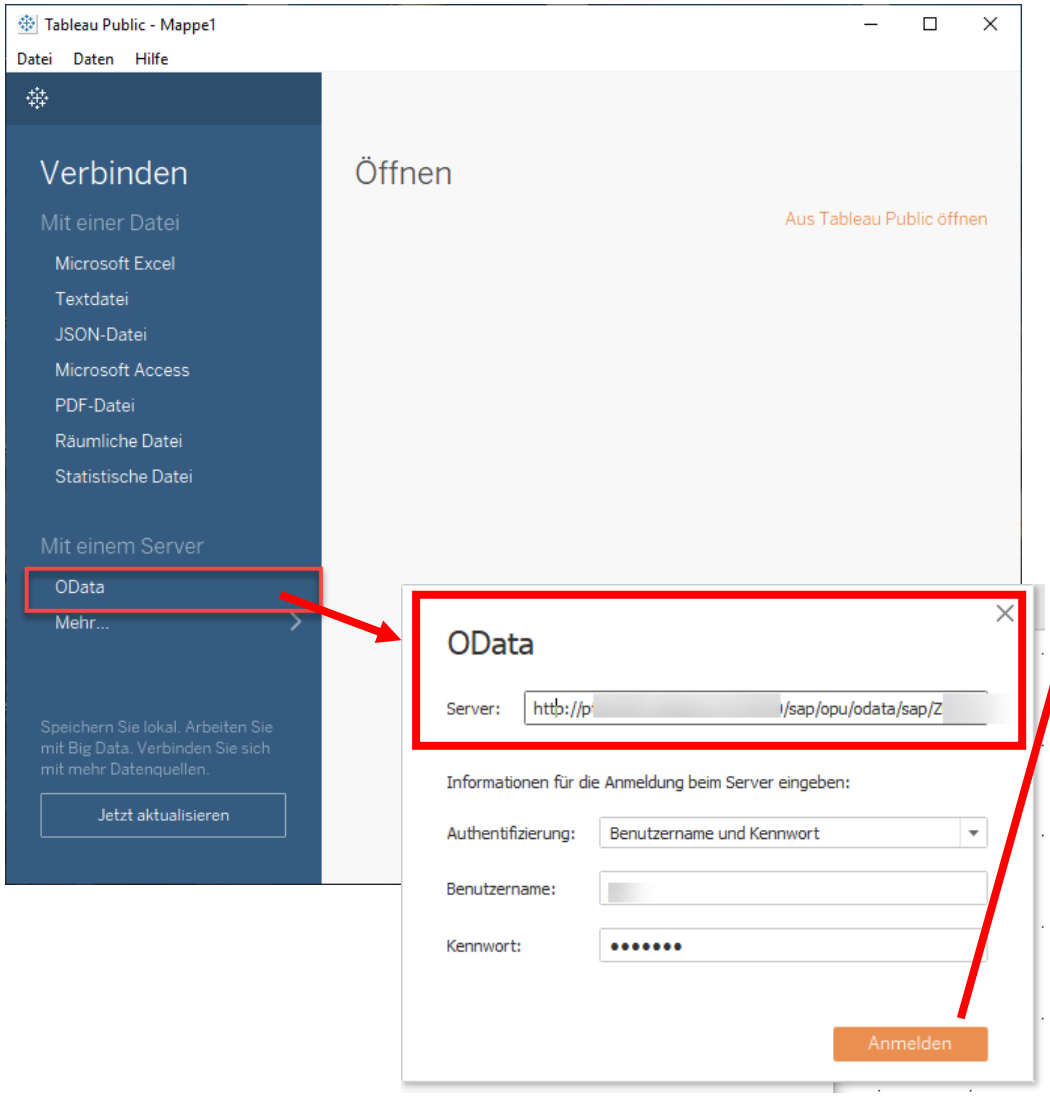
Using the „ICF Nodes“ menu
Alternatively, transaction SICF and paht „/sap/opu/odata/sap/*“

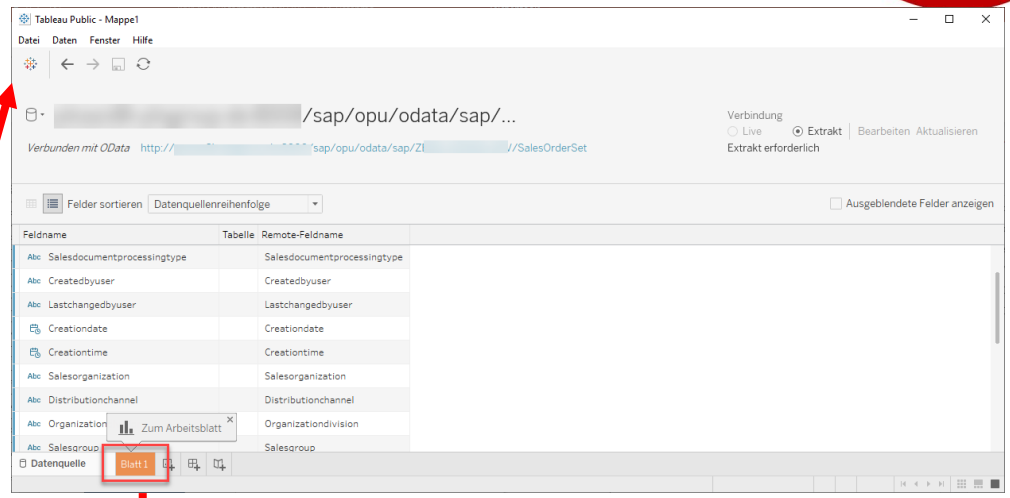
Step 4: Test OData Service – and get first look

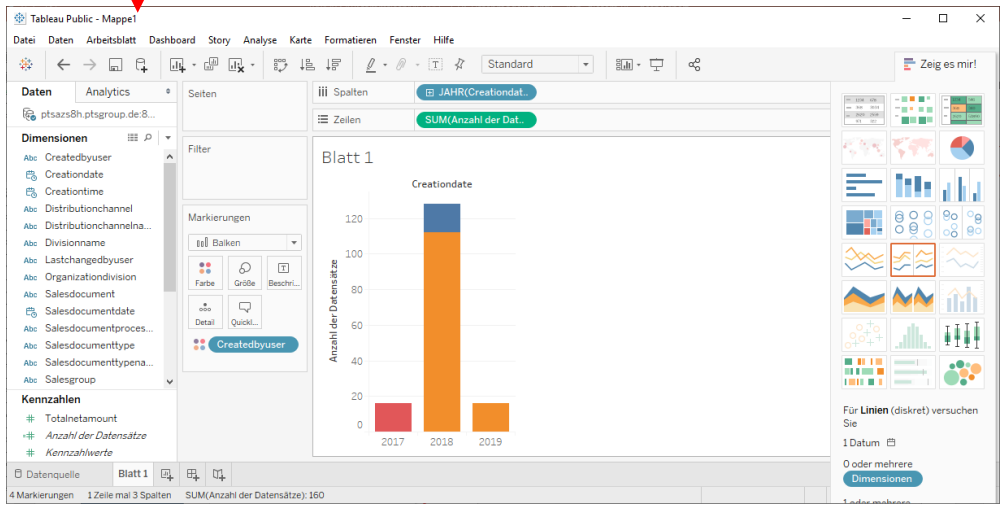


Transaction /IWFND/MAINT_SERVICE
Select EntitySet and execute
Check OData output
URL for external call in the response

Step 5: External connect to the OData Service e.g. Tableau Public or other consumer







Workaround: OData based on CDS with SEGW Tools – interesting for systems with older Releases

- Transaction SEGW
- Create new project
- Data Model → Import → ABAP Dictionary Structur → CDS SQL View (generated)
  With Entity Set
- Service Implementation → (EntitySet) → Map to Data Source → Business Entity → CDS View
- Assign fields
- Generate
- Continue with Step 2: Service in the Frontend register (SEGW project name)
- Further Info: https://blogs.sap.com/2015/04/20/creating-odata-services-out-of-cds-views/