Ten tips from using the ABAP Programming Model for SAP Fiori on AnyDB

DX134

John Patterson | @jasper_07

Our Fiori adoption


Costing too much

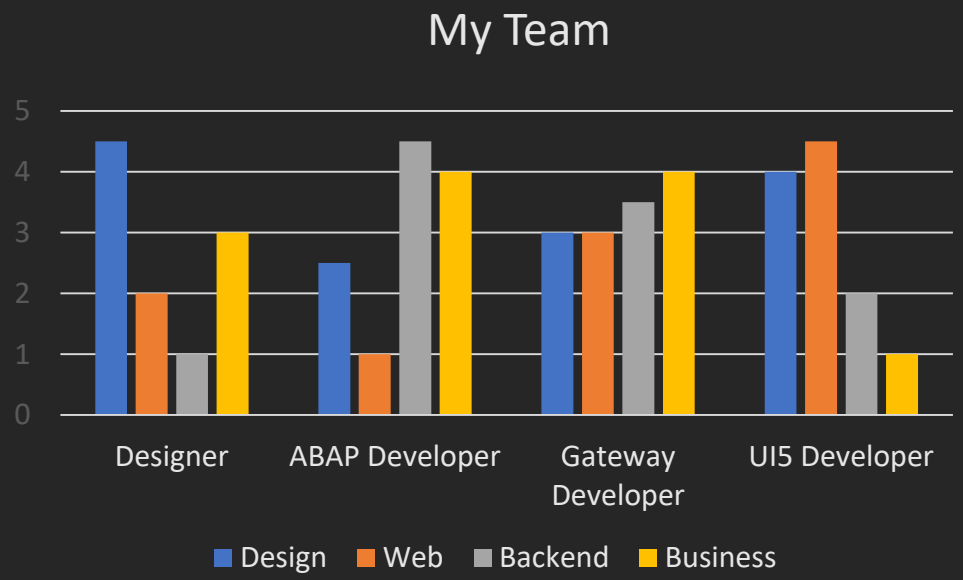

Taking too long


Hard to find resources

Can’t keep up with demand

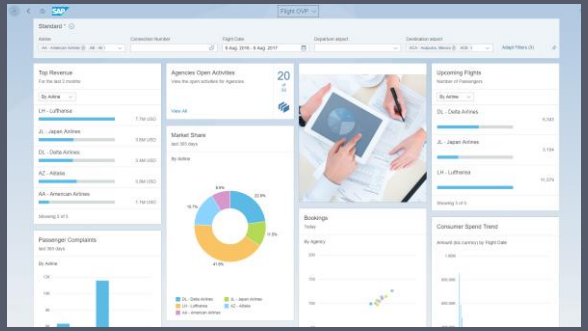

Need more developers to upskill

You go to war with the developers you have

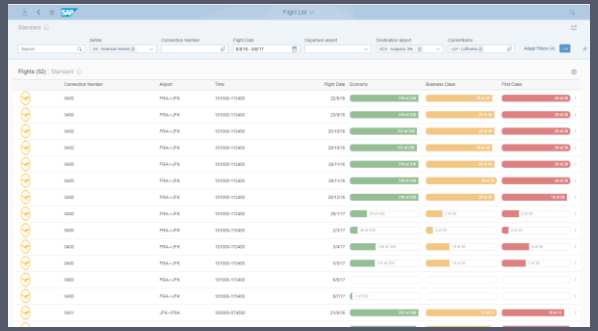


Fiori Elements

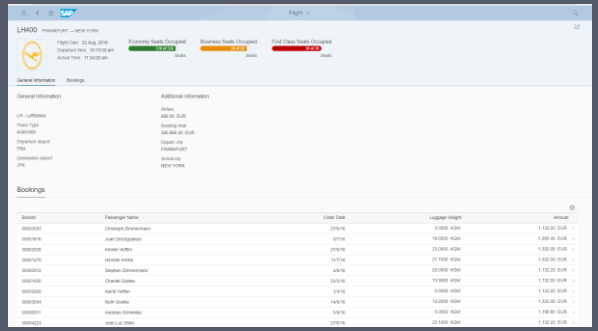
Metadata-Driven Uis based on CDS Annotations



Overview Page

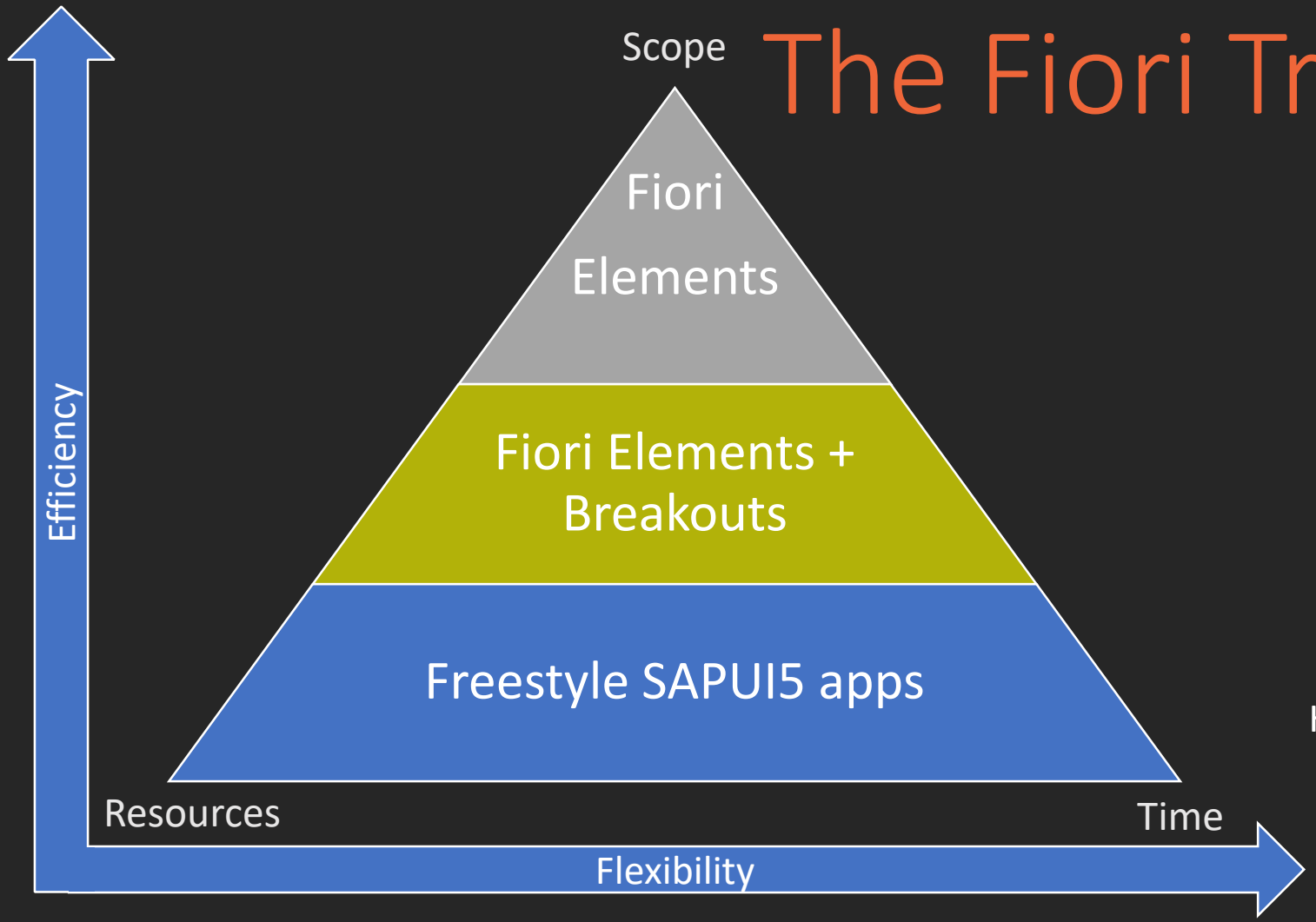


List Report



Object Page

The Fiori Triangle



Low hanging fruit

Here be dragons

High business value

@jasper_07

Limitations

CDS on AnyDB

- Performance issues
- No Fuzzy search
- Work arounds

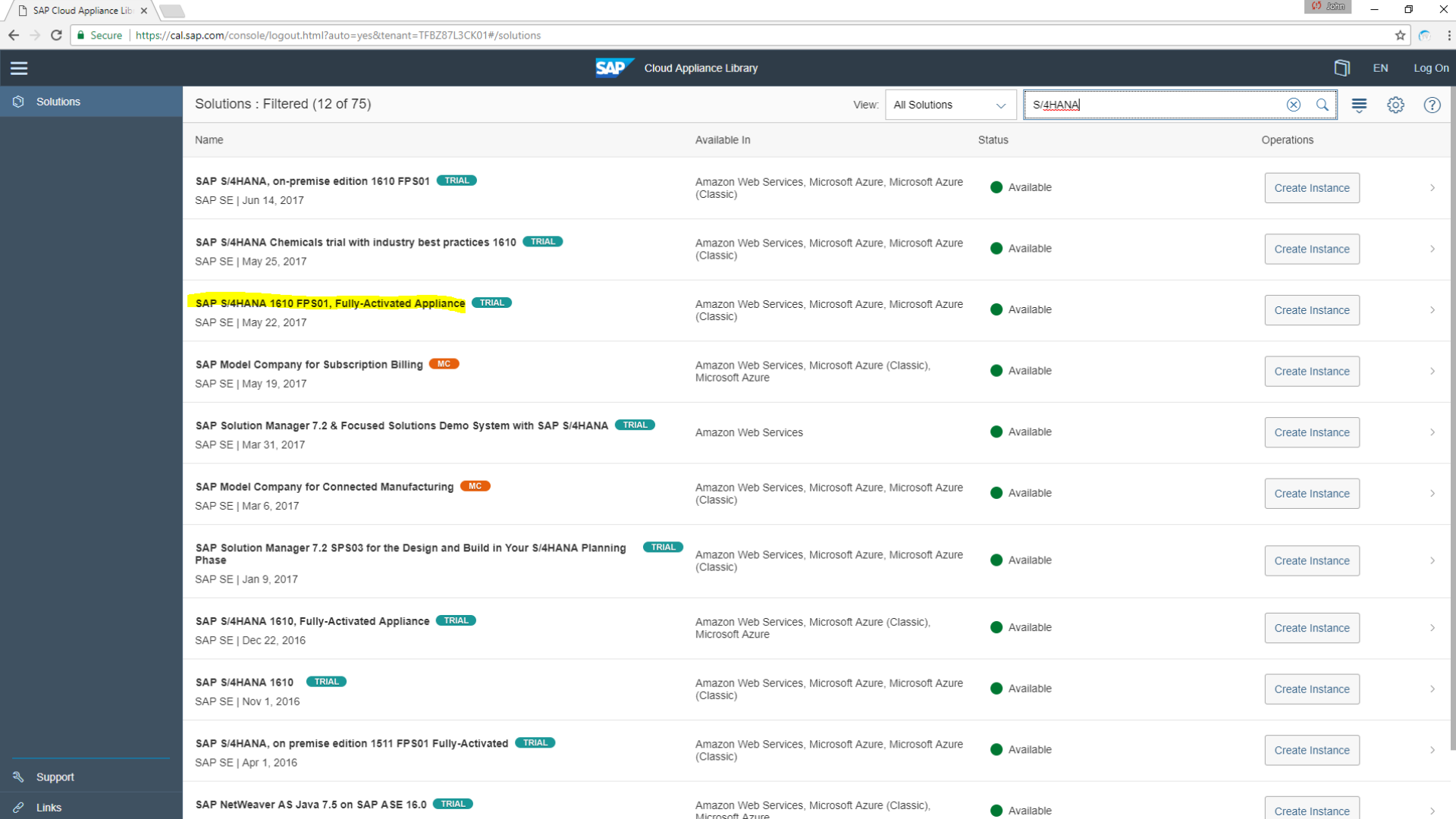
Fiori Elements

- Steeper than expected learning curve
- WebIDE wizard missing key features
- Breakouts very restricted Extension API

Get access to a system with examples

1

Working examples really reduce the learning curve


SAP Cloud Appliance Lib
John
Secure
https://cal.sap.com/console/logout.html?auto=yes&tenant=TFBZ87L3CK01#/solutions
Cloud Appliance Library
EN
Log On
Solutions
Solutions : Filtered (12 of 75)
View:
All Solutions
S/4HANA
Name
Available In
Status
Operations
SAP S/4HANA, on-premise edition 1610 FPS01 TRIAL
SAP SE | Jun 14, 2017
Amazon Web Services, Microsoft Azure, Microsoft Azure (Classic)
Available
Create Instance
SAP S/4HANA Chemicals trial with industry best practices 1610 TRIAL
SAP SE | May 25, 2017
Amazon Web Services, Microsoft Azure, Microsoft Azure (Classic)
Available
Create Instance
SAP S/4HANA 1610 FPS01, Fully-Activated Appliance TRIAL
SAP SE | May 22, 2017
Amazon Web Services, Microsoft Azure, Microsoft Azure (Classic)
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Create Instance
SAP Model Company for Subscription Billing MC
SAP SE | May 19, 2017
Amazon Web Services, Microsoft Azure (Classic), Microsoft Azure
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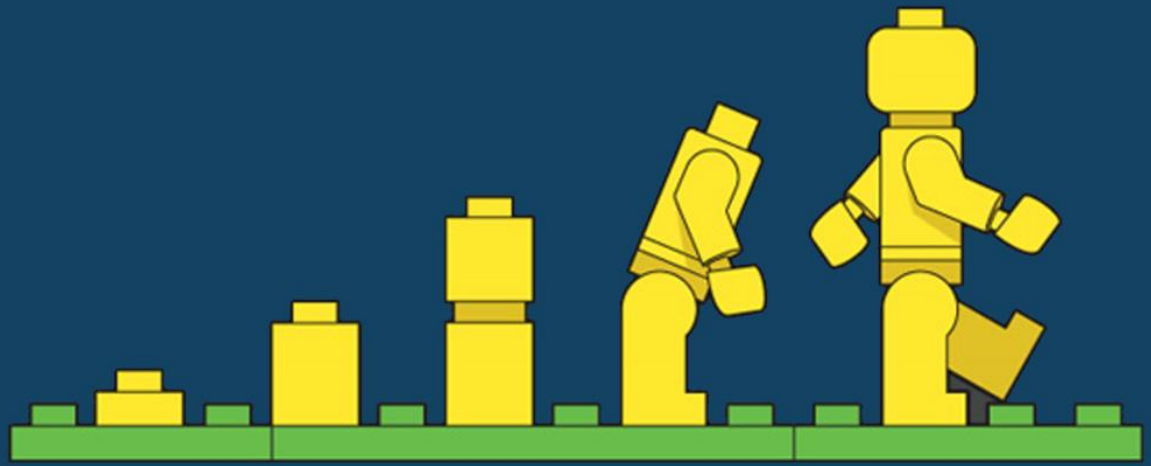
SAP Solution Manager 7.2 & Focused Solutions Demo System with SAP S/4HANA TRIAL
SAP SE | Mar 31, 2017
Amazon Web Services
Available
Create Instance
SAP Model Company for Connected Manufacturing MC
SAP SE | Mar 6, 2017
Amazon Web Services, Microsoft Azure, Microsoft Azure (Classic)
Available
Create Instance
SAP Solution Manager 7.2 SPS03 for the Design and Build in Your S/4HANA Planning Phase TRIAL
SAP SE | Jan 9, 2017
Amazon Web Services, Microsoft Azure, Microsoft Azure (Classic)
Available
Create Instance
SAP S/4HANA 1610, Fully-Activated Appliance TRIAL
SAP SE | Dec 22, 2016
Amazon Web Services, Microsoft Azure (Classic), Microsoft Azure
Available
Create Instance
SAP S/4HANA 1610 TRIAL
SAP SE | Nov 1, 2016
Amazon Web Services, Microsoft Azure, Microsoft Azure (Classic)
Available
Create Instance
SAP S/4HANA, on premise edition 1511 FPS01 Fully-Activated TRIAL
SAP SE | Apr 1, 2016
Amazon Web Services, Microsoft Azure, Microsoft Azure (Classic)
Available
Create Instance
SAP NetWeaver AS Java 7.5 on SAP ASE 16.0 TRIAL
Amazon Web Services, Microsoft Azure (Classic), Microsoft Azure
Available
Create Instance
Support
Links

Start building up your own library of examples

2



Generating OData Services

1

Via CDS Annotation @OData.publish

EXPOSE

2

Via SEGW using CDS Referenced Data Source

ENRICH

3

Via SEGW using Mapped Data Source

ENHANCE

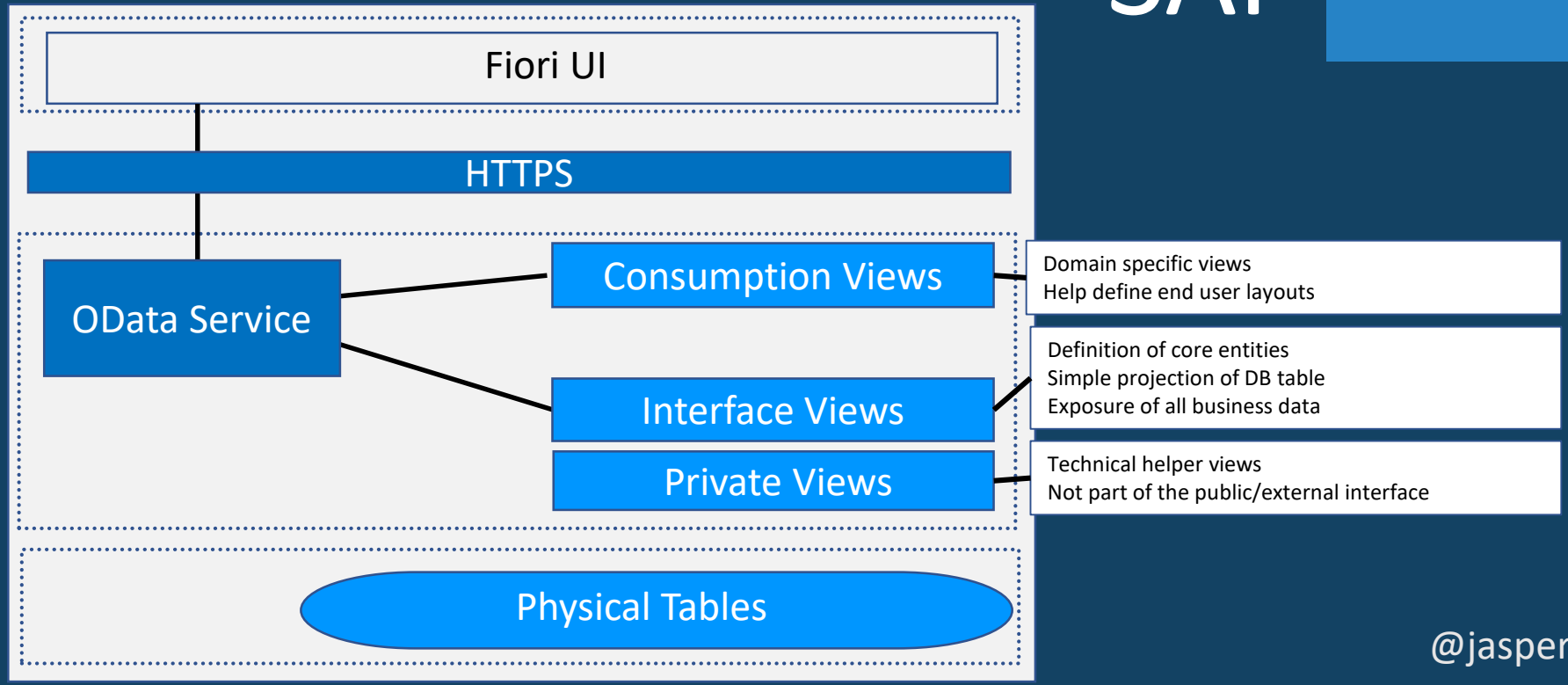
When to use @OData.publish?

3

Generates a single root entity with associations. Ideal for List Report and Object Page

Structure CDS views like SAP

4



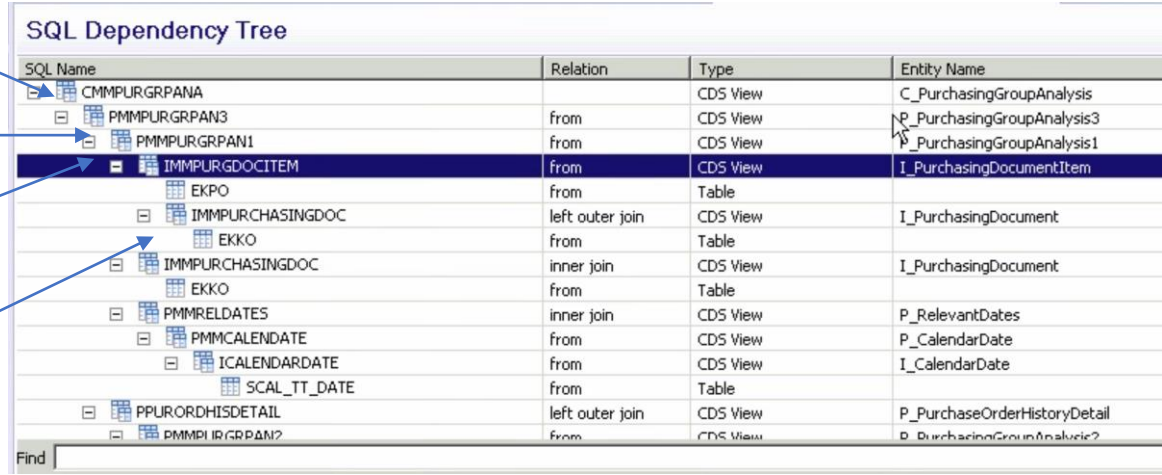
Views on Views

Consumption View “C”

Private View “P”

Interface View “I”

Database table



Open SQL vs Native SQL

5

Analyze how CDS on HANA works to bridge the gaps in AnyDB

Aggregate Example

Open SQL will want to ‘group by’ all non-aggregate fields = SELECT fields + the KEY fields

That doesn’t work!! KEY is unique

Trick don’t use KEY fields, let CDS populate a locally generated KEY

Learnt from observing HANA XS and Analytical views

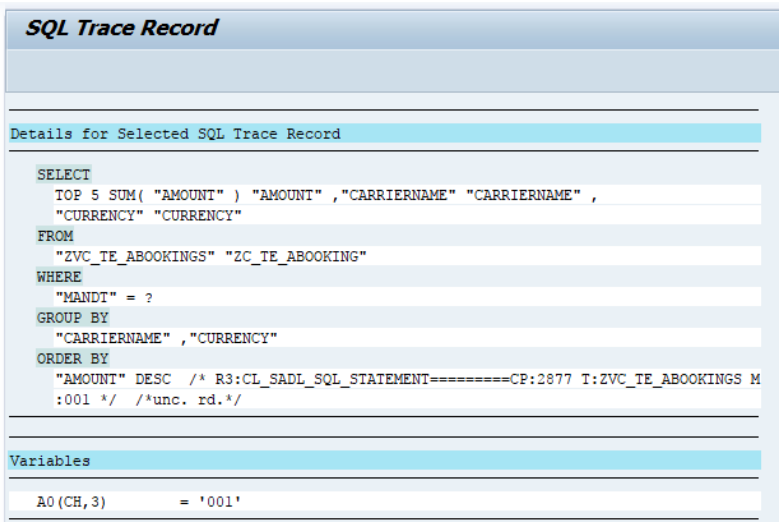
```
define view Zc_Te_Abooking as select from Zi_Te_Bookings as book
 association [1] to Zc_Te_Agency as _Agency on $projection.AgencyNumber = _Agency.AgencyNumber
 association [1] to Zi_Te_Carrier as _Carrier on $projection.CarrierId =  _Carrier.CarrierId
 association [1] to Zi_Te_Connection as _Connection on $projection.CarrierId =  _Connection.Ca
                                                    and $projection.ConnectionId = _Connection.
{
    @Search.defaultSearchElement: true
    book.CarrierId,
    book.ConnectionId,
    @UI.lineItem: [{position:10,qualifier:'Carrier', importance:#HIGH}]
    _Carrier.Name as CarrierName,

    book.FlightDate,
    book.BookId,
    @Semantics.currencyCode: true
    cast( 'USD' as abap.cuky ) as Currency,
    @UI.lineItem: [{position:20,qualifier:'Carrier', importance:#HIGH, type: #AS_DATAPOINT },
    @DefaultAggregation: #SUM
    book.LocalCurrencyAmount as Amount,
    book.AgencyNumber,
    @UI.lineItem: [{position:10,qualifier:'Agency', importance:#HIGH}]
    coalesce( _Agency.AgencyName, 'Internet Booking' ) as AgencyName,
    @DefaultAggregation: #COUNT
    cast(0 as abap.int4) as NumberOfItems,
    _Connection.AirportFrom,
    _Connection.AirportTo,
    _Connection,
    _Agency
}
```

Automagic KEY

```
▼<EntityType Name="Zc_Te_AbookingType" sap:label="Analytics on Booking" sap:semantics="aggregate" sap:content-version="1">
  ▼<Key>
    <PropertyRef Name="ID"/>
   </Key>
   <Property Name="ID" Type="Edm.String" Nullable="false" sap:creatable="false" sap:updatable="false" sap:sortable="false" sap:filterable="false"/>
   <Property Name="CarrierId" Type="Edm.String" MaxLength="3" sap:aggregation-role="dimension" sap:display-format="UpperCase" sap:label="Airline"/>
   <Property Name="NumberOfItems" Type="Edm.Int32" sap:aggregation-role="measure"/>
   <Property Name="AirportFrom" Type="Edm.String" MaxLength="3" sap:aggregation-role="dimension" sap:display-format="UpperCase" sap:label="Departure
```

Zc_Te_Abooking?$top=5&$orderby=Amount desc&$select=CarrierName,Currency,Amount


```
{
 - d: {
     __count: "8",
   - results: [
     - {
       - __metadata: {
           id: http://vhcalnplci.dummy.nodomain:8000/sap/opu/odata/sap/ZTE_FLIGHT_OVP_SRV/Zc_Te_Abooking('-.-.-.-.-.-.23.-.3.-._.SQ%20-%20Singapore%20AirlinesUSD'),
           uri: http://vhcalnplci.dummy.nodomain:8000/sap/opu/odata/sap/ZTE_FLIGHT_OVP_SRV/Zc_Te_Abooking('-.-.-.-.-.-.23.-.3.-._.SQ%20-%20Singapore%20AirlinesUSD'),
           type: "ZTE_FLIGHT_OVP_SRV.Zc_Te_AbookingType"
         },
         CarrierName: "SQ - Singapore Airlines",
         Currency: "USD",
         Amount: "25604007.50"
       },
```



Simple Effective and Reusable

When to use SEGW & CDS Reference?

6

Need multiple root entities, like an OVP or need to add additional metadata, enrich query results or mix CDS with classic Gateway

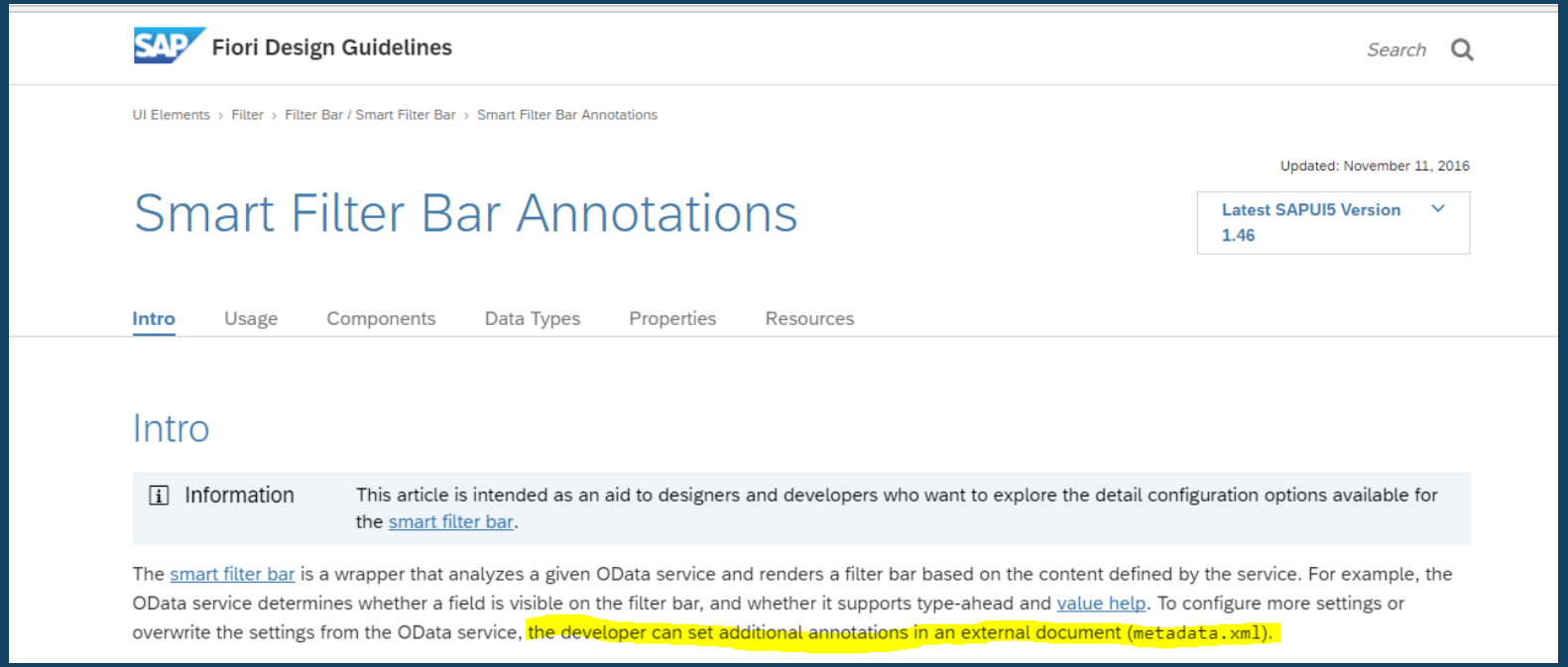
Enrich returned values

CL_EPM_REF_APPS_SHOP_DPC_EXT

```
256  METHOD images_get_entity.
257    super->images_get_entity(
258      EXPORTING
259        iv_entity_name              = iv_entity_name
260        iv_entity_set_name          = iv_entity_set_name
261        iv_source_name              = iv_source_name
262        it_key_tab                  = it_key_tab
263        io_request_object           = io_request_object
264        io_tech_request_context     = io_tech_request_context
265        it_navigation_path          = it_navigation_path
266      IMPORTING
267        er_entity                   = er_entity
268        es_response_context         = es_response_context
269    ).
270
271    DATA(lt_entityset) = VALUE cl_sepmra_shop=>tt_productimage( ( CORRESPONDING #( er_entity ) ) ).
272
273    _shop_facade->image_enrich_transient_values( CHANGING ct_image = lt_entityset ).
274
275    er_entity = lt_entityset[ 1 ].
276  ENDMETHOD.
277
```

Know your Smart Controls

7



Fiori Design Guidelines

Search

UI Elements › Filter › Filter Bar / Smart Filter Bar › Smart Filter Bar Annotations

Updated: November 11, 2016

Smart Filter Bar Annotations

Latest SAPUI5 Version 1.46

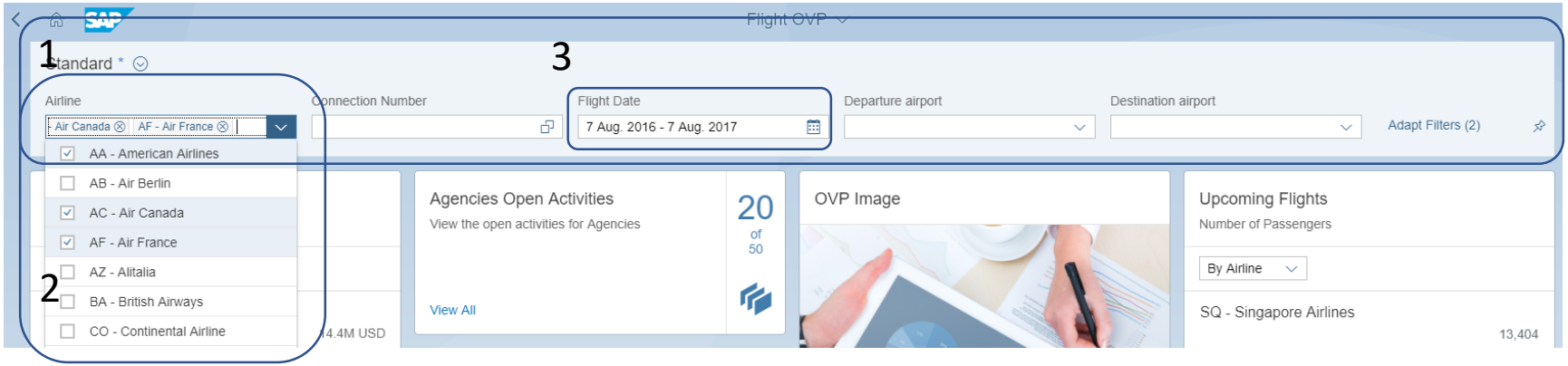
Intro | Usage | Components | Data Types | Properties | Resources

Intro

Information — This article is intended as an aid to designers and developers who want to explore the detail configuration options available for the smart filter bar.

The smart filter bar is a wrapper that analyzes a given OData service and renders a filter bar based on the content defined by the service. For example, the OData service determines whether a field is visible on the filter bar, and whether it supports type-ahead and value help. To configure more settings or overwrite the settings from the OData service, the developer can set additional annotations in an external document (`metadata.xml`).

Smart Control Example



1. Smart Filter Bar
2. Multi Select Fixed Value
3. Interval value

Smart Control Example

```
</EntityType>
▼<EntityType Name="Zc_Te_Flight_FilterType" sap:label="Filter for OVP" sap:content-version="1">
  ▼<Key>
     <PropertyRef Name="CarrierId"/>
     <PropertyRef Name="ConnectionId"/>
     <PropertyRef Name="FlightDate"/>
   </Key>
   <Property Name="CarrierId" Type="Edm.String" Nullable="false" MaxLength="3" sap:display-format="UpperCase" sap:filter-restriction="multi-value" sap:label="Airline" sap:value-list="fixed-values"/>
   <Property Name="ConnectionId" Type="Edm.String" Nullable="false" MaxLength="4" sap:display-format="NonNegative" sap:label="Connection Number"/>
   <Property Name="FlightDate" Type="Edm.DateTime" Nullable="false" Precision="0" sap:display-format="Date" sap:filter-restriction="interval" sap:label="Flight Date"/>
```

1 2 3

ZCL_ZTE_FLIGHT_MPC_EXT

```
66  METHOD add_interval_filter.
67    create_annotation( iv_entity_type = iv_entity_type iv_property = iv_property )->add( iv_key   = /iwbep/if_ana_odata_types=>gcs_ana_odata_annotation_key-filter_restriction
68                                                                                          iv_value = /iwbep/if_ana_odata_types=>gcs_ana_odata_annotation_value-filter-interval ).
69  ENDMETHOD.
70
71  METHOD create_annotation.
72    ro_annotation = model->get_entity_type( |{ iv_entity_type }| )->get_property( |{ iv_property }| )->/iwbep/if_mgw_odata_annotatabl~create_annotation(
73      iv_annotation_namespace = /iwbep/if_mgw_med_odata_types=>gc_sap_namespace ).
74  ENDMETHOD.
75
76  METHOD define.
77    super->define( ).
78
79    "set flight date as an interval
80    add_interval_filter( EXPORTING iv_entity_type = gc_zc_te_flighttype iv_property = 'FlightDate' ).
81
82    "set carrier as a multi select static value list
83    add_multi_value_filter( EXPORTING iv_entity_type = gc_zc_te_flighttype iv_property  = 'CarrierId' ).
84    model->get_entity_type( gc_zc_te_flighttype )->get_property( 'CarrierId' )->set_value_list( /iwbep/if_mgw_odata_property=>gcs_value_list_type_property-fixed_values ).
85    add_text_property( EXPORTING iv_entity_type = gc_zc_te_flighttype iv_property = 'CarrierId'  iv_text_property = 'to_Carrier/Name' ).
86
87
```

3 1 2

When to use SEGW & Mapped data source?

8

More complex scenarios, you want to dynamically change the behavior or inject additional logic into a query

Query Options

Set search fields

Add additional sort criteria

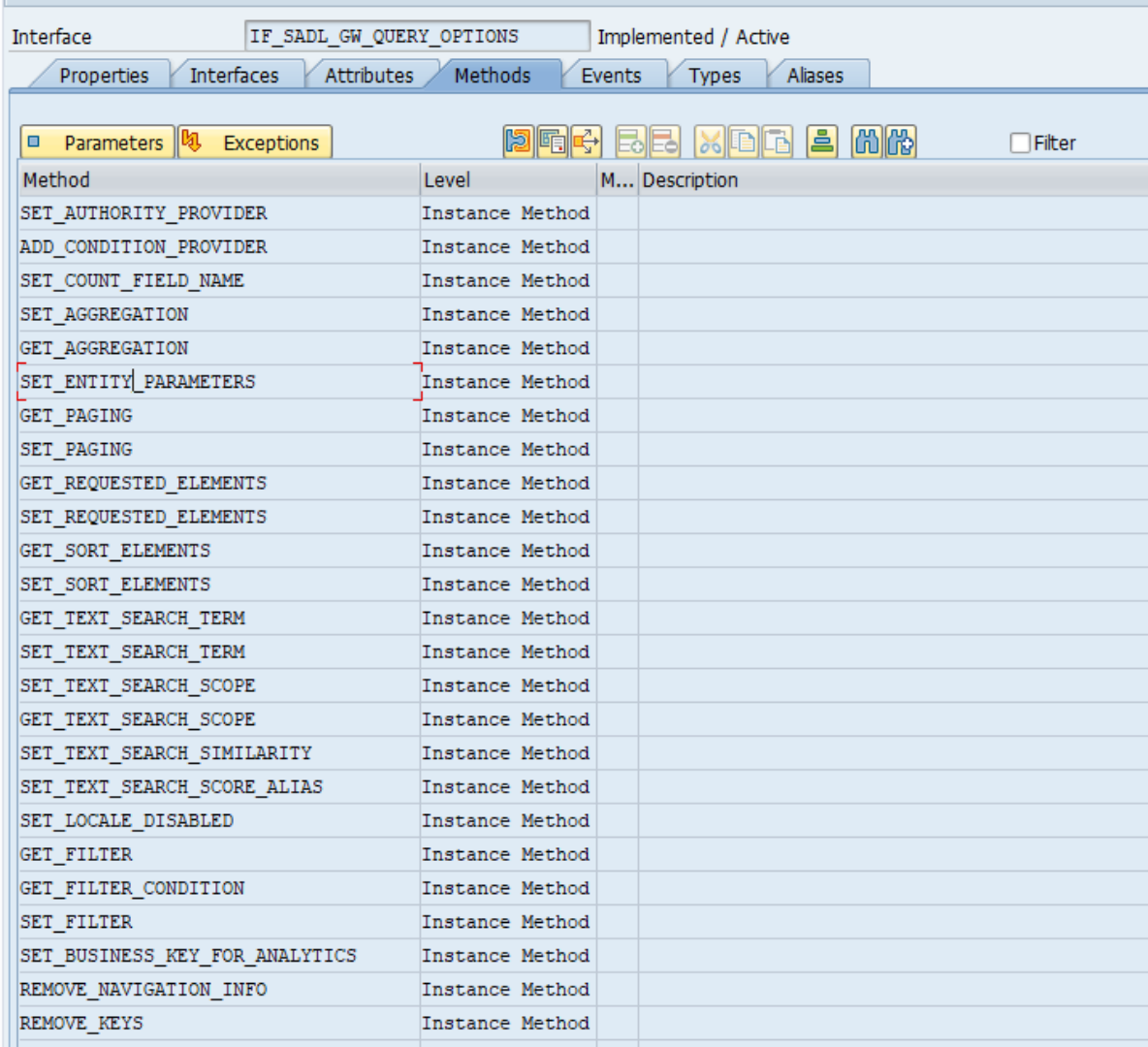
Define additional field selection

Add additional filter criteria

Define aggregates and groups

Set parameters

Change navigation behavior



Query Options Example

```
CLASS ZCL_ZCDS_SADL_TEST2_DPC_EXT IMPLEMENTATION.


  METHOD if_sadl_gw_query_control~set_query_options.

    "add additional filter
    io_query_options->get_filter_condition( IMPORTING et_filter_condition = DATA(lt_filter_condition) ).
    APPEND VALUE #( element = 'PROCESSED' operator = 'EQ' low = abap_false ) TO lt_filter_condition.
    IF lines( lt_filter_condition ) > 1.
      APPEND VALUE #( operator = 'AND' ) TO lt_filter_condition.
    ENDIF.
    io_query_options->set_filter( it_filter_condition = lt_filter_condition ).

    "add additional fields to be selected
    io_query_options->get_requested_elements( IMPORTING et_elements = DATA(lt_requested_elements) ).
    APPEND 'PRODUCT_ID' TO  lt_requested_elements.
    io_query_options->set_requested_elements( lt_requested_elements ).

    "set STATUS and CURRECNY_CODE parameters
    DATA(lt_parameters) = VALUE if_sadl_public_types=>tt_entity_parameters( (
       entity_alias = 'SalesOrderHeaders'
       parameters = VALUE #( ( name = 'CURRENCY_CODE' value = 'AUD' ) ( name = 'STATUS' value = 'APPROVED' ) )
    ) ).
    io_query_options->set_entity_parameters( lt_parameters ).

    super->if_sadl_gw_query_control~set_query_options( iv_entity_set = iv_entity_set io_query_options = io_query_options ).

  ENDMETHOD.

```

Fiori Elements Breakouts

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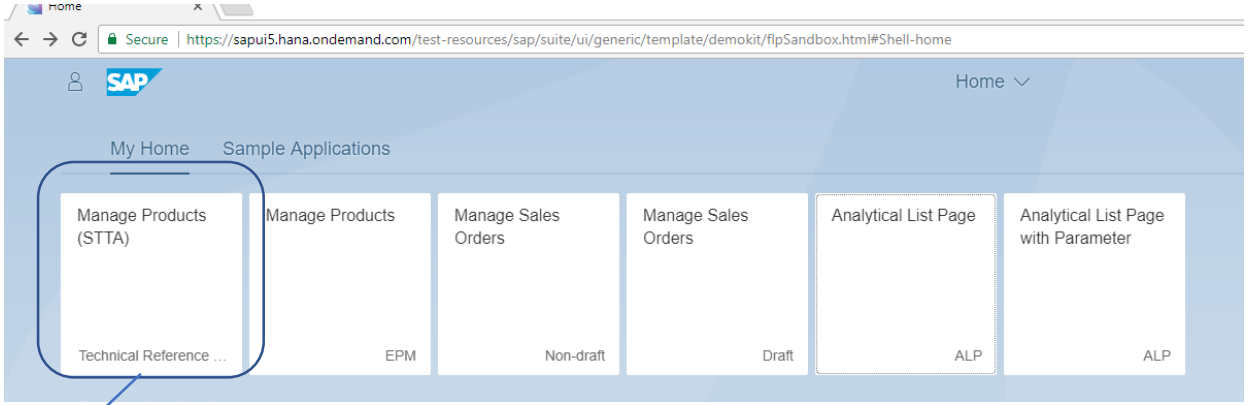
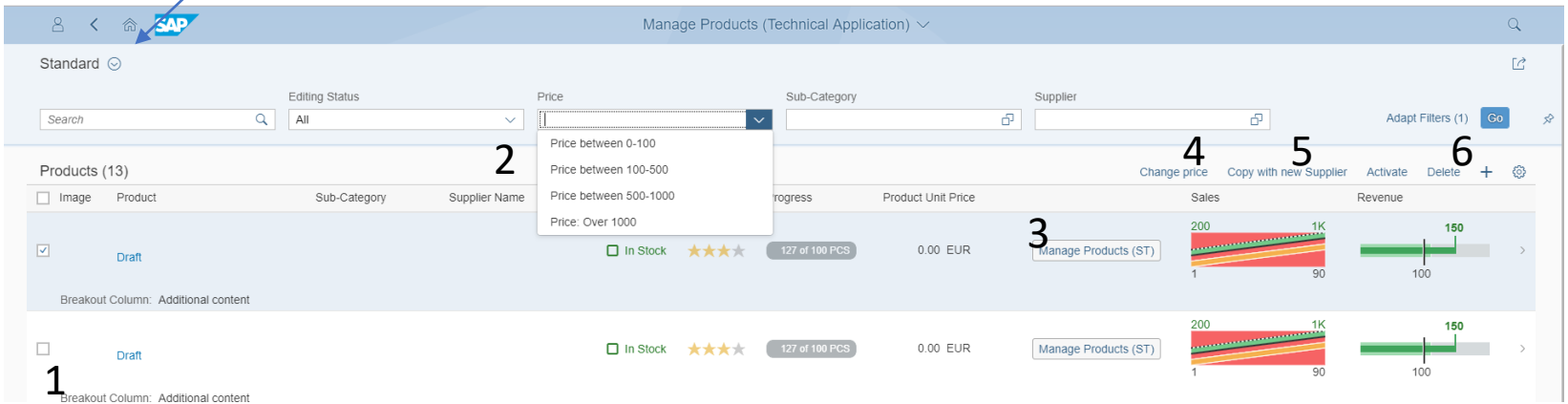
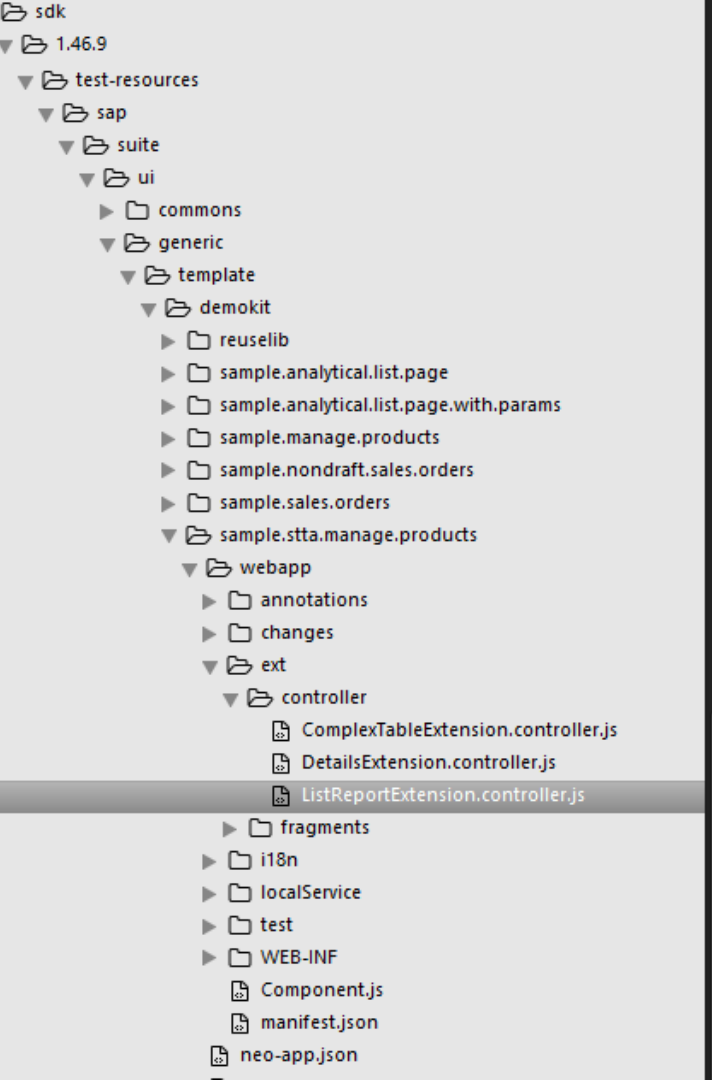
Good examples hidden in the SAPUI5 SDK, WebIDE wizard has limitations, know when to walk away

Breakout Example








```
sap.ui.controller("STTA_MP.ext.controller.ListReportExtension", {

    onInitSmartFilterBarExtension: function() {
        // the custom field in the filter bar might have to be
        // bound to a custom data model
        // if a value change in the field shall trigger a follow
        // up action, this method is the place to define and
        // bind an event handler to the field
    },

    onListNavigationExtension: function(oEvent) {
        var oNavigationController = this.extensionAPI.getNavigationController();
        var oBindingContext = oEvent.getSource().getBindingContext();
        var oObject = oBindingContext.getObject();

        // for  laser printers  we trigger external navigation for all others we
        if (oObject.ProductCategory == "Laser Printers") {
            oNavigationController.navigateExternal("EPMProductManageSt");
        } else {
            // return false to trigger the default internal navigation
            return false;
        }
        // return true is necessary to prevent further default navigation
        return true;
    },

    onBeforeRebindTableExtension: function(oEvent) {
        // usually the value of the custom field should have an
        // effect on the selected data in the table. So this is
        // the place to add a binding parameter depending on the
        // value in the custom field.
        var oBindingParams = oEvent.getParameter("bindingParams");
        oBindingParams.parameters = oBindingParams.parameters || {};
```

Fiori Elements and Build.me

10

Great for rapid prototyping Fiori Elements, but don’t assume the generated code is reusable

Takeaways

1. One size doesn’t fit all
2. Fiori Elements can be used to help solve scaling problems
3. Need to find examples and create own examples

Give something back to the community

FEEDBACK

Please complete a session evaluation for this session!

DX134

John Patterson | @jasper_07

Links

Code from talk - github.com/jasper07/Teched17

SAPUI5 SDK - Fiori Elements Reference Apps

Fiori Design Guidelines - Smart Table

Generating an OData Service Based on a CDS View

Fine-Tuning the Execution of SADL-Based Gateway Services

The Semantically Rich Data Model – An ABAP based CDS Views example

My CDS view self study tutorial