

S4/HANA

- [SAP S/4HANA CLOUD] - KEY USER EXTENSIBILITY WITH CUSTOM LOGIC & FIELD

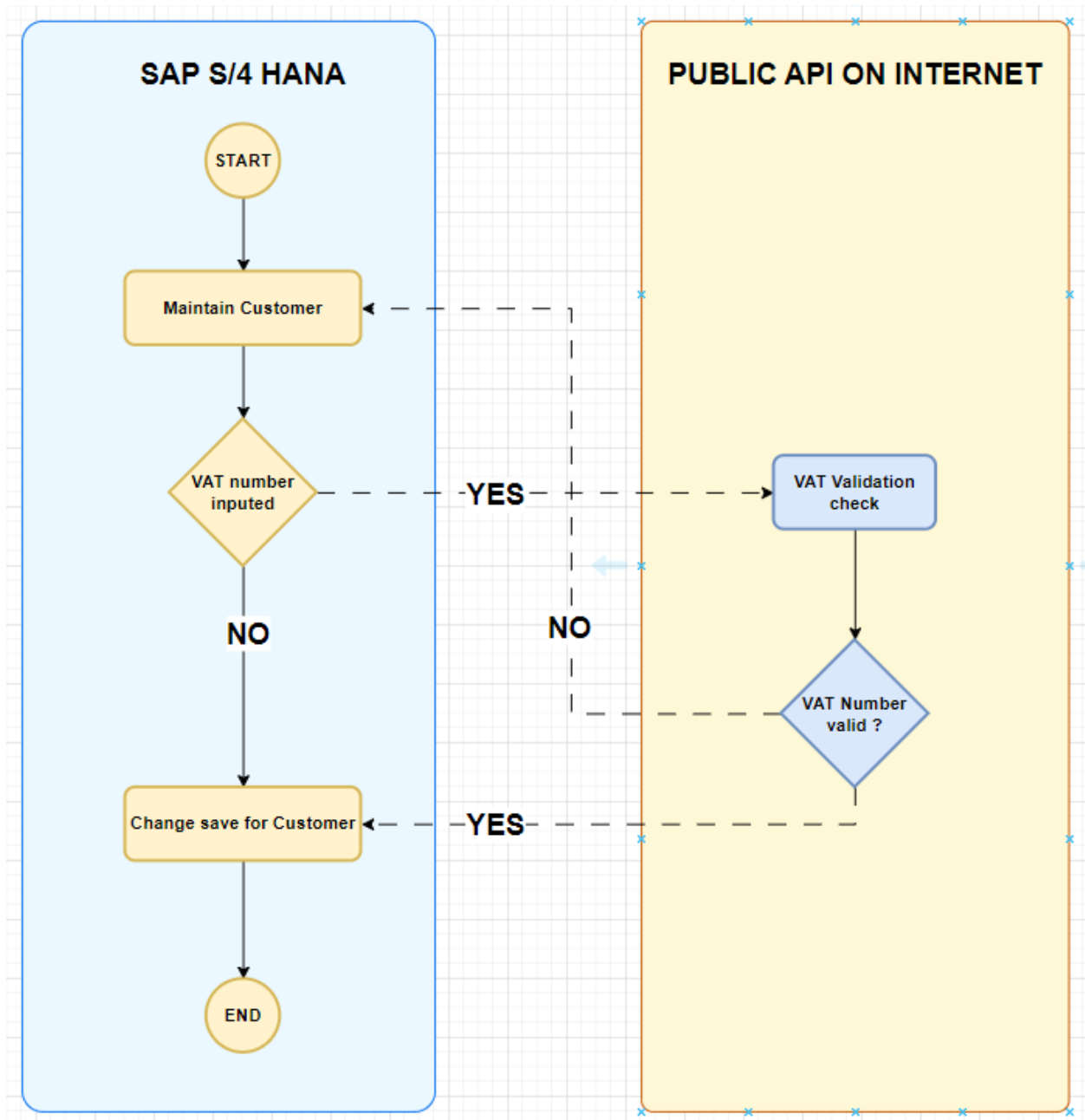
[SAP S/4HANA CLOUD] – KEY USER EXTENSIBILITY WITH CUSTOM LOGIC & FIELD

As we known, S/4 HANA cloud public edition support extensions like Key User, Developer and Side by side extensibility. In this article I want to share my understanding for Key User Extensibility by using Custom filed, Custom logic and User interface adaptation.

BUSINESS SCENARIO

Master data specialist go to app Manage Customer Master to maitain customer. Business requirement in this perspective is add custom field into this app called VAT_COUNTRY and VAT_NUMBER. When he input VAT_COUNTRY and VAT_NUMBER, App will call to external service to check VAT number valid or not. If VAT number valid, customer will be saved, else customer can not save.

BUSINESS DIAGRAM



SOLUTION APPROACH

Create custom field VAT_COUNTRY and VAT_NUMBER (Custom field)

Add Custom field into Manage Customer Master App (User Interface Adaptation - Adapt UI)

Configuration communication system for service external (Communication System)

Configuration custom communication scenario and create outbound service (Custom Communication Scenario)

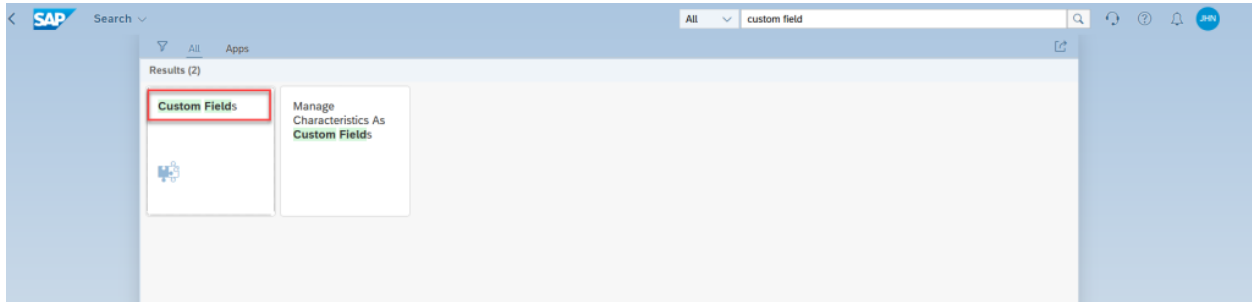
Configuration communication arrangement

Create custom logic with BAdI Validate Customer Master (**Custom Logic**)

Write Code ABAP call to external service.

STEP BY STEP CONFIGURATION

CREATE CUSTOM FIELD



New Field

Details

Business Context: * **Customer Core View (CUSTOMER_GENERAL)**

Label: * VAT_Country

Identifier: * YY1_ VAT_Country

Tooltip: * VAT_Country

Type: * Code List

Length: * 3

Business Context Capacity: ■ 3%

List Values (3)

<input type="checkbox"/>	Code Value	Description
<input type="checkbox"/>	VN	Viet Nam
<input type="checkbox"/>	GB	United Kingdom
<input type="checkbox"/>	DE	Germany

SAP Custom Fields and Logic

Custom Fields (1)

Label	Identifier	Business Context Code	Business Context	Type	Status
<input type="checkbox"/> VAT_Country	YY1_VAT_Country	CUSTOMER_GENERAL	Customer Core View	Code List	Published

Default this custom field will be not display anywhere until we enable it.

[LZV] I_CUSTOMER

Data Preview

100 rows retrieved - 153 rows (partial result)

Select Columns

Select required columns for Data Preview.

VAT_Country

Select All Deselect All

OK Cancel

Full Name	CreatedByUser	CreationDate	AddressID	CustomerClassification	VATRegistration
Customer 1	SAP_SYSTEM	2023-02-09	000000078		
Customer 2	SAP_SYSTEM	2023-02-09	000000139		
Customer DD	SAP_SYSTEM	2023-02-09	000000077		
Customer 1	SAP_SYSTEM	2023-02-09	000000104		
Customer 2	SAP_SYSTEM	2023-02-09	000000103		
Customer 50 (DE)	SAP_SYSTEM	2023-02-09	000000122		
Customer 50 (US)	SAP_SYSTEM	2023-02-09	000000125		
Customer 51 (FR)	SAP_SYSTEM	2023-02-09	000000126		FR10379821994
Customer 3	SAP_SYSTEM	2023-02-09	000000139		
Customer 4	SAP_SYSTEM	2023-02-09	000000140		
Customer 6 (R...)	SAP_SYSTEM	2023-02-09	000000141		
Customer 8	SAP_SYSTEM	2023-02-09	000000142		
Customer 9 Cu...	SAP_SYSTEM	2023-02-09	000000143		
Customer 14	SAP_SYSTEM	2023-02-09	000000144		
Customer MY 3	SAP_SYSTEM	2023-02-09	000000145		
Customer MY 4	SAP_SYSTEM	2023-02-09	000000146		
Customer MY 6 (R...)	SAP_SYSTEM	2023-02-09	000000147		
Customer MY 8	SAP_SYSTEM	2023-02-09	000000148		
Customer MY 9	SAP_SYSTEM	2023-02-09	000000149		
Customer MY 14	SAP_SYSTEM	2023-02-09	000000150		
Customer MY 12	SAP_SYSTEM	2023-02-09	000000157		
Customer MY 13	SAP_SYSTEM	2023-02-09	000000158		
Customer 12	SAP_SYSTEM	2023-02-09	000000155		
Customer 13	SAP_SYSTEM	2023-02-09	000000156		
Company Domestic SG C...	SAP_SYSTEM	2023-02-09	000000166		
Company Domestic Cust...	SAP_SYSTEM	2023-02-09	000000165		
Company Domestic MY ...	SAP_SYSTEM	2023-02-09	000000170		

If we want to use this custom field in CDS view I_Customer, we need to active it

SAP Custom Fields and Logic

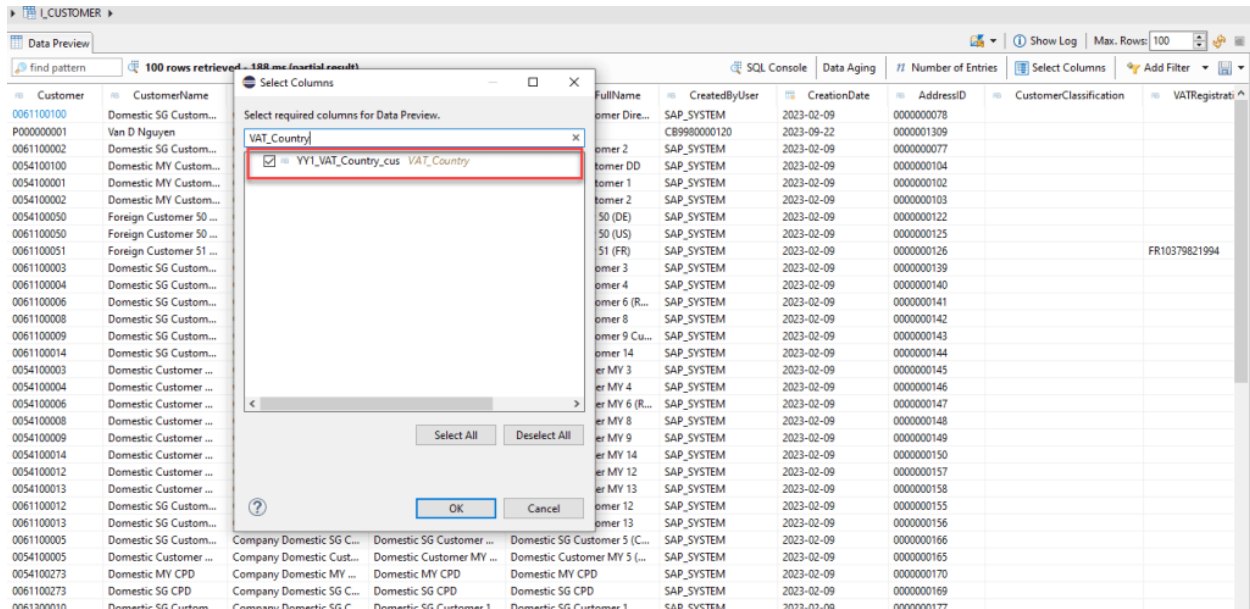
Business Context: Customer Core View (CUSTOMER_GENERAL)

General Information User Interfaces (11) Analytics (5) APIs (1) BO Operations Email Templates Form Templates Business Scenarios SOAP APIs (3) BAPIs IDocs (1) Where-Used

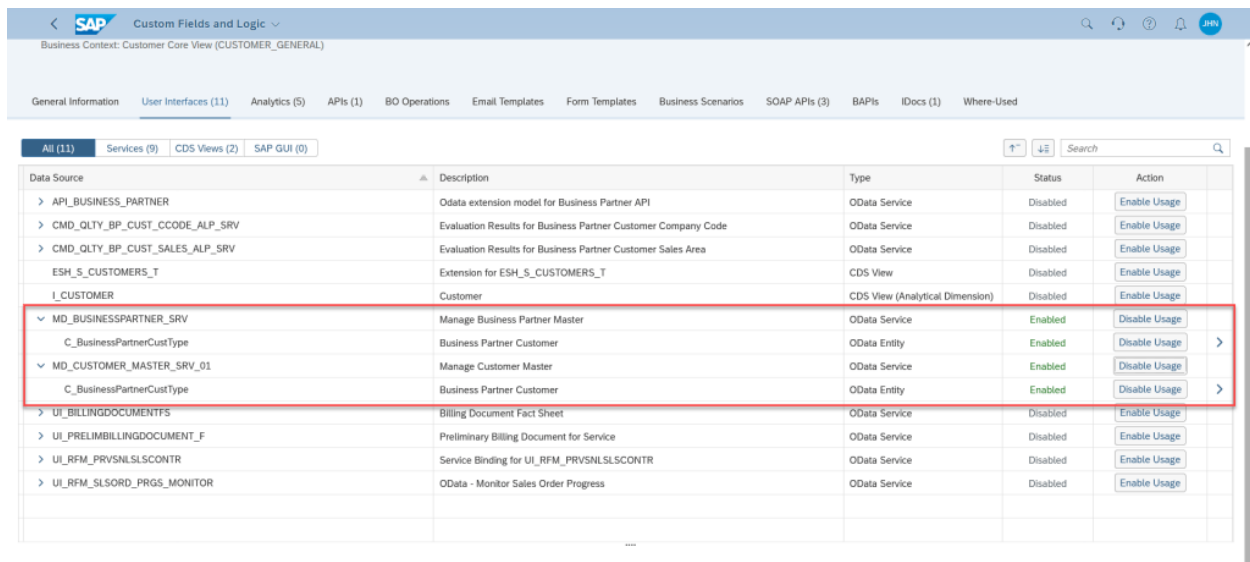
All (11) Services (9) CDS Views (2) SAP GUI (0)

Data Source	Description	Type	Status	Action
ESH_S_CUSTOMERS_T	Extension for ESH_S_CUSTOMERS_T	CDS View	Disabled	Enable Usage
I_CUSTOMER	Customer	CDS View (Analytical Dimension)	Enabled	Disable Usage

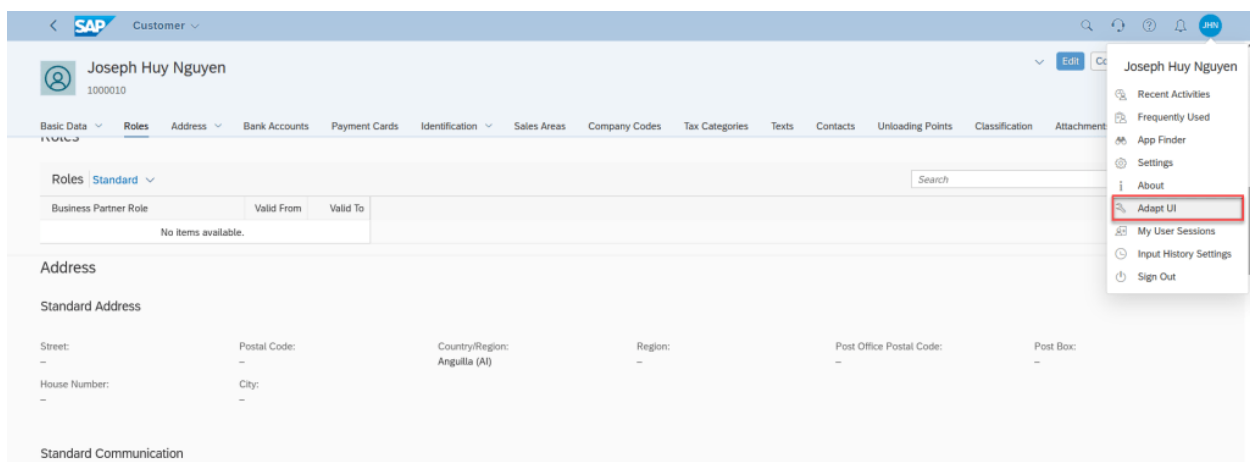
Check on CDS view again



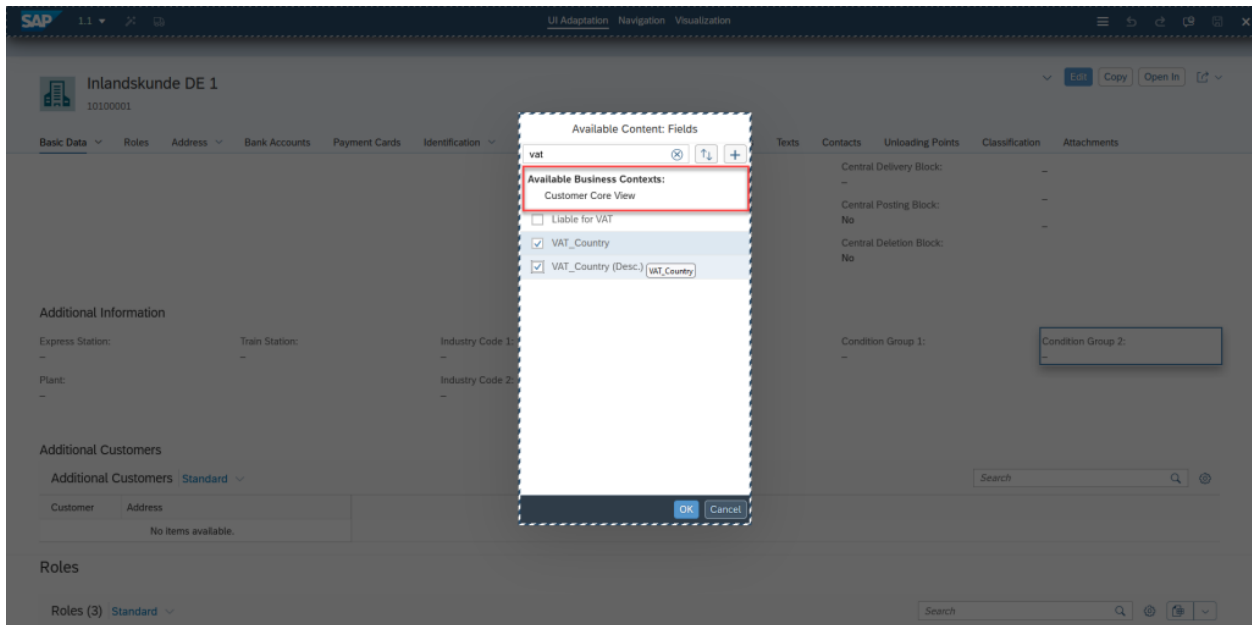
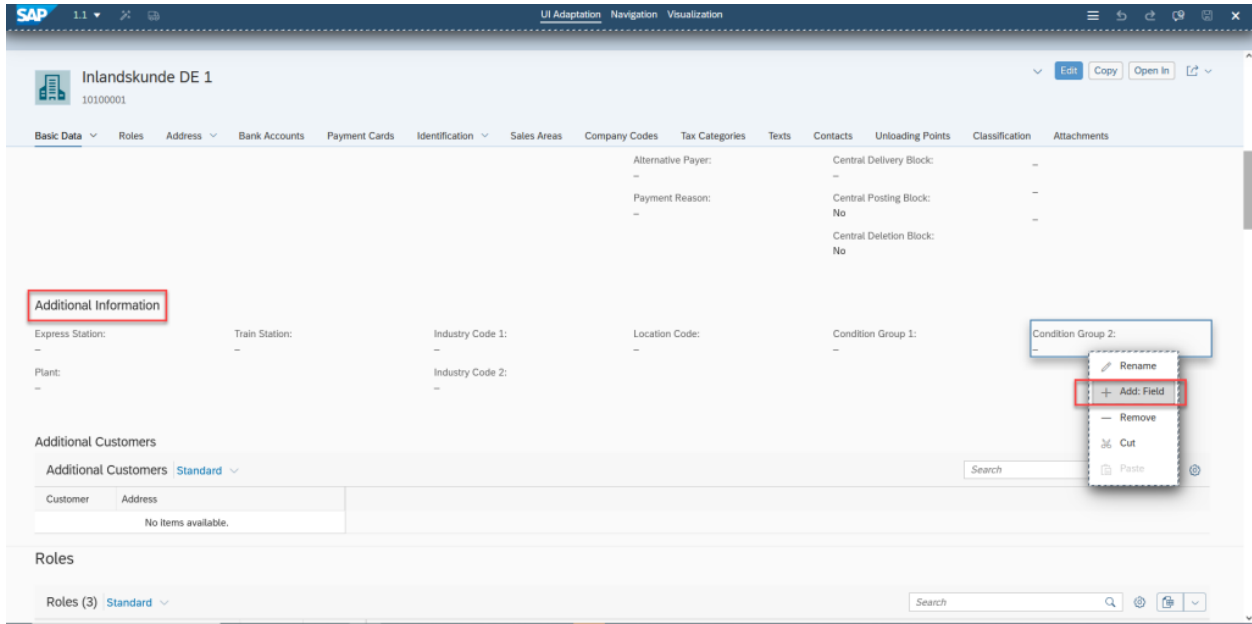
OK, come back our scenario, we need to enable it on UI of **Manage Customer Master App**. So we need to enable it



USER INTERFACE ADAPTATION (ADAPT UI)



Because of we created custom field with business context is **Customer Core View** so we need to select section accordingly



The same way we will create more custom field is VAT_Number and add them into UI

Custom Fields and Logic

Custom Fields (24)

Label	Identifier	Business Context Code	Business Context	Type	Status
Cust Project SO	YY1_CustProjectSO	SD_SALESDOC	Sales: Sales Document	Text	Published
ProjectID	YY1_ProjectID			Text	Published
Chiết Khấu	YY1_chietkhau			Text	Published
Country	YY1_Country			Code List	Published
Custom Period	YY1_custom_p			Code List	Not Published
DVT	YY1_DVT			Text	Published
Demo	YY1_Demo			Text	Published
Email Address	YY1_EmailAdd			Text	Published
Field	YY1_Field			Text	Published
Item Text	YY1_ItemText			Text	Published
POText	YY1_POText			Text	Published
PhoneNumber1	YY1_PhoneNu			Text	Published
Purchasing Processing Status	YY1_status	MM_PURDOC_HEADER	Procurement: Purchasing Document	Text	Published
STT	YY1_STT	MM_PURDOC_ITEM	Procurement: Purchasing Document Item	Text	Published
Supplier	YY1_Supplier	MM_PURDOC_HEADER	Procurement: Purchasing Document	Text	Published
SupplierName	YY1_SupplierName	MM_PURDOC_HEADER	Procurement: Purchasing Document	Text	Published
TAX	YY1_TaxNumber1	MM_PURDOC_HEADER	Procurement: Purchasing Document	Text	Published
TelephoneNumber1	YY1_TelephoneNumber1	MM_PURDOC_HEADER	Procurement: Purchasing Document	Text	Published
Thuế	YY1_TaxCode	MM_PURDOC_ITEM	Procurement: Purchasing Document Item	Text	Published

Details

Business Context: Customer Core View (CUSTOMER_GENERAL)

Label: VAT_Number

Identifier: YY1_VAT_Number

Tooltip: VAT_Number

Type: Numerical Text

Length: 10

Business Context Capacity: 4%

Buttons: Create, Create and Edit, Cancel

Custom Fields and Logic

VAT_Number

Field Type: Numerical Text
Identifier: YY1_VAT_Number
Business Context: Customer Core View (CUSTOMER_GENERAL)

Not Published

General Information | User Interfaces (11) | Analytics (5) | APIs (1) | BO Operations | Email Templates | Form Templates | Business Scenarios | SOAP APIs (3) | BAPIs | IDocs (1) | Where-Used

Data Source	Description	Type	Status	Action
C_MDQtyBPCustSalesAreaResultType	Customer Sales Area Rule Results	OData Entity	Disabled	Enable Usage
ESH_S_CUSTOMERS_T	Extension for ESH_S_CUSTOMERS_T	CDS View	Disabled	Enable Usage
I_CUSTOMER	Customer	CDS View (Analytical Dimension)	Disabled	Enable Usage
MD_BUSINESSPARTNER_SRV	Manage Business Partner Master	OData Service	Enabled	Disable Usage
C_BusinessPartnerCustType	Business Partner Customer	OData Entity	Enabled	Disable Usage
MD_CUSTOMER_MASTER_SRV_01	Manage Customer Master	OData Service	Enabled	Disable Usage
C_BusinessPartnerCustType	Business Partner Customer	OData Entity	Enabled	Disable Usage
UI_BILLINGDOCUMENTFS	Billing Document Fact Sheet	OData Service	Disabled	Enable Usage
I_CUSTOMERTYPE	Customer	OData Entity	Disabled	Enable Usage
UI_PRELIMBILLINGDOCUMENT_F	Preliminary Billing Document for Service	OData Service	Disabled	Enable Usage
I_CUSTOMERTYPE	Customer	OData Entity	Disabled	Enable Usage
UI_RFM_PRIVNLSLSCONTR	Service Binding for UI_RFM_PRIVNLSLSCONTR	OData Service	Disabled	Enable Usage

Customer

Inlandskunde DE 1

10100001

Basic Data | Roles | Address | Bank Accounts | Payment Cards | Identification | Sales Areas | Company Codes | Tax Categories | Texts | Contacts | Unloading Points | Classification | Attachments

Alternative Payer:	Central Delivery Block:	-
Payment Reason:	Central Posting Block:	No
	Central Deletion Block:	No

Additional Information

Express Station:	Train Station:	Industry Code 1:	Location Code:	Condition Group 1:	VAT_Country (Desc.):
-	-	-	-	-	-
Plant:		Industry Code 2:		Condition Group 2:	VAT_Number:
-		-		-	-
				VAT_Country:	-

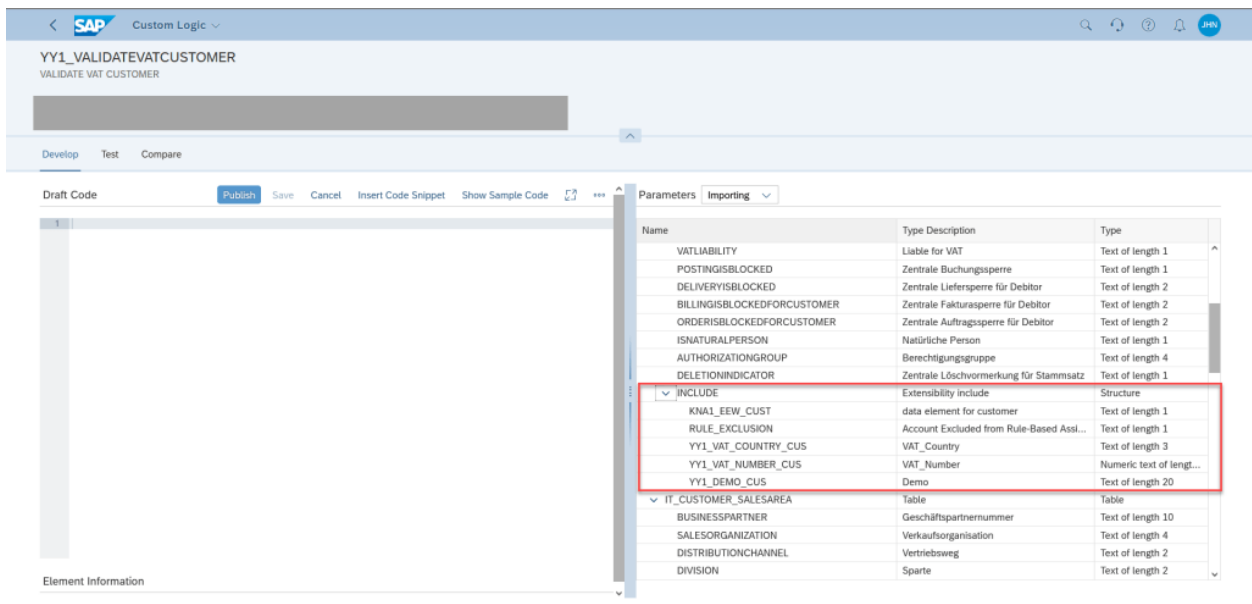
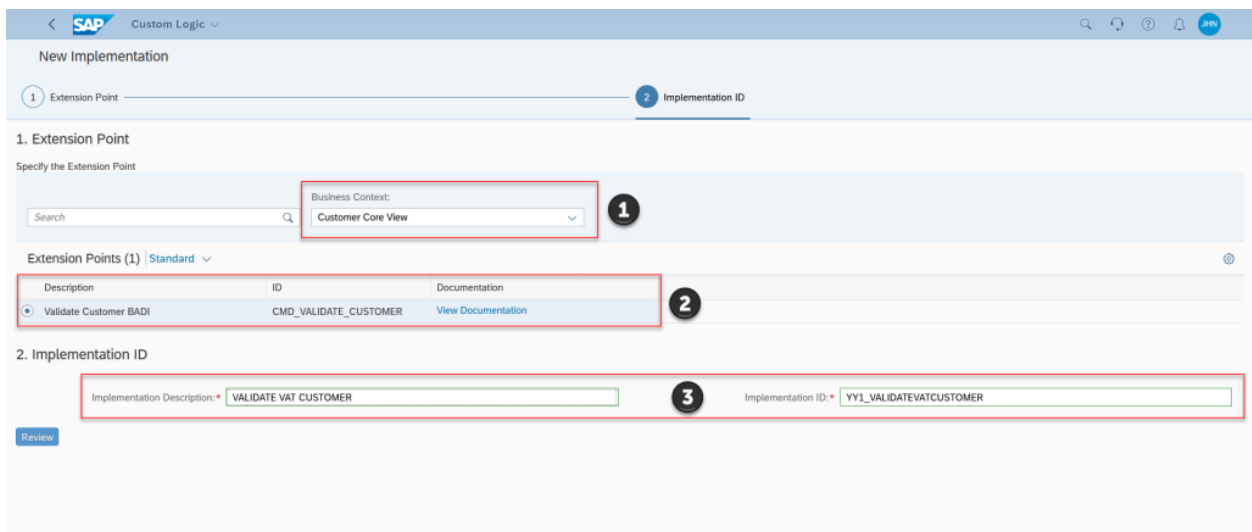
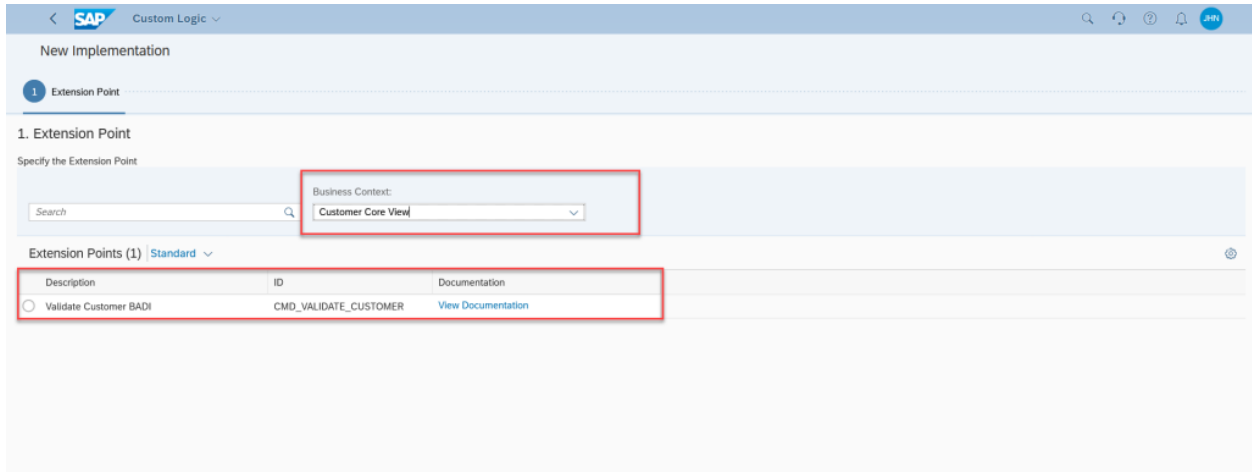
Additional Customers

Additional Customers Standard

Customer	Address
No items available.	

Roles

CREATE CUSTOM LOGIC



Implement BAdI to Call the External VAT Service

in this section, we will add code ABAP call to external service API to validate VAT number. Assumption that we configured communication system, communication user, custom scenario, communication arrangement successful.

SAP Custom Logic

Y11_VALIDATEVATCUSTOMER
VALIDATE VAT CUSTOMER

Created By: CB99R0000046 (Joseph Huy Nguyen) Last Published By: CB99R0000046 (Joseph Huy Nguyen)
Created At: 11/26/2023, 19:49:46 Last Published At: 11/26/2023, 21:47:01

Develop Test Compare

Published Code

```

1 2 - * Declaration of required parameters
3 3 DATA ls_cust_gen LIKE LINE OF it_customer_gen.
4 4 DATA ls_validationmessage LIKE LINE OF ct_validationmessage.
5 5 "read the Customer General Data
6 6 READ TABLE it_customer_gen INTO ls_cust_gen WITH KEY businesspartner = i_cmd_bp_object_key-businesspartner businesspartneruuid = i_cmd_bp_object_key-businesspartneruuid.
7 7 - * check if the custom fields are filled
8 8 CHECK ls_cust_gen-include-yy1_vat_country_cus IS NOT INITIAL.
9 9 CHECK ls_cust_gen-include-yy1_vat_number_cus IS NOT INITIAL.
10 10
11 11 - * Check if outbound service exists in the communication scenario
12 12 - * Replace the values for communication_scenario and outbound_service as required.
13 13 CHECK cl_ble_http_client=>is_service_available(
14 14   communication_scenario = 'YY1_COMM_SCENARIO'
15 15   outbound_service       = 'YY1_COMM_OUTBOUND_REST'
16 16   ) = abap_true.
17 17
18 18 - * Creation of the HTTP client to access the outbound service
19 19 - * Replace the values for communication_scenario and outbound_service as required.
20 20 DATA lo_client = cl_ble_http_client=>create(
21 21   communication_scenario = 'YY1_VALIDATE_VAT'
22 22   outbound_service       = 'YY1 YY1_VALIDATE_VAT_REST_REST'
23 23   ).
24 24 DATA lv_vatnumber type string.
25 25 - * convert number field to string
26 26 lv_vatnumber = ls_cust_gen-include-yy1_vat_number_cus.
27 27 CONCATENATE '/' ls_cust_gen-include-yy1_vat_country_cus '/' lv_vatnumber INTO DATA(lv_vat).
28 28 - * Call service
29 29 DATA request = cl_ble_http_request=>create( ).
30 30 request->set_method( 'GET' )->set_resource_extension( lv_vat ).

```

Element Information

Name	Type Description	Type
POBOXDEVIA	Region zum Post...	Text of ...
POBOXDEVIA	Land/Region zu...	Text of ...
TRANSPORTZ	Transportzone, L...	Text of ...
STREETNAME	Straße	Text of ...
HOUSENUMBER	Hausnummer	Text of ...
HOUSENUMBER	Ergänzung zur H...	Text of ...
STREETPREFIX	Straße 2	Text of ...
ADDITIONALST	Straße 3	Text of ...
STREETSUFFIX	Straße 4	Text of ...
ADDITIONALST	Straße 5	Text of ...
COUNTRY	Länder-/Region...	Text of ...
CORRESPONDEN	Sprachenschlüssel	Text of ...
REGION	Region (Bundes...	Text of ...
ADRESSTIMEZO	Zeitzone der Adr...	Text of ...
TAXJURISDICTION	Steuerstandort	Text of ...
POBOXLOBBYNA	Postfachstation (...)	Text of ...
DELIVERYSERVIC	Art des Zustell...	Text of ...
DELIVERYSERVIC	Nummer des Zus...	Text of ...
IT_CUSTOMER_COM	Table	Table
BUSINESSPARTNE	Geschäftspartner...	Text of ...
COMPANYCODE	Buchungskreis	Text of ...
COMPANYCODEFC	Buchungskreis	Text of ...

Reference Code

* Declaration of required parameters

```
DATA ls_cust_gen LIKE LINE OF it_customer_gen.
```

```
DATA ls_validationmessage LIKE LINE OF ct_validationmessage.
```

"read the Customer General Data

```
READ TABLE it_customer_gen INTO ls_cust_gen WITH KEY businesspartner = i_cmd_bp_object_key-
businesspartner businesspartneruuid = i_cmd_bp_object_key-businesspartneruuid.
```

* check if the custom fields are filled

```
CHECK ls_cust_gen-include-yy1_vat_country_cus IS NOT INITIAL.
```

```
CHECK ls_cust_gen-include-yy1_vat_number_cus IS NOT INITIAL.
```

* Check if outbound service exists in the communication scenario

* Replace the values for communication_scenario and outbound_service as required.

```
CHECK cl_ble_http_client=>is_service_available(
  communication_scenario = ' YY1_COMM_SCENARIO'
  outbound_service       = ' YY1_COMM_OUTBOUND_REST'
) = abap_true.
```

* Creation of the HTTP client to access the outbound service

* Replace the values for communication_scenario and outbound_service as required.

```
DATA(lo_client) = cl_ble_http_client=>create(
  communication_scenario = ' YY1_VALIDATE_VAT'
  outbound_service       = ' YY1 YY1_VALIDATE_VAT_REST_REST'
```

```

    ).
    DATA lv_vatnumber type string.

* convert number field to string
    lv_vatnumber = ls_cust_gen-include-yy1_vat_number_cus.
    CONCATENATE '/' ls_cust_gen-include-yy1_vat_country_cus '/' lv_vatnumber INTO DATA(lv_vat).

* Call service
    DATA(request) = cl_ble_http_request=>create( ).
    request->set_method( 'GET' )->set_resource_extension( lv_vat ).
    TRY .
    DATA(response) = lo_client->send( request ).

* Get the body of the response if required.
    DATA(lv_body) = response->get_body( ).
    [CATCH cx_ble_http_exception INTO DATA(lx).

* The http status code can be checked.
    [CASE lx->status_code.
    [WHEN 404.
    [ls_validationmessage-msgty = 'E'.
        ls_validationmessage-msgid = 'CVI_API'.
        ls_validationmessage-msgno = '001'.
        ls_validationmessage-MSGV1 = '404'.
        APPEND ls_validationmessage TO ct_validationmessage.

        WHEN 500.
        ls_validationmessage-msgty = 'E'.
        ls_validationmessage-msgid = 'CVI_API'.
        ls_validationmessage-msgno = '001'.
        ls_validationmessage-MSGV1 = '500'.
        APPEND ls_validationmessage TO ct_validationmessage.
    [WHEN OTHERS.
    [ls_validationmessage-msgty = 'E'.
        ls_validationmessage-msgid = 'CVI_API'.
        ls_validationmessage-msgno = '001'.
        ls_validationmessage-MSGV1 = 'OTHERS'.
        APPEND ls_validationmessage TO ct_validationmessage.

    [ENDCASE.

```

ENDTRY.

Test custom logic code

The screenshot shows the SAP Custom Logic development environment for the function 'YY1_VALIDATEVATCUSTOMER'. The 'Parameters' tab is active, displaying a table of parameters. A red box highlights the 'Changing Parameters' dropdown menu. The 'Code Version' tab shows the latest published code, which includes logic for validating VAT customer data.

Name	Value In	Value Out	Type Description	Action
CT_VALIDATIONMESSAGE			List of system messages in T1...	Add
MSGTY	No value	E	Message Type	
MSGID	No value	CVI_API	Message Class	
MSGNO	No value	001	Message Number	
MSGV1	No value	500	Message Variable	
MSGV2	No value		Message Variable	
MSGV3	No value		Message Variable	
MSGV4	No value		Message Variable	

```
2 * Declaration of required parameters
3 DATA ls_cust_gen LIKE LINE OF it_customer_gen
4 DATA ls_validationmessage LIKE LINE OF ct_validationmessage
5 * Read the Customer General Data
6 READ TABLE it_customer_gen INTO ls_cust_gen WITH KEY businesspartner =
7 * Check if the custom fields are filled
8 CHECK ls_cust_gen-include-yy1_vat_country_cus IS NOT INITIAL
9 CHECK ls_cust_gen-include-yy1_vat_number_cus IS NOT INITIAL
10
11 * Check if outbound service exists in the communication scenario
12 * Replace the values for communication_scenario and outbound_service as
13 CHECK cl_ble_http_client=>is_service_available(
14   communication_scenario = 'YY1_VALIDATE_VAT'
15   outbound_service       = 'YY1_YY1_VALIDATE_VAT_REST_REST'
16 ) = abap_true.
17
18 * Creation of the HTTP client to access the outbound service
19 * Replace the values for communication_scenario and outbound_service as
20 DATA lo_client = cl_ble_http_client=>create(
21   communication_scenario = 'YY1_VALIDATE_VAT'
22   outbound_service       = 'YY1_YY1_VALIDATE_VAT_REST_REST'
23 ).
24 DATA lv_vatnumber type string
25 * convert number field to string
26 lv_vatnumber = ls_cust_gen-include-yy1_vat_number_cus
27 CONCATENATE '/' ls_cust_gen-include-yy1_vat_country_cus '/' lv_vatnumber
28 * Call service
29 DATA( result ) = cl_ble_http_client=>create(
```

Test on Manage Customer Master App

The screenshot shows the SAP Manage Customer Master App interface. The 'Additional Information' section is visible, with several fields highlighted in red. A red box highlights the 'VAT_Country' dropdown menu, which is set to 'Viet Nam (VN)'. Another red box highlights the 'VAT_Number' field, which contains the value '123'. A third red box highlights the 'Other Messages' section, which displays an error message: '500: Invalid value (foreign key check failed)'. The 'VAT_Country' field is also highlighted in red.

CONCLUSION

In this article I shared a way how to add more custom field into user interface and implement BAdI with custom logic. In the same way we can implement key user extensibility for some business requirement like Validate fields, Prepopulate a custom field ,etc. Thanks for your reading and adny advise kindly leave your comment on this.