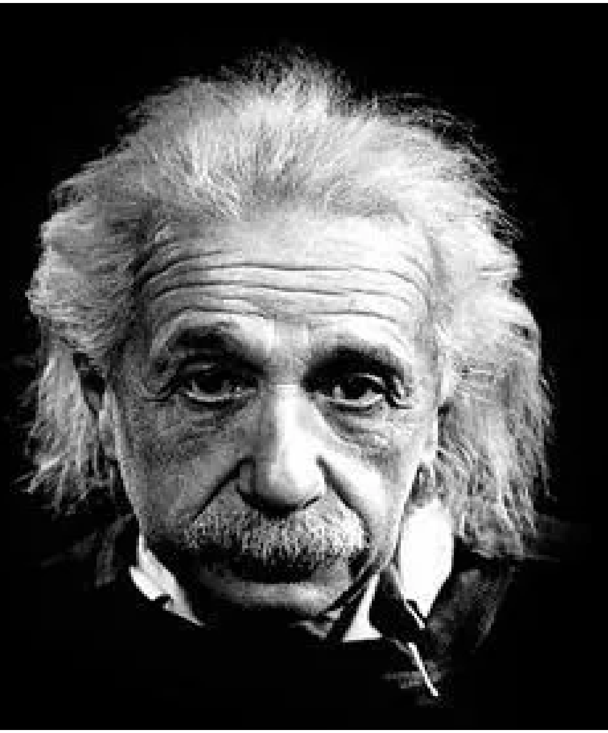
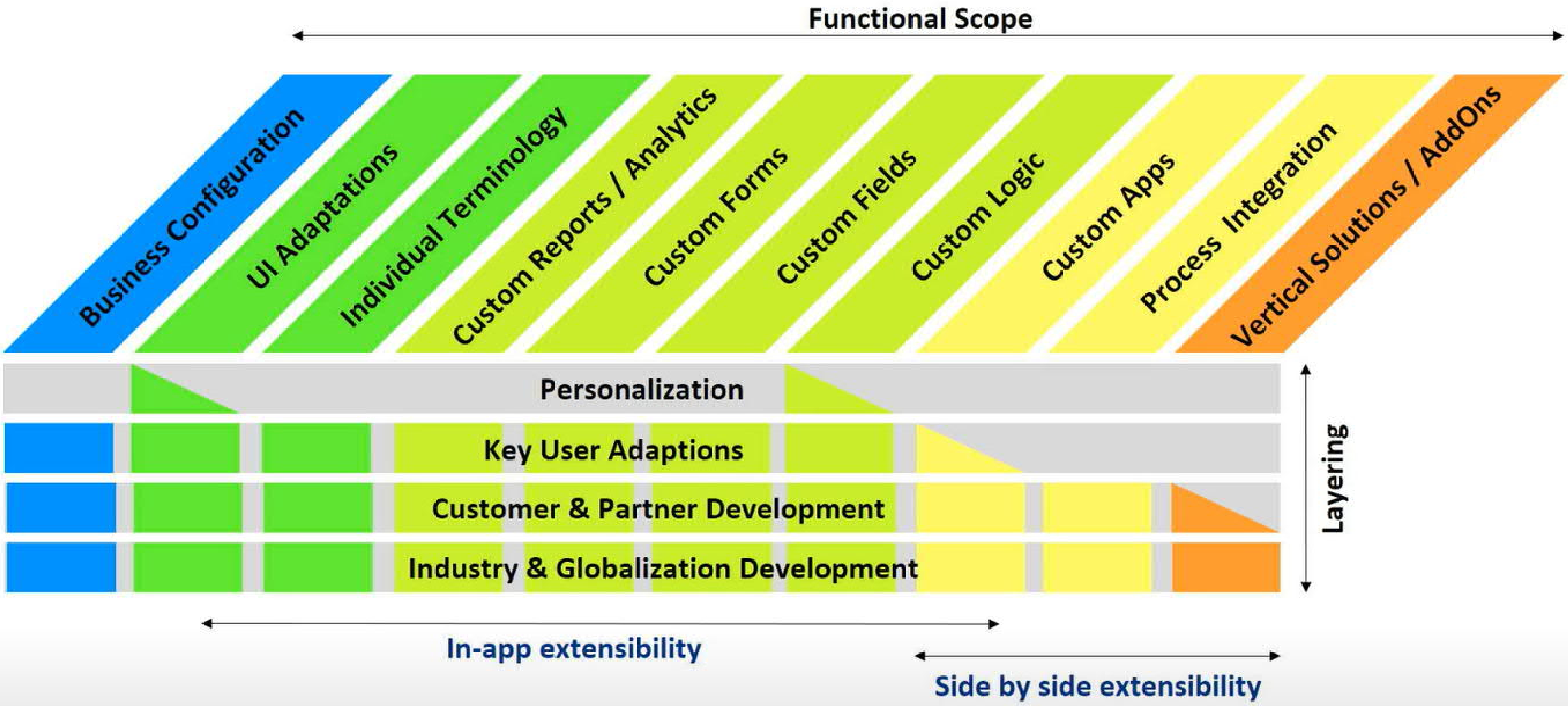
In-App Extensibility



> “Make everything as
> simple as possible,
> but not simpler.”
> —Albert Einstein

SAP S/4HANA UX Extension Options

Extensibility spectrum



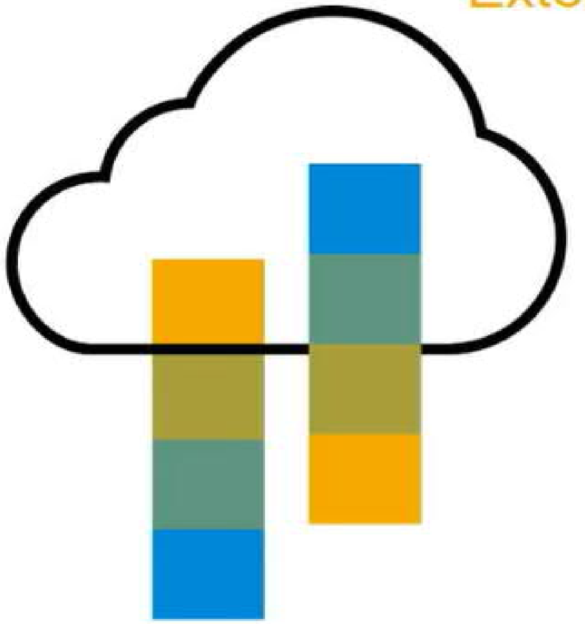
SAP S/4HANA UX Extension Options

On-cloud

SAP S/4HANA Cloud

Cloud Extensions

Benefits of Cloud Extensions!



Extensibility

Cloud-Ready

System Stability

SAP S/4HANA UX Extension Options

So who is a key user?

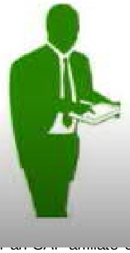
Normal business user with the appropriate business knowledge (a business expert)

- not necessarily have technical or programming skills
- should be aware about the lifecycle
- should have insight on how extensions fit into overall strategy in long term

Authorization to adapt artifacts like UIs, Business Processes

SAP S/4HANA UX Extension Options

Extensibility roles – What fits whom matrix?

Who am I?	What I want from extension?	Effects of changes?	Options available?
A **business user** (standard end-user) 	I should be able to **personalize** my screens	Changes should be only relevant to me	**SAP Fiori Personalization**
A **business expert** **(key user)** 	I **adapt** the apps for my team	Changes should only affect my team or team under my LOB	**In-App Extensibility**
A **developer** 	I **build new/modify** apps for my company	Changes affect all users	**In-App Extensibility** **Side-by-Side Extensibility**

SAP S/4HANA Extensibility

Roles & Needs

Business User

Fiori personal settings

I want to

- ✓ Change order of columns in a table
- ✓ Hide tabs
- ✓ Change format of dates/numbers
- ✓ Hide few apps on launchpad

My changes should not affect other people

Business Expert, Key User

In-App Extensibility

I want to

- ✓ Add custom fields,
- ✓ Add/change business logic
- ✓ Use custom CDS views for analytics and custom interfaces
- ✓ Use custom forms

My changes should affect people in my LOB/company

Developer

In-App Extensibility

Side by side Extensibility

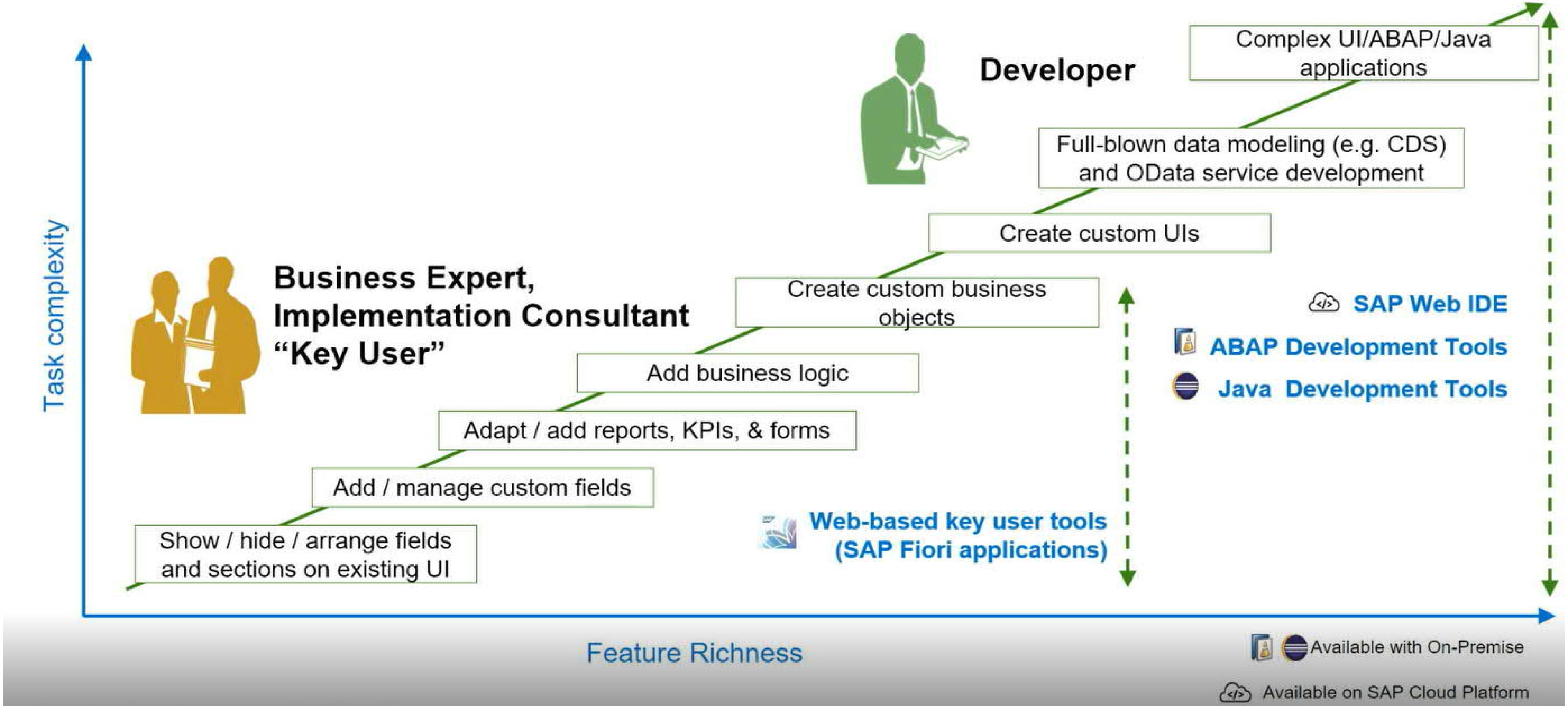
I want to

- ✓ Add/change complex business logic
- ✓ Add new business objects / apps
- ✓ De-couple software lifecycle of standard and extensions

My changes should affect people in my company

SAP S/4HANA UX Extension Options

Key user tools features in SAP S/4HANA Cloud & SAP S/4HANA extensibility mix



Task complexity

Feature Richness

Business Expert, Implementation Consultant "Key User"

Developer

Show / hide / arrange fields and sections on existing UI

Add / manage custom fields

Adapt / add reports, KPIs, & forms

Add business logic

Create custom business objects

Create custom UIs

Full-blown data modeling (e.g. CDS) and OData service development

Complex UI/ABAP/Java applications

Web-based key user tools (SAP Fiori applications)

SAP Web IDE

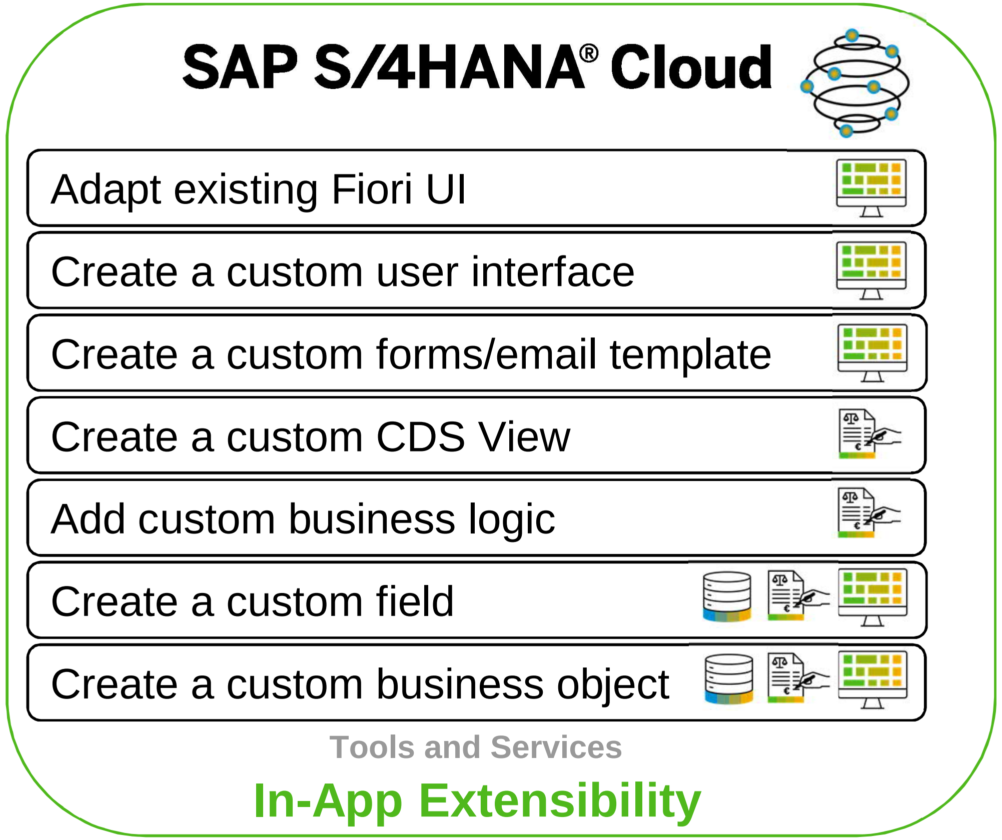
ABAP Development Tools

Java Development Tools

Available with On-Premise

Available on SAP Cloud Platform

In-App Extensibility



In-App Extensibility; Enrich the core

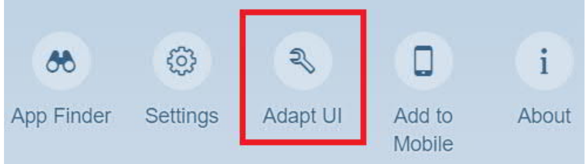
- Variants of standard processes and business logic (for example, micro-vertical solutions, localization)
- Focus on company-owned business documents (for example, legal compliance)
- Analytics extensibility (for example, tailored operational
  reporting for minimized
  asset allocation)

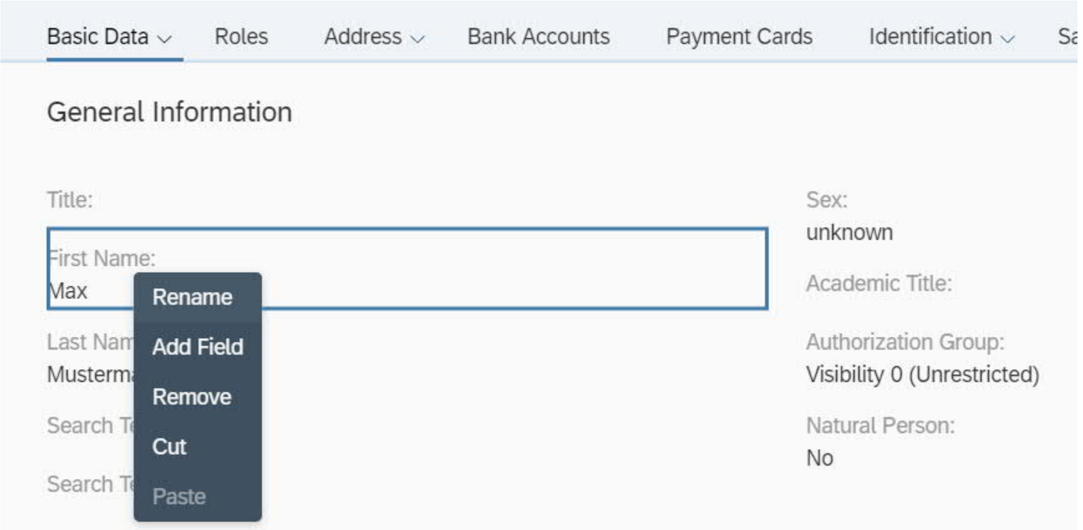
User Interface Layer

Application Layer

Database Layer

Adapt existing Fiori UI





General Information

Title:

First Name:
Max

Last Nam
Musterma

Search T

Search T

Sex:
unknown

Academic Title:

Authorization Group:
Visibility 0 (Unrestricted)

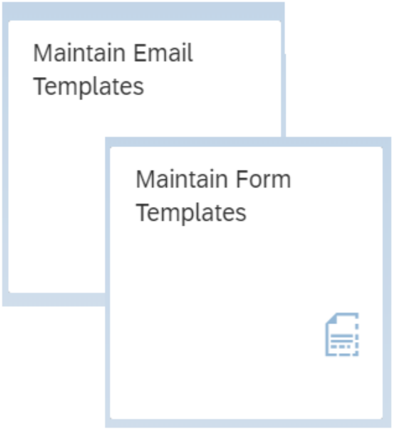
Natural Person:
No

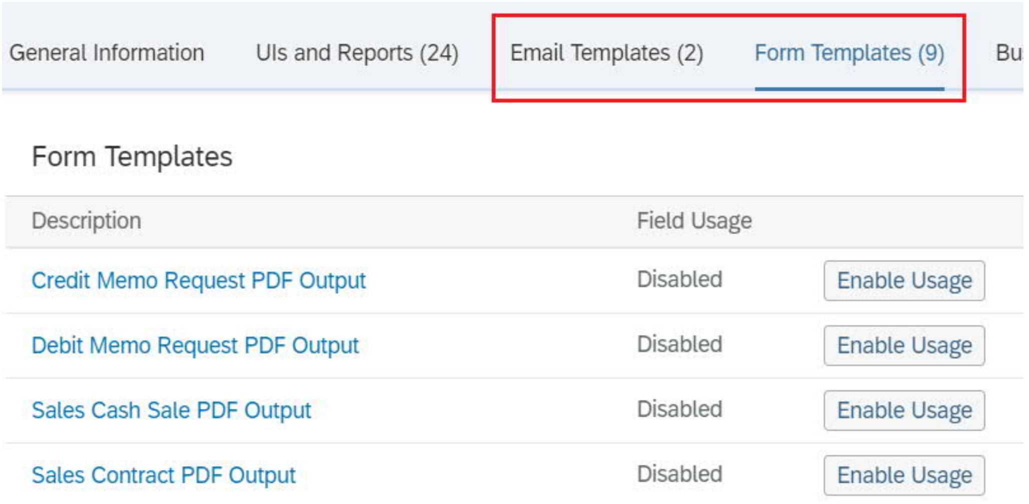
- Change a standard UI to fit the desired usage in a specific business context
- Change the UI the following:
  - Hide fields in a form, table, or filter, hide groups and areas
  - Rename labels
  - Add field to UI from field repository
  - Move form field or UI group, create new groups and move fields into, combine fields into one line, split combined fields
  - Define new filter and table variants

SAP HELP

Custom forms and email templates

Creation





Form Templates

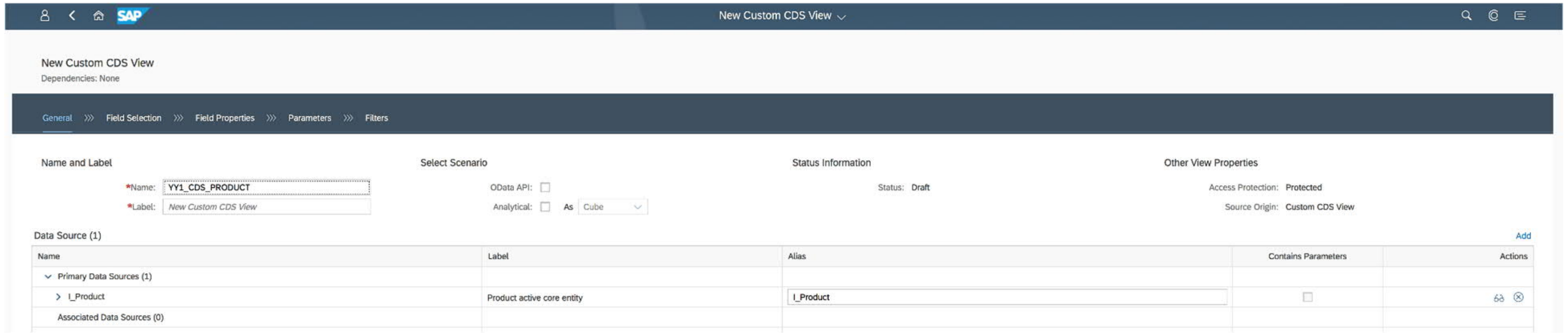
Description	Field Usage	
Credit Memo Request PDF Output	Disabled	Enable Usage
Debit Memo Request PDF Output	Disabled	Enable Usage
Sales Cash Sale PDF Output	Disabled	Enable Usage
Sales Contract PDF Output	Disabled	Enable Usage

- Create a new custom Email or Form template based on an existing data source
- Extend your form and email templates with new custom fields
- Reuse existing templates

SAP HELP

Custom Core Data Services (CDS) views

Custom CDS Views



New Custom CDS View

Dependencies: None

General >>> Field Selection >>> Field Properties >>> Parameters >>> Filters

Name and Label

*Name: YY1_CDS_PRODUCT

*Label: New Custom CDS View

Select Scenario

OData API: □

Analytical: □ As Cube

Status Information

Status: Draft

Other View Properties

Access Protection: Protected

Source Origin: Custom CDS View

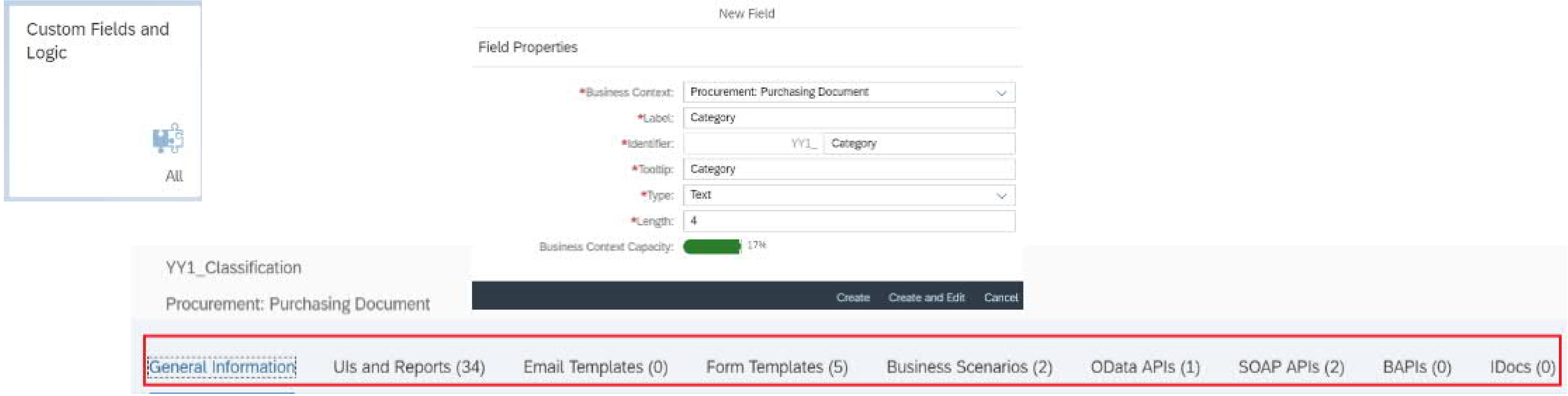
Data Source (1)

Name	Label	Alias	Contains Parameters	Actions
Primary Data Sources (1)				
I_Product	Product active core entity	I_Product	□	
Associated Data Sources (0)				

- You can use CDS view to:
  - build new analytical cubes and queries
  - consume them in custom code extensions (“BAdIs”)
  - expose them as read OData service

SAP HELP

Custom Fields



New Field

Field Properties

*Business Context: Procurement: Purchasing Document

*Label: Category

*Identifier: YY1_ Category

*Tooltip: Category

*Type: Text

*Length: 4

Business Context Capacity: 17%

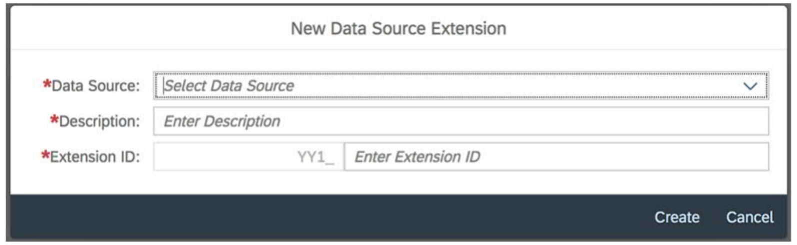
YY1_Classification

Procurement: Purchasing Document

- Create new fields in the application's business context
- Choose different data types (e.g. Number, Text, Associations to SAP Object) to fit the desired usage
- Use this app to create your own fields and enhancement implementations to customize applications and their UIs, reports, email templates, and form templates
- Make your field available in other languages

SAP HELP

Custom Data Source Extensions

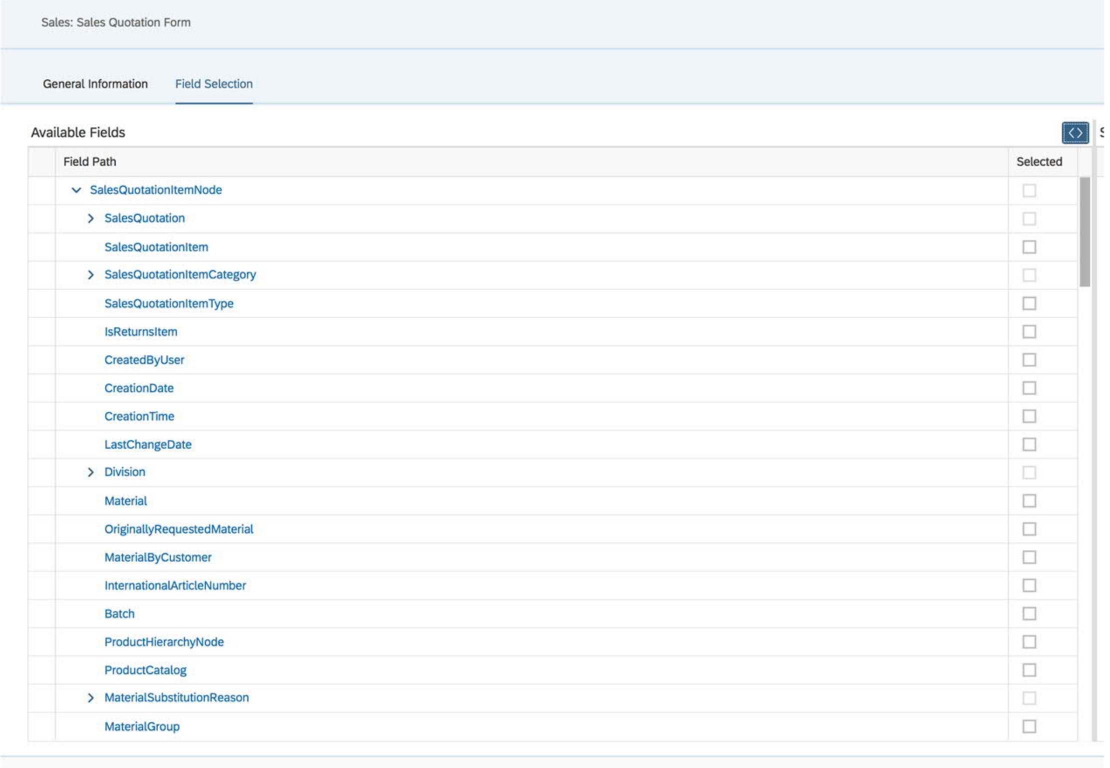


New Data Source Extension

*Data Source: Select Data Source

*Description: Enter Description

*Extension ID: YY1_ Enter Extension ID



Sales: Sales Quotation Form

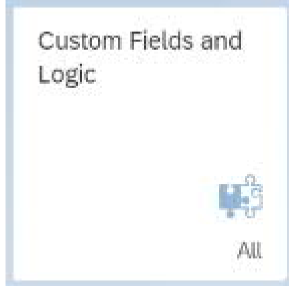
Available Fields

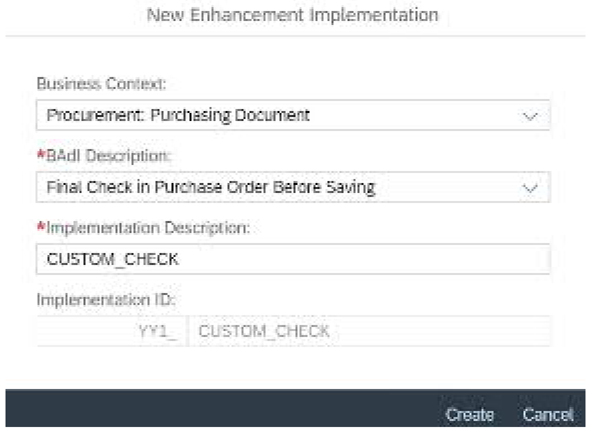
Field Path	Selected
⌄ SalesQuotationItemNode	□
› SalesQuotation	□
SalesQuotationItem	□
› SalesQuotationItemCategory	□
SalesQuotationItemType	□
IsReturnsItem	□
CreatedByUser	□
CreationDate	□
CreationTime	□
LastChangeDate	□
› Division	□
Material	□
OriginallyRequestedMaterial	□
MaterialByCustomer	□
InternationalArticleNumber	□
Batch	□
ProductHierarchyNode	□
ProductCatalog	□
› MaterialSubstitutionReason	□
MaterialGroup	□

- Data source extensions enables users to add additional fields delivered with SAP Standard Objects
- Data Source Extensions provide read access to this standard fields

SAP HELP

Custom Logic



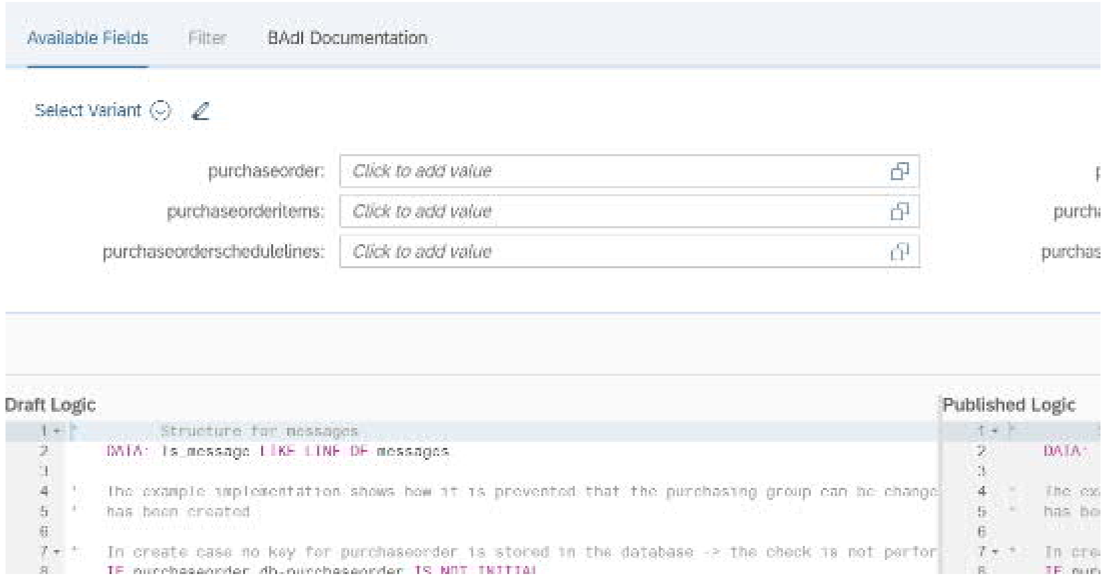

New Enhancement Implementation

Business Context: Procurement: Purchasing Document

*BAdI Description: Final Check in Purchase Order Before Saving

*Implementation Description: CUSTOM_CHECK

Implementation ID: YY1_ CUSTOM_CHECK



purchaseorder: Click to add value

purchaseorderitems: Click to add value

purchaseorderschedulelines: Click to add value

Draft Logic

```
*           Structure for messages
    DATA: ls_message LIKE LINE OF messages

*   The example implementation shows how it is prevented that the purchasing group can be change
*   has been created

*   In create case no key for purchaseorder is stored in the database -> the check is not perfor
    IF purchaseorder_db-purchaseorder IS NOT INITIAL
```

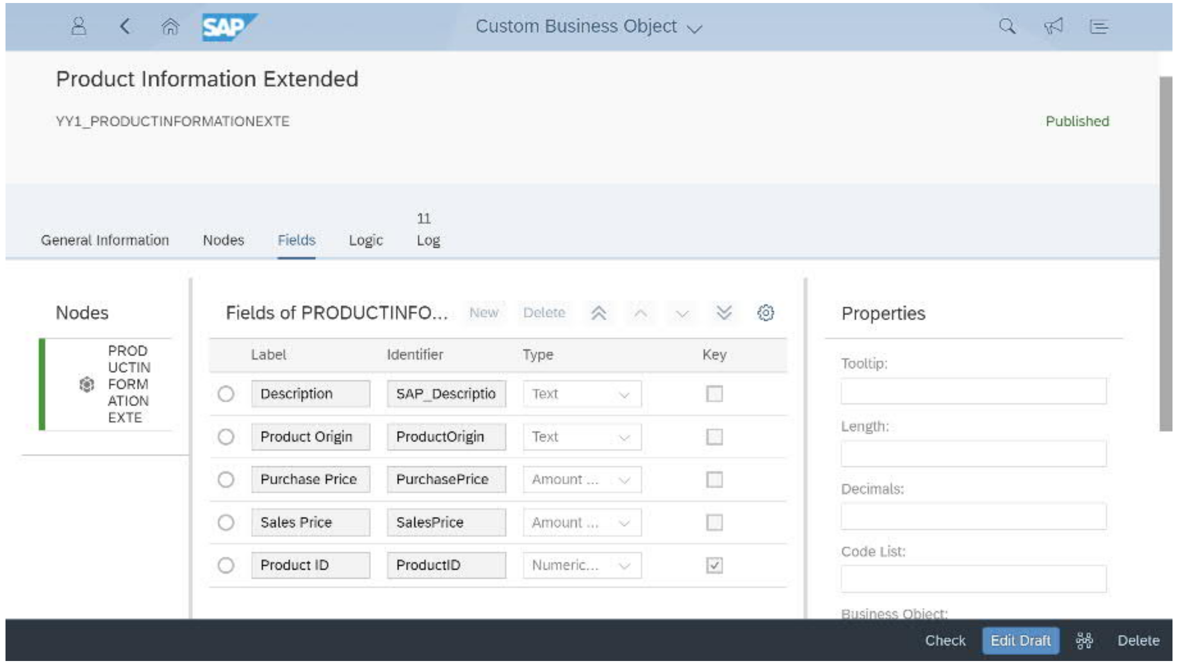
Published Logic

```
    DATA:

*   The ex
*   has be

*   In cre
    IF pur
```

- Extend your business processes
- Make use of restricted ABAP Code in Custom Logic
  - Not allowed: any DB operation except selects from released views, tweaking new tasks, dynamic programming, code generation
- Test draft code before publishing
- BAdI Documentation and sample code is provided

SAP HELP

Custom Business Object



Product Information Extended

YY1_PRODUCTINFORMATIONEXTE

Published

Nodes

PRODUCTINFORMATIONEXTE

Fields of PRODUCTINFO...

	Label	Identifier	Type	Key
○	Description	SAP_Descriptio	Text	□
○	Product Origin	ProductOrigin	Text	□
○	Purchase Price	PurchasePrice	Amount ...	□
○	Sales Price	SalesPrice	Amount ...	□
○	Product ID	ProductID	Numeric...	☑

Properties

Tooltip:

Length:

Decimals:

Code List:

Business Object:

- Create your own business objects and thus the corresponding database table
- Generate Create and Update OData services for your custom business objects
- Implement custom logic in your custom business object
- Generate your own UI for your custom business object

SAP HELP

Data privacy policy for Custom Fields and Custom Business Object

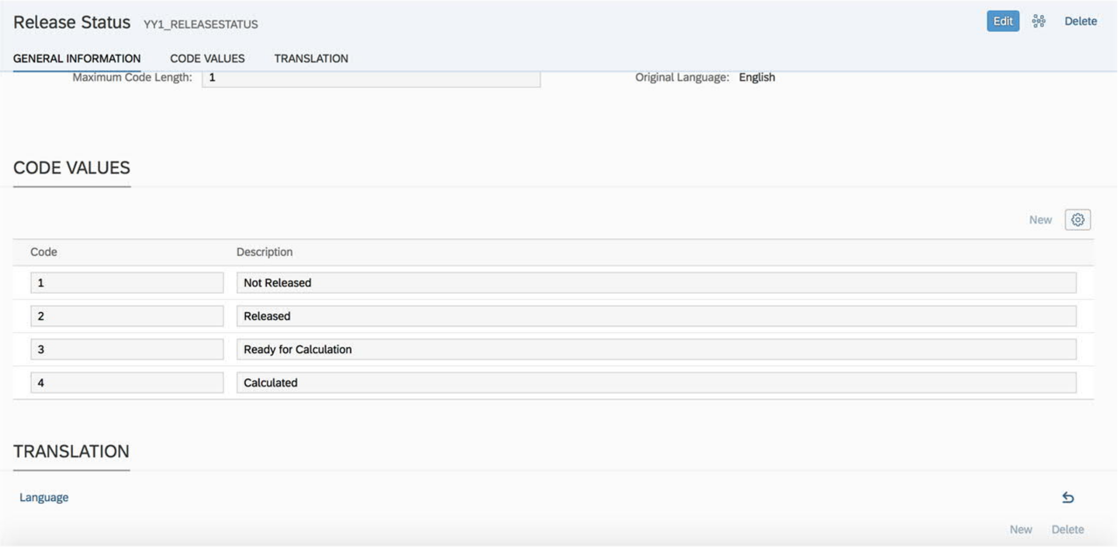
Custom fields and custom business objects cannot be marked as relevant for Data Protection & Privacy (DP&P) and cannot be blocked or deleted. Please don’t store DP&P relevant content in custom fields or custom business objects

Custom Fields:
https://help.sap.com/viewer/f544846954f24b9183eddadcc41bdc3b/1805.500/en-US/57909455bf7c4fdd8bcf48d76c1eae33.html

Custom Business Object:
https://help.sap.com/viewer/f544846954f24b9183eddadcc41bdc3b/1805.500/en-US/b45696ca0d9143cba040797e9c71aa44.html

Custom Reusable Elements

Custom Code List



Release Status YY1_RELEASESTATUS

Maximum Code Length: 1

Original Language: English

CODE VALUES

Code	Description
1	Not Released
2	Released
3	Ready for Calculation
4	Calculated

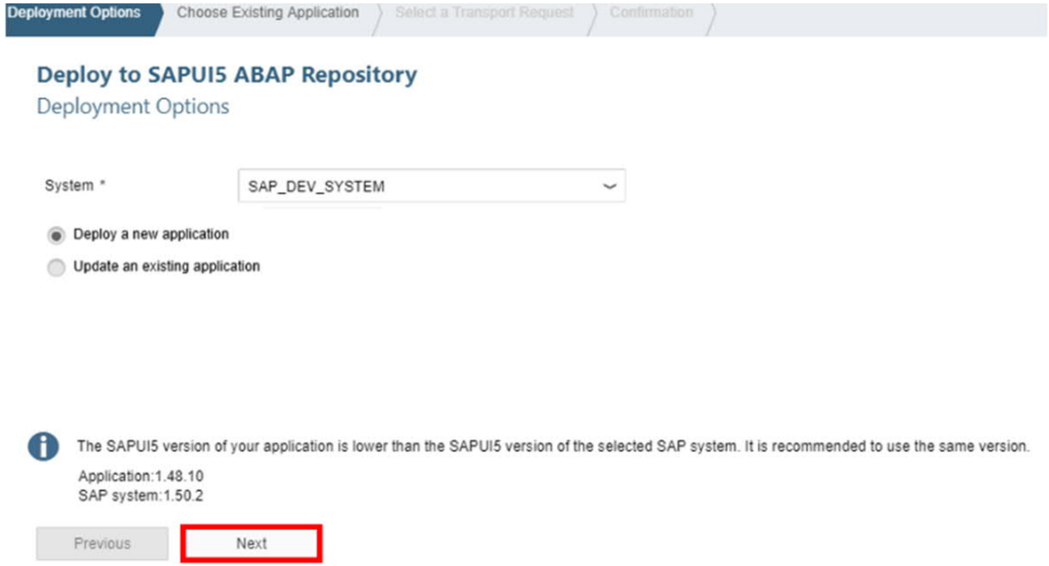
TRANSLATION

Language

- You can reuse a code list in several custom business objects
- A code list consists of code values (example: enUS) and code value descriptions (example English (US))
- After a code list hast been transported, you cannot modify or delete code values anymore
- Code values descriptions can be translated

Blog Entry

Create a custom user interface in SAP S/4HANA Cloud



Deploy to SAPUI5 ABAP Repository

Deployment Options

System * SAP_DEV_SYSTEM

● Deploy a new application

○ Update an existing application

The SAPUI5 version of your application is lower than the SAPUI5 version of the selected SAP system. It is recommended to use the same version.

Application:1.48.10
SAP system:1.50.2

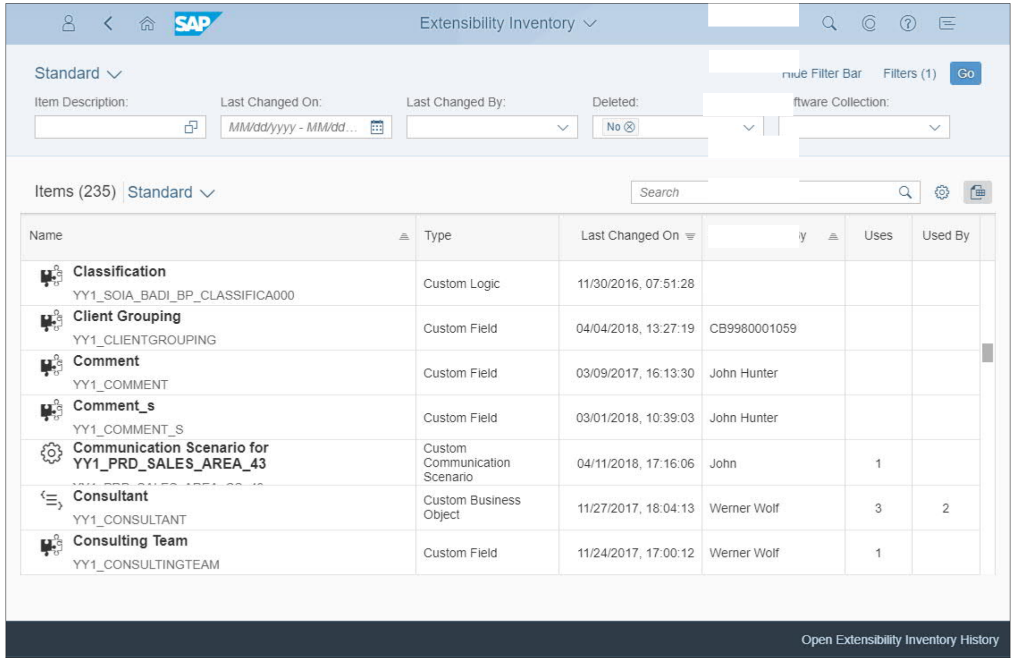
- Create you own custom user interface using SAP Web IDE service of the SAP Cloud Platform
- Deploy your UI back to the SAPUI5 ABAP Repository of SAP S/4HANA Cloud
- Step by step tutorial: https://www.sap.com/developer/tutorials/abap-custom-ui-tile.html

Extensibility Inventory Application

Extensibility Inventory

321

Items



Item Description:

Last Changed On: MM/dd/yyyy - MM/dd…

Last Changed By:

Deleted: No

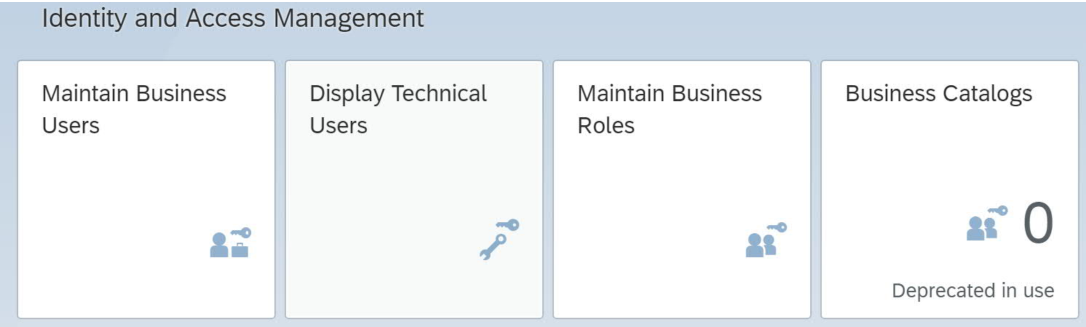
ftware Collection:

Items (235) Standard

Name	Type	Last Changed On	y	Uses	Used By
Classification YY1_SOIA_BADI_BP_CLASSIFICA000	Custom Logic	11/30/2016, 07:51:28			
Client Grouping YY1_CLIENTGROUPING	Custom Field	04/04/2018, 13:27:19	CB9980001059		
Comment YY1_COMMENT	Custom Field	03/09/2017, 16:13:30	John Hunter		
Comment_s YY1_COMMENT_S	Custom Field	03/01/2018, 10:39:03	John Hunter		
Communication Scenario for YY1_PRD_SALES_AREA_43	Custom Communication Scenario	04/11/2018, 17:16:06	John	1	
Consultant YY1_CONSULTANT	Custom Business Object	11/27/2017, 18:04:13	Werner Wolf	3	2
Consulting Team YY1_CONSULTINGTEAM	Custom Field	11/24/2017, 17:00:12	Werner Wolf	1	

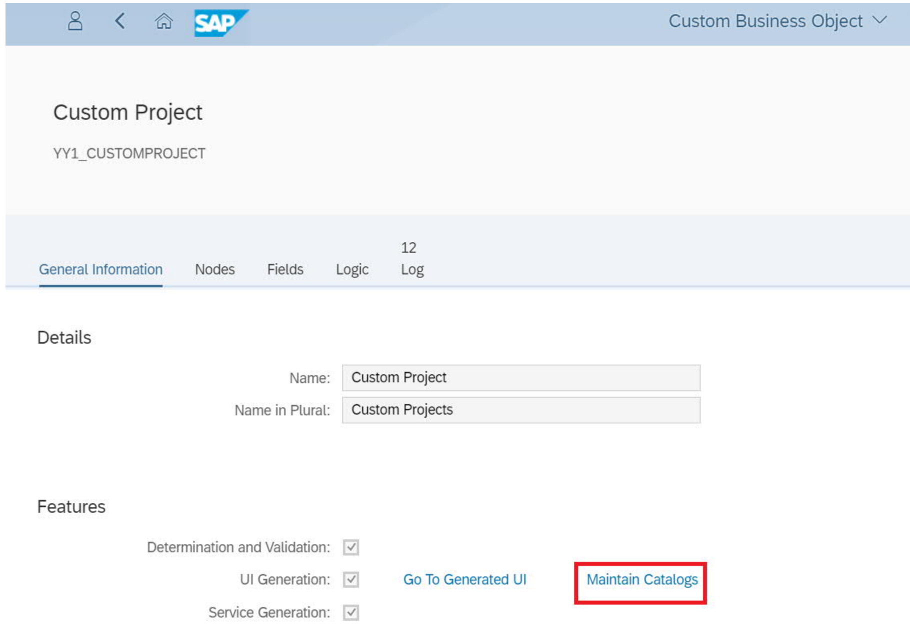
- Display an overview of your extensibility items and view associations or dependencies between various extensibility items
- See how importing or exporting extensibility items affect other extensibility items

Roles and Authorizations



Identity and Access Management

Maintain Business Users	Display Technical Users	Maintain Business Roles	Business Catalogs 0 Deprecated in use



Custom Project

YY1_CUSTOMPROJECT

Details

Name: Custom Project

Name in Plural: Custom Projects

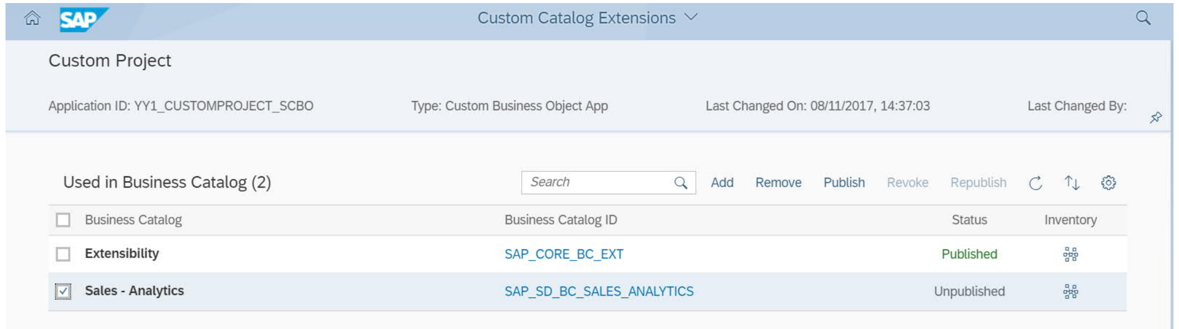
Features

Determination and Validation: ☑

UI Generation: ☑ Go To Generated UI Maintain Catalogs

Service Generation: ☑

- Access to extension objects can be restricted by associating them to Catalogs
- This can be done for Custom Business Objects, Custom UI and Custom Analytical Queries
- Roles and Catalogs can be maintained using Identity and Access Management applications



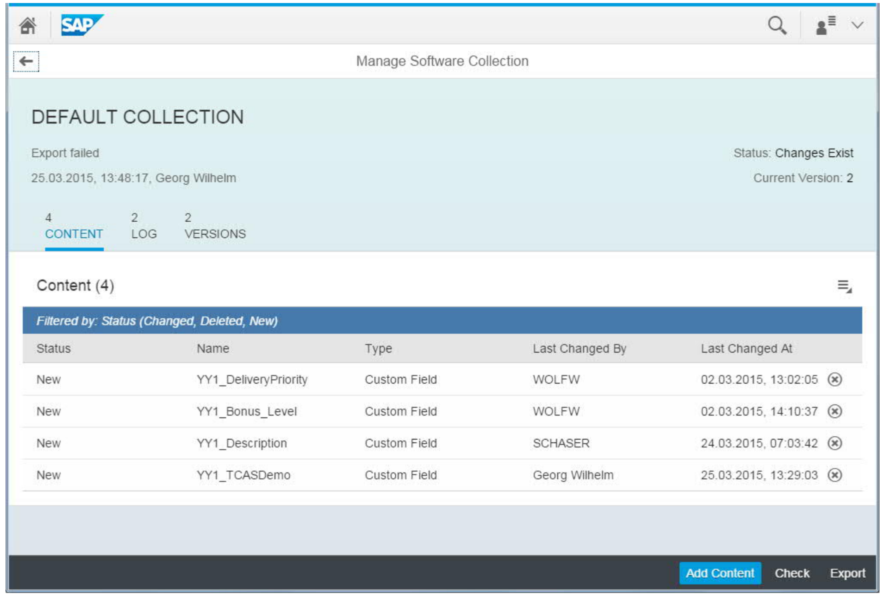
Custom Project

Application ID: YY1_CUSTOMPROJECT_SCBO Type: Custom Business Object App Last Changed On: 08/11/2017, 14:37:03 Last Changed By:

Used in Business Catalog (2)

□	Business Catalog	Business Catalog ID	Status	Inventory
□	**Extensibility**	SAP_CORE_BC_EXT	Published	
☑	**Sales - Analytics**	SAP_SD_BC_SALES_ANALYTICS	Unpublished	

In-app Extensibility – Lifecycle Management



Manage Software Collection

DEFAULT COLLECTION

Export failed

25.03.2015, 13:48:17, Georg Wilhelm

Status: Changes Exist

Current Version: 2

4 CONTENT 2 LOG 2 VERSIONS

Content (4)

Filtered by: Status (Changed, Deleted, New)

Status	Name	Type	Last Changed By	Last Changed At
New	YY1_DeliveryPriority	Custom Field	WOLFW	02.03.2015, 13:02:05
New	YY1_Bonus_Level	Custom Field	WOLFW	02.03.2015, 14:10:37
New	YY1_Description	Custom Field	SCHASER	24.03.2015, 07:03:42
New	YY1_TCASDemo	Custom Field	Georg Wilhelm	25.03.2015, 13:29:03

Key User Fiori App for transport of custom objects (Cloud): *Manage Software Collection* and *Import Software Collection*

Public Cloud

SAP updates:

- All extensibility capabilities offered to customers must continue to work after an SAP software update without manual work;
- in other words: SAP software updates do not depend on adaptations by the customer.

Transport of custom objects:

- transport from the test to the production system
- performed by the key user without interaction with the service provider
- outside of the maintenance window of the service provider.

On Premise

- Customer manages SAP updates and customer transport with “classical” transport tools (correction and transport system, CTS)

Thank you.

THE BEST RUN SAP